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MITSUBISHI ELECTRIC

MITSUBISHI CNC

HANDBOOK

M800/M80/E80/C80 Series

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I Alarms

1 Operation Errors (M)

M00 Aux ax dog overrun 0001

Details

When executing dog-type reference position, the zero point return speed is too fast or the dog length is too short.

Remedy

- Lower the zero point return speed or increase the dog length.

M00 Aux ax R-pnt direction illegal 0003

Details

When executing reference position return, the axis was moved in the opposite of the designated direction.

Remedy

- Move the axis in the correct direction.

M00 Aux ax external interlock 0004

Details

The axis interlock function is valid.

Remedy

- Cancel the interlock signal.

M00 Aux ax internal interlock 0005

Details

An interlock was established by the servo OFF function.

Remedy

- Cancel the servo OFF.

M00 Aux ax soft limit 0007

Details

The stored stroke limit was reached.

Remedy

Check the stored stroke limit setting and machine position.

M00 Aux ax R ret invld at abs alm 0024

Details

Reference position return was executed during an absolute position alarm.

Remedy

- Initialize the absolute position reference point and then fix the absolute position coordinates.

M00 Aux ax R ret invld at ini 0025

Details

Reference position return was executed during absolute position initial setting.

Remedy

Initialize the absolute position reference point and then fix the absolute position coordinates.

M01 Dog overrun 0001

Details

When returning to the reference position, the near-point detection limit switch did not stop over the dog, but overran the dog.

Remedy

- Increase the length of the near-point dog.
- Reduce the reference position return speed.

M01 Some ax does not pass Z phase 0002

Details

One of the axes did not pass the Z-phase during the initial reference position return after the power was turned ON.

Remedy

- Move the detector one rotation or more in the opposite direction of the reference position, and repeat reference position return.

M01 R-pnt direction illegal 0003

Details

When manually returning to the reference position, the return direction differs from the axis movement direction selected with the AXIS SELECTION key.

Remedy

- The selection of the AXIS SELECTION key's +/- direction is incorrect. The error is canceled by feeding the axis in the correct direction.

M01 External interlock axis exists 0004

Details

The external interlock function has activated (the input signal is "OFF") and one of the axes has entered the interlock state.

Remedy

- As the interlock function has activated, release it before resuming operation.
- Correct the sequence on the machine side.
- Check for any broken wires in the "interlock" signal line.

M01 Internal interlock axis exists 0005

Details

The internal interlock state has been entered.
The absolute position detector axis has been removed.
A command for the manual/automatic simultaneous valid axis was issued from the automatic mode.
The manual speed command was issued while the "tool length measurement 1" signal is ON.
A travel command has been issued to an inclined axis whose base axis is in control axis synchronization across part systems.
Selected an axis other than the 1st axis when the manual speed command was issued.
A travel command has been issued to an axis stopped by the collision detection function.
Positioning or interpolation command was issued during the spindle-mode rotary axis control mode.

Remedy

- The servo OFF function is valid, so release it first.
- An axis that can be removed has been issued, so perform the correct operations.
- The command is issued in the same direction as the direction where manual skip turned ON, so perform the correct operations.
- During the manual/automatic simultaneous mode, the axis commanded in the automatic mode became the manual operation axis. Turn OFF the "manual/automatic valid" signal for the commanded axis.
- Turn ON the power again, and perform absolute position initialization.
- Turn OFF the "tool length measurement 1" signal to start the program by the manual speed command.
- Cancel the control axis synchronization across part systems, then issue a travel command to the inclined axis.
- Select the 1st axis of each part system when issuing the manual speed command.
- Cancel the collision detection alarm.
- Check the program after cancelling the error by reset.

M01 H/W stroke end axis exists 0006

Details

The stroke end function has activated (the input signal is "OFF") and one of the axes is in the stroke end status.

Remedy

- Move the machine manually.
- Check for any broken wires in the "stroke end" signal line.
- Check for any limit switch failure.

M01 S/W stroke end axis exists 0007

Details

The stored stroke limit I, II, IIB or IB function has activated.

Remedy

- Move the machine manually.
- Correct any setting error of the parameters for the stored stroke limit.

M01 Chuck/tailstock stroke end ax 0008

Details

The chuck/tail-stock barrier function turned ON, and an axis entered the stroke end state.

Remedy

- Reset the alarm with reset, and move the machine in the reverse direction.

M01 Ref point return No. invalid 0009

Details

2nd reference position return was performed before 1st reference position return has been completed.

Remedy

- Execute 1st reference position return.

M01 Illegal op in mid pt sg block 0013

Details

The operation mode was changed to MDI during single block stop at the middle point of G28/G29/G30.

Remedy

- Change the operation mode.
- Reset to clear the alarm.

M01 Sensor signal illegal ON 0019

Details

The sensor signal was already ON when the tool measurement mode (TLM) signal was validated.
The sensor signal turned ON when there was no axis movement after the tool measurement mode (TLM) signal was validated.
The sensor signal turned ON at a position within 100 μm from the final entry start position.

Remedy

- Turn the tool measurement mode signal input OFF, and move the axis in a safe direction.
- Disabling the sensor signal also clears the operation alarm.

(Note) When the "tool length measurement 1" signal is disabled, the axis can be moved in either direction. Pay attention to the movement direction.

M01 Ref point retract invalid 0020

Details

Reference position retract was performed while the coordinates had not been established.

Remedy

- Execute reference position return.

M01 Tool ofs invld after R-pnt 0021

Details

Reference position return had been performed during the tool retract and return, which invalidated the tool compensation amount after the reference position return.

Remedy

- The error is cleared if the operation mode is changed to other than reference position return before the axis performs reference position return.
- The error is cleared when the tool return is completed.
- The error is cleared if reset 1 is input or the emergency stop button is pushed.

M01 R-pnt ret invld at abs pos alm 0024

Details

A reference position return signal was enabled during an absolute position detection alarm.

Remedy

- Reset the absolute position detection alarm, and then perform the reference position return.

M01 R-pnt ret invld at zero pt ini 0025

Details

A reference position return signal was input during zero point initialization of the absolute position detection system.

Remedy

- Complete the zero point initialization, and then perform reference position return.

M01 High-accuracy skip disabled 0028

Details

The drive unit's hardware or software does not conform to the high-accuracy skip.

Remedy

- The software or hardware does not conform to the function. Contact service center.

M01 Hi-ac skip coord retrieval err 0029

Details

Failed to retrieve the skip coordinate value from the drive unit.

Remedy

- Check the wiring.
- Check the parameters.

M01 Now skip on 0030

Details

The "skip input" signal remains enabled when the operation has shifted from skip retract to measurement.

Remedy

- Increase the skip retract amount.

M01 No skip 0031

Details

Even though the 1st skip was to the correct position, the 2nd skip could not be found.

Remedy

- Check whether the measurement target has moved.

M01 Rtn dir err in manual measure 0033

Details

Return direction in manual measurement is the opposite of the parameter setting.

Remedy

- Check the setting of the parameter "#2169 Rtn dir err in manual measure" (Return direction in manual measurement).
- Move the axis manually in the direction to a safe position, then reset.

M01 No specifications 0036

Details

The specification is not supported.

Remedy

- Check the specifications.

M01 Chopping axis R-pnt incomplete 0050

Details

Chopping mode has been entered while the chopping axis has not completed reference position return. All axes interlock has been applied.

Remedy

- Reset the NC or disable the "chopping" signal, and then carry out the reference position return.

M01 Synchronous error excessive 0051

Details

The synchronization error of the master and slave axes exceeded the allowable value under synchronous control.
A deviation exceeding the synchronization error limit value was found with the synchronization deviation detection.

Remedy

- Select the correction mode and move one of the axes in the direction in which the errors are reduced.
- Check the parameter "#2024 synerr".
- Increase the allowable value or reset it to "0" (check disabled).
- When using simple C-axis synchronous control, set the contents of the R2589 register to "0".

M01 No spindle select signal 0053

Details

Synchronous tapping command was issued when the spindle select signals (SWS) for all spindles were OFF in the multiple-spindle control II.

Remedy

- Turn ON the spindle select signal (SWS) responding to the tapping spindle before performing the synchronous tapping command.

M01 No spindle serial connection 0054

Details

Synchronous tapping command was issued when the spindle that the spindle select signal (SWS) was ON was not serially connected in the multiple-spindle control II.

Remedy

- Make sure the spindle select signal (SWS) for the responding spindle is ON.
- Consider the machine construction when issuing the command.

M01 Spindle fwd/rvs run para err 0055

Details

Asynchronous tapping command was issued when M code of the spindle forward/reverse run command, set by the parameter "#3028 sprcmm", was one of the followings in the multiple-spindle control II.

- M0, M1, M2, M30, M98, M99, or M198
- M code No. that commands to enable/disable the "macro interrupt" signal

Remedy

- Correct the parameter "#3028 sprcmm" (Tap cycle spindle forward run/reverse run M command) setting.

M01 Tap pitch/thread number error 0056

Details

The command for the pitch or the number of threads is not correct in the synchronous tapping command of the multiple-spindle control II.
The pitch is too small for the spindle rotation speed.
Thread number is too large for the spindle rotation speed.

Remedy

- Correct the pitch, number of threads or rotation speed of the tapping spindle.

M01 Wait for tap retract 0057

Details

The axis travel command is interlocked as the tap retract is being enabled.

Remedy

- If tapping is necessary, perform tapping retract in advance. However, tapping retract is not allowed during cycle start operation. Carry out tapping retract after resetting.
- If tapping is not necessary, cancel the tap retract enabled condition by the tap retract enabled cancel signal.

M01 Handle ratio too large 0060

Details

The handle ratio is too large for the handle feed clamp speed.
(The handle feed clamp speed changes according to the rapid traverse rate, external feedrate, maximum speed outside the soft limit range and etc. (or external deceleration speed when external deceleration is valid))
Too large handle ratio means the ratio with which the machine is unable to move the distance of [iunit * handle ratio] within 0.1ms at the clamp speed.

Example)

When iunit=B (0.001mm) and clamp speed cs (mm/min)
The operation error (M01 0060) will occur if
ratio M>cs/60(s)*0.1(ms)/0.001(mm)=cs*10/6.

Remedy

- Change the settings of the handle feed clamp speed or the handle ratio.

M01 R-pos offset value illegal 0065

Details

At the start of reference position initial setting, the parameter "#2034 rfpofs" (Distance-coded reference position detection offset) is not set to "0".

Remedy

- Set the parameter "#2034 rfpofs" to "0", then turn the power ON again to perform the reference position initial setting.

M01 R-pos scan distance exceeded 0066

Details

Reference position could not be established within the maximum scan distance.

Remedy

- Check the scale to see if it has dirt or damage.
- Check if the servo drive unit supports this function.

M01 Illegal op in wk instl err cmp 0070

Details

One of the following operations was attempted during workpiece installation error compensation.

- Manual interruption
- Automatic operation handle interruption
- MDI interruption
- PLC interruption

Remedy

- Return the operation mode to the original mode to remove the cause. During workpiece installation error compensation, manual interruption, automatic operation handle interruption, MDI interruption, PLC interruption, etc. is not allowed.

M01 Illegal op in dia/rad select 0095

Details

An axis used in the following functions is also used as an axis to perform diameter/radius designation selection.

- Chopping
- Synchronization control

Or diameter/radius designation selection (G10.9) was issued to the axis in the above mode.

Remedy

- Check the program.
- Do not carry out the following functions using an axis to perform diameter/radius designation selection.
  - Chopping
  - Synchronization control

M01 No operation mode 0101

Details

[No operation mode]
No operation mode
[Aux ax no operation mode]
The operation mode is not designated, or the operation mode was changed during axis movement.

Remedy

[No operation mode]
- Check for any broken wires in the input mode signal wire.
- Check for any failure of the MODE SELECT switch.
- Correct the sequence program.

[Aux ax no operation mode]
- Correctly designate the operation mode.

M01 Cutting override zero 0102

Details

The "cutting feed override" switch on the machine operation panel is set to"0".
The override was set to "0" during a single block stop.

Remedy

- Set the "cutting feed override" switch to a value other than "0" to clear the error.
- If the "cutting feed override" switch has been set to a value other than "0", check for any short circuit in the signal line.
- Correct the sequence program.

M01 External feed rate zero 0103

Details

[External feed rate zero]
MANUAL FEEDRATE switch on the machine operation panel is set to "0" when the machine is in the JOG or automatic dry run mode.
"Manual feedrate B" is set to "0" during the JOG mode when manual feedrate B is valid.
"Each axis manual feedrate B" is set to "0" during the JOG mode when each axis manual feedrate B is valid.
[Aux ax feedrate 0]
The operation parameter's feedrate setting is zero.The operation parameter feedrate setting is zero. Or, the override is valid, and the override value is zero.

Remedy

[External feed rate zero]
- Set the MANUAL FEEDRATE switch to a value other than "0" to release the error.
- If the MANUAL FEEDRATE switch has been set to a value other than "0" check for any short circuit in the signal line.
- Correct the sequence program.

[Aux ax feedrate 0]
- Set a value other than zero in the feedrate setting or override value.

M01 F 1-digit feed rate zero 0104

Details

The F1-digit feedrate has been set to "0" when the F1-digit feed command was executed.

Remedy

- Set the F1-digit feedrate (the parameter "#1185 spd_F1" (F1 digit feedrate F1) to "#1189 spd_F5" (F1 digit feedrate F5)).

M01 Spindle stop 0105

Details

The spindle stopped during the synchronous feed/thread cutting command.

Remedy

- Rotate the spindle.
- If the workpiece is not being cut, start dry run.
- Check for any broken wire in the spindle encoder cable.
- Check the connections for the spindle encoder connectors.
- Check the spindle encoder pulse.
- Correct the program. (commands and addresses)

M01 Handle feed ax No. illegal 0106

Details

The axis, designated at handle feed, is out of specifications.
No axis has been selected for handle feed.
Multiple axes in a part system are allocated to a handle.

Remedy

- Check for any broken wires in the handle feed axis selection signal line.
- Correct the sequence program.
- Check the number of axes in the specifications.
- Check the axis allocation to the handle.

M01 Spindle rotation speed over 0107

Details

Spindle rotation speed exceeded the axis clamp speed during the thread cutting command.

Remedy

- Lower the commanded rotation speed.

M01 Fixed pnt mode feed ax illegal 0108

Details

The axis, designated in the manual arbitrary feed, is out of specifications.
The feedrate in manual arbitrary feed mode is illegal.

Remedy

- Check for any broken wires in the axis selection signal line or the feedrate line for the manual arbitrary feed mode.
- Check the specifications for the manual arbitrary feed mode.

M01 Block start interlock 0109

Details

An interlock signal has been input to lock the block start.

Remedy

- Correct the sequence program.

M01 Cutting block start interlock 0110

Details

An interlock signal has been input to lock the cutting block start.

Remedy

- Correct the sequence program.

M01 Restart switch ON 0111

Details

Restart switch has been turned ON and manual mode has been selected before the restart search is completed.

Remedy

- Search the block to restart.
- Turn the restart switch OFF.

M01 Program check mode 0112

Details

The cycle start button was pressed during program check or in program check mode.

Remedy

- Press the reset button to cancel the program check mode.

M01 Cycle st. in buffer correct 0113

Details

The cycle start button was pressed during buffer correction.

Remedy

- Press the cycle start button after the buffer correction is completed.

M01 In reset process 0115

Details

The cycle start button was pressed during resetting or tape rewinding.

Remedy

- When rewinding the tape, wait for the winding to end, or press the reset button to stop the winding, and then press the cycle start button.
- During resetting, wait for the resetting to end, and then press the automatic start button.

M01 Playback not possible 0117

Details

The playback switch was turned ON during editing.

Remedy

- Cancel the editing by pressing the input or previous screen key before turning ON the playback switch.

M01 Turn stop in normal line cntrl 0118

Details

The turning angle at the block joint exceeded the limit during normal line control.
In normal line control type I:
The parameter "#1523 C_feed" (Normal line control axis turning speed) has not been set.
In normal line control type II:
When turning in the inside of the arc, the set value for the parameter "#8041 C-rot. R" is larger than the arc radius.

Remedy

- Correct the program.
- Correct the parameter "#1523 C_feed" (Normal line control axis turning speed) setting.
- Correct the parameter "#8041 C-rot. R" setting.

M01 Reverse run impossible 0119

Details

Any of the following conditions are occurring.
a) There is no block to run backward
b) Eight blocks without a travel command continued

Remedy

- Execute forward run to clear the alarm.
- Reset to clear the alarm.

M01 In synchronous correction mode 0120

Details

The synchronous correction mode switch was pressed in non-handle mode.

Remedy

- Select the handle or manual arbitrary feed mode.
- Turn OFF the correction mode switch.

M01 No synchronous control option 0121

Details

The synchronous control operation method was set (with R2589) while no synchronous control option was provided.

Remedy

- Set "0" for "synchronous control operation method".

M01 Computer link B not possible 0123

Details

Cycle start was attempted before resetting was completed.
Computer link B operation was attempted at the 2nd or further part system in a multi-part system.

Remedy

- Perform the cycle start after resetting has been completed.
- Set "#8109 HOST LINK" to "0" and then set to "1" before performing the cycle start.
- Computer link B operation cannot be performed at the 2nd or further part system in a multi-part system.

M01 X/Z axes simultaneous prohibit 0124

Details

The basic axis corresponding to the inclined axis was started simultaneously in the manual mode while the inclined axis control was valid.

Remedy

- Turn the inclined axis and basic axis start OFF for both axes. (This is also applied for manual/automatic simultaneous start.)
- Disable the basic axis compensation, or command it to axes one by one.

M01 Program restart machine lock 0126

Details

Machine lock was applied on the return axis being manually returned to the restart position.

Remedy

- Cancel the machine lock and resume the operation.

M01 Rot axis parameter error 0127

Details

Orthogonal coordinate axis name does not exist.
Rotary axis name does not exist.
A duplicate name is used for the designated orthogonal coordinate axis.
The number of axes that were selected to change tool length compensation along the tool axis amount exceeds the maximum number of axes.
The designated orthogonal coordinate axis name is the same as the rotary axis name.

Remedy

- Correct the rotary axis configuration parameters.

M01 Restart pos return incomplete 0128

Details

Cycle start was performed with an axis whose return to the restart position was not complete.

Remedy

- Perform restart position return manually.
- Validate the parameter "#1302 AutoRP" (Automatic return by program restart), then execute cycle start.

M01 PLC interruption impossible 0129

Details

After the cycle start, the "PLC interrupt" signal was turned ON during buffer correction, program restart, arbitrary reverse run, tool retract and return, high-speed high-accuracy control II, NURBS interpolation or single block stop at the middle point of G28/G29/G30.

Remedy

- By turning OFF the "PLC interrupt" signal, or by resetting the NC the error can be cancelled.

M01 Restart posn return disabled 0130

Details

Restart position return was attempted in a mode where the return is disabled.

Remedy

- Correct the program restart position.

M01 Zero point return interruption 0131

Details

Compound type fixed cycle program was interrupted with manual zero point return, and cycle start was carried out without carrying out reset.

Remedy

- Cancel the program execution by reset.

M01 Excessive no. of reverse block 0133

Details

During the reverse run in arbitrary reverse run, any one of the part systems reverse-ran for 20 blocks.

Remedy

- This error is cancelled by forward run.

M01 Illegal mode in prg check mode 0134

Details

Any of the following modes has been turned ON during the manual arbitrary reverse run mode.

- MDI interruption mode
- Manual/automatic simultaneous valid (MAE1 to 8)
- Arbitrary feed mode (PTP)
- Arbitrary reverse control mode (RVMD)
- Manual speed command enabled
- High-speed simple program check mode (SMLK)

Remedy

- The error can be cancelled by turning OFF the error-causing mode.

M01 Too many active axes per sys 0135

Details

High-accuracy control has been executed in a part system which has 9 or more enabled control axes, except for a slave or synchronous axis.

Remedy

- Reduce the number of enabled control axes (except for a slave axis and synchronous axis) of the part system to 8 or less through synchronous control, control axis synchronization across part systems, or mixed control before executing high-accuracy control.

M01 Pre-intrpl variable accel err 0136

Details

- The parameter "#12060 VblAccPreInt" (Variable-acceleration pre-interpolation acceleration/deceleration ON) is set to "1" and the parameter "#8090 SSS ON" is set to "0".

Remedy

- To enable the variable acceleration pre-interpolation acceleration/deceleration, set the parameter "#8090 SSS ON" to "1".
  To disable the variable acceleration pre-interpolation acceleration/deceleration, set the parameter "#12060 VblAccPreInt" to "0".

M01 Unable to start automatic mode 0137

Details

- Although start of automatic operation is not allowed after a machine groupwise alarm stop ("#1472 mgralmrestart"=0), start of automatic operation has been attempted after the said alarm stop.
- The cycle operation is started with the guide bushing spindle synchronization related spindle is not being set.
- The cycle operation is started while the "G/B spindle synchronization: temporary cancel" signal is turned ON.

Remedy

- Remove the cause of the stop by alarm.
- Set the parameter "#1472 mgralmrestart" (Allowing automatic operation to start after machine groupwise alarm stop) to "1".
- Check the parameter "#3074 GBsp".
- Turning OFF the "G/B spindle synchronization: temporary cancel" signal before starting the cycle operation.

M01 Tool data sorting in progress 0138

Details

Cycle start or graphic check has been attempted during sorting of tool management data.

Remedy

- Execute cycle start after the tool data sorting is completed.
- Execute graphic check after the tool data sorting is completed.

M01 Tolerance control invalid 0139

Details

The parameter "#12066 Tolerance ctrl ON" is set to "1", although "#8090 SSS ON" is "0".

Remedy

- To enable the tolerance control, set "#8090 SSS ON" to "1".
  To disable the tolerance control, set "#12066 Tolerance ctrl ON" to "0".

M01 Ill manualmode select in 3Dcnv 0145

Details

The following unselectable manual mode was selected during 3-dimensional coordinate conversion.

- manual reference position return

Remedy

- Cancel the 3-dimensional coordinate conversion modal.

M01 Start err in PRM rot manu feed 0146

Details

Axis start has been attempted with any of the following operations while the coordinate rotation by parameter for manual feed is enabled.

- Tool retract and return
- Manual tool length measurement
- Manual skip

Remedy

- Turn OFF the "Coordinate rotation by parameter: Coordinate switch for manual feed" signal.

M01 Multiaxes in RRM rot manu feed 0147

Details

Two or more of the three basic axes were started at a time for the coordinate rotation by parameter for manual feed.

Remedy

- Disable the coordinate rotation by parameter for manual feed or start one axis at a time.

M01 Chopping override zero 0150

Details

The override became "0" in the chopping operation.

Remedy

- Check the chopping override (R2503).
- Check the rapid traverse override (R2502).

M01 Command axis chopping axis 0151

Details

A chopping axis movement command was issued from the program during the chopping mode. (This alarm will not occur for the command with the movement amount "0".)
(All axes interlock state will be applied.)

Remedy

- Press the reset button or turn OFF the "chopping" signal. When the "chopping" signal is turned OFF, the axis returns to the reference position and performs the movement command in the program.

M01 Bottom dead center pos. zero 0153

Details

The bottom dead center position is set to the same position as the upper dead center position.

Remedy

- Correct the bottom dead center position.

M01 Chopping disable for handle ax 0154

Details

Chopping has been attempted while the chopping axis is selected as the handle axis.

Remedy

- Select an axis other than the chopping axis as the handle axis, or start chopping after changing the mode to the other mode.

M01 Dir cmnd mode invalid 0157

Details

- The drive unit's software or hardware does not conform to the direct command mode.
- Inclined axis control is active.
- Control axis synchronization across part system is active.
- Control axis superimposition was activated during direct command mode.

Remedy

- The software or hardware does not conform to the function. Contact service center.
- Turn the inclined axis control valid signal OFF.
- Turn the synchronous control request signal OFF.
- Turn the superimposition control request signal OFF.

M01 Dir cmnd mode restart invalid 0158

Details

•Cycle start was carried out without reset after the retract in direct command mode.

Remedy

•Finish the machining for now by resetting the NC.

M01 No speed set out of soft limit 0160

Details

[No speed set out of soft limit]

The axis, without any maximum speed outside of the soft limit range set, was returned from the outside of the soft limit range.

[Aux ax sta No. illegal]

A station No. exceeding the No. of indexed divisions was designated.

Remedy

[No speed set out of soft limit]

•Correct the parameter "#2021 out_f" (Maximum speed outside soft limit range) setting.

•Correct the soft limit range (with the parameter "#2013 OT-" (Soft limit I-) and "#2014 OT+" (Soft limit I+)).

[Aux ax sta No. illegal]

•Correctly designate the station No.

M01 Aux ax R-pnt ret incomplete 0161

Details

Automatic/manual operation was started before reference position return was executed with the incremental system.

Remedy

•Execute the reference position return.

M01 Aux abs position initializing 0162

Details

The start signal was input while initializing the absolute position reference point.

Remedy

•Complete the absolute position reference point initialization.

M01 Aux ax abs position error 0163

Details

The start signal was input during an absolute position alarm.

Remedy

•Initialize the absolute position reference point and then fix the absolute position coordinates.

M01 Aux ax arbitrary positioning 0164

Details

The manual operation mode was started during the random positioning mode.

Remedy

•Turn the random positioning mode OFF before switching to the manual operation mode.

M01 Aux uneven index sta No. ilgl 0165

Details

The commanded station No. was higher than 20 or the number of indexing stations during uneven indexing.

The station No.0 was specified during uneven indexing.

Remedy

•Check the commanded station No. and the parameter "#12801 aux_station" setting.

M01 Aux axis changeover error 0166

Details

One of the following attempts was made on an axis that is switchable between NC axis and auxiliary axis.

•A command intended for an NC axis in manual mode was issued to an auxiliary axis.

•NC axis control select signal was turned OFF while the NC axis was in motion.

•NC axis control select signal was turned ON while the auxiliary axis was in motion.

Remedy

•If you wish to issue a command intended for an NC axis in manual mode, turn ON the NC axis control select signal so as to set the axis as an NC axis.

•Do not change NC axis control select signal while the axis is in motion.

M01 Aux ax torque limit value zero 0167

Details

Torque limit value of the parameter group to use is "0".

Remedy

•Check the torque limit value of the parameter group to use (#12814 aux_TL1, #12824 aux_TL2, #12834 aux_TL3, or #12844 aux_TL4).

M01 Ill. op during T tip control 0170

Details

Illegal operation was attempted during tool tip center control.

Remedy

•Change the operation mode to the previous one and restart.

M01 Illegal op in spline interpol2 0180

Details

Any of the following operations was performed during spline interpolation 2.

•Change to manual mode

•Change to MDI mode

•PLC interruption

Remedy

•Return to the original operation mode, and then remove the error cause.

M01 Illegal OP in tilted face cut 0185

Details

Any of the following illegal operations was attempted during inclined surface machining mode.
- Manual interrupt
- Handle interrupt in automatic operation
- MDI interrupt
- PLC interrupt
- Arbitrary reverse run

Remedy

Switch the operation mode back to the previous to remove the cause of this failure.
- During inclined surface machining mode, it's impossible to perform manual interrupt, handle interrupt in automatic operation, MDI interrupt, PLC interrupt, etc.

M01 5-axis control config. error 0186

Details

The operation you input cannot be executed under the axis configuration of the part system.
- 3D manual feed was attempted.
- The rotation center error compensation has been turned ON.
- The rotary axis is set to the spindle mode of the spindle position control.

Remedy
- Check the rotary axis configuration parameters.
- Correct the axis configuration of the part system.
- Press the reset button to cancel this alarm.

M01 Rotary axis para unswitchable 0187

Details

The rotary axis configuration parameter switch request signal has turned ON for a part system where any of the following modes is active.
- Tool center point control mode
- Inclined surface machining mode
- Workpiece installation error compensation mode
- Tool axis direction tool length compensation mode
- Simple inclined surface machining mode
- 3D radius compensation mode
- 3D manual feed
- Tool handle feed & interruption
- R-Navi mode

Remedy
- Cancel the alarm by NC reset or by turning OFF the rotary axis configuration parameter switch request signal.

M01 Interference check invalidated 0200

Details

The 3D machine interference check is invalidated. This alarm is output to NC alarm 5.

Remedy
- Validate all the interference check settings.
- If there is any axis which has not completed zero point return, establish the zero point first.

M01 Machine interference 1 0201

Details

It was judged that an interference occurred in the No.1 step interference check and caused a deceleration stop.
When machine interference is detected, the interfered part is highlighted (yellow/red) and the part's name is displayed on the 3D monitor's model display.

Remedy
- Move the axis in a direction which does not cause interference.
- Press RESET to cancel the alarm.
- (In manual operation)
  You can move the axis in the same travel direction as before the interference.
  But the axis movement is done using the 2nd step interference check distance.

M01 Machine interference 2 0202

Details

It was judged that an interference occurred in the No.2 step interference check and caused a deceleration stop.
When machine interference is detected, the interfered part is highlighted (red) and the part's name is displayed on the 3D monitor's model display.

Remedy
- Move the axis in a direction which doesn't cause interference.
- Press RESET to cancel the alarm.

M01 Tool interfere. check disabled 0205

Details

Tool interference check has been disabled.
This alarm is output to the NC alarm 5.

Remedy
- Turn ON the [Tool check] menu of 3D monitor.
- Set the tool data.
- If you prevent an alarm from being output while the tool interference check is disabled, set "0" in "#11100 3D_MChk_ToolAlm".

M01 Too many simul. control axes 0211

Details

The given command has caused any axis other than those commanded to move. So the total number of axes to move has exceeded the maximum number of simultaneous contour control axes.

Remedy
- Check the maximum number of simultaneous contour control axes of your NC.
- Check the machining program to make sure the total number of axes to move will not exceed the maximum number of simultaneous contour control axes.

M01 Changing prg format disabled 0215

Details

The PFCHR signal has been switched (from ON to OFF or OFF to ON) during automatic operation.

Remedy

- Use G188 to change the program format during automatic operation.

* The warning display is cancelled by changing PFCHR back to the previous state.

M01 Multi ax for 3D manual feed 0230

Details

More than one axis was designated in manual mode while the 3-dimensional manual feed was valid.

Remedy

- Command the manual feed to each axis one by one.

M01 3D manual feed coord sys err 0231

Details

- More than one of the three bits for selecting hypothetical coordinate system was turned ON.
- Virtual coordinate system was selected while the 3-dimensional manual feed was invalidated by the parameter setting.
- The manual tool length measurement or workpiece position measurement is being attempted.

Remedy

- Check the sequence program.
- Enable 3-dimensional tool radius compensation (set the parameter "#7912 NO_MANUAL" to "0").
- Finish the manual tool length measurement or workpiece position measurement.

M01 Illegal op in 3D tool R comp 0232

Details

An illegal operation (such as manual interrupt) was attempted during 3-dimensional tool radius compensation (tool vertical direction compensation).

Remedy

- Operations such as manual interrupt are disabled while 3-dimensional tool radius compensation (tool vertical direction compensation) is being performed.

M01 Coord select w/o 3D man. Feed 0233

Details

Hypothetical coordinate system has been selected although 3D manual feed is not included in the specifications.

Remedy

Turn OFF all the 3D manual feed coordinate system selection signals (including MJCT).

M01 No spec: Rot center error comp 0240

Details

No option of rotation center error compensation is found.

Remedy

- Check the specifications.

M01 Rot center err comp excessive 0241

Details

Compensation amount calculation was excessive, so the amount was clamped by +/- 1mm.

Remedy

- Review the position deviation and angular deviation values.

M01 Unable to start measuring err 0245

Details

You executed cycle start while measurement of rotation center error or workpiece installation error is invalid.

Remedy

Execute cycle start for one part system that is ready for measurement.
Activate memory mode before executing cycle start.

M01 Invalid op mode in err measure 0246

Details

You switched the operation to any mode other than memory during measurement of rotation center error or workpiece installation error.

Remedy

Switch the operation to memory mode.
Manual interruption, automatic operation handle interruption, MDI interruption, etc. are invalid during error measurement.
Execute cycle start after completion or cancel of the measurement.

M01 Machining surface operation disabled 0250

Details

Machining surface operation (selection, indexing or cancel) was attempted while the operation is disabled.

Remedy

- Cancel the other modes so that the inclined surface machining command (G68.2), tool axis direction control (G53.1) and the inclined surface machining cancel command (G69) can be issued.
- Wait until the axes stop completely (until the smoothing for all axes reaches zero).
- Perform operation search for machining programs.

M01 Axs travel n/a in manual index 0251

Details

Moving a rotary axis was attempted during manual machining surface indexing, when a manual operation mode other than handle mode was selected.

Remedy

- Change the operation mode to a handle mode before carrying out the manual surface indexing.

M01 Tool length compensation amt 0 0252

Details

The tool length compensation amount for performing the R-Navi indexing type 2 is 0.

Remedy

- Set the tool length compensation amount for performing the indexing type 2 to a value other than 0.

M01 Feat coord ill w/ multi-handle 0253

Details

Manual feed feature coordinate system was selected while two or more handles were ON.

Remedy

- Manual feed on a feature coordinate system is disabled while two or more handles are enabled (*).
- Press [Manual coord] and select the machine coordinate system.
- Reduce the number of enabled handles (*) to one.
- (*) An enabled handle means the handle for which "Nth handle valid" signal (HSnS) is ON.

M01 No spec: Spatial error comp 0260

Details

The spatial error compensation option is not available.

Remedy

Check the specifications.

M01 Spatial error comp excessive 0261

Details

The compensation amount is outside the setting range.
Due to the calculation of the excessive amount, it is clamped by +/-1mm.

Remedy

Set the compensation amount within the setting range.

M01 Auto backlash adjust illegal 0270

Details

- A measurement condition adjustment or backlash adjustment was attempted to an axis with which automatic backlash adjustment is impossible.
- A measurement condition adjustment or backlash adjustment was attempted even though all the axes had not reached the 1st reference position.
- The operation mode is other than memory mode.
- The slave axis of synchronous control is selected as adjustment axis.
- An attempt has been made to start an adjustment by cycle start.

Remedy

- Check the adjustment axis.
- Start the adjustment after all the axes return to the 1st reference position.
- Check the operation mode.
- Select the master axis of synchronous control as adjustment axis when adjusting the slave axis.
- Start the adjustment by automatic backlash adjustment start signal.

M01 Operating auto backlash adjust 0271

Details

An illegal operation was attempted during measurement condition adjustment or backlash adjustment.

Remedy

- Continue the operation after canceling the measurement condition adjustment and backlash adjustment.

M01 APLC password mismatch 0280

Details

The APLC authentication password is inconsistent.

Remedy

- Contact the machine tool builder.

M01 High-cycle sampling disabled 0290

Details

- The drive unit's hardware or software does not conform to the high-cycle sampling mode.
- High-cycle data are not used even when high-cycle sampling has been set.
- High-cycle sampling was attempted while the axis targeted for high-cycle sampling was moving.
- High-cycle sampling was attempted during speed monitor mode.
- High-cycle sampling was attempted while any of the following operations is being executed: Dog-type zero point return, absolute position setting, synchronous tapping, spindle synchronization, hobbing, tool spindle synchronization IC.

Remedy

- The software or hardware does not conform to the function. Contact service center.
- Set data for high-cycle sampling.
- Execute high-cycle sampling after stopping the axis targeted for high-cycle sampling.
- Execute high-cycle sampling after cancelling the speed monitor mode.
- Execute high-cycle sampling after stopping the currently executed functions.

M01 N/A during high-cycle sampling 0291

Details

- An attempt to activate "Speed monitor mode" was made during the high-cycle sampling mode.
- An attempt to change the gear signal was made during the high-cycle sampling mode.
- An attempt to execute spindle orientation was made during the high-cycle sampling mode.
- Spindle detach was attempted during the high-cycle sampling mode.
- Any of the following operations was attempted during the high-cycle sampling mode: Dog-type zero point return, absolute position setting, spindle/C axis changeover, synchronous tapping, spindle synchronization, hobbing, or tool spindle synchronization IC.

Remedy

- Change the speed monitor mode signal back, finish high-cycle sampling, and then select the speed monitor mode.
- Change the gear signal back, finish high-cycle sampling, and then change the gear.
- Change the spindle orientation signal back, finish high-cycle sampling, and then execute orientation.
- Change the spindle detach signal back, finish high-cycle sampling, and then carry out spindle detachment.
- Execute the operation after terminating high-cycle sampling.

M01 Invalid cmd during param write 0292 (Axis name)

Details

A function which is unavailable during parameter write was commanded.
- Spindle/C axis changeover
- Speed observation mode signal ON
- High-speed synchronous tapping
- PLC axis indexing

Remedy

- Cancel the write of the parameter.
- Command the following functions after the parameter write is completed.
  - Spindle/C axis changeover
  - Speed observation mode signal ON
  - High-speed synchronous tapping
  - PLC axis indexing

M01 SP orient. Z detection error 0301

Details

Z phase detection has failed to be completed during execution of proximity-switch orientation.

Remedy

- Check for a failure of the proximity switch.

M01 Illegal movement command during superimposition 1003

Details

- A machine command was issued to the superimposing axis.
- Reference position return was attempted on the superimposing axis.
- Skip command was issued to the master or superimposing axis.
- Dog-type reference position return was attempted on the master axis.

Remedy

- Correct the program.

M01 Superimposition command illegal 1004

Details

- Superimposition start command was issued to the axis which is executing the following functions.
  Synchronization control
  Milling interpolation
  Feed-forward thread cutting control
- Superimposition start command was issued to the axis which was under superimposition control.
- The superimposition command was issued to an axis that belongs to the same part system as a basic or synchronous axis of synchronization across part systems.

Remedy

- Correct the program.
- Turn OFF the feed-forward control request signal.

M01 G114.n command illegal 1005

Details

G114.n has been commanded during the execution of G114.n.
G51.2 has been commanded when G51.2 spindle-spindle polygon machining mode has been already entered at another part system.
Multiple spindle synchronization set command is illegal.

Remedy

- Command G113 to cancel the operation.
- Turn ON the "spindle synchronization cancel" signal (Y18B8: SPSYC) to cancel the operation.
- Command G50.2 to cancel the operation.
- Turn ON the "spindle-spindle polygon cancel" signal (YCD1) to cancel the operation.
- Correct the program.

M01 Spindle in-use by synchro tap 1007

Details

The spindle is being used in synchronized tapping.

Remedy

- Cancel the synchronized tapping.

M01 GB spindle synchro signal OFF 1014

Details

- A forward run, reverse run, orientation, synchronous tapping, spindle synchronization, tool spindle synchronization I, tool spindle synchronization II or C-axis servo ON command was issued to the reference spindle while the guide bushing spindle synchronization signal was OFF.
- The guide bushing spindle synchronization signal was turned OFF during a forward run, reverse run, orientation, synchronous tapping, spindle synchronization, tool spindle synchronization I, tool spindle synchronization II or C-axis servo ON command.
- Orientation was commanded during the "guide bushing spindle synchronization" signal ON with spindle zero point detection with proximity switch and turret indexing enabled.
- C axis servo ON was commanded during the "guide bushing spindle synchronization" signal ON with spindle C axis parameter change enabled.

Remedy

- Check the ladder program.
- Check the parameters.

M01 GB SP sync:Spindle type error 1015

Details

- An analog spindle analog spindle is used for the master spindle or the guide bushing spindle.
- Spindle-mode servo is used for the master spindle or the guide bushing spindle.
- Turret gear change control valid spindle is used for the master spindle or the guide bushing spindle.

Remedy

- Check the parameters.
- Change the reference spindle or the guide bushing spindle to spindle drive unit.
- Change the reference spindle or the guide bushing spindle to turret gear change control invalid.

M01 GB SP sync:Phase mem sgnl ilgl 1021

Details

- The guide bushing spindle synchronization phase memory signal was turned ON while the master spindle or guide bushing spindle was rotating.
- The guide bushing spindle synchronization phase memory signal was turned ON while the guide bushing spindle synchronization signal was OFF.

Remedy

- Check the ladder program.

M01 GB SP sync:Phase set sgnl ilgl 1022

Details

- The guide bushing spindle synchronization phase alignment signal was turned ON while the master spindle or guide bushing spindle was stopped.

Remedy

- Check the ladder program.

M01 GB SP sync:Z phase not pass 1023

Details

- When the guide bushing spindle synchronization phase memory signal was ON, the master spindle or guide bushing spindle's Z-phase was not passed.

Remedy

- Check the ladder program.

M01 Cmnd impsbl in spindle rtry ax 1024

Details

Toward the synchronous tapping spindle, the switch to servo-mode is commanded to the spindle-mode rotary axis.
The spindle-mode rotary axis in servo-mode is commanded as the synchronous tapping spindle.

Remedy

Switch to the spindle-mode rotary axis.

M01 Other cmnd disabled in orient. 1025

Details

- Spindle superimposition control command has been given to an orientation mode spindle with the said spindle treated as either the basic or superimposed spindle.
- Orientation command has been given to the basic or superimposed spindle that is under spindle superimposition control.

Remedy

- Cancel the orientation mode.
- Use G113 or the "Spindle sync cancel" signal to cancel spindle superimposition.

M01 SP-C ax ctrl runs independntly 1026

Details

C axis mode command has been issued for polygon machining spindle.
C axis mode command has been issued for synchronized tapping spindle.
Polygon command has been issued for synchronized tapping spindle.
Spindle is being used as spindle/C axis.

Remedy

- Cancel the C axis command.
- Cancel the polygon machining command.
- Cancel the C axis with servo OFF.

M01 Thread recutting impossible 1027

Details

- The lead axis for thread recutting is not present in a thread recut enabled part system.
- A variable lead thread cut command has been given in the first thread cut block of thread recutting.

Remedy

- Thread recutting is not supported. Disable thread recutting or press RESET to cancel the alarm, and correct the program.

M01 Thread recutting data illegal 1028

Details

The lead axis and spindle for thread cutting are different from those predetermined.

Remedy

- Disable thread recutting or press RESET to cancel the alarm, and correct the settings of lead axis and spindle.

M01 Variable speed thread disabled 1029

Details

- "#8045 Varying spd thread" has been set to "1" to issue a variable speed thread cut command even though the function is not included in the specifications.
- A variable speed thread cut command has been given while the feed axis acceleration/deceleration type is soft acceleration/deceleration.
- A variable speed thread cut command has been given while the spindle encoder signal is not sent via serial input.
- A variable speed thread cut command has been given even though the spindle, lead axis or plane composing axes are controlled by drive other than MDS-E Series.
- The spindle intended for thread cutting is executing synchronous tapping, spindle synchronization, guide bushing spindle synchronization or spindle/C axis control.

Remedy

- Check the specifications.
- Check the parameters.
- Check the program.
- Check the Encoder selection signal (R register).

M01 Synchronization mismatch 1030

Details

Different M codes were each commanded as synchronization M code in each of the two part systems.
Synchronization with the "!" code was commanded in another part system during M code synchronization.
Synchronization with the M code was commanded in another part system during synchronization with the "!" code.

Remedy

- Correct the program so that the M codes match.
- Correct the program so that the same synchronization codes are commanded.

M01 Multiple C axes select invalid 1031

Details

The "C axis selection" signal has been changed when the multiple C axes selection is not available.
The selected axis by the "C axis selection" signal cannot be controlled for the multiple C axes selection.

Remedy

- Correct the parameter settings and program.

M01 Tap retract Sp select illegal 1032

Details

Tap retract has been executed with a different spindle selected. Cutting feed is in wait state until synchronization is completed.

Remedy

- Select the spindle for which tap cycle was halted before turning ON the "tap retract" signal.

M01 Sp-Sp polygon cut interlock 1033

Details

Cutting feed is in wait state until synchronization is completed.

Remedy

- Wait for the synchronization to end.

M01 Mixed sync ctrl prmtr illegal 1034

Details

There is a mistake in the settings of mixed control axis parameters (crsax [1] to [8]).
Mixed control was attempted within one and the same part system.
Any of the parameter settings is disabling mixed control.

Remedy

- Check the parameter settings for mixed synchronization control.

M01 Mixed sync ctrl disable modal 1035

Details

Mixed synchronization control was commanded for a part system in which mixed synchronization control is disabled as shown below.

- During nose R compensation mode
- During pole coordinate interpolation mode
- During cylindrical interpolation mode
- During balance cut mode
- During fixed cycle machining mode
- During facing turret mirror image
- During constant surface speed control mode
- During hobbing mode
- During axis name switch
- During interference check III alarm (interference detection, interference alarm area intrusion or interference warning area intrusion)

An axis was transferred to another part system, and mixed control was attempted with the part system's maximum number of control axes exceeded.
An axis was removed from the part system, and mixed control was attempted with the part system's number of axes zero.
Another axis exchange was attempted to the axis which was already transferred to another part system for mixed control.
Mixed control was attempted with an axis of a part system not in automatic operation.

Remedy

- Correct the program.

M01 Synchro ctrl setting disable 1036

Details

"Synchronous control operation method" was set (with R2589) when the mode was not the C axis mode.
"Synchronous control operation method" was set (with R2589) in the zero point not set state.
Mirror image is disabled.
External mirror image or parameter mirror image was commanded during facing turret mirror image.
You have set the "Synchronous control operation method" (R2589) of multiple axis synchronization, although the multiple axis synchronization control cannot be used.

Remedy

- Set the contents of the R2589 register to "0".
- Correct the program and parameters.

M01 Synchro start/cancel disable 1037

Details

Synchronous control start/cancel command was issued when the start/cancel is disabled.

Remedy

- Correct the program and parameters.

M01 Move cmnd invld to synchro ax 1038

Details

A travel command was issued to a synchronous axis in synchronous control.

Remedy

- Correct the program.

M01 No spindle speed clamp 1043

Details

- When the parameter "#1146 Sclamp" has been set to "1", the constant surface speed command (G96) was issued to the spindle which is not selected for the spindle speed clamp command (G92/G50) under Multiple spindle control II.
- When the parameter "#1146 Sclamp" has been set to "0", both the G96 (Constant surface speed control ON) modal and the pindle forward or reverse rotation signal have turned ON for the spindle, on which the speed clamp command is disabled.

Remedy

Press the reset key and carry out the remedy below.

- Issue the G92/G50 command to the spindle that is to be used for the constant surface speed control.

M01 Cont ax superimpos II prm illg 1044

Details

- There is a mistake in the setting of the superimposition control base axis parameter (#2089 bsax_pl).
- Superimposition control is not available under the current parameter settings.

Remedy

- Correct the parameter.

M01 Sync error btwn part systems 1045

Details

After a single block stop or automatic operation pause was executed during single block stop operation between part systems, cycle start has not been performed on either part system.

Remedy

Perform cycle start for all the part systems where a single block stop or automatic operation pause was executed.

M01 Z detect speed parameter error 1049

Details

Phase-Z detection speed has not been set in "#3109 zdetspd".

Remedy

- Set the phase-Z detection speed in "#3109 zdetspd".

M01 Intrf chck across sys: Set err 1050

Details

Setting of Interference check across part systems is incorrect.

Remedy

- Correct the setting of Interference check across part systems.

M01 Intrf chck across sys: Area AL 1051

Details

Interference is already occurring on the set interfering object.

Remedy

- Turn OFF the interference check valid signal, moving the axis to a position where the interfering objects do not collide each other, and then restart Interference check across part systems.

M01 Intrf check across sys: Alarm 1052

Details

A command has been given that causes the interfering objects to collide each other.

Remedy

- Correct the program.

M01 Interfe chk 0pt return incomp 1053

Details

Interference check between part systems had started while zero point return of the part system set interfering object has not completed.

Remedy

- Turn OFF the interference check valid signal, and complete zero point return in the all part systems set interfering object.

M01 Feed-forward control disabled 1060

Details

Feed-forward control was attempted while any of the following functions was enabled.

- Control axis superimposition I/II
- Control axis synchronization between part systems I/II

Remedy

- Turn OFF the feed-forward control request signal.

M01 Superimposition axis param err 1070

Details

- Cutting feed clamp rate is unspecified for a superimposition-related axis. Or the specified rate is outside the setting range.
  "#2091 plclamp", "#2629 pl3clamp" or "#2630 pl3clamp2"
- Rapid traverse rate is unspecified for a superimposition-related axis.
  Or the specified rate is outside the setting range.
  "#2090 plrapid", "#2621 plrapid2",
  "#2626 pl3rapid", "#2627 pl3rapid2" or "#2628 pl3rapid3"

Remedy

- Set the cutting feed clamp rate of the superimposition-related axis within the setting range.
- Set the rapid traverse rate of the superimposition-related axis within the setting range.

M01 Tool retract & return disabled 1080

Details

Tool retract and return command has been given in any of the following modes:

- Mixed control (Cross axis control) I
- Mixed control (Cross axis control) II
- Control axis synchronization between part systems I
- Control axis synchronization between part systems II
- Control axis superimposition I
- Control axis superimposition II
- Arbitrary axis superimposition control
- Tool spindle synchronization IA (spindle - spindle polygon)
- Tool spindle synchronization IB (spindle - spindle polygon)
- Tool spindle synchronization IC (spindle - NC axis polygon)
- Tool spindle synchronization II (hob)
- Spindle superimposition control

Remedy

Turn OFF the transit point designation signal.

M01 Arbitrary axis unexchangeable 1101

Details

The axis declared in the arbitrary axis exchange command is incapable of being exchanged.

Remedy

- Correct the program (mainly check the processing timing).

M01 Cross control axis exists 1102

Details

A manual travel command has been given to the axis being exchanged when manual interruption is disabled under cross machining control (when "#1435 crsman" = 0).

Remedy

- This error can be cancelled by either one of the following operations.
  1: Cancel the manual travel command
  2: Reset the NC

M01 Arbitrary ax superimp. sys err 1103

Details

- Arbitrary axis superimposition command has been issued in any part system other than the one that contains either the basic or superimposed axis of arbitrary axis superimposition control.
- Arbitrary axis superimposition cancel command has been issued in any part system other than the one that contains the superimposed axis of arbitrary axis superimposition control.

Remedy

- Correct the program so that the arbitrary axis superimposition command is given in an appropriate part system.

M01 Spindle speed fluctuation 1105

Details

The actual spindle speed has fluctuated exceeding the allowable range, while spindle speed fluctuation detection (G162) is active.
The number following "S", which is output together with this alarm, indicates the spindle where speed fluctuations were detected.

Remedy

- Unnecessarily large load may be applied to the spindle during automatic operation.
  Reduce the spindle load.
- To prevent this alarm from being output during spindle speed fluctuation detection (G162), set the parameter #1242 set14 BIT2 to ON.

M01 Sp synchro phase calc illegal 1106

Details

Spindle synchronization phase alignment command was issued while the "phase shift calculation request" signal was ON.

Remedy

- Correct the program.
- Correct the sequence program.

M01 Illegal cmd in SP oscillation 1108

Details

A function that cannot be used with spindle oscillation was commanded during spindle oscillation.

Remedy

- Command the function after finishing spindle oscillation.

M01 SP oscillation cmd illegal 1109

Details

Spindle oscillation was commanded during executing a function that cannot be used with spindle oscillation.

Remedy

- Command spindle oscillation after finishing the function that cannot used with spindle oscillation.

M01 SP oscillation set val illegal 1110

Details

Spindle oscillation was commanded while a value out of range is set as spindle oscillation amplitude or spindle oscillation frequency.

Remedy

- Check the setting values of the amplitude and frequency.

M01 Sub part system I call error 1111

Details

- Sub part system control I command (G122) has been given to a part system where the sub part system I operation mode is deactivated.
- Sub part system control I command (G122) has been given to a part system which is not reserved as the sub part system in M80.

Remedy

- Activate the sub part system I operation mode for the sub part system before issuing G122.
  Part systems marked "SUB" on the monitor screen are under the sub partsystem I operation mode.
- Command the sub part system start to the sub part system which is reserved with "#1483 SBS1_sys num" for M80.

M01 Sub part system II start error 1112

Details

When the sub part system control II has been commanded, no part system is left capable of being activated as a sub part system.

Remedy

- Do not exceed the maximum number of simultaneously activatable sub part systems when commanding G144.
- Set the parameter #1437 SBS2_Spec BIT0 to 0 if you wish to wait until the sub part system becomes capable of being activated.

M01 Constant surface speed rdndnt 1113

Details

- Constant surface speed is commanded from other part system to the spindle that is in the thread/ thread cycle or the tapping cycle/ synchronous tapping cycle.
- To the spindle in constant surface speed control, the thread/ thread cycle or the tapping cycle/ synchronous tapping cycle are commanded from other part system.

Remedy

- Check the program.

M01 Constant torque disabled 1114

Details

- Constant torque control is commanded to the axis which the parameter "#2296 SV096(TQC)" (Constant torque control: Stopper-direction torque) setting is "0".
- Constant or proportional torque stopper control is commanded to the axis which is in movement by automatic or manual operation.
- Constant torque control is canceled to the constant torque control axis in movement by automatic or manual operation.
- Constant torque control is commanded to the proportional torque stopper control axis.
- Constant torque control is commanded again during the axis movement by constant torque control cancel.
- Constant torque control axis is at stroke limit or H/W stroke end.

Remedy

- Check the program.
- Check the sequence program.

M01 P torque stopper disabled 1115

Details

- Proportional torque stopper control is commanded to the axis which the parameter "#2296 SV096(TQC)" (Constant torque control: Stopper-direction torque) setting is "0".
- Proportional torque stopper control is commanded to the axis which is in movement by automatic or manual operation.
- The axis movement is commanded to the axis which is in the proportional torque constant control.
- Proportional torque constant control is commanded again during the axis movement by proportional torque constant control cancel.
- Proportional torque constant control axis is at stroke limit or H/W stroke end.

Remedy

- Check the program.
- Check the sequence program.

M01 Droop cancel disabled 1116

Details

- Constant torque control droop cancel is commanded to the axis which is not in the constant/ proportional torque control.
- Constant torque control droop cancel is commanded to the axis in movement by automatic or manual operation.

Remedy

- Check the program.
- Check the sequence program.

M01 Cmnd disabled in droop cancel 1117

Details

The axis movement by automatic or manual operation is commanded to the axis which the constant torque control droop is being canceled.

Remedy

- Check the program.
- Check the sequence program.

M01 SP equivalent load factor over 1120

Details

The equivalent load factor of the spindle motor has exceeded the set threshold that causes the excess warning.

Remedy

- Change the operation pattern in a way that decreases the spindle motor load.

M01 Differential tap cmnd disabled 1131

Details

- Differential speed tap command has been given although any rotation command has not been input to the basic spindle that is under spindle superimposition control.
- Synchronous tap command has been given to the basic spindle that is under spindle superimposition control.

Remedy

- Cancel the synchronous tapping cycle.

M01 Spd clamp in differential tap 1132

Details

- A tap cycle or synchronous tap cycle command given to the superimposed spindle has caused the spindle's actual rotation speed to exceed the spindle clamp speed.

Remedy

- Correct the spindle rotation speed in synchronous tap cycle.

M01 Constant surface spd disabled 1133

Details

- A constant surface speed control command has been given to the basic or superimposed spindle during differential speed tapping under spindle superimposition control.
- A differential speed tapping command has been issued while constant surface speed control is executed on the basic or superimposed spindle that is under spindle superimposition control.

Remedy

- Cancel the synchronous tap cycle or constant surface speed control.

M01 Spindle sync cancel error 1135

Details

- Spindle synchronization cancel command has been issued during rotation of C axis under spindle sync C axis control.
- G113 (without the address H or D) has been issued during the spindle synchronization for two or more sync sets.

Remedy

- This operation error is cancelled when C axis stops. Issue a spindle sync cancel command after C axis has stopped.
- Use G113D or G113H to cancel the spindle synchronization.

M01 GB SP sync:Cancel sgnl illegal 1137

Details

The guide bushing spindle synchronization temporary cancel signal was turned ON/OFF when the master spindle and the guide bushing spindle were in one of the following modes.

- During rotation (when not stopped)
- During tap cycle synchronization mode
- During spindle synchronization mode
- During tool-spindle synchronization I (polygon machining) mode
- During tool-spindle synchronization II (hobbing) mode
- During spindle C axis control C axis mode
- During orientation/indexing

Remedy

- Check the ladder program.

M01 GB SP sync runs independently 1138

Details

- The reference spindle was commanded as a spindle related to tool spindle synchronization IC (polygon).
- The guide bushing spindle was commanded as a synchronous tapping spindle.
- The guide bushing spindle was commanded as a spindle related to spindle synchronization/tool spindle synchronization I (polygon)/tool spindle synchronization II (hobbing).

Remedy

- Check the program.

M01 Cmds illegal in spindle synchr 1139

Details

Synchronous tapping was issued for the reference spindle or the synchronized spindle during spindle synchronization.

Remedy

- Cancel the synchronous tapping.

M01 Operation non-continuable(STO) 1151

Details

An axis in STO state exists in the part system.

Remedy

- Release the STO state and reset the NC.

M01 Prog check: work posn error 1215

Details

When the NC reset signal is input with the High-speed simple program check: Coordinate position check ON signal (Y76B) set to ON, the workpiece coordinate position is different from the position at the program start.

Remedy

- Correct the machining program.

M01 Prog check: machine posn error 1216

Details

When the NC reset signal is input with the High-speed simple program check: Coordinate position check ON signal (Y76B) set to ON, the machine coordinate position is different from the position at the program start.

Remedy

- Correct the machining program.

M01 NC/PLC axis switch illegal 1250

Details

The following operation was performed to an axis which can be switched over between NC axis and PLC axis.

- PLC axis switchover signal was turned ON or OFF when it was prohibited to switch over the axis.

Remedy

- Make sure the axis switchover status signal is OFF and change the ON/OFF of the axis switchover signal.

M01 No spec: Multi axis synch ctrl 1254

Details

You have set the R register for selecting synchronous control operation method, although the option of multiple axis synchronization control is OFF.

Remedy

- Set 0 in R2589 (Synchronous control operation method selection).

M01 Multiple secondary ax selected 1255

Details

For the multiple axis synchronization control, you selected two or more slave axes without selecting any master axis.

Remedy

- Correct the setting of R2589 (Synchronous control operation method selection).

M03 Interference detection 0001 yyzz

Details

A command has been given that causes two or more objects to interfere with each other.
yy : Interference object definition number (1)
zz : Interference object definition number (2)

Remedy

- Cancel the alarm with reset.
- Disable the interference check III mode first before moving the interfering object further in the interference direction.

M03 Entry in interfere alarm area 0002 yyzz

Details

Two or more interfering objects are in the interference alarm area.
yy : Interference object definition number (1)
zz : Interference object definition number (2)

Remedy

- Disable the interference check III mode before moving.
- Check the interference definition and the interference selection.

M03	**Entry in interfere warn area**	0003	yyzz

Details

A command has been given that causes two or more interfering objects to enter the interference warning area.
yy : Interference object definition number (1)
zz : Interference object definition number (2)

Remedy

- Interfering objects are in the interference warning area.

If an operational problem is expected to occur, stop moving the axes with feed hold, cancellation of manual axis movement or reset.

M03	**Interference data unspecified**	1001	

Details

You attempted to turn ON the interference check III mode with the interfering object data disabled.

Remedy

- Execute the interference data ON command to enable the interference data before turning ON the interference check III mode.

M03	**Interf. 3D objects count error**	1002	

Details

The total number of solid objects used as interfering object has exceeded the maximum.

Remedy

- The total number of interfering solid objects set in the system variable or R register has exceeded the maximum. Correct the setting.

M03	**Interfere check III: time over**	1003	

Details

The allowable process time for interference check III has been exceeded.

Remedy

- Turn OFF the interference check III mode.
- Correct the interfering object definition.

M03	**Interfere: control axis error**	2001	Interference object definition number

Details

In the interfering object definition, the IJK control axes have been set as follows:
- Nonexistent axis name (an axis not set in the base axis specification parameter "#1022 axname2")
- I, J and K axes belong to different part systems
- Rotary axis

Remedy

- Correct the setting of the IJK control axes in the interfering object definition.

M03	**Interf:2 rot axes in cylinder**	2002	Interference object definition number

Details

In the interfering object definition, two or more rotary axes have been set for the cylindrical solid definition No.

Remedy

- Correct the solid designation and the setting of the IJK axis rotation angle in the interfering object definition.

M03	**Interfere:2 rot axes in cuboid**	2003	Interference object definition number

Details

In the interfering object definition, two or more rotary axes have been set for the cuboidal solid definition No.

Remedy

- Correct the setting of the IJK axis rotation angle in the interfering object definition.

M03	**Interfere: rotary axis error**	2004	Interference object definition number

Details

In the interfering object definition, the IJK rotary axes have been set as follows:
- Nonexistent axis name
  (an axis not set in the base axis specification parameter (#1022 axname2))
- Linear axis
- All three axes are rotary axes

Remedy

- Correct the setting of the IJK rotary axes in the interfering object definition.

M03	**Interfere:2 rot axes object er**	2005	Interference object definition number

Details

The solid object set in the interfering object definition is unavailable as an interfering object defined with two rotary axes.

Remedy

- Correct the setting of the solid in the interfering object definition.

M03	**Interfere:1 rot axis object er**	2006	Interference object definition number

Details

The solid object set in the interfering object definition is unavailable as an interfering object defined with one rotary axis.

Remedy

- Correct the setting of the solid in the interfering object definition.

M03	**Interf. selection: offset over**	3001	Interference object definition number

Details

In the interfering object selection, the interfering object model coordinate system offset 1 has exceeded the setting.

Remedy

- Correct the setting of the interfering object model coordinate system offset 1 in the interfering object selection.

M03	**Interf:rot objects comb. error**	3002	Interference object definition number

Details

The following selection was made for the rotary interfering objects:

- You selected a one-rotary-axis object and two-rotary-axis object at a time.
- You selected two or more two-rotary-axis objects.

Remedy

- Correct the setting of the n-th interfering object selection.

M50	**Workpiece offset unreflected**	5000

Details

Any of the following offsets of the selected modal has not been reflected in the workpiece position counter: workpiece offset, extended workpiece offset, external workpiece offset or workpiece shift.

Remedy

The warning is cancelled by any of the following operations.

- Cycle start
- Reset
- Emergency stop

M90 Parameter set mode

Details

The setup parameter lock is released.
Cycle start is disabled when setup parameters can be set.

Remedy

- Refer to the manual issued by the machine tool builder.

M97 Maintenance part activated

Details

Activated maintenance part has not completed the product procedures.

Remedy

- Contact our service center.

2 Stop Codes (T)

T01 Axis in motion 0101

Details

Automatic start is not possible as one of the axes is moving.

Remedy

- Try automatic start again after all axes have stopped.

T01 NC not ready 0102

Details

Automatic start is not possible as the NC is not ready.

Remedy

- Another alarm has occurred. Check the details and remedy.

T01 Reset signal ON 0103

Details

Automatic start is not possible as the "reset" signal has been input.

Remedy

- Turn OFF the "reset" signal.
- Check for any failure of the reset switch which has caused the switch's continuous ON.
- Correct the sequence program.

T01 Auto operation pause signal ON 0104

Details

The feed hold switch on the machine operation panel is ON (valid).

Remedy

- Correct the feed hold switch setting.
- The feed hold switch is B contact switch.
- Fix any broken wires in the feed hold signal line.
- Correct the sequence program.

T01 H/W stroke end axis exists 0105

Details

Automatic start is not possible as one of the axes is at the stroke end.

Remedy

- Manually move any axis whose end is at the stroke end.
- Check for any broken wires in the stroke end signal line.
- Check for any failure in the stroke end limit switch.

T01 S/W stroke end axis exists 0106

Details

Automatic start is not possible as one of the axes is at the stored stroke limit.

Remedy

- Move the axis manually.
- If the axis's end is not at the stroke end, check the parameters.

T01 No operation mode 0107

Details

The operation mode has not been selected.

Remedy

- Select automatic operation mode.
- Check for any broken wires in the signal line for automatic operation mode (memory, tape, MDI).

T01 Operation mode duplicated 0108

Details

Two or more automatic operation modes have been selected.

Remedy

- Check for any short circuit in the mode (memory, tape, MDI) selection signal line.
- Check for any failure in the switch.
- Correct the sequence program.

T01 Operation mode changed 0109

Details

The automatic operation mode has changed to another automatic operation mode.

Remedy

- Return to the original automatic operation mode, and execute automatic start.

T01 Tape search execution 0110

Details

Automatic start is not possible as tape search is being executed.

Remedy

- Wait for the tape search to be completed and then execute the automatic start.

T01 Cycle start prohibit 0111

Details

Automatic start is disabled because restart search is in execution.

Remedy

- Execute automatic start after the restart search is completed.

T01 CNC overheat 0113

Details

Automatic start is not possible because a thermal alarm (Z53 CNC overheat) has occurred.

Remedy

- Temperature of the control unit has exceeded the specified temperature.
- Take appropriate measures to cool the unit.

T01 Cycle st. prohibit(Host comm.) 0115

Details

Automatic start cannot is not possible because the NC is communicating with the host computer.

Remedy

- Wait for the communication with host computer to be ended and then execute the automatic start.

T01 **Cycle st prohibit(Battery alm)** 0116

Details

Automatic start is not possible because the voltage of the battery in the NC control unit has dropped.

Remedy

- Replace the battery of the NC control unit.
- Contact the service center.

T01 **R-pnt offset value not set** 0117

Details

Automatic operation is not possible because no reference position offset value has been set.

Remedy

- Perform the reference position initialization setting, then set "#2034 rfpofs(Distance-coded reference position detection offset)".

T01 **In absolute position alarm** 0138

Details

- A start signal was input during an absolute position detection alarm.

Remedy

- Clear the absolute position detection alarm, and then input the start signal.

T01 **In abs posn initial setting** 0139

Details

- A start signal was input during zero point initialization in the absolute position detection system.

Remedy

- Complete zero point initialization before inputting the start signal.

T01 **In manual measurement** 0143

Details

Automatic start is disabled because manual measurement is in execution.

Remedy

- Execute automatic start after the manual measurement is completed.

T01 **Sub part sys I mode is active** 0146

Details

Cycle start signal was input for the part system that has applied Sub-part system I operation mode.

Remedy

- Use Sub-part system I operation mode signal to switch whether to start the operation as Sub-part system control or to execute cycle start as Main-part system.

T01 **Cycle st. prohibit(safe speed)** 0165

Details

An automatic operation was started in one of the following machining modes during the safe speed clamp: thread cutting, synchronous tapping, cross machining, superimposition control, tool center point control or SSS control.

Remedy

- Turn ON the safely-limited speed monitoring request signal and press the cycle start button.
- Close the door and press the cycle start button.

T01 **Cycle start prohibit (AL Z83)** 0172

Details

Cycle start is disabled while the system alarm Z83 (NC started during SP rotation) is occurring.

Remedy

- Turn OFF the power and make sure that the spindle is at a standstill. And then turn the power ON again.

T01 **In interference check alarm** 0173

Details

Cycle start cannot be operated because interference check alarm is in progress.

Remedy

- Release the interference check alarm before operating the cycle start.

T01 **Cycle st forbid (measuring err)** 0176

Details

Cycle start cannot be executed for other part systems during measurement of rotation center error or workpiece installation error.

Remedy

Execute cycle start for one part system that is ready for measurement.
Cancel measurement when error measurement is not executed.

T01 **Cycle start prohibit (OP error)** 0177

Details

Cycle start was executed during operation error where cycle start cannot be executed.

Remedy

After canceling operation error, execute cycle start.

T01 **Cycle start prohibit(SBT warn)** 0185

Details

Cycle start is disabled because the axis in SBT warning exists in the system.

Remedy

After cancelling the SBT warning, execute the cycle start.

T01 **Cycle start prohibit** 0190

Details

Automatic start is not possible because the setting of setup parameters is enabled.

Remedy

- Refer to the manual issued by the machine tool builder.

T01 **Cycle start prohibit** 0191

Details

Automatic start was attempted while a file was being deleted/written.

Remedy

- Wait for the file to be deleted/written and then execute the automatic start.

T01 Cycle st. prohibit (Term exp'd) 0193

Details

Automatic start is not possible because the valid term has been expired.

Remedy

- Obtain a decryption code from the machine tool builder and input it in the NC, then turn the power ON again.

T01 Cycle start disabled (in SBT) 0194

Details

Cycle start is disabled because the break test is being executed for some axes in the system.

Remedy

- Execute cycle start after the break test is completed.

T01 Cycle start prohibit(in SBT) 0197

Details

Cycle start is disabled because the axis in brake test exists in the system.

Remedy

After the brake test completed, execute the cycle start.

T02 H/W stroke end axis exists 0201

Details

An axis is at the stroke end.

Remedy

- Manually move the axis away from the stroke end limit switch.
- Correct the machining program.

T02 S/W stroke end axis exists 0202

Details

An axis is at the stored stroke limit.

Remedy

- Manually move the axis.
- Correct the machining program.

T02 Reset signal ON 0203

Details

The reset has been entered.

Remedy

- The program execution position has returned to the start of the program. Execute automatic operation from the start of the machining program.

T02 Auto operation pause signal ON 0204

Details

The "feed hold" switch is ON.

Remedy

- Press the CYCLE START switch to resume the automatic operation.

T02 Operation mode changed 0205

Details

The operation mode has changed to another mode during automatic operation.

Remedy

- Return to the original automatic operation mode, and press the CYCLE START switch to resume the automatic operation.

T02 Acc/dec time cnst too large 0206

Details

The acceleration and deceleration time constants are too large. (This alarm occurs with the system alarm Z59.)

Remedy

- Set a larger value for "#1206 G1bF(Maximum speed)".
- Set a smaller value for "#1207 G1btL(Time constant)".
- Set a lower cutting speed.

T02 Abs posn detect alarm occurred 0215

Details

An absolute position detection alarm occurred.

Remedy

- Clear the absolute position detection alarm.

T02 Aux axis changeover error 0220

Details

A travel command was issued to an auxiliary axis.

Remedy

- Turn ON the "NC axis control selection" signal and press the CYCLE START switch to restart the automatic operation with.

T02 FEED HOLD: SOS axis 0221

Details

SOS axis exists in the system.

Remedy

Cancel SOS state and execute cycle start, and you can continue automatic operation from the stop point.

T03 Single block stop signal ON 0301

Details

The SINGLE BLOCK switch on the machine operation panel is ON.
The SINGLE BLOCK or MACHINE LOCK switch changed.

Remedy

- Press the CYCLE START switch to resume the automatic operation.

T03 Block stop cmnd in user macro 0302

Details

A block stop command was issued in the user macro program.

Remedy

- Press the CYCLE START switch to resume the automatic operation.

T03 Operation mode changed 0303

Details

Automatic mode changed to another automatic mode.

Remedy

- Return to the original automatic operation mode, and press the CYCLE START switch to resume the automatic operation.

T03 MDI completed 0304

Details

MDI operation has ended the last block.

Remedy

- Set the MDI operation again, and press the CYCLE START switch to start the MDI operation.

T03 Block start interlock 0305

Details

The interlock signal, which locks the block start, is ON.

Remedy

- Correct the sequence program.

T03 Cutting blck start interlock 0306

Details

The interlock signal, which locks the block cutting start, is ON.

Remedy

- Correct the sequence program.

T03 Safe speed clamp is ON 0308

Details

One of the following commands was issued during the safe speed clamp:
thread cutting, synchronous tapping, cross machining, superimposition control, tool center point control or SSS control.

Remedy

- Turn ON the safely-limited speed monitoring request signal before performing the operation.
- Perform the operation with the door closed.

T03 Inclined Z offset change 0310

Details

The "inclined axis control: No Z axis compensation" signal has turned ON or OFF during the program operation.

Remedy

- Press the CYCLE START switch to resume the automatic operation.

T03 Aux axis changeover error 0330

Details

The "NC axis control selection" signal was turned OFF while a NC axis was traveling.

Remedy

- Turn the "NC axis control selection" signal ON and press the CYCLE START switch to resume the automatic operation.

T04 Collation stop 0401

Details

Collation stop occurred.

Remedy

- Execute the automatic start to resume the automatic operation.

T10 Fin wait (Factors for waiting completion)

Details

The following Nos. are shown during the operation of the corresponding completion wait factor. The numbers will disappear when the operation is completed.
The completion wait factor is indicated with four digits (in hexadecimal).

Display format of completion wait factor
0_____
(a)(b)(c)

Each of the hexadecimal numbers (a), (b) and (c) indicates the following details.

(a)
bit0: In dwell execution
bit3: Unclamp signal wait (Note 1)
(b)
bit0: Waiting for spindle position to be looped
bit3: Door open (Note 2)
(c)
bit0: Waiting for MSTB completion
bit1: Waiting for rapid traverse deceleration
bit2: Waiting for cutting speed deceleration
bit3: Waiting for spindle orientation completion
(Note 1) For type A (#1282 ext18/bit3 = 0)

- Waiting for turning ON or OFF of the unclamp finish signal for the index table indexing.

For type B (#1282 ext18/bit3 = 1)

- Waiting for turning ON of the unclamp finish signal for the index table indexing.
- Waiting for turning ON of the clamp finish signal for the index table indexing.

(*) The complete standby status is established when the unclamp finish and clamp finish signals are both turned ON. Set the clamp finish signal to OFF after performing required process with the PLC.

(Note 2) This shows the door open state caused by the door interlock function.

T11	Fin wait	(Factors for waiting completion)

Details

The following Nos. are shown during the operation of the corresponding completion wait factor. The numbers will disappear when the operation is completed.
The completion wait factor is indicated with four digits (in hexadecimal).

Display format of completion wait factor
0__ __ __
(a)(b)(c)

Each of the hexadecimal numbers (a), (b) and (c) indicates the following details.

(b)
bit0:Operation alarm display being postponed

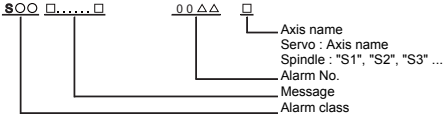
Remedy

- The parameter "#1342 AlmDly" may be able to postpone displaying a part of an operation alarm, depending on the setting.
  This stop code will remain displayed while any alarm is being postponed.
  And it will disappear if the postponed alarm is displayed or canceled.

3 Servo/Spindle Alarms (S)

3.1 Servo Errors (S01/S03/S04)

Servo alarm is displayed in the following format.



Alarm class	Message	Reset method	Resetting methods
S01	Servo alarm	PR	After removing the cause of the alarm, reset the alarm by turning the NC power ON again.
S03	Servo alarm	NR	After removing the cause of the alarm, reset the alarm by inputting the NC RESET key.
S04	Servo alarm	AR	After removing the cause of the alarm, reset the alarm by turning the NC and drive unit power ON again.

The numerical value in the column of "No." in the table after the following page is the double-digit number displayed on the LED which is on the front-side of the drive unit.
At the time of the occurrence of the servo errors (S01/S03/S04), this number will be displayed in the last two digits of the "alarm number".

(Note) For the troubleshooting at the time of the occurrence of the servo errors, refer to your drive unit's instruction manual.

(1) Drive unit alarm

No.	Name	Details	Reset method	Servo stop method	Spindle stop method
10	Insufficient voltage	A drop of bus voltage was detected in main circuit.	PR	Dynamic stop	Coast to a stop
11	Axis selection error	The axis selection rotary switch has been incorrectly set.	AR	Initial error	Initial error
12	Memory error 1	A hardware error was detected during the power ON self-check.	AR	Initial error	Initial error
13	Software processing error 1	An error was detected for the software execution state.	PR	Dynamic stop	Coast to a stop
14	Software processing error2	The current processor is not operating correctly.	AR	Dynamic stop	Coast to a stop
16	Initial magnetic pole position detection error	In the built-in motor which uses the absolute position encoder, the servo ON has been set before the magnetic pole shift amount is set. The magnetic pole position, detected in the initial magnetic pole position detection control, is not correctly set.	PR	Dynamic stop	Coast to a stop
17	A/D converter error	A current feedback error was detected.	PR	Dynamic stop	Coast to a stop
18	Main side encoder: Initial communication error	An error was detected in the initial communication with the motor side encoder.	PR	Initial error	Initial error
19	Encoder communication error in synchronous control	An error of the shared encoder on the machine side was detected on the secondary axis of the speed command synchronization control.	PR	Dynamic stop	-
1A	Sub side encoder: Initial communication error	An error was detected in the initial communication with the machine side encoder.	PR	Initial error	Initial error
1B	Sub side encoder: Error 1	An error was detected by the encoder connected to the machine side. The error details are different according to the encoder type. Refer to "Encoder alarm" for details.		Dynamic stop	Coast to a stop
1C	Sub side encoder: Error 2				
1D	Sub side encoder: Error 3				
1E	Sub side encoder: Error 4				
1F	Sub side encoder: Communication error	An error was detected in the communication with the machine side encoder.	PR	Dynamic stop	Coast to a stop
21	Sub side encoder no signal 2	In the machine side encoder, ABZ-phase feedback cannot be returned even when the motor moves.	PR	Dynamic stop	Coast to a stop
22	Encoder data error	An error was detected in the feedback data from the position encoder.	AR	Dynamic stop	-
23	Excessive speed error	The state that there is a difference between the actual speed and command speed continued for longer than the excessive speed deviation timer setting.	NR	-	Coast to a stop
24	Grounding	The motor power cable is in contact with FG (Frame Ground).	PR	Dynamic stop	Coast to a stop
25	Absolute position data lost	The absolute position data was lost in the encoder.	AR	Initial error	-
26	Unused axis error	In the multiaxis drive unit, there is an axis set to free, and the other axis detected a power module error.	PR	Dynamic stop	Coast to a stop

(Note 1) Definitions of terms in the table are as follows.
Main side encoder: Encoder connected to CN2
Sub side encoder: Encoder connected to CN3
(Note 2) Resetting methods
NR: Reset with the NC RESET button. This alarm can also be reset with the PR and AR resetting conditions.
PR: Reset by turning the NC power ON again. This alarm can also be reset with the AR resetting conditions.
When the control axis is removed, this alarm can be reset with the NC RESET button. (Excluding alarms 32 and 37.)
AR: Reset by turning the NC and servo drive unit power ON again.

No.	Name	Details	Reset method	Servo stop method	Spindle stop method
27	Sub side encoder: Error 5	An error was detected by the encoder connected to the machine side. The error details are different according to the encoder type. Refer to "Encoder alarm" for details.		Dynamic stop	Coast to a stop
28	Sub side encoder: Error 6				
29	Sub side encoder: Error 7				
2A	Sub side encoder: Error 8				
2B	Main side encoder: Error 1	An error was detected by the encoder connected to the motor side. The error details are different according to the encoder type. Refer to "Encoder alarm" for details.		Dynamic stop	Coast to a stop
2C	Main side encoder: Error 2				
2D	Main side encoder: Error 3				
2E	Main side encoder: Error 4				
2F	Main side encoder: Communication error	An error was detected in the communication with the motor side encoder.	PR	Dynamic stop	Coast to a stop
30	Over regeneration	Over-regeneration level exceeded 100%. The regenerative resistor is overloaded.	PR	Dynamic stop	Coast to a stop
31	Overspeed	The motor speed exceeded the allowable speed.	PR	Deceleration stop	Deceleration stop
32	Power module error (overcurrent)	The power module detected the overcurrent.	PR	Dynamic stop	Coast to a stop
33	Overvoltage	The bus voltage in main circuit exceeded the allowable value.	PR	Dynamic stop	Coast to a stop
34	NC communication: CRC error	The data received from the NC was outside the setting range.	PR	Deceleration stop	Deceleration stop
35	NC command error	The travel command data received from the NC was excessive.	PR	Deceleration stop	Deceleration stop
36	NC communication: Communication error	The communication with the NC was interrupted.	PR	Deceleration stop	Deceleration stop
37	Initial parameter error	An incorrect set value was detected among the parameters send from the NC at the power ON. In the SLS(Safely Limited Speed) function, an error was detected in the relation between the safety speed and safety rotation number in the speed observation mode.	PR	Initial error	Initial error
38	NC communication: Protocol error 1	An error was detected in the communication frames received from the NC. Or, removing an axis or changing an axis was performed in the synchronous control.	PR	Deceleration stop	Deceleration stop
39	NC communication: Protocol error 2	An error was detected in the axis data received from the NC. Or, in changing an axis, the parameter setting of the synchronous control was applied when the axis was installed.	PR	Deceleration stop	Deceleration stop
3A	Overcurrent	Excessive motor drive current was detected.	PR	Dynamic stop	Coast to a stop
3B	Power module error (overheat)	The power module detected an overheat.	PR	Dynamic stop	Coast to a stop
3C	Regeneration circuit error	An error was detected in the regenerative transistor or in the regenerative resistor.	PR	Dynamic stop	-
3D	Power supply voltage error at acceleration/deceleration	A motor control error during acceleration/deceleration, due to a power voltage failure, was detected.	PR	Dynamic stop	-
3E	Magnetic pole position detection error	The magnetic pole position, detected in the magnetic pole position detection control, is not correctly detected.	AR	Dynamic stop	Coast to a stop

(Note 1) Definitions of terms in the table are as follows.
Main side encoder: Encoder connected to CN2
Sub side encoder: Encoder connected to CN3
(Note 2) Resetting methods
NR: Reset with the NC RESET button. This alarm can also be reset with the PR and AR resetting conditions.
PR: Reset by turning the NC power ON again. This alarm can also be reset with the AR resetting conditions.
When the control axis is removed, this alarm can be reset with the NC RESET button. (Excluding alarms 32 and 37.)
AR: Reset by turning the NC and servo drive unit power ON again.

No.	Name	Details	Reset method	Servo stop method	Spindle stop method
41	Feedback error 3	Either a missed feedback pulse in the motor side encoder or an error in the Z-phase was detected in the full closed loop system.	PR	Dynamic stop	Coast to a stop
42	Feedback error 1	Either a missed feedback pulse in the position detection or an error in the Z-phase was detected. Or the distance-coded reference check error exceeded the allowable value when the distance-coded reference scale was used.	PR	Dynamic stop	Coast to a stop
43	Feedback error 2	An excessive difference in feedback was detected between the machine side encoder and the motor side encoder.	PR	Dynamic stop	Coast to a stop
45	Fan stop	An overheat of the power module was detected during the cooling fan stopping.	PR	Dynamic stop	Coast to a stop
46	Motor overheat / Thermal error	Either the motor or the motor side encoder detected an overheat. Or, the thermistor signal receiving circuit of the linear motor or direct-drive motor was disconnected. Or, the thermistor signal receiving circuit was short-circuited.	NR	Deceleration stop	Deceleration stop
48	Main side encoder: Error 5	An error was detected by the encoder connected to the main side. The error details are different according to the connected encoder. Refer to "Encoder alarm".		Dynamic stop	Coast to a stop
49	Main side encoder: Error 6				
4A	Main side encoder: Error 7				
4B	Main side encoder: Error 8				
4C	Current error at initial magnetic pole estimate	Current detection failed at the initial magnetic pole estimation.	NR	Dynamic stop	Coast to a stop
4D	Dual signal error	An error was detected in the signal related to the dual signal. Refer to "Dual signal error (4D)" for details.			
4E	NC command mode error	An error was detected in the control mode send from the NC.	NR	Deceleration stop	Deceleration stop
4F	Instantaneous power interrupt	The control power supply has been shut down for 50ms or more.	NR	Deceleration stop	Deceleration stop
50	Overload 1	Overload detection level became 100% or more. The motor or the drive unit is overloaded.	NR	Deceleration stop	Deceleration stop
51	Overload 2	In a servo system, current command of 95% or more of the unit's max. current was given continuously for 1 second or longer. In a spindle system, current command of 95% or more of the motor's max. current was given continuously for 1 second or longer.	NR	Deceleration stop	Deceleration stop
52	Excessive error 1	A position tracking error during servo ON was excessive.	NR	Deceleration stop	Deceleration stop
53	Excessive error 2	A position tracking error during servo OFF was excessive.	NR	Dynamic stop	-
54	Excessive error 3	There was no motor current feedback when the alarm "Excessive error 1" was detected.	NR	Dynamic stop	Coast to a stop
56	Commanded speed error	The encoder has detected that the commanded speed exceeded 1.15 times of the rapid traverse rate (rapid), or the motor rotation speed exceeded the maximum speed.	NR	-	Deceleration stop
58	Collision detection 1: G0	A disturbance torque exceeded the allowable value in rapid traverse modal (G0).	NR	Max cap dec stop	-
59	Collision detection 1: G1	A disturbance torque exceeded the allowable value in the cutting feed modal (G1).	NR	Max cap dec stop	-
5A	Collision detection 2	A current command with the maximum drive unit current value was detected.	NR	Max cap dec stop	-

(Note 1) Definitions of terms in the table are as follows.
Main side encoder: Encoder connected to CN2
Sub side encoder: Encoder connected to CN3
(Note 2) Resetting methods
NR: Reset with the NC RESET button. This alarm can also be reset with the PR and AR resetting conditions.
PR: Reset by turning the NC power ON again. This alarm can also be reset with the AR resetting conditions.
When the control axis is removed, this alarm can be reset with the NC RESET button. (Excluding alarms 32 and 37.)
AR: Reset by turning the NC and servo drive unit power ON again.

No.	Name	Details	Reset method	Servo stop method	Spindle stop method
5B	Safely limited: Commanded speed monitoring error	A commanded speed exceeding the safely limited speed was detected in the safely limited mode.	PR	Deceleration stop	Deceleration stop
5D	Safely limited: Door state error	The door state signal input in the NC does not coincide with the door state signal input in the drive unit in the safely limited mode. Otherwise, door open state was detected in normal mode.	PR	Deceleration stop	Deceleration stop
5E	Safely limited: Speed feedback monitoring error	A motor speed exceeding the safely limited speed was detected in the safely limited mode.	PR	Deceleration stop	Deceleration stop
5F	External contactor error	A contact of the external contactor is welding.	NR	Deceleration stop	Deceleration stop
60, 61, 63 to 77	Power supply alarm	The power supply unit detected an error. The error details are different according to the connected power supply unit. Refer to "Power supply alarm" for details.		Dynamic stop	Coast to a stop
62	Power supply: Frequency error			Deceleration stop	Deceleration stop
80	Main side encoder cable error	The cable type of the motor side encoder cable is for rectangular wave signal.	AR	Initial error	-
81	Sub side encoder cable error	The cable type of the machine side encoder cable does not coincide with the encoder type which is set by the parameter.	AR	Initial error	-
87	Drivers communication error	The communication frame between drive units was aborted.	PR	Dynamic stop	Coast to a stop
88	Watchdog	The drive unit does not operate correctly. "888" is displayed for MDS-EJ/EJH Series.	AR	Dynamic stop	Coast to a stop
8A	Drivers communication data error 1	The communication data 1 between drivers exceeded the tolerable value in the communication between drive units.	PR	Dynamic stop	Coast to a stop
8B	Drivers communication data error 2	The communication data 2 between drivers exceeded the tolerable value in the communication between drive units.	PR	Dynamic stop	Coast to a stop

(Note 1) Definitions of terms in the table are as follows.
Main side encoder: Encoder connected to CN2
Sub side encoder: Encoder connected to CN3
(Note 2) Resetting methods
NR: Reset with the NC RESET button. This alarm can also be reset with the PR and AR resetting conditions.
PR: Reset by turning the NC power ON again. This alarm can also be reset with the AR resetting conditions.
When the control axis is removed, this alarm can be reset with the NC RESET button. (Excluding alarms 32 and 37.)
AR: Reset by turning the NC and servo drive unit power ON again.

Encoder alarm (Servo drive unit)

Alarm number when the encoder is connected to CN2 side		2B	2C	2D	2E	48	49	4A	4B
Alarm number when the encoder is connected to CN3 side		1B	1C	1D	1E	27	28	29	2A
OSA405 OSA676	Mitsubishi Electric	Memory alarm	LED alarm	Data alarm	Encoder thermal error	-	-	-	-
OSA405ET2AS OSA676ET2AS		Memory alarm	LED alarm	Data alarm	Encoder thermal error	-	-	-	-
OSA24RS		CPU alarm	-	Data alarm	Encoder thermal error	-	-	-	-
MDS-EX-HR		Memory error	-	Data error	-	Scale not connected	-	-	-
AT343 AT543 AT545 AT1143 ST748	Mitsutoyo	Initialization error	EEPROM error	Photoelectric type, static capacity type data mismatch	ROM/RAM error	CPU error	Photoelectric type overspeed	Static capacity type error	Photoelectric type error
LC193M, LC493M LC195M, LC495M, LC291M, LIC2197M, LIC2199M MC15 RCN223M, RCN227M, RCN727M, RCN827M, RCN2590M, RCN5390M, RCN5590M, RCN8390M ROC425M, ROC2390M ECA4000Series EIB Series	HEIDENHAIN	Initialization error	EEPROM error	Relative/absolute position data mismatch	ROM/RAM error	CPU error	Overspeed	Absolute position data error	Relative position data error
MPRZ scale	Mitsubishi Heavy Industries Machine Tool	Installation accuracy fault	-	Detection position deviance	Scale breaking	Absolute value detection fault	-	Gain fault	Phase fault
SR67A, SR75, SR85 SR74, SR77 SR84, SR87 RU77 RS87	Magnescale	Laser diode error	System memory error	Encoder mismatch error	-	-	Over speed	Absolute position data error	Relative position data error
SAM/SVAM/GAM/LAM/HAM Series	FAGOR	-	-	Absolute value detection error	H/W error	CPU error	-	-	-
RL40N/RA Series	Renishaw	Initialization error	-	Absolute position data error	-	-	Over speed	-	-
WMFA/WMBA/WMRA/LMFA/LMBA Series (Note)	AMO	Initialization error	-	Relative/absolute position data mismatch	-	-	Over speed	Absolute position data error	-

Alarm number when the encoder is connected to CN2 side		2B	2C	2D	2E	48	49	4A	4B
Alarm number when the encoder is connected to CN3 side		1B	1C	1D	1E	27	28	29	2A
AMS-ABS-3B Series	Schneeberger	-	-	-	Absolute position data error	-	-	-	-

(Note) A drive unit processes all reset types of alarms as "PR". However, "AR" will be applied according to the encoder.

Encoder alarm (Spindle drive unit)

Alarm number when the encoder is connected toCN2 side		**2B**	**2C**	**2D**	**2E**	**48**	**49**	**4A**	**4B**
Alarm number when the encoder is connected to CN3 side		**1B**	**1C**	**1D**	**1E**	**27**	**28**	**29**	**2A**
TS5690 TS5691	**Mitsubishi Electric**	Memory error	Waveform error	-	-	-	Overspeed	-	Relative position data error
MDS-EX-HR		Initialization error	-	Data error	-	Connection error	-	-	-
OSA24RS		CPU error	-	Data error	-	-	-	-	-
EIB Series	**HEIDENHAIN**	Initialization error	EEPROM error	-	-	CPU error	Overspeed	-	Relative position data error
ADB-20J ADB-K20M	**Mitsubishi Heavy Industries Machine Tool**	Installation accuracy fault	-	Detection position deviance	Scale breaking	-	-	Gain fault	Phase fault

(Note) A drive unit processes all reset types of alarms as "PR". However, "AR" will be applied according to the encoder.

Dual signal error (4D)

No.	Name	Sub info	Details
004D.xxx	Dual signal error	-	An error was detected in the signal related to the dual signal. The name of the axis with an error is displayed. The number "xxx" in the decimal place indicates the sub-number.

(Note) Resetting method may be "PR" depending on the sub-number in the decimal place.

004D.xxx : Alarm number.Sub-number

Sub-No.	Name	Details	Reset method	Axis type	Servo stop method	Spindle stop method
1	Power shutoff error	Either of the STO signals entered an input state while the STO function is disabled.	NR	Each axis	Dynamic stop	Coast to a stop
2	Illegal power shutoff error	Either of the STO signals entered an input state during servo ON command or during deceleration and stop with the STO function enabled.	NR	Each axis	Dynamic stop	Coast to a stop
3	STO signal mismatch error	Input states of two STO signals were mismatched while the STO function is enabled.	NR	Each axis	Dynamic stop	Coast to a stop
15	Safety communication: Communication error 1	A receiving error was detected in the safety communication.	NR	Each axis	Dynamic stop	Coast to a stop
16	Safety communication: Initial communication error 1	A receiving error was detected in the initial communication for the safety communication.	PR	Each axis	Dynamic stop	Coast to a stop
17	Voltage diagnosis error	A power error was detected in the safety function.	NR	Each axis	Dynamic stop	Coast to a stop
19	DRAM diagnosis error	A DRAM error was detected in the safety function.	PR	Each axis	Dynamic stop	Coast to a stop
21	Control process error	An error was detected in the status of software execution for the safety function.	PR	Each axis	Dynamic stop	Coast to a stop
23	Safety encoder: Initial communication error 1	An error was detected in the initial communication with a safety encoder.	PR	Each axis	Initial error	Initial error
24	PCB error	A PCB error was detected in the safety function.	PR	Each axis	Initial error	Initial error
25	Synchronization error	A synchronization error was detected in the safety function.	PR	Each axis	Dynamic stop	Coast to a stop
26	Flash ROM diagnosis error	A Flash ROM error was detected in the safety function.	PR	Each axis	Initial error	Initial error
33	Safety encoder: Communication error 1	An error was detected in the communication with a safety encoder.	PR	Each axis	Dynamic stop	Coast to a stop
34	Safety encoder: Diagnosis error 1	A power supply voltage error was detected in the safety encoder.	PR	Each axis	Dynamic stop	Coast to a stop
35	Safety encoder: Diagnosis error 2	A H/W error was detected in the safety encoder.	PR	Each axis	Dynamic stop	Coast to a stop
36	Safety encoder: Diagnosis error 3	A process error was detected in the safety encoder.	PR	Each axis	Dynamic stop	Coast to a stop
37	Safety encoder: Diagnosis error 4	An A/D conversion error was detected in the safety encoder.	PR	Each axis	Dynamic stop	Coast to a stop
39	Non-safety encoder: Position feedback fixation diagnosis error	The position feedback from the non-safety encoder remains unchanged.	PR	Each axis	Dynamic stop	Coast to a stop
40	Safety encoder: Thermal error	The safety encoder detected a thermal error.	PR	Each axis	Dynamic stop	Coast to a stop
53	Safety communication: Transmission interval mismatch error	An error was detected in the transmission interval setting.	NR	Each axis	Initial error	Initial error
54	Safety communication: Initial communication error 2	A receiving error was detected in the initial communication for the safety communication.	NR	Each axis	Initial error	Initial error
55	Safety communication: Communication error 2	A receiving error was detected in the safety communication.	NR	Each axis	Dynamic stop	Coast to a stop
56	Safety parameter setting range error	A setting error was detected in the safety parameter.	PR	Each axis	Initial error	Initial error
57	Safety parameter combination error	A combination error was detected in the safety parameter.	PR	Each axis	Initial error	Initial error
65	Register diagnosis error	A resister diagnosis error was detected in the safety function.	PR	Each axis	Initial error	Initial error

004D.xxx : Alarm number.Sub-number

Sub-No.	Name	Details	Reset method	Axis type	Servo stop method	Spindle stop method
66	Calculation device diagnosis error	An error was detected in the calculation device diagnosis for the safety function.	PR	Each axis	Initial error	Initial error
67	Sequence diagnosis error	An error was detected in the sequence diagnosis for the safety function.	PR	Each axis	Dynamic stop	Coast to a stop
68	Stack diagnosis error	An error was detected in the stack diagnosis for the safety function.	PR	Each axis	Dynamic stop	Coast to a stop
69	Temperature diagnosis error	Overheat was detected in the safety function.	NR	Each axis	Dynamic stop	Coast to a stop
71	Watchdog error	The safety function is not operating correctly.	PR	Each axis	Dynamic stop	Coast to a stop
72	Clock diagnosis error	An error was detected in the clock diagnosis for the safety function.	PR	Each axis	Dynamic stop	Coast to a stop
74	DO output compare error	An error was detected in the status of DO output for the safety function.	PR	Each axis	Dynamic stop	Coast to a stop
75	ISC communication error	An error was detected in the inter-system communication for the safety function.	PR	Each axis	Dynamic stop	Coast to a stop
78	Safety communication: Initial communication error 3	A receiving error was detected in the initial communication for the safety communication.	PR	Each axis	Dynamic stop	Coast to a stop
88	Safety circuit: STO error	An error was detected in the read-back diagnosis for STO.	PR	Each axis	Dynamic stop	Coast to a stop
91	Safety circuit: SBC error	An error was detected in the read-back diagnosis for SBC.	PR	Each axis	Dynamic stop	Coast to a stop
126	Safety communication: Communication error 3	A receiving error was detected in the safety communication.	PR	Each axis	Dynamic stop	Coast to a stop

(2) Power supply alarm

No.	Name	Details	Reset method
61	Power supply: Power module overcurrent	Overcurrent protection function in the power module has started its operation.	PR
62	Power supply: Frequency error	The input power supply frequency increased above the specification range.	PR
66	Power supply: Process error	An error occurred in the process cycle.	PR
67	Power supply: Phase interruption	An open-phase condition was detected in input power supply circuit.	PR
68	Power supply: Watchdog	The system does not operate correctly.	AR
69	Power supply: Grounding	The motor power cable is in contact with FG (Frame Ground).	PR
6A	Power supply: External contactor welding	A contact of the external contactor is welding.	PR
6B	Power supply: Rush circuit error	An error was detected in the rush circuit.	PR
6C	Power supply: Main circuit error	An error was detected in charging operation of the main circuit capacitor.	PR
6D	Parameter setting error	An error was detected in the parameter sent from the drive unit.	PR
6E	Power supply: H/W error	An error was detected in the internal memory.	AR
	A/D error	An error was detected in the A/D converter.	
	Unit ID error	An error was detected in the unit identification.	
6F	Power supply error	No power supply is connected to the drive unit, or a communication error was detected.	AR (Note 4)
70	Power supply: External emergency stop error	A mismatch of the external emergency stop input and NC emergency stop input continued for 30 seconds.	PR
71	Power supply: Instantaneous power interruption	The power was momentarily interrupted.	NR
72	Power supply: Fan stop	A cooling fan built in the power supply unit stopped, and overheat occurred in the power module.	PR
73	Power supply: Over regeneration	Over-regeneration detection level became over 100%. The regenerative resistor is overloaded. This alarm cannot be reset for 15 min from the occurrence to protect the regeneration resistor. Leave the drive system energized for more than 15 min, then turn the power ON to reset the alarm.	NR
74	Power supply: Option unit error	An alarm was detected in the power backup unit (power supply option unit).	NR (Note 3)
75	Power supply: Overvoltage	L+ and L- bus voltage in main circuit exceeded the allowable value. As the voltage between L+ and L- is high immediately after this alarm, another alarm may occur if this alarm is reset in a short time. Wait more than 5 min before resetting so that the voltage drops.	NR
76	Power supply: Function setting error	The rotary switch setting of external emergency stop is not correct, or a wrong external emergency stop signal is input.	AR
	Power supply: Function selection error	Undefined area for the rotary switch is selected	
77	Power supply: Power module overheat	Thermal protection function in the power module has started its operation.	PR

(Note 1) If a power supply alarm (60 to 77) occurs, all servos will stop with the dynamic brakes, and all spindles will coast to a stop.
(Note 2) "b", "C" and "d" displayed on the power supply unit's LED as a solid light (not flickering) do not indicate an alarm.
(Note 3) Check the LED display of the power backup unit to identify what alarm is occurring to the power backup unit.
**** Refer to your drive unit's instruction manual for details.**
(Note 4) When the power supply alarm (6F) is detected in the 2nd part system, the reset method differs depending on the detected power supply alarm.

3.2 Initial Parameter Errors (S02)

S02	Initial parameter error	2201-2264	(Axis name)

Details

The servo parameter setting data is illegal.The alarm No. is the No. of the servo parameter where the error occurred.

Remedy

Check the descriptions for the appropriate servo parameters and correct them.

S02	Initial parameter error	2301	(Axis name)

Details

The number of constants to be used in the following functions is too large:
Electronic gears.
Position loop gain.
Speed feedback conversion.

Remedy

Check that all the related parameters are specified correctly.
sv001:PC1, sv002:PC2, sv003:PGN1
sv018:PIT, sv019:RNG1, sv020:RNG2

S02	Initial parameter error	2302	(Axis name)

Details

When high-speed serial incremental detector (OSE104, OSE105) is connected,parameters for absolute position are set to ON.
Set the parameters for absolute position detection to OFF.
To detect an absolute position, replace the incremental specification detector with an absolute position detector.

Remedy

Check that all the related parameters are specified correctly.
sv017:SPEC, sv025:MTYP

S02	Initial parameter error	2303	(Axis name)

Details

No servo option is found.
The closed loop (including the ball screw-end detector) or dual feedback control is an optional function.

Remedy

Check that all the related parameters are specified correctly.
sv025:MTYP/pen
sv017:SPEC/dfbx

S02	Initial parameter error	2304	(Axis name)

Details

No servo option is found.
The SHG control is an optional function.

Remedy

Check that all the related parameters are specified correctly.
sv057:SHGC
sv058:SHGCsp

S02	Initial parameter error	2305	(Axis name)

Details

No servo option is found.
The adaptive filtering is an optional function.

Remedy

Check that all the related parameters are specified correctly.
sv027:SSF1/aflt

S02	Initial parameter error:PR	13001-13256	(Axis name)

Details

Parameter error
The spindle parameter setting data is illegal.
The alarm No. is the No. of the spindle parameter where the error occurred.

Remedy

Check the descriptions for the appropriate spindle parameters and correct them.
Even when the parameter is set to a value within the setting range, an error is occurring due to the hardware compatibility or specifications or in relation to several other parameters.
Refer to "Parameter Numbers during Initial Parameter Error" of each drive unit instruction manual for details.

3.3 Safety Function Errors (S05)

S05	Safety function error	0001	(Axis name)

Details

The STO signal has been input through the CN8 connector.

Remedy

Make sure that a short-circuiting connector has been inserted into CN8.

S05	Safety function error	0002	(Axis name)

Details

STO signal is input by dedicated wiring STO function during servo ON.

Remedy

Refer to the manual of drive unit.

S05	Safety function error	0004	(Axis name)

Details

STO signal is illegally input by dedicated wiring STO function during servo OFF.
(Illegal input : Signal input state for STO1 and STO2 is mismatched.)

Remedy

Refer to the manual of drive unit.

S05	Safety function error	0006	(Axis name)

Details

STO signal is illegally input by dedicated wiring STO function during servo ON.
(Illegal input : Signal input state for STO1 and STO2 is mismatched.)

Remedy

Refer to the manual of drive unit.

3.4 Parameter Errors (S51)

S51	Parameter error	2201-2264	(Axis name)

Details

Servo parameter setting data is illegal.The alarm No. is the No. of the servo parameter where the warning occurred.

Remedy

Check the descriptions for the appropriate servo parameters and correct them.

S51	Parameter error	13001-13256	(Axis name)

Details

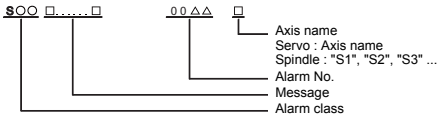
Spindle parameter setting data is illegal.
The alarm No. is the No. of the spindle parameter where the warning occurred.

Remedy

Check the descriptions for the appropriate spindle parameters and correct them.
Even when the parameter is set to a value within the setting range, an error is occurring due to the hardware compatibility or specifications or in relation to several other parameters.
Refer to "Parameter Numbers during Initial Parameter Error" of each drive unit instruction manual for details.

3.5 Servo Warnings (S52)

Servo warning is displayed in the following format.



Alarm class	Message
S52	Servo warning

The numerical value in the column of "No." in the table after the following page is the double-digit number displayed on the LED which is on the front-side of the drive unit.
At the time of the occurrence of the servo warnings (S52), this number will be displayed in the last two digits of the "alarm number".

(Note) For the troubleshooting at the time of the occurrence of the servo warnings, refer to your drive unit's instruction manual.

(1) Drive unit warning

No.	Name	Details	Reset method	Stop method
96	Scale feedback error	An excessive difference in feedback amount was detected between the main side encoder and the MPI scale in MPI scale absolute position detection system.	*	-
97	Scale offset error	An error was detected in the offset data that is read at the NC power-ON in MPI scale absolute position detection system.	PR	-
9B	Incremental encoder/ magnetic pole shift warning	The difference between the magnetic pole position after the phase Z has been passed (magnetic pole shift amount:SV028) and the initially detected position is excessive in the built-in motor's incremental control system.The magnetic pole is controlled by the initial detection value.	*	-
9E	Absolute position encoder: Revolution counter error	An error was detected in the revolution counter data of the absolute position encoder. The accuracy of absolute position is not guaranteed.	*	-
9F	Battery voltage drop	The battery voltage to be supplied to the absolute position encoder is dropping.	NR	-
A3	In initial setup of ABS position	This warning is detected until the axis reaches the reference position during the initial setup of the distance-coded reference check function. This warning turns OFF after the axis has reached the position, thus set the value displayed on the drive monitor to the parameter.	PR	-
A4	Dual signal warning	An input was detected in the signal related to the dual signal. Refer to "Dual signal warning (A4)" for details.	*	-
A6	Fan stop warning	A cooling fan in the drive unit stopped.	*	-
E0	Overregeneration warning	Over-regeneration detection level exceeded 80%.	*	-
E1	Overload warning	A level of 80% of the Overload 1 alarm state was detected.	*	-
E4	Parameter warning	An incorrect set value was detected among the parameters send from the NC in the normal operation.	*	-
E6	Control axis detachment warning	A control axis is being detached. (State display)	*	-
E7	NC emergency stop	In NC emergency stop. (State display)	*	Dec stop enabled
E8 to EF	Power supply warning	The power supply unit detected a warning. The error details are different according to the connected power supply unit. Refer to "Power supply warning".	*	- *EA: Dec stop enabled

(Note1) Definitions of terms in the table are as follows.
Main side encoder: Encoder connected to CN2
Sub side encoder: Encoder connected to CN3
(Note 2) Resetting methods
*** : Automatically reset once the cause of the warning is removed.**
NR: Reset with the NC RESET button. This warning can also be reset with the PR and AR resetting conditions.
PR: Reset by turning the NC power ON again. This warning can also be reset with the AR resetting conditions.
When the control axis is removed, this warning can be reset with the NC RESET button. (Excluding warning 93.)
AR: Reset by turning the NC and servo drive unit power ON again.
(Note 3) Servo and spindle motor do not stop when the warning occurs.
(Note 4) When an emergency stop is input, servo and spindle motor decelerate to a stop. (When SV048, SV055 or SV056 is set for servo and when SP055 or SP056 is set for spindle.)

Dual signal warning (A4)

No.	Name	Sub info	Details
00A4.00	Dual signal warning	Axis name	The system has been set in the STO state. The STO state is also entered at the time of emergency stop, but in this case, this warning will not appear because the emergency stop has priority.

(2) Power supply warning

No.	Name	Details	Reset method
E9	Instantaneous power interruption warning	The power was momentarily interrupted.	NR
EA	In external emergency stop state	External emergency stop signal was input.	*
EB	Power supply: Over regeneration warning	Over-regeneration detection level exceeded 80%.	*
EE	Power supply: Fan stop warning	A cooling fan built in the power supply unit stopped.	*
EF	Power supply: Option unit warning	A warning was detected in the power backup unit (power supply option unit).	* (Note 3)

(Note 1) Resetting methods
*** : Automatically reset once the cause of the warning is removed.**
NR: Reset with the NC RESET button. This warning can also be reset with the PR and AR resetting conditions.
PR: Reset by turning the NC power ON again. This warning can also be reset with the AR resetting conditions.
When the control axis is removed, this warning can be reset with the NC RESET button. (Excluding warning 93.)
AR: Reset by turning the NC and servo drive unit power ON again.
(Note 2) Servo and spindle motor do not stop when the warning occurs.
(Note 3) Check the LED display of the power backup unit to identify what warning is occurring to the power backup unit.
**** Refer to your drive unit's instruction manual for details.**

3.6 Safety Function Warnings (S53)

S53	Safety function warning	0001	(Axis name)

Details

The system has been set in the STO state.
The STO state is also entered at the time of emergency stop, but in this case, this warning will not appear because the emergency stop has priority.

4 MCP Alarms (Y)

Y02 System alm: Process time over 0050

Details

System alarm: Process time is over.

Remedy

The software or hardware may be damaged.
Contact the service center.
(Note) When two or more alarms (Y02 0051) occur at the same time, only the alarm which has occurred first is displayed.

Y02 SV commu er: Data ID error 0051 xy03

Details

A communication error has occurred between controller and drive unit.
x: Channel No. (0 to)
y: Drive unit rotary switch No. (0 to)

Remedy

- Take measures against noise.
- Check for any failure of the communication cable connectors between controller and drive unit or between two drive units.
- Check for any failure of the communication cables between controller and drive unit or between two drive units.
- A drive unit may be faulty. Take a note of the 7-segment LED contents of each drive unit and contact the Service Center.
- Update the drive unit software version.

(Note) When two or more alarms (Y02 0051) occur at the same time, only the alarm which has occurred first is displayed.

Y02 SV commu er: Recv frame No. 0051 xy04

Details

A communication error has occurred between controller and drive unit.
x: Channel No. (from 0)
y: Drive unit rotary switch No. (from 0)

Remedy

- Take measures against noise.
- Check for any failure of the communication cable connectors between controller and drive unit or between two drive units.
- Check for any failure of the communication cables between controller and drive unit or between two drive units.
- A drive unit may be faulty. Take a note of the 7-segment LED contents of each drive unit and contact the Service Center.
- Update the drive unit software version.

(Note) When two or more alarms (Y02 0051) occur at the same time, only the alarm which has occurred first is displayed.

Y02 SV commu er: Commu error 0051 x005

Details

A communication error has occurred between controller and drive unit.
x: Channel No. (from 0)

Remedy

- Take measures against noise.
- Check for any failure of the communication cable connectors between controller and drive unit or between two drive units.
- Check for any failure of the communication cables between controller and drive unit or between two drive units.
- A drive unit may be faulty. Take a note of the 7-segment LED contents of each drive unit and contact the Service Center.
- Update the drive unit software version.

(Note) When two or more alarms (Y02 0051) occur at the same time, only the alarm which has occurred first is displayed.

Y02 SV commu er: Connect error 0051 x006

Details

A communication error has occurred between controller and drive unit.
x: Channel No. (from 0)

Remedy

- Take measures against noise.
- Check for any failure of the communication cable connectors between controller and drive unit or between two drive units.
- Check for any failure of the communication cables between controller and drive unit or between two drive units.
- A drive unit may be faulty. Take a note of the 7-segment LED contents of each drive unit and contact the Service Center.
- Update the drive unit software version.

(Note) When two or more alarms (Y02 0051) occur at the same time, only the alarm which has occurred first is displayed.

Y02 SV commu er: Safe posn FB err 0051 x007

Details

A communication error has occurred between controller and drive unit.
x: Channel No. (from 0)

Remedy

- Take measures against noise.
- Check for any failure of the communication cable connectors between controller and drive unit or between two drive units.
- Check for any failure of the communication cables between controller and drive unit or between two drive units.
- A drive unit may be faulty. Take a note of the 7-segment LED contents of each drive unit and contact the Service Center.
- Update the drive unit software version.

(Note) When two or more alarms (Y02 0051) occur at the same time, only the alarm which has occurred first is displayed.

Y02 SV commu er : Init commu error 0051 xy20

Details

A communication error has occurred between controller and drive unit.
A drive unit stopped due to transition failure from initial communication to runtime.
x: Channel No. (from 0)
y: Drive unit rotary switch No. (from 0)

Remedy

- Take measures against noise.
- Check for any failure of the communication cable connectors between controller and drive unit or between two drive units.
- Check for any failure of the communication cables between controller and drive unit or between two drive units.
- A drive unit may be faulty. Take a note of the 7-segment LED contents of each drive unit and contact the Service Center.
- Update the drive unit software version.

(Note) When two or more alarms (Y02 0051) occur at the same time, only the alarm which has occurred first is displayed.

Y02 SV commu er: Node detect err 0051 xy30

Details

A communication error has occurred between controller and drive unit.
No response from drive unit to the request from NC when setting network configuration.
x: Channel No. (from 0)
y: Station No. (from 0)

Remedy

- Take measures against noise.
- Check for any failure of the communication cable connectors between controller and drive unit or between two drive units.
- Check for any failure of the communication cables between controller and drive unit or between two drive units.
- A drive unit may be faulty. Take a note of the 7-segment LED contents of each drive unit and contact the Service Center.
- Update the drive unit software version.

(Note) When two or more alarms (Y02 0051) occur at the same time, only the alarm which has occurred first is displayed.

Y02 SV commu er: Commu not support 0051 xy31

Details

A communication error has occurred between controller and drive unit.
Drive unit's software version doesn't support the communication mode that the controller requires.
x: Channel No. (from 0)
y: Station No. (from 0)

Remedy

- Take measures against noise.
- Check for any failure of the communication cable connectors between controller and drive unit or between two drive units.
- Check for any failure of the communication cables between controller and drive unit or between two drive units.
- A drive unit may be faulty. Take a note of the 7-segment LED contents of each drive unit and contact the Service Center.
- Update the drive unit software version.

(Note) When two or more alarms (Y02 0051) occur at the same time, only the alarm which has occurred first is displayed.

Y03 Drive unit unequipped axis name

Details

The drive unit is not correctly connected.
Alphabet (axis name): Servo axis drive unit not mounted
1 to 4: PLC axis drive unit not mounted
S: No.1 spindle drive unit not mounted
T: No.2 spindle drive unit not mounted
M: No.3 spindle drive unit not mounted
N: No.4 spindle drive unit not mounted

Remedy

Check the drive unit mounting state.
- Check the end of the cable wiring.
- Check for any broken wires.
- Check the connector insertion.
- The drive unit input power has not been ON.
- The drive unit axis No. switch is illegal.

Y05 Initial parameter error (Parameter No.)

Details

There is a problem in the value set for the number of axes or the number of part systems.

Remedy

Correct the value set for the following corresponding parameters:
"#1001 SYS_ON (System validation setup)",
"#1002 axisno (Number of axes)",
"#1039 spinno (Number of spindles)", etc.
"#2187 chgPLCax (PLC axis switchover axis No.)", etc.

- Make sure that the parameters unavailable for a switchover axis (#1068 slavno, #12800 chgauxno, etc.) are OFF.

Y05 Initial parameter error 2674 (Sub-number)

Details

The parameter setting of the multiple axis synchronization control is incorrect.
The sub-number is displayed after the error number.
0002:
More than three sets combining the synchronization control and the multiple axis synchronization control are set.
0003:
The slave axis of multiple axis synchronization control overlaps with the synchronization control axis.
0004:
The master axis of multiple axis synchronization control overlaps with the synchronization control axis.
0005:
The master axis is set to the axis which crosses the part system.
0006:
The slave axis setting is also set to the master axis.
0007:
The function which cannot be used with the multiple axis synchronization control is enabled.

Remedy

Correct the parameter setting.

Y06 mcp_no setting error 0001

Details

There is a skipped number in the channels.

Remedy

Check the values set for the following parameters.
"#1021 mcp_no (Drive unit I/F channel No. (servo))"
"#3031 smcp_no (Drive unit I/F channel No. (spindle))"

Y06 mcp_no setting error 0002

Details

There is a duplicate setting for random layout.

Remedy

Check the values set for the following parameters.
"#1021 mcp_no (Drive unit I/F channel No. (servo))"
"#3031 smcp_no (Drive unit I/F channel No. (spindle))"

Y06 mcp_no setting error 0003

Details

The drive unit fixed setting "0000" and random layout setting "****" are both set.

Remedy

Check the values set for the following parameters.
"#1021 mcp_no (Drive unit I/F channel No. (servo))"
"#3031 smcp_no (Drive unit I/F channel No. (spindle))"

Y06 mcp_no setting error 0004

Details

The spindle/C axis "#1021 mcp_no (Drive unit I/F channel No. (servo))" and "#3031 smcp_no (Drive unit I/F channel No. (spindle))" are not set to the same values.

Remedy

Check the values set for the following parameters.
"#1021 mcp_no (Drive unit I/F channel No. (servo))"
"#3031 smcp_no (Drive unit I/F channel No. (spindle))"

Y06 mcp_no setting error 0005

Details

A random layout has been set while "#1154 pdoor" has been set to "1" in two-part system.

Remedy

Check the values set for the following parameters.
"#1021 mcp_no (Drive unit I/F channel No. (servo))"
"#3031 smcp_no (Drive unit I/F channel No. (spindle))"

Y06 mcp_no setting error 0006

Details

The channel No. parameter is not within the setting range.

Remedy

Check the values set for the following parameters.
"#1021 mcp_no (Drive unit I/F channel No. (servo))"
"#3031 smcp_no (Drive unit I/F channel No. (spindle))"

Y07 Too many axes connected 00xy

Details

The number of axes connected to each channel exceeds the maximum number of connectable axes.
The exceeded number of axes per channel is displayed as alarm No.
x: Exceeded number of axes at drive unit interface channel 2 (0 to F)
y: Exceeded number of axes at drive unit interface channel 1 (0 to F)

This alarm also occurs when the drive unit is connected only with the 2nd channel without connecting with the 1st channel.

Remedy

Remove connected axes from the channel whose alarm No. is other than '0' for the number displayed as the alarm No. Keep the number of connected axes to or less than the maximum that can be connected.
(Note 1) The number of axes is limited per each drive unit interface channel.
(Note 2) Maximum number of axes that can be connected differs depending on whether or not an expansion unit is available or the setting of '#11012 16 axes for 1ch (Connecting 16 axes for 1ch)'. With the expansion unit, up to eight axes can be connected to a channel. Without the expansion unit, up to eight axes are allowed when '#11012 16 axes for 1ch (Connecting 16 axes for 1ch)' is set to '0', sixteen axes when set to '1'.
(Note 3) If this alarm occurs, the alarm 'Y03 Message: Drive unit unequipped' will not occur.
(Note 4) This alarm is displayed taking precedence over the alarm 'Y08 Too many drive units connected' and 'Y09 Too many axisno connected'.

Y08 Too many drive units connected 00xy

Details

The number of drive units connected to each channel exceeds 8.
The exceeded number of drive units per channel is displayed as alarm No.
x: Exceeded number of drive units at drive unit interface channel 2 (0 to F)
y: Exceeded number of drive units at drive unit interface channel 1 (0 to F)

Remedy

Remove drive units from the channel whose alarm No. is other than "0" for the number displayed as the alarm No. Keep the number of connected drive units to 8 or less.
(Note 1) The drive unit is not counted when all the axes connected to it are invalid.
(Note 2) If this alarm occurs, the alarm "Y03 Message: Drive unit unequipped" will not occur.
(Note 3) The alarm "Y07 Too many axes connected" and "Y09 Too many axisno connected" are displayed taking precedence over this alarm.

Y09 Too many axisno connected 00xy

Details

The No. of the axis (drive unit's rotary switch No.) connected to each channel is bigger than the No. allowed.
If the axis No. of each channel is bigger than the No. allowed, "1" is displayed for the alarm No.
x: "1" when the axis No. at drive unit interface channel 2 is too big
y: "1" when the axis No. at drive unit interface channel 1 is too big

Remedy

For the channel whose alarm No. is "1", keep the axis No. (drive unit's rotary switch No.) not bigger than the No. allowed.
(Note 1) The axis No. is limited per each drive unit interface channel.
(Note 2) The biggest allowed connected axis No. differs depending on whether or not an expansion unit is available or the setting of "#11012 16 axes for 1ch (Connecting 16 axes for 1ch)". The biggest connectable axis No. is as shown below.
With the expansion unit, axes No. '0' to '7' can be connected.
Without the expansion unit, axes No. '0' to '7' are allowed when '#11012 16 axes for 1ch (Connecting 16 axes for 1ch)' is set to '0', axes No. '0' to 'F' when set to '1'.
(Note 3) If this alarm occurs, the alarm "Y03 Message: Drive unit unequipped" will not occur.
(Note 4) This alarm is displayed taking precedence over the alarm "Y08 Too many drive units connected".
(Note 5) The alarm "Y07 Too many axes connected" is displayed taking precedence over this alarm.

Y12 No commu. with axis drv unit

Details

Although the high-speed synchronous tapping option is valid, the connected drive unit doesn't support the option.

Remedy

- Replace the drive unit with that supports the option.
- Set "High-speed synchronous tapping disabled axis" parameter as disabled for the axis to which you don't use the high-speed synchronous tapping.

Y13 No commu. with sp drv unit

Details

Although the high-speed synchronous tapping option is valid, the connected drive unit doesn't support the option.

Remedy

- Replace the drive unit with that supports the option.
- Set "High-speed synchronous tapping disabled axis" parameter as disabled for the spindle to which you don't use the high-speed synchronous tapping.

Y15 RIO connection error 0001 (Error channel)

Details

RIO station number is too large
Although a non-RIO2.0 unit is connected, 9 or a greater number is set as a station No.

Remedy

- If a non-RIO2.0 unit is connected, set the station No. to be 8 or smaller.
- If you use 9 or a greater station No., do not connect a non-RIO2.0 unit.

Y15 RIO connection error 0002 (Error channel)

Details

RIO3 connection error
A non-RIO2.0 unit is connected to RIO3.

Remedy

- Connect a RIO2.0-compatible or RIO2.0-dedicated unit.

Y15 RIO connection error 0003 (Error channel)

Details

RIO communication processing time exceeded (PC medium speed)
Due to too short DI/DO refresh cycle, the control may not refresh all the DI/DOs connected to one RIO channel at a time.

Remedy

- Correct the setting of "#1334 DI/DO refresh cycl(DI/DO refresh cycle)".
- Connect the remote IO units to RIO1, RIO2 and RIO3 dispersedly to reduce the number of RIO stations connected per RIO channel.

Y15 RIO connection error 0004 (Error channel)

Details

RIO communication processing time exceeded (PC high speed)
Due to too short DI/DO refresh cycle, the control may not refresh all the DI/DOs connected to one RIO channel at a time.

Remedy

- Connect the remote IO units to RIO1, RIO2 and RIO3 dispersedly to reduce the number of RIO stations (which perform high-speed input/output) per RIO channel.

Y20	Parameter compare error	0001	(Axis name)

Details

The speed monitoring parameter in the NC does not correspond to the parameter transmitted to the drive unit.
The name of the axis with an error is displayed.

Remedy

The NC or the servo drive unit may be damaged.
Contact the service center.

Y20	Sfty obsrvation: Cmd spd err	0002	(Axis name)

Details

The speed exceeding the speed set with the parameter was commanded during the speed monitoring mode.
The name of the axis with an error is displayed.

Remedy

Check the speed monitoring parameter and the sequence program.
Restart the NC.

Y20	Sfty obsrvation: FB pos err	0003	(Axis name)

Details

The commanded position, transmitted to the servo drive unit from NC, is totally different from the feedback position received from the servo drive unit during the speed monitoring mode.
The name of the axis with an error is displayed.

Remedy

The NC or the servo drive unit may be damaged.
Contact the service center.

Y20	Sfty obsrvation: FB speed err	0004	(Axis name)

Details

Actual rotation speed of the motor is exceeding the speed that has been set with speed monitoring parameter during the speed monitoring mode.
The name of the axis with an error is displayed.

Remedy

Correct the speed observation parameter and the sequence program.
Restart the NC.

Y20	Door signal: Input mismatch	0005	Door No.

Details

Door state signals on the NC side and the drive side do not match. It may be caused by the followings:

- Cable disconnection
- Damaged door switch
- Damaged NC or servo drive unit

Remedy

Check the cable.
Check the door switch.
Restart the NC.

Y20	No speed observation mode in door open	0006	Door No.

Details

The door open state was detected when the speed monitoring mode was invalid.
The causes may be same as the ones for 0005 (Door signal: Input mismatch). Also the sequence program may not be correct.

Remedy

Correct the sequence program.
Restart the NC.

Y20	Speed obsv: Para incompatible	0007	(Axis name)

Details

Two speed monitoring parameters are not matched at the rising edge of the "speed monitor mode" signal.
The name of the axis with an error is displayed.

Remedy

Correct the relevant parameters so that the two speed monitoring parameters match.
Restart the NC.

Y20	Contactor welding detected	0008	Contactor info

[M8]

Details

Contactor welding was detected.
Displays the bit corresponding to the No. of the abnormal contactor for the contactor information.
Some contactors take a while to be shutdown after the servo ready is turned OFF, and the servo ready was turned ON in the meantime.

Remedy

- Make sure that contactor's auxiliary b contact signal is output correctly to the device set on "#1330 MC_dp1(Contactor weld detection device 1)" and "#1331 MC_dp2(Contactor weld detection device 2)".
- If welding, replace the contactor.
- Restart the NC.

[C80]

Details

Contactor welding was detected.
The alarm indicates the parameter to which the weld detection device of the error contactor is assigned with the bit.
bit0: #1330 MC_dp1
bit1: #1331 MC_dp2
bit2: #1339 MC_dp3
bit3: #1340 MC_dp4

Remedy

- Make sure that the contactor's auxiliary b contact signal is output correctly to the contactor weld detection device.
  If welding, replace the contactor.
- Check the setting of the contactor weld detection device parameter.

Y20 No spec: Safety observation 0009

Details

"#2313 SV113 SSF8/bitF (ssc SLS (Safely Limited Speed) function)" and "#13229 SP229 SFNC9/bitF (ssc SLS (Safely Limited Speed) function)" are set for a system with no safety observation option.

Remedy

Disable "#2313 SV113 SSF8/bitF (ssc SLS (Safely Limited Speed) function)" and "#13229 SP229 SFNC9/bitF (ssc SLS (Safely Limited Speed) function)".
Then, restart the NC.

Y20 SDIO connector input volt err 0010

Details

24VDC power is not supplied to SDIO connector correctly. (SDIO 4A pin supply voltage was dropped to 16V or less, or 1ms or more instant power interrupt was detected.)
In this case, "Pw sply:Inst pw interpt(DC24V)" alarm occurs because the contactor control output signal cannot be controlled.
This state remains until restarting the NC even if the cause of the alarm has been removed.

Remedy

Check the wiring. Supply 24VDC power to the SDIO connector.
Restart the NC.

Y20 Device setting illegal 0011 Contactor info

[M8]

Details

- The device set in the parameter "#1353 MC_ct1" (Contactor shutoff output 1 device) does not exist.
- The device set in the parameter "#1353 MC_ct1" (Contactor shutoff output 1 device) is used as an output device in PLC program.

Remedy

- In the parameter "#1353 MC_ct1" (Contactor shutoff output 1 device), set the device to which a remote I/O is connected. Use the device to control the contactor.
- Confirm that the devices set by the parameter "#1353 MC_ct1" (Contactor shutoff output 1 device)" are not used as an output device in PLC program.

Restart the NC.

[C80]

Details

Setting of the contactor shutoff output device parameter is incorrect.
The alarm indicates the parameter of the incorrect setting with the bit.
bit0: #1353 MC_ct1

Remedy

- Check the setting of the contactor shutoff output device parameter.

Y20 Contactor operation abnormal 0012 Contactor info

[M8]

Details

Contactor's operation is not following the NC's commands.
Displays the No. of the abnormal contactor for the contactor information.

Remedy

- Check and correct "#1353 MC_ct1" (Contactor shutoff output 1 device) setting.
- Check the wiring for contactor shutoff.
- Check for contactor's welding.
- Restart the NC.

[C80]

Details

Contactor does not operate as commanded by the NC.
The alarm indicates the parameter to which the weld detection device of the error contactor is assigned with the bit.
bit0: #1330 MC_dp1
bit1: #1331 MC_dp2
bit2: #1339 MC_dp3
bit3: #1340 MC_dp4

Remedy

- Check the settings of the following parameters.
  #1330 MC_dp1
  #1331 MC_dp2
  #1339 MC_dp3
  #1340 MC_dp4
  #1353 MC_ct1
  #1357 mchkt1
- Check the wiring for contactor shutoff.
- Check for contactor's welding.

Y20 STO function operation illegal 0013

Details

The drive unit's STO function has failed to work properly.

Remedy

If this alarm has occurred alone, a drive unit failure can be suspected.
If other alarms have been generated at the same time, it is also possible that there is communication problem. Check the optical cable wiring.

Y20 STO function illegal at pwr ON 0014

Details

The motor power has not been shut down with the STO function when the NC power was turned ON.

Remedy

If this alarm has occurred alone, a drive unit failure can be suspected.
If other alarms have been generated at the same time, it is also possible that there is communication problem. Check the optical cable wiring.

Y20 Dual signal: parameter setting error 0027

Details

A setting of #2118 SscDrSel, #3071 SscDrSelSp, #2180 S_DIN, or #3140 S_DINSp is not correct.

Remedy

- Correct the parameter setting.

Y20 Safety observation: parameter memory error 0031 (Parameter No.)

Details

The following parameters are not consistent with the check data.
#2180 S_DIN, #3140 S_DINSp

Remedy

- Correct the parameter setting.
- Restore the backup data, as the parameter or check data may be corrupted.

Y21 Speed obsv signal: Speed over 0001 (Axis name)

Details

The speed exceeds the safety speed limit when the "speed monitor mode" signal is ON.
The name of the axis with an error is displayed.

Remedy

Decelerate the speed to reset the warning and start the speed monitor.

Y40 Machine group-based stop

Details

A machine group-based alarm stop has occurred, or the machine group-based PLC interlock signal has been input.

Remedy

- Remove the cause of the stop by alarm.Turn OFF the machine group-based PLC interlock signal.

Y51 Parameter G0tL illegal 0001

Details

The time constant has not been set or exceeded the setting range.

Remedy

Correct "#2004 G0tL (G0 time constant (linear))".

Y51 Parameter G1tL illegal 0002

Details

The time constant has not been set or exceeded the setting range.

Remedy

Correct "#2007 G1tL (G1 time constant (linear))".

Y51 Parameter G0t1 illegal 0003

Details

The time constant has not been set or exceeded the setting range.

Remedy

Correct "#2005 G0t1 (G0 time constant (primary delay) / Second-step time constant for soft acceleration/deceleration)".

Y51 Parameter G1t1 illegal 0004

Details

The time constant has not been set or exceeded the setting range.

Remedy

Correct "#2008 G1t1 (G1 time constant (primary delay)/Second-step time constant for soft acceleration/deceleration)".

Y51 Parameter grid space illegal 0009

Details

The grid space is illegal.

Remedy

Correct "#2029 grspc(Grid interval)".

Y51 Parameter stapt1-4 illegal 0012

Details

The time constant has not been set or exceeded the setting range.

Remedy

Correct the parameters from "#3017 stapt1(Tap time constant (Gear: 00))" to "#3020 stapt4(Tap time constant (Gear: 11))".

Y51 Slave axis No. illegal 0014

Details

In the axis synchronization, parameter settings for slave axis have been attempted in different part system from that of master axis.

Remedy

Correct the "#1068 slavno (Slave axis number)" setting.

Y51 Parameter skip_tL illegal 0015

Details

The time constant has exceeded the setting range.

Remedy

Correct "#2102 skip_tL (Skip time constant linear)".

Y51 Parameter skip_t1 illegal 0016

Details

The time constant has exceeded the setting range.

Remedy

Correct "#2103 skip_t1 (Skip time constant primary delay / Second-step time constant for soft acceleration/deceleration)".

Y51 Parameter G0bdcc illegal 0017

Details

"#1205 G0bdcc (Acceleration and deceleration before G0 interpolation)" for the 2nd part system is set to acceleration/deceleration before G0 interpolation.

Remedy

Correct "#1205 G0bdcc (Acceleration and deceleration before G0 interpolation)".

Y51 OMR-II parameter error 0018

Details

An illegal setting was found in the OMR-II-related parameters. OMR-II has been disabled.

Remedy

Correct the related parameter settings.

Y51 PLC indexing stroke length err 0019

Details

"#12804 aux_tleng (Linear axis stroke length)" has not been set or exceeded the setting range while the linear axis equal indexing is enabled for the PLC indexing axis.

Remedy

Correct "#12804 aux_tleng (Linear axis stroke length)".

Y51 Hi-acc time const unextendable 0020

Details

High-accuracy acceleration/deceleration time constant extension option is unavailable.

Remedy

- Adjust the setting of "#1207 G1btL" to be within the range of when the high-accuracy control time constant extension option is OFF.
- High-accuracy acceleration/deceleration time constant extension option is unavailable for a system configured with multiple part systems. Change the system to be made up of a single part system, or set the said option to OFF.

Y51 Superimpos linear G0 error 0022

Details

The time constant has not been set or exceeded the setting range.

Remedy

Check "#2092 plG0tL G0 time constant for superimposition control (linear)".

Y51 Superimpos linear G1 error 0023

Details

The time constant has not been set or exceeded the setting range.

Remedy

Check "#2094 plG1tL G1 time constant for superimposition control (linear)".

Y51 Primary delay G0time const err 0028

Details

The time constant has not been set or the set time constant is out of the specified range.

Remedy

Correct "#2093 plG0t1 G0 time constant for superimposition (primary delay)/2nd step of soft acceleration/deceleration".

Y51 Primary delay G1time const err 0029

Details

The time constant has not been set or the set time constant is out of the specified range.

Remedy

Correct "#2095 plG1t1 G1 time constant for superimposition (primary delay)/2nd step of soft acceleration/deceleration".

Y51 Jerk filter time constant err 0030

Details

Setting of "#12051 Jerk_filtG1" is greater than that of "#1568 SfiltG1".
Or setting of "#12052 Jerk_filtG0" is greater than that of "#1569 SfiltG0".

Remedy

Change the setting of "#12051 Jerk_filtG1" to be smaller than "#1568 SfiltG1".
Or change the setting of "#12052 Jerk_filtG0" to be smaller than "#1569 SfiltG0".

Y51 Unable to alloc. hi-acc buffer 0031

Details

The high-accuracy acceleration/deceleration buffer has failed to be allocated.

Remedy

The software or hardware may be damaged. Contact the service center.

Y51 Too many hi-speed/accu systems 0032

Details

The parameter "#8040 High-speed high-accuracy control-enabled part system" is set to 1 for three or more part systems.

Remedy

Set the parameter "#8040 High-speed high-accuracy control-enabled part system" to 1 for up to two part systems.

Y51 Parameter G0tL_2 illegal 0033

Details

The time constant is out of the specified range.

Remedy

Correct "#2598 G0tL_2 (G0 time constant 2 (linear))".

Y51 Parameter G0t1_2 illegal 0034

Details

The time constant is out of the specified range.

Remedy

Correct "#2599 G0t1_2 (G0 time constant 2 (primary delay)/Second-step time constant for soft acceleration/deceleration)".

Y51 3ax line accel G0time const er 0035

Details

The time constant has not been set or the set time constant is out of the specified range.

Remedy

Correct "#2622 pl3G0tL G0 time constant (linear) for 3-axis serial superimposition control".

Y51 3ax line accel G1time const er 0036

Details

The time constant has not been set or the set time constant is out of the specified range.

Remedy

Correct "#2624 pl3G1tL G1 time constant (linear) for 3-axis serial superimposition control".

Y51 3ax prim delay G0time const er 0037

Details

The time constant has not been set or the set time constant is out of the specified range.

Remedy

Correct "#2623 pl3G0t1 G0 time constant (primary delay) for 3-axis serial superimposition control/2nd step of soft acceleration/deceleration".

Y51 3ax prim delay G1time const er 0038

Details

The time constant has not been set or the set time constant is out of the specified range.

Remedy

Correct "#2625 pl3G1t1 G1 time constant (primary delay) for 3-axis serial superimposition control/2nd step of soft acceleration/deceleration".

Y51 Machine group No. discrepancy 0039

Details

The machine group Nos. that are used for the machine groupwise alarm stop function are different among the axes related to inclined axis control and synchronous control.

Remedy

Give an identical machine group No. to all the axes related to inclined axis control and synchronous control.

Y51 M-group alarm stop disabled 0040

Details

The machine group-based alarm stop function has been disabled, because both the machine group-based alarm stop and collision detection functions were enabled.

Remedy

- Disable the collision detection function if you wish to use the machine group-based alarm stop function.

Y51 Basic axes I, J, K error 0045

Details

The 1st letter of name extension axis for 2-letter axis (#1013 axname) is specified to the basic axes I, J, and K (parameter #1026 to #1028).

Remedy

- Set the letter other than the 1st letter of name extension axis for 2-letter axis (#1013 axname) to the basic axes I, J and K (parameter #1026 to #1028).

Y51 Values of PC1/PC2 too large 0101

Details

The PC1 and PC2 settings for the rotary axis are too large.

Remedy

Correct "#2201 SV001 PC1 (Motor side gear ratio)" and "#2202 SV002 PC2 (Machine side gear ratio)".

Y51 ABS/INC same axis name 0104

Details

In the absolute/incremental command method using the axis address (L system and when "#1076 AbsInc" = 1), the axis that the same axis address is set in "#1013 axname" and "#1014 incax" exists.

Remedy

Correct the settings so that the same axis address is not set in "#1013 axname" and "#1014 incax".

Y51 Axis name initial setting err 0105

Details

The axis address that is out of the setting range (other than X, Y, Z, U, V, W, A, B, C, H) is set in "#1013 axname" or "#1014 incax".

Remedy

Set the axis address within the setting range to "#1013 axname" and "#1014 incax".

Y90 No spindle signal 0001-0007

Details

There is an error in the spindle encoder signal.
The data transmission to the drive unit is stopped when this error occurs.

Remedy

Check the spindle encoder's feedback cable and the encoder.

5 System Alarms (Z)

Z02 System error

Details

The operation result is illegal.

Remedy

•Contact the service center.

Z11 CC-L IE F communication error n1 n2

Details

A communication error has occurred in the communication that uses a CC-Link IE field network unit.
n1: Indicates the No. of slot to which the expansion unit with the communication error or diagnostic alarm is mounted (in hexadecimal format).
n2: Indicates the alarm No. of the slot where the communication error or diagnostic alarm is occurring (in hexadecimal format).

Refer to the list of messages in specification manual.

Z13 CC-L IE F parameter error (Parameter No.)

Details

Parameter setting of #[Parameter No.] is incorrect.
Refer to the list of messages in specification manual.

Remedy

Correct the setting.

Z14 CC-Link IE F H/W test status n1 n2

Details

H/W test is completed for the CC-Link IE field network unit.
Check the test result.
n1: Indicates the H/W test result of slot 1 (in hexadecimal format).
n2: Indicates the H/W test result of slot 2 (in hexadecimal format).

0: H/W test is normally completed or not performed
2: External self-loopback test is completed with connection error
3: External self-loopback test is completed with communication error
FFFF: H/W test is underway

Remedy

Take the following measures according to the test result.
0: Check the communication mode.
If the mode is H/W test, switch it to online, and turn OFF and ON the NC power.
If a mode other than H/W test is active, check the result of the other slot and take the measures.
2: Make sure the connection of Ethernet cable, or exchange the cable. And then perform the test again.
If the error occurs again, exchange the H/W.
3: Exchange the Ethernet cable, and perform the test again.
If the error occurs again, exchange the H/W.
FFFF: Turn OFF and ON the NC power.
If the result is unchanged, exchange the H/W.

Z18 Network expansion card error n1 n2

Details

An abnormality has occurred on the field network communication expansion unit.
n1: Error slot No.
n2: Error No.

Remedy

0 99:
Two Fieldbus communication expansion units which cannot be used simultaneously are mounted simultaneously. Remove either of Fieldbus communication expansion unit.
Other than 0 99:
A failure on the hardware can be speculated. Replace the field network communication expansion unit.

Z21 PROFIBUS parameter error (Parameter No.)

Details

The parameter #[Parameter #] is incorrect.

Remedy

Correct the setting.

Z23 AXIS EX-ADR. ERROR

Details

The axis not extending the address (1 character axis) exists at the back of the axis extending the address (2 character axis) in the same system.

Remedy

•Improve the axis composition. The axis not extending the address can not exist at the back of the axis extending the address in the same system.

Z25 Unable to start safe spd clamp

Details

The SLS observation request signal has been turned OFF in any of the following machining modes: Thread cutting, synchronous tapping, cross machining, superimposition control, tool center point control or SSS control

Remedy

•Perform the operation with the SLS observation request signal ON.
•Perform the operation with the door closed.

Z26 NC unit replacement illegal

Details

NC unit is replaced to the FCU8-MU541, FCU8-MA541, FCU8-MU501, or FCU8-MU502.

Remedy

•Contact to your service center.
•Press the reset to cancel the warning and continue the operations.

Z27 FnctnlSafetyExpnsCard MountErr

Details

A functional safety expansion card is mounted to the NC unit (FCU8-MU501 or FCU8-MU50).

Remedy

- Contact to your service center.
- Press the reset to cancel the warning and continue the operations.

Z28 EtherNet/IP parameter error (Parameter No.)

Details

Parameter setting of #[Parameter No.] is incorrect.
Refer to the list of messages in" EtherNet/IP specification manual".

Remedy

Correct the setting.

Z29 EtherNet/IP communication err n1 n2 n3 n4

Details

A communication error has occurred in the communication that uses an EtherNet/IP expansion unit.
[n1: Output the device Number (in hexadecimal format)]
FF: Simultaneously mounting two EtherNet/IP expansion units error
Other than FF: Device No. of the connected device
[n2: Output the position No. (in hexadecimal format)]
FF: Simultaneously mounting two EtherNet/IP expansion units error
Other than FF: Device No. of the connected device
[n3: Output the device communication status (IN) (in hexadecimal format)]
[n4: Output the device communication status (OUT) (in hexadecimal format)]
For details, refer to "EtherNet/IP Specifications manual".

Z31 Socket open error(socket) 0001

Details

Socket open error (socket)

Remedy

Set the parameter then turn the power OFF and ON again.

Z31 Socket bind error(bind) 0002

Details

Socket bind error (bind)

Remedy

Set the parameter then turn the power OFF and ON again.

Z31 Connection wait queue error(listen) 0003

Details

Connection wait queue error (listen)

Remedy

Set the parameter then turn the power OFF and ON again.

Z31 Connection request error(accept) 0004

Details

Connection request error (accept)

Z31 Data recv error(socket error) 0005

Details

Data receive error (socket error)

Z31 Data recv error(data error) 0006

Details

Data receive error (data error)

Z31 Data send error(socket error) 0007

Details

Data send error (socket error)

Z31 Data send error(data error) 0008

Details

Data send error (data error)

Z31 Socket close error(close) 000A

Details

Socket close error (close)

Remedy

Set the parameter then turn the power OFF and ON again.

Z34 DeviceNet error

Details

Any of the following errors has occurred in the DeviceNet unit.

- Master function error (X03 is ON)
- Slave function error (X08 is ON)
- Message communication error (X05 is ON)

If the errors have occurred in more than one unit, the error No. of the unit with the smallest slot No. is displayed.
If the master function, slave function and message communication errors have occurred at the same time, the error is displayed in the following priority order.

1. Master function error
2. Slave function error
3. Message communication error

Remedy

- Select the [Ext. PLC link control] menu on the maintenance screen to open the unit confirmation screen, and check the unit in error and details to cancel the error.

Z35 Direct Socket connection error 0001

Details

- Connection has failed.
- Five or more clients attempted a connection.

Remedy

- Check the connection of the network cables, and check for broken wires and a failure of the network connection devices such as hub.
- When using the Direct Socket communication I/F, connect up to four clients.

Z35 Direct Socket receive error 0002

Details

- Receiving data from a client has failed.

Remedy

- Check the connection of the network cables, and check for broken wires and a failure of the network connection devices such as hub.

Z35 Direct Socket send error 0003

Details

- Sending data to a client has failed.

Remedy

- Check the connection of the network cables, and check for broken wires and a failure of the network connection devices such as hub.

Z35 Direct Socket timeout error 0004

Details

There was no response from client computers, and a timeout error occurred.

Remedy

- Check the connection of the network cables, and check for broken wires and a failure of the network connection devices such as hub.

Z35 Direct Socket comm OFF 0005

Details

The direct Socket communication I/F is OFF.

Remedy

- Check the parameter "#11051 Direct Socket ON".

Z36 EcoMonitorLight comm. error

Details

An error has occurred in the communication with EcoMonitorLight.

Remedy

Make sure that the CNC has the same communication settings (station No.,baud rate, parity and stop bit) as the EcoMonitorLight in error.
Make sure that there are no problems with the serial cable connected to the EcoMonitorLight.
Make sure to place the serial cable in a low-noise environment.

Z37 EcoMonitorLight qty discrepant

Details

The number of EcoMonitorLight units connected is inconsistent with the setting of the parameter #11061.

Remedy

Make sure that the value set in the parameter #11061 coincides with the number of EcoMonitorLight units connected to the CNC.
Also make sure all the EcoMonitorLight units connected are powered ON and the station No. is not duplicated.

Z38 Insulation deterioration wrn

Details

The motor insulation has been deteriorated.
0001: Motor insulation deterioration: Caution
0002: Motor insulation deterioration: Replacement required
0003: Motor insulation deterioration: Relay welding detected

Remedy

0001: The insulation resistance value of the motor has dropped.
Contact the service center.
0002: The insulation resistance value of the motor is less than or equal to the reference value.
Contact the service center.
When measuring the insulation resistance of the motor and the measured resistance value is less than or equal to the specified value, the motor may be damaged.
0003: The drive unit may be damaged.
Contact the service center.

Z39 E-mail send error

Details

E-mail sending with the email notification to operator function failed.

Remedy

- Check the e-mail environment setting.
- Check the registered e-mail address.
- Set "0" in "#8134 E-mail send disabled".

Z40 Format mismatch

Details

"#1052 MemVal (No. of common variables shared in part system designation)", formatted at "0", was set to "1".

Remedy

- Reset "#1052 MemVal (No. of common variables shared in part system designation)" to "0" or format and restart.

Z49 RIO watchdog error 0001

Details

An error has occurred in the remote I/O unit.

Remedy

- Turn the power ON again.
- If this error remains active after the power ON, replace the remote I/O unit.

Z51 E2PROM error 001x

Details

[Type]
Z51 E2PROM error 0011: Read error
Z51 E2PROM error 0012: Write error

Remedy

- If the same alarm is output by the same operation, the cause is an H/W fault. Contact the Service Center.

Z52 Battery fault 000x

Details

The voltage of the battery in the NC control unit has dropped. (The battery used to save the internal data.)
0001: Battery warning
0002: Battery detecting circuit error
0003: Battery alarm
(Note) The display of "Z52 battery fault 0001" can be removed by resetting. However, the warning state will not be cleared until the battery is replaced.

Remedy

- Replace the battery of the NC control unit.
- Check for any disconnection of the battery cable.
- After fixing the battery's fault, check the machining program.

Z53 CNC overheat

Details

The controller or operation board temperature has risen above the designated value.
(Note) Temperature warning
When an overheat alarm is detected, the alarm is displayed and the overheat signal is output simultaneously. Automatic operation will be continued, while restarting after resetting or stopping with M02/M30 is not possible. (Restarting after block stop or feed hold is possible.)
The alarm will be cleared and the overheat signal will turn OFF when the temperature drops below the specified temperature.
Z53 CNC overheat 000x
[000x]
(For all models)
0001: The temperature in the control unit is high.
The ambient temperature must be lowered immediately when a "Z53 CNC overheat" alarm occurs. However, if the machining needs to be continued, set "#6449/bit7 Control unit temperature alarm ON" to "0". Then the alarm will be invalidated.

Remedy

- Cooling measures are required.
- Turn OFF the controller power, or lower the temperature with a cooler, etc.

Z55 RIO communication stop

Details

An error occurs in the communication between the control unit and remote I/O unit.
Disconnection of a cable
Fault in remote I/O unit
Fault of power supply to remote I/O unit
The communication interrupted station is displayed in hexadecimal for each RIO channel when an error occurs in the communication between the control unit and remote I/O unit.
When the control displays a communication stop station, it divides the RIO channel stations (up to 64 stations) into groups of 8 stations. If any of the 8 stations has the communication stop error, the number is displayed with the alarm.
Z55 RIO communication stop __ __ __ __ __ __ __ __
(a) (b) (c) (d) (e) (f) (g) (h)
(a)(b): RIO1
(c)(d): RIO2
(e)(f): RIO3
(g)(h): "00" fixed
(a)(b), (c)(d), and (e)(f) indicate the following stations in hexadecimal.
bit0: 1st to 8th stations
bit1: 9th to 16th stations
bit2: 17th to 24th stations
bit3: 25th to 32nd stations
bit4: 33rd to 40th stations
bit5: 41st to 48th stations
bit6: 49th to 56th stations
bit7: 57th to 64th stations
(Example) Stations #1 and #8 of RIO1 and stations #24 and #64 of RIO3 have the communication error.
Z55 RIO communication stop 0100 8400
The RIO error status can be monitored through the R registers on the self diagnostic or I/F diagnostic screen.

Remedy

- Check and replace the cables.
- Replace the remote I/O unit.
- Check the power supply (existence of supply and voltage).

Z57 System warning

Details

Program memory capacity has been set over the value that can be formatted.
An expansion device/expansion cassette has not mounted after formatting.
The mounted expansion device/expansion cassette is different from the one that was mounted at formatting.

Remedy

Check the followings.
- Program memory capacity
- Mounting of an expansion device/expansion cassette
- APLC release option

Z58 ROM write not completed

Details

A machine tool builder macro program has not been written to FROM after being registered/ edited/ copied/ condensed/ merged/ the number changed/ deleted.

Remedy

- Write the machine tool builder macro program to FROM.

The program does not need to be written to FROM unless the editing operations and so on need to be valid after the NC power OFF.

Z59 Acc/dec time cnst too large

Details

Acceleration and deceleration time constants are too large.
(This alarm occurs with the stop code (T02 0206).)

Remedy

- Set the larger value for "#1206 G1bF(Maximum speed)".
- Set the smaller value for "#1207 G1btL(Time constant)".
- Set the lower feedrate.

Z60 Fieldbus communication error n1 n2 n3 n4

Details

A communication error has occurred on the Fieldbus communication with FCU8-WN563.
[n1: denotes the master station status (in the hexadecimal form).]
00: Offline: In initialization
40: Stop: I/O communication stopped
80: Clear: Resetting the output data of each slave by sending zero data
C0: In operation: In I/O communication
FF: Two Fieldbus expansion units are mounted.
[n2: denotes the error condition (in the hexadecimal form).]
bit0: Control error: Parameter error
bit1: Auto clear error: Communication with all the slave stations was cut because a communication with one slave station had an error.
bit2: Non-exchange error: A slave station has communication error.
bit3: Fatal error: Communication cannot be continued because of severe network failure.
bit4: Not ready: CNC communication is not ready.
bit5: Timeout error: Timeout is detected in communication with each station.
bit6: Not used
bit7: Not used
FF: Two Fieldbus expansion units are mounted.
[n3: denotes the slave station where communication error has occurred(in the hexadecimal form).]
* FF is indicated when two Fieldbus expansion units are mounted.
[n4: denotes the error number (in the hexadecimal form).]
This shows the communication state with slave station where error is occurring.
For details, refer to "PROFIBUS-DP Specification manual".

Z64 Valid term soon to be expired xx

Details

The valid term will be expired in less than a week. Remaining valid term is xx days.

Remedy

- Obtain a decryption code from the machine tool builder and input it in the NC, then turn the power ON again.

Z65 Valid term has been expired

Details

The valid term has been expired with no decryption code input.

Remedy

- Obtain a decryption code from the machine tool builder and input it in the NC, then turn the power ON again.

Z67 CC-Link communication error

Details

A communication error occurred during CC-Link communication using CC-Link unit.

Remedy

- Refer to "List of Messages" in CC-Link (Master/Local) Specification manual (BNP-C3072-089).

Z68 CC-Link unconnected

Details

A cable between CC-Link unit and a device is disconnected or broken.

Remedy

- Find the unconnected cable by checking SW0080 to SW0083 and connect it.

Z69 External link error 2

Details

A FROM/TO instruction was used while the MELSEC-Q interface expansion module is not installed.

Remedy

Install the MELSEC-Q interface expansion module.

Z69 External link error 3

Details

A negative value was set for an I/O No. in the FROM/TO instruction.

Remedy

Correct the I/O No.

Z69 External link error 4

Details

A negative value was set for transfer size in the FROM/TO instruction.

Remedy

Correct the transfer size.

Z69 External link error 5

Details

The number of FROM/TO instructions within one scan has exceeded 50.

Remedy

Correct the user PLC (ladder sequence) so that the number of FROM/TO instructions per scan is 50 or less.

Z69 External link error 6

Details

The access to the buffer memory by the FROM/TO instruction has exceeded 12K words per scan.

Remedy

Correct the user PLC (ladder sequence) so that the buffer memory access by the FROM/TO instruction won't exceed 12K words per scan. (The total size of FROM/TO is up to 12K words.)

Z69 External link error 7

Details

A FROM/TO instruction was used in high-speed processing.

Remedy

Delete the FROM/TO instruction from high-speed processing.

Z69 External link error 8

Details

The bit device number designated in the FROM/TO instruction is not a multiple of 16.

Remedy

Correct the bit device number designated in the FROM/TO instruction to be a multiple of 16.

Z69 External link error 9

Details

With a FROM/TO instruction, a value out of the address range (negative value, or 0x8000 or over) was set as the head address of the buffer memory.

Remedy

Correct the head address of the buffer memory.

Z69 External link error 10

Details

An alarm occurred in the MELSEC module mounted on the extension base.

Remedy

Check for any disconnection of the MELSEC module and the cables on the extension base. Then turn the CNC's power ON again.

Z69 External link error 11

Details

The I/O No. designated in the FROM/TO instruction is different from the mounted location of the intelligent function module on the extension base (the module's I/O No.).

Remedy

Correct the I/O No. Then turn the CNC's power ON again.

Z82 3D machine interference/No machine model 0001

Details

Machine model is not registered.

Remedy

- Press RESET to cancel the alarm.
  Movement can be resumed after the cancellation. However, the 3D machine interference check will become invalid.
- Inform the machine tool builder if an alarm occurs.

Z82 3D machine interference/Machine model illegal 0002

Details

Machine model is illegal.

Remedy

- Press RESET to cancel the alarm.
  Movement can be resumed after the cancellation. However, the 3D machine interference check will become invalid.
- Inform the machine tool builder if an alarm occurs.

Z82 3D machine Interference check load excess 0003

Details

The calculation of the interference check took time and caused a deceleration.

Remedy

- Inform the machine tool builder.
- Restart the axis in case of a manual operation.
- In case of an automatic operation, the operation will automatically resume when the processing load of the interference check decreases.

Z82 3D machine Interference check error 0004

Details

The interference check failed.

Remedy

- Take a note of the failed status and contact the service center.
- Press RESET to cancel the alarm. Invalidate the 3D machine interference check to continue the operation.

Z84 Unable to save all the history

Details

The system is unable to store the data due to lack of free space on the internal memory.

Remedy

- Ensure sufficient free space on the internal memory.

Z85 OP panel I/O not connected 0001

Details

Failed to recognize the connection between the NC unit and operation panel I/O unit.

Remedy

- Make sure an operation panel I/O unit is connected.
- Make sure an operation panel I/O unit is supplied with power.
- Check for disconnection of the cable between the NC unit and operation panel I/O unit.

*If you connect no operation panel I/O unit to the NC unit, set the parameter "#1261 set33/bit1" to "1"."

Z85 No display conn. to panel I/O 0002

Details

No display unit is connected to the operation panel I/O unit.

Remedy

- Make sure an operation panel I/O unit for M800W Series is connected.
- Make sure the display unit is being powered.
- Check for any cable disconnection between operation panel I/O and display units.
  - *If operation panel I/O is not connected to display unit in your system configuration, set the parameter "#1261 set33 /bit2" to "0".

Z85 Power ON sequence error 0003

Details

No display unit is connected to the operation panel I/O unit.

Remedy

- Make sure an operation panel I/O unit for M800W Series is connected.
- Make sure the operation panel I/O unit is being powered.
- Check for any cable disconnection between NC and operation panel I/O units.
- Make sure the operation panel I/O and display units are connected.
  - * If operation panel I/O is not connected to display unit in your system configuration, set the parameter "#1261 set33/bit2" to "0".
  - * If no operation panel I/O is connected in your system configuration, set the parameter "#1261 set33/bit1" to "1", and "#1261 set33/bit2" to "0".

Z85 Power OFF sequence error 0004

Details

Power OFF sequence has not been executed correctly.

Remedy

- Make sure an operation panel I/O unit for M800W Series is connected.
- Make sure the operation panel I/O unit is being powered.
- Check for any cable disconnection between NC and operation panel I/O units.
- Make sure the operation panel I/O and display units are connected.
  - *If no operation panel I/O is connected in your system configuration, set the parameter "#1261 set33/bit1" to "1", and "#1261 set33/bit2" to "0".
  - *If operation panel I/O is not connected to display unit in your system configuration, set the parameter "#1261 set33/bit2" to "0"."

Z85 Display unit shutoff timeout 0005

Details

Timeout has occurred during wait for the display power shutdown when automatic power OFF is being executed.

Remedy

- Make sure an operation panel I/O unit for M800W Series is connected.
- Make sure the operation panel I/O unit is being powered.
- Check for any cable disconnection between NC and operation panel I/O units.
- Make sure the operation panel I/O and display units are connected.
  - *If no operation panel I/O is connected in your system configuration, set the parameter "#1261 set33/bit1" to "1", and "#1261 set33/bit2" to "0".
  - * If operation panel I/O is not connected to display unit in your system configuration, set the parameter "#1261 set33/bit2" to "0".

Z86 Overvoltage detection warning 0001

Details

Overvoltage was detected in hardware voltage.

Remedy

- If this alarm occurs frequently, check the power supply voltage.

Z86 Overvoltage detection alarm 0002

Details

Overvoltage was detected in hardware voltage.

Remedy

- Turn OFF and ON the NC power.
- If this alarm occurs frequently, check the power supply voltage.

Z92 Memory ECC error 0004

Details

Incorrect data has been read out from the internal memory.

Remedy

- Contact the service center.

6 Absolute Position Detection System Alarms (Z7*)

Z70 Abs posn base set incomplete 0001 (Axis name)

Details

Zero point initialization is incomplete. Otherwise, the spindle was removed.

Remedy

Complete zero point initialization.

(Note) To release alarm "Z70 Abs data error", enter the parameter data output when establishing the absolute position and turn ON the power again. For the rotary axis, however, the alarm cannot be released by entering the parameter data.

•Zero point initialization: Required

Z70 Absolute position lost 0002 (Axis name)

Details

The absolute position basic point data saved in the NC has been damaged.

Remedy

Set the parameters. If the basic point data is not restored by setting the parameters, perform zero point initialization.

(Note) To release alarm "Z70 Abs data error", enter the parameter data output when establishing the absolute position and turn ON the power again. For the rotary axis, however, the alarm cannot be released by entering the parameter data.

•Zero point initialization: (Required)

Z70 Abs posn param changed 0003 (Axis name)

Details

Any of the parameters for absolute position detection has been changed.
#1003 iunit
#1017 rot
#1018 ccw
#1040 M_inch
#2049 type
#2201 PC1
#2202 PC2
#2218 PIT
#2219 RNG1
#2220 RNG2
#2225 MTYP

Remedy

Correct the parameter settings. Then turn the power ON again and perform zero point initialization.

(Note) To release alarm "Z70 Abs data error", enter the parameter data output when establishing the absolute position and turn ON the power again. For the rotary axis, however, the alarm cannot be released by entering the parameter data.

•Zero point initialization: Required

Z70 Abs posn initial set illegal 0004 (Axis name)

Details

The zero point initialization point is not at the grid position.

Remedy

Perform the zero point initialization again.

(Note) To release alarm "Z70 Abs data error", enter the parameter data output when establishing the absolute position and turn ON the power again. For the rotary axis, however, the alarm cannot be released by entering the parameter data.

•Zero point initialization: Required

Z70 Abs posn param restored 0005 (Axis name)

Details

The data has been restored by inputting the parameters during the alarm No.0001, 0002, and 0003.

Remedy

Turn the power ON again to start the operation.

(Note) To release alarm "Z70 Abs data error", enter the parameter data output when establishing the absolute position and turn ON the power again. For the rotary axis, however, the alarm cannot be released by entering the parameter data.

•Zero point initialization: Not required

Z70 Abs posn data lost 0080 (Axis name)

Details

The absolute position data has been lost. An error of the multi-rotation counter data in the detector and so on may be the cause. (Liquid penetrates into encoder connector, etc.)

Remedy

Replace the detector and complete zero point initialization.

(Note) To release alarm "Z70 Abs data error", enter the parameter data output when establishing the absolute position and turn ON the power again. For the rotary axis, however, the alarm cannot be released by entering the parameter data.

•Zero point initialization: Required
•Servo alarm No.: (9E)etc.

Z70 Abs posn error(servo alm 25) 0101 (Axis name)

Details

The servo alarm No. 25 was displayed and the power was turned ON again.

Remedy

Perform zero point initialization again.

(Note) To release alarm "Z70 Abs data error", enter the parameter data output when establishing the absolute position and turn ON the power again. For the rotary axis, however, the alarm cannot be released by entering the parameter data.

•Zero point initialization: Required
•Servo alarm No.: -25

Z70 Abs posn error(servo alm E3) 0106 (Axis name)

Details

The servo alarm No. E3 was displayed and the power was turned ON again.

Remedy

Perform zero point initialization again.

(Note) To release alarm "Z70 Abs data error", enter the parameter data output when establishing the absolute position and turn ON the power again. For the rotary axis, however, the alarm cannot be released by entering the parameter data.

- Zero point initialization: Required
- Servo alarm No.: (E3)

Z71 AbsEncoder:Backup voltage drop 0001 (Axis name)

Details

Backup voltage in the absolute position detector dropped.

Remedy

Replace the battery, check the cable connections, and check the detector. Turn the power ON again and perform zero point initialization.

- Zero point initialization: Required
- Alarm reset when power is turned OFF: -(Z70-0101 is displayed after the power is turned ON again.)
- Servo alarm No.: 25

Z71 AbsEncoder: Commu error 0003 (Axis name)

Details

Communication with the absolute position detector has been disabled.

Remedy

Check and replace the cables, card or detector. Turn the power ON again and perform zero point initialization.

- Zero point initialization: (Required) only when the detector has been replaced.
- Alarm reset when power is turned OFF: Reset
- Servo alarm No.: 91

Z71 AbsEncoder: Abs data changed 0004 (Axis name)

Details

Absolute position data has been changed at the absolute position establishment.

Remedy

Check and replace the cables, card or detector. Turn the power ON again and perform zero point initialization.

- Zero point initialization: (Required) only when the detector has been replaced.
- Alarm reset when power is turned OFF: Reset
- Servo alarm No.: 93

Z71 AbsEncoder: Serial data error 0005 (Axis name)

Details

An error of the serial data was found in the absolute position detector.

Remedy

Check and replace the cables, card or detector. Turn the power ON again and perform zero point initialization.

- Zero point initialization: (Required) only when the detector has been replaced.
- Alarm reset when power is turned OFF: Reset
- Servo alarm No.: 92

Z71 AbsEncoder: Abs/inc posn diffr 0006 (Axis name)

Details

Servo alarm E3

Absolute position counter warning

Remedy

Operation is possible until the power is turned OFF.

- Zero point initialization: (Required) after the power is turned ON again.
- Alarm reset when power is turned OFF: Reset (Z70-0106 is displayed after the power is turned ON again.)
- Servo alarm No.: E3

Z71 AbsEncoder: Initial commu er 0007 (Axis name)

Details

Initial communication with the absolute position detector is not possible.

Remedy

Check and replace the cables, card or detector. Turn the power ON again and perform zero point initialization.

- Zero point initialization: (Required) only when the detector has been replaced.
- Alarm reset when power is turned OFF: Reset
- Servo alarm No.: 18

Z72 Message: Position check error (Axis name)

Details

An error is detected at the comparison of detector's absolute position and controller coordinate values in the absolute position detection system.

Z73 Battery for abs data fault 0001

Details

Low backup battery

Servo alarm 9F

Low battery voltage

Remedy

If the battery voltage is low or the cable is damaged, there is no need to initialize the absolute position.

7 Distance-coded Reference Scale Errors (Z8*)

Z80 Basic position lost 0001

Details

The basic point data saved in the NC has been damaged.

Remedy

- Set the parameters. If the basic point data is not restored by setting the parameters, perform zero point initialization.

Z80 Basic position restore 0002

Details

The basic point data has been restored by setting the parameters.

Remedy

- Turn the power ON again to start the operation.

Z80 No spec: Distance-coded scale 0003

Details

The distance-coded reference scale has been set available although this function is out of the specifications.

Remedy

- Check the specifications.
- If you do not use this function, correct the detector type with the servo parameter.

Z81 R-pos adjustment data lost 0001

Details

Reference position adjustment value data saved in the NC has been damaged.

Remedy

- Set the parameter. If the data is not restored by setting the parameter, establish the reference position again.

Z81 R-pos adjustment data restored 0002

Details

After the 'Z81 R-pos adjustment data lost 0001', the data has been recovered by setting the parameter.

Remedy

- Establish the reference position to start the operation.

Z83 NC started during SP rotation 0001

Details

The NC was started while the spindle was rotating.

Remedy

- Turn the power OFF and confirm that the spindle is not rotating, then turn the power ON again.

You can select whether or not to stop the spindle forcibly at the occurrence of this alarm by the setting of the base common parameter "#1284 ext20/bit1 (Spindle control selected in response to Z83 (NC started during SP rotation))".

8 Emergency Stop Alarms (EMG)

EMG Emergency stop PLC

Details

The user PLC has entered the emergency stop state during the sequence process.

Remedy

- Investigate and remove the cause of the user PLC emergency stop.

EMG Emergency stop EXIN

Details

The "emergency stop" signal is significant (open).

Remedy

- Cancel the "emergency stop" signal.
- Check for any broken wires.

EMG Emergency stop SRV

Details

An alarm occurred in the servo system causing an emergency stop.

Remedy

- Investigate and remove the cause of the servo alarm.

EMG Emergency stop STOP

Details

The user PLC (ladder sequence) is not running.

Remedy

- Check the setting of the control unit rotary switch CS2. Correct it if set to "1".
- Check the [RUN/SP] (run/stop) switch on the PLC edit file save screen (onboard function). Turn it OFF if ON.

EMG Emergency stop SPIN

Details

Spindle drive unit is not mounted.

Remedy

- Cancel the causes of the other emergency stop.
- Check the "emergency stop" signal input in the spindle drive unit.

EMG Emergency stop PC_H

Details

Failure in the high-speed PC processing abnormal

Remedy

- Correct the sequence program. (To stop monitoring the high-speed PC processing temporarily, set "1" in "#1219 aux03/bit1 (Stop high-speed PC monitoring function)". Disable the monitoring function only as a temporary measure.)

EMG Emergency stop PARA

Details

Setting of the door open II fixed device is illegal.
Setting of the parameters for dog signal random assignment is illegal.

Remedy

- Correct the "#1155 DOOR_m" and "#1156 DOOR_s" settings. (When the door open II fixed device is not used, set "#1155 DOOR_m" and "#1156 DOOR_s" to "100".)
- Correct the "#2073 zrn_dog (Origin dog Random assignment device)", "#2074 H/W_OT+ (H/W OT+ Random assignment device)", "#2075 H/W_OT- (H/W OT- Random assignment device)" and "#1226 aux10/bit5 (Arbitrary allocation of dog signal)" settings.

EMG Emergency stop LINK

Details

An emergency stop occurs when the FROM/TO instruction is not executed within 500ms.

Remedy

- Execute the FROM/TO instruction one or more times every 500ms.

The time in which no interrupt request is issued from MELSEC is measured and stored in the following R registers:
R10190: Current timeout counter
R10191: Maximum timeout counter after power ON
R10192: Maximum timeout counter after system is started up (this is backed up)

Details

MELSEC is in error and reset states.

Remedy

- Check the MELSEC states.

Details

The contents of MELSEC-specific code area in buffer memory have been damaged.

Remedy

- Check the MELSEC states.

Details

PLC serial link communication has stopped.
(Note) When "WAIT" is entered in the PLC serial link, only the preparation sequence has been established before the communication stops.
It is supposed that the settings of the serial link parameters "#1902 Din size" and "#1903 Dout size" are incorrect or the "#1909 Tout (ini)" set-time is too short in base common parameters.

Remedy

- Check the CC-Link card wiring and the external sequencer transmission.
- Check the link communication errors shown on the diagnostic screen.
- Correct the settings of the serial link parameters in base common parameters.

EMG Emergency stop WAIT

Details

The preparation sequence is not sent from the master station. Otherwise, the contents of the received preparation sequence are inconsistent with those of the parameters, so that the usual sequence cannot be started.

(Note) When "LINK" is also entered for the PLC serial link, refer to "Note" in the section, "LINK".

Remedy

- Check that the CC-Link card switch setting and wiring as well as the external sequencer transmission are normal.
- Check the diagnostic screen for link communication errors.

EMG Emergency stop XTEN

Details

The CC-Link card is operating incorrectly.

Switch/parameter settings for the CC-Link card are incorrect.

Remedy

- Replace the CC-Link card.
- Correct the switch/parameter settings for the CC-Link card.

EMG Emergency stop LAD

Details

The sequence program has an illegal code.

Remedy

- Correct any illegal device Nos. or constants in the sequence program.

EMG Emergency stop CVIN

Details

The "emergency stop" signal for power supply is significant (open) because the external emergency stop function for power supply is enabled.

Remedy

- Cancel the "emergency stop" signal.
- Check for any broken wires.

EMG Emergency stop MCT

[M8]

Details

The contactor shutoff test is being executed.

Remedy

- The emergency stop is reset automatically after the contactor shutoff is confirmed.
- If the contactor shutoff is not confirmed within 5 seconds after the "contactor shutoff test" signal has been input, the "contactor welding detected" alarm occurs and the emergency stop status remains.
- Make sure that the contactor's auxiliary b contact signal is correctly output to the device that is set in "#1330 MC_dp1" and "#1331 MC_dp2" (Contactor weld detection device 1 and 2), and then turn the power ON again.

[C80]

Details

The contactor shutoff test is being executed.

Safety-related I/O observation has not started, while "#51595 SIO_StartCond" is 1.

Remedy

- The emergency stop is reset automatically after the contactor shutoff is confirmed.
- If the contactor shutoff is not confirmed within 5 seconds after the "contactor shutoff test" signal (Y742) has been input, the "contactor welding detected" alarm occurs and the emergency stop status remains.
- Make sure that the contactor's auxiliary b contact signal is correctly output to the device that is set in "#1330 MC_dp1", "#1331 MC_dp2", "#1339 MC_dp3" and "#1340 MC_dp4" (Contactor weld detection device 1,2,3 and 4), and then turn the power ON again.
- Make sure that the safety I/O device is supplied with power, before turning ON the safety I/O observation start request signal (ZR416/Bit1).

EMG Emergency stop IPWD

Details

The data backup for power failure might not have been executed successfully at the previous power failure.

Remedy

- If this message appears frequently, the power supply may be deteriorated. Contact the service center.

9 Computer Link Errors (L)

L01 Timeout error 0004

Details

Communication ended with timeout.
(CNC has a 248-byte receive buffer. The time during which CNC receives 248 bytes exceeds the 'TIME-OUT' value set in the I/O device parameter.

Remedy

- Set a greater timeout value in the input/output device parameter.
- Check the software in HOST and make sure that the HOST transmits data in response to DC1(data request) from CNC.
- Set '#9614 START CODE' to '0'.

L01 Host ER signal OFF 0010

Details

ER signal in HOST (or DR signal in CNC) is not turned ON.

Remedy

- Check for any disconnected cable.
- Check for any broke wire.
- Make sure that the HOST power is turned ON.

L01 Parity H error 0015

Details

Communication ended with parity H.

Remedy

- Check the software in HOST and make sure that the data to be transmitted to CNC is ISO code.

L01 Parity V error 0016

Details

Communication ended with parity V.

Remedy

- Correct the data to transmit to CNC.

L01 Overrun error 0017

Details

CNC received 10 bytes or more data from HOST in spite of DC3 (request to stop data transfer) transmission from CNC to the HOST, which terminated the communication.
CNC received 10 bytes or more data from HOST during the data transmission from CNC to the HOST.

Remedy

- Check the software in HOST and make sure that the HOST stops transmitting data within 10 bytes after receiving DC3.
- Correct the software in HOST not to transmit data such as a command or header to CNC during receiving a machining program.

10 User PLC Alarms (U)

(Note) U10 Illegal PLC (User PLC is illegal)
- "xx" in the lower 16 bits of the sub-status 1 indicates the program No. (0x01 to 0x78(in the hexadecimal form))
- The sub-alarm No. "yy" of sub- status 1 indicates the project No. ("yy" is not displayed when the maximum number of projects is 1)

(Note) For details of user PLC alarms (U), refer to the PLC Development Manual.

U01	**No user PLC**	-	-

Details

No sequence program is included in the built-in ROM or temporary memory area.
(1) Sequence program is not stored in the built-in ROM.
(2) Sequence program is not written from the GX Developer or internal PLC edit function.
(3) Sequence program cannot be read due to broken built-in ROM.
(4) No large capacity PLC additional specifications.

Remedy

(1) Write the sequence program from the GX Developer or internal PLC edit function, and then execute the built-in ROM writing.
(2) Check the presence of additional specification "Large PLC capacity" and reconsider the storable size.
(3) If (1) or (2) does not solve the problem, there is a possibility that built-in ROM is broken.

U10	**Illegal PLC**	0x04xx.yy	Number of steps

Details

Software instruction interruption illegal
An error was found in data for the sequence program in execution.
(1) Sequence program stored in the built-in ROM is broken.
(2) Sequence program under development (before writing into F-ROM) is broken.

Remedy

Contact Mitsubishi.

U10	**Illegal PLC**	0x100*	-

Details

A H/W error was detected during the PLC execution.

Remedy

Contact Mitsubishi.

U10	**Illegal PLC**	0x110*	-

Details

The PLC system execution preparation failed.

Remedy

Contact Mitsubishi.

U10	**Illegal PLC**	0x120*	-

Details

Number of ladder over (at PLC system startup)
The total number of "ladder files" stored in built-in ROM exceeded the maximum.

Remedy

Write "sequence program", "comment file", "PLC message file", and "source information file" again.

U10	**Illegal PLC**	0x130*	-

Details

Number of data over (at PLC system startup)
The total number of "comment files", "PLC message files", and "source information files" stored in built-in ROM exceeded the maximum.

Remedy

Remedy the error in either of the following methods.
(1) Select [Format PLC memory] with GX Developer and format the memory after setting [Target memory] to [Memory card(RAM)]. After that, write "comment file", "PLC message file", and "source information file" again.
(2) Create a ladder with [Add New Data] in built-in PLC editing function and execute "Format". After that, write "sequence program", "comment file", "PLC message file", and "source information file" again.

U10	**Illegal PLC**	0x20xx.yy	Number of steps

Details

Label branching error (Before executing PLC)
Occurs only when the bit selection parameter (#6452 bit6) "branch destination label check valid" is set to "1".
(1) The CJ and CALL instructions were placed to a nonexistent label.
(2) The CJ instruction was placed to the global label. (Branching is possible only with the CALL instruction.)

Remedy

Check the branch destination of the CJ and CALL instructions existing in the steps occurred.

U10	**Illegal PLC**	0x21xx.yy	Number of steps

Details

Label duplication error (Before executing PLC)
(1) When using the multi-programming method:
- Global labels are duplicated
- Local labels are duplicated within the same file

(2) When using the independent program method, labels are duplicated.

Remedy

Correct the duplication of the labels existing in the steps occurred.

U10	Illegal PLC	0x22xx.yy	-

Details

Local label over (Before executing PLC)

The boundary value set with the PC parameter (global label boundary value) has been exceeded by the total number of local labels.

Remedy

(1) Reduce the number of local labels used.
- Use as sequentially as possible from P0.

(2) Reset the PC parameter (global label boundary value).

U10	Illegal PLC	0x230*.yy	-

Details

Global label boundary value error (Before executing PLC)

The content of PC parameter (global label boundary value) is not normal.

(1) When using the multi-programming method, a value greater than the maximum value is set.

(2) When using the independent program method, the global label boundary value is set.

Remedy

(1) When using the multi-programming method, correct the global label boundary value to an appropriate value.

(2) When using the independent program method, delete the global label boundary value.

U10	Illegal PLC	0x24xx.yy	Number of steps

Details

Reserved label error (Before executing PLC)

(1) When using the multi-programming method, disabled reserved label exists.

(2) When using the independent program method, reserved labels are duplicated.

Remedy

(1) When using the multi-programming method, delete the reserved label.

(2) When using the independent program method:
- Delete the PC parameter program settings.
- Correct the duplication of reserved labels.

U10	Illegal PLC	0x25xx.yy	-

Details

Program setting error (Before executing PLC)

(1) When using the multi-programming method, PC parameter setting is not correct.
- PC parameter (program setting) is not set.
- Unstored program name is set.
- The contents of the program name is abnormal.
- More than the maximum number of programs that can be set (120 programs) are set.

(2) When using the independent program method, multiple programs are stored.

(3) When the multi-project is valid, the sum of all projects exceeds the number of the programs which can be set (120 programs).

Remedy

(1) When using the multi-programming method, check the PC parameter program settings.
- Check the program settings.
- Check the program name stored in the NC.
- Review the program name and rename it if necessary.
  e.g. The program name and the M device number in the PLC program are overlapped.
- Set the number to 120 or less.

(2) When using the independent program method:
- Store only one program file.

(3) When the multi-project is valid, set the number of programs that can be set to be less than 120 programs as the sum of all projects.

U10	Illegal PLC	0x26xx.yy	-

Details

RET instruction error

(1) RET instruction was not executed at the branch destination of the CALL instruction.

(2) RET instruction was executed without execution of CALL instruction.

Remedy

Check the following matters for the entire sequence program to be executed.

(1) Check if RET instruction is programmed at the end of sub-routine

(2) Check if diverged to the other operation in the middle of sub-routine and RET instruction is not executed.

(3) Check if jumped to the END reservation label (P4005) in the middle of sub- routine.

(4) Check if there is delimiter (FEND instruction) between adjacent program and sub-routine program.

U10	Illegal PLC	0x27xx.yy	Number of steps

Details

Ladder code error (Before executing PLC)

An error was found in data for the sequence program to be executed.

(1) Disabled PLC instruction is used.

(2) Sequence program stored in the built-in ROM is broken.

(3) Sequence program under development (before writing into the built-in ROM) is broken.

Remedy

Transferring, storing and F-ROM writing of the sequence program must be re- executed with the GX Developer or PLC onboard edit function.

U10	Illegal PLC	0x280*	-

Details

No main processing ladders (Before executing PLC)

Main processing program to be executed cannot be identified.

(1) When using the multi-programming method, main processing "scan" is not set in the PC parameter (program setting).

(2) When using the independent program method, no reservation ladder for the main processing ladder is available.

Remedy

(1) When using the multi-programming method, check the PC parameter program settings.

(2) When using the independent program method, add the reservation label (P4002) for the medium speed ladder.

U10	Illegal PLC	0x29xx.yy	-

Details

Execution area over (Before executing PLC)
The total number of steps for the ladder to be executed has exceeded the size of PLC processor execution area.

Remedy

Check the PC parameter (program setting) and set so that the total number of steps for the ladder to be executed does not exceed the PLC processor execution area.

U10	Illegal PLC	0x30xx.yy	Number of steps

Details

FOR instruction nesting over
17th level of nesting for FOR instruction was executed.

Remedy

Check the number of FOR instruction's nestings in the steps generated, and keep the number to 16 or less.

U10	Illegal PLC	0x31xx.yy	Number of steps

Details

NEXT instruction error
(1) NEXT instruction was executed before FOR instruction.
(2) After FOR instruction, END(FEND) was executed before NEXT instruction.

Remedy

(1) Check the NEXT instruction existing in the number of steps generated and correct.
(2) Check the ladder circuit of the program No. generated and correct. (Note that the number of steps at the error position is displayed as "0".)
- Check if JMP,CALL,CJ instructions were executed between FOR and NEXT instruction, and NEXT instruction was jumped.
- Check if FOR instruction and NEXT instruction are all paired.

U10	Illegal PLC	0x32xx.yy	Number of steps

Details

BREAK instruction error
BREAK was executed outside the range between FOR and NEXT instruction.

Remedy

Check the BREAK instruction existing in the step generated and correct.

U10	Illegal PLC	0x400*	-

Details

PLC system error

Remedy

Contact Mitsubishi.

U10	Illegal PLC	0x500*	-

Details

Maximum project No. illegal (at PLC system startup)
Multi-project parameter setting is illegal (due to the following reason).
•The value outside the setting range (1 to number of usable project) was detected.

Remedy

(1) Check the presence of the expansion project additional specification and reconsider the setting range.
(2) The multi-project parameter (maximum project No.) setting is illegal. Set the multi-project parameter again.
(3) If (1) or (2) does not solve the problem, there is a possibility that the NC system is broken. Contact Mitsubishi.

U10	Illegal PLC	0x510*	-

Details

Project ratio illegal
Multi-project parameter setting is illegal (due to the following reason).
•It was detected that the total of ratios of all projects was outside the range from 0 to 100.

Remedy

(1) The multi-project parameter (project ratio) setting is illegal. Set the multi- project parameter again.
(2) If (1) does not solve the problem, there is a possibility that the NC system is broken. Contact Mitsubishi.

U10	Illegal PLC	0x520*	-

Details

Temporary memory area over (at the PLC system startup)
Multi-project parameter setting is illegal (due to the following reason).
•The ratio to which the area after the project ratio setting is smaller than the size of ladder stored in the temporary memory area was detected.

Remedy

(1) Check the presence of the large-capacity PLC additional specification and reconsider the size that can be stored.
(2) The multi-project parameter (project ratio) setting is illegal. Set the multi- project parameter again.
(3) If (1) or (2) does not solve the problem, there is a possibility that the NC system is broken. Contact Mitsubishi.

U10	Illegal PLC	0x530*	-

Details

Built-in ROM area over (at the PLC system startup)
Multi-project parameter setting is illegal (due to the following reason).
•The ratio to which the area after the project ratio setting is smaller than the size of ladder stored in the built-in ROM area was detected.

Remedy

(1) Check the presence of the large-capacity PLC additional specification and reconsider the size that can be stored.
(2) The multi-project parameter (project ratio) setting is illegal. Set the multi- project parameter again.
(3) If (1) or (2) does not solve the problem, there is a possibility that the NC system is broken. Contact Mitsubishi.

U10	Illegal PLC	0x540*	-

Details

Comment area over (at the PLC system startup)
Multi-project parameter setting is illegal (due to the following reason).
- The ratio to which the area after the project ratio setting is smaller than the size of comment and message stored in the built-in ROM area.

Remedy

(1) The multi-project parameter (project ratio) setting is illegal. Set the multi- project parameter again.
(2) If (1) does not solve the problem, there is a possibility that the NC system is broken. Contact Mitsubishi.

U10	Illegal PLC	0x550*	-

Details

Execution project illegal (at the PLC system startup)
Multi-project parameter setting is illegal (due to the following reasons).
- The value outside the setting range (ON/OFF) was detected.
- All execution projects are OFF.

Remedy

(1) The multi-project parameter (execution project) setting is illegal. Set the multi-project parameter again.
(2) If (1) does not solve the problem, there is a possibility that the NC system is broken. Contact Mitsubishi.

U10	Illegal PLC	0x560*	-

Details

Project execution order illegal (at the PLC system startup)
Multi-project parameter setting is illegal (due to the following reasons).
- The value outside the setting range (1 to 6) was detected.
- The redundant project execution order number was detected.

Remedy

(1) The multi-project parameter (project execution order) setting is illegal. Set the multi-project parameter again.
(2) If (1) does not solve the problem, there is a possibility that the NC system is broken. Contact Mitsubishi.

U10	Illegal PLC	0x570*	-

Details

Parameter setting illegal for the number of common device points (at PLC system startup)
Multi-project parameter setting is illegal (due to the following reasons).
- The value outside the setting range (0 to the minimum number of points in all projects) was detected.
- It was detected that the number of points was not a multiple of 16.

Remedy

(1) Check the presence of the expansion project additional specification and reconsider the setting range.
(2) The multi-project parameter setting is illegal. Set the multi-project parameter again.
(3) If (1) or (2) does not solve the problem, there is a possibility that the NC system is broken. Contact Mitsubishi.

U10	Illegal PLC	0x580*.yy	-

Details

Parameter setting illegal for number of device points (at PLC system startup)
The parameter setting for the number of device points is illegal (due to the following reasons).
- The total number of points in one project 29K or more was set.
- The illegal value (-1 point or less, or 61441 points or more) for the number of device points was detected.
- It was detected that the number of device points was not a multiple of 16.
- The number outside the usable number of device points in whole projects was detected.

Remedy

(1) The parameter setting for the number of device points is illegal. Set the parameter of the number of device points again and reboot the system.
(2) If (1) does not solve the problem, there is a possibility that the NC system is broken. Contact Mitsubishi.

U10	Illegal PLC	0x700*.yy	-

Details

Caution; Ladder program writing during RUN is disabled (In independent program method)
With RUN write ON, sequence program is operated in independent program method. Run write is not available with this condition.

Remedy

The ladder program writing (RUN write) can not be used in independent program method.
Disable RUN write, or change the method into multi-program one.

U10	Illegal PLC	0x71xx.yy	Number of steps

Details

Caution; Ladder program writing during RUN is disabled (common pointer is used in high-speed processing)
With RUN write is ON, high-speed program with common pointer is running. RUN write is not available with this condition.

Remedy

RUN write is not available when high-speed processing with common pointer is running. Change the high-speed processing program to the one without common pointer.

U10	Illegal PLC	0x720*	-

Details

Caution; Ladder program writing during RUN is disabled (high-speed processing size is exceeding)
With RUN write ON, the execution size of high-speed processing program has exceeded 4000 steps. RUN write is not available with this condition.

Remedy

RUN write is not available when execution size of high-speed processing program exceeds 4000 steps.
Edit the high-speed processing program to reduce the execution size to 4000 steps or less.
(When multi-project is valid, edit the program to reduce the execution size to 4000 steps or less in total of all the project.)

U10 Illegal PLC 0x730*.yy -

Details

Caution; Ladder program writing during RUN is disabled (number of labels in high-speed processing is beyond the capacity)
With RUN write ON, the number of local labels in high-speed processing program has exceeded 256. RUN write is not available with this condition.

Remedy

RUN write is not available when the number of local labels in high-speed processing program exceeds 256. Edit the high-speed program to reduce the number of local labels to less than 256.
(When multi-project is valid, edit the program to reduce the number of local labels to less than 256 per project.)

U10 Illegal PLC 0x80xx.yy Number of steps

Details

Software exceptional interruption (BCD instruction error) has occurred.
With BCD and DBCD instructions, BIN value outside its input range was attempted to be converted into BCD.

Remedy

Check the usage of BCD, DBCD instructions existing in the steps occurred.

U10 Illegal PLC 0x81xx.yy Number of steps

Details

Software exceptional interruption (BIN instruction error) has occurred.
With BIN and DBIN instructions, BCD value outside its input range was attempted to be converted into BIN.

Remedy

Check the usage of BIN, DBIN instructions existing in the steps occurred.

U10 Illegal PLC 0x82xx.yy Number of steps

Details

Software exceptional interruption (Bus error) has occurred.

Remedy

Contact Mitsubishi.

U10 Illegal PLC 0x83xx.yy Number of steps

Details

Software exceptional interruption (Unmounted instruction error) has occurred.
(1) When the bit selection parameter (#6452 bit6) "branch destination label check valid" is set to "0", jumped to an undefined label.
(2) Sequence program in execution is broken.

Remedy

(1) Set the bit selection parameter (#6452 bit6) "branch destination label check valid" to "1" and check the branching step to the undefined label.
(2) Contact Mitsubishi.

U10 Illegal PLC 0x84xx.yy Number of steps

Details

Software exceptional interruption (Instruction format error) has occurred.

Remedy

Contact Mitsubishi.

U10 Illegal PLC 0x85xx.yy Number of steps

Details

Software exceptional interruption (Instruction bus error) has occurred.
(1) When the bit selection parameter (#6452 bit6) "branch destination label check valid" is set to "0", jumped to an undefined label.
(2) Sequence program in execution is broken.

Remedy

(1) Set the bit selection parameter (#6452 bit6) "branch destination label check valid" to "1" and check the branching step to the undefined label.
(2) Contact Mitsubishi.

U10 Illegal PLC 0x86xx.yy Number of steps

Details

Software exceptional interruption (CALL/RET instruction error) has occurred.

Remedy

Contact Mitsubishi.

U10 Illegal PLC 0x87xx.yy Number of steps

Details

Software exceptional interruption (memory area error) has occurred.

Remedy

Contact Mitsubishi.

U10 Illegal PLC 0x8Bxx.yy Number of steps

Details

Software exceptional interruption (ASYNC BUS error) has occurred.

Remedy

Contact Mitsubishi.

U50 PLC stopped

Details

The ladder is stopped.

Remedy

Run the PLC.

U55 PLC stopped / is not saved

Details

The ladder is stopped and the edited sequence program is not stored in the built-in ROM.
(The contents of temporary memory area and sequence program in the built-in ROM are mismatched.)

Remedy

Run the PLC.
Use GX Developer or the built-in PLC edit function to perform write to the built-in ROM.

U60 Ladder is not saved

Details

The edited sequence program is not stored in the built-in ROM.
(The contents of temporary memory area and sequence program in the built-in ROM are mismatched.)

Remedy

Use GX Developer or the built-in PLC edit function to perform write to the built-in ROM.

11 Network Service Errors (N)

N001 Modem initial error

Details

An error occurred in the modem connection at the power ON.

Remedy

- Check the connection between the NC and modem, connection port and power supply to modem.

N002 Redial over

Details

- The number of redials exceeded due to the dial transmission failure.

Remedy

- Wait a while, and then dial again.

N003 TEL unconnect

Details

- The phone line is not connected.

Remedy

- Check for any disconnection in the modem's phone line.

N004 Net communication error

Details

- An error other than the above occurred during communication.

Remedy

- Note down how the error occurred and contact the service center.

N005 Invalid net communication

Details

- The modem connection port is being used for another function such as input/output.
- The modem connection port settings are incorrect.

Remedy

- Stop using the modem connection port with the other function, and then turn the power ON again.
- Correct the settings of the modem connection port.

N006 Received result of diagnosis

Details

- A diagnosis data file has been received.

Remedy

- Clear the message.

N007 Send data size over

Details

- A file larger than Anshin-net server capacity (64Kbyte) has been transmitted in machining data sharing.

Remedy

- Reduce the size of machining program file so that it won't exceed the capacity of Anshin-net server.

N008 No file on server

Details

- The file reception failed in machining data sharing because no file exists on Anshin-net server.

Remedy

- Confirm that a machining program file exists on Anshin-net server before receiving it.

N009 Password error

Details

- The file reception failed in machining data sharing due to a wrong password.

Remedy

- Input the password again.

N010 Customer number error

Details

- The file reception failed in machining data sharing due to a wrong customer number.

Remedy

- Input the customer number again.

N011 Storage capacity over

Details

- The file reception failed in machining data sharing because the size of the file to be received is bigger than free space in the NC.

Remedy

- Ensure sufficient free space in the NC.

N012 File deletion error

Details

- A file on Anshin-net server cannot be deleted in machining data sharing.

Remedy

- Confirm that the file exists on Anshin-net server.
- Note down how the error occurred and contact the service center.

12 Program Errors (P)

These alarms occur during automatic operation, and the causes of these alarms are mainly program errors which occur, for instance, when mistakes have been made in the preparation of the machining programs or when programs which conform to the specification have not been prepared.

P10 No. of simultaneous axes over

Details

The number of axis addresses commanded in a block is exceeds the specifications.

Remedy

- Divide the alarm block command into two.
- Check the specifications.

P11 Illegal axis address

Details

The axis address commanded by the program does not match any of the ones set by the parameter.

Remedy

- Correct the axis names in the program.

P20 Division error

Details

- The issued axis command cannot be divided by the command unit.
- A cutting feed command has been issued to the index table indexing axis when the parameter "#2580 index_ Gcmd" is set to "1".

Remedy

- Correct the program.

P29 Not accept command

Details

The command has been issued when it is impossible.

- The normal line control command (G40.1, G41.1, G42.1) has been issued during the modal in which the normal line control is not acceptable.
- The command has been issued during the modal in which the 2-part system synchronous thread cutting is not acceptable.
- A workpiece coordinate system preset command (G92.1) has been issued during tool length compensation, nose R compensation or tool radius compensation.

Remedy

- Correct the program.

P30 Parity H error

Details

The number of holes per character on the paper tape is even for EIA code and odd for ISO code.

Remedy

- Check the paper tape.
- Check the tape puncher and tape reader.

P31 Parity V error

Details

The number of characters per block on the paper tape is odd.

Remedy

- Make the number of characters per block on the paper tape even.
- Set the parameter parity V selection OFF.

P32 Illegal address

Details

An address not listed in the specifications has been used.

Remedy

- Correct the program address.
- Correct the parameter settings.
- Check the specifications.

P33 Format error

Details

The command format in the program is not correct.

Remedy

- Correct the program.

P34 Illegal G code

Details

- The commanded G code is not in the specifications.
  An illegal G code was commanded during the coordinate rotation command.
- G51.2 or G50.2 was commanded when the rotary tool axis No. (the parameter "#1501polyax") was set to "0".
  G51.2 or G50.2 was commanded when the tool axis was set to the linear axis (the parameter "#1017 rot" = 0).

Remedy

- Check and correct the G code address in the program.
- Check the parameter setting values.

P35 Setting value range over

Details

The setting range for the addresses has been exceeded.

Remedy

- Correct the program.

P36 Program end error

Details

"EOR" has been read during tape and memory mode.

Remedy

- Enter the M02 and M30 command at the end of the program.
- Enter the M99 command at the end of the subprogram.

P37 O, N number zero

Details

"0" has been specified for program or sequence No.

Remedy

- Designate program Nos. within a range from 1 to 99999999.
- Designate sequence Nos. within a range from 1 to 99999999.

P38 No spec: Add. Op block skip

Details

"/n" has been issued while the optional block skip addition is not in the specifications.

Remedy

- Check the specifications.

P39 No specifications

Details

- A non-specified G code was commanded.
- The selected operation mode is out of the option setting.
- The selected operation mode is out of the parameter setting.

Remedy

- Check the specifications.
- Check the parameter setting values.

P40 Pre-read block error

Details

When tool radius compensation is executed, there is an error in the pre-read block and so the interference check is disabled.

Remedy

- Reconsider the program.

P45 G code combination error

Details

The combination of G codes in a block is inappropriate.
A part of unmodal G codes and modal G codes cannot be commanded in a same block.

Remedy

Correct the combination of G codes.
Separate the incompatible G codes into different blocks.

P48 Restart pos return incomplete

Details

A travel command was issued before the execution of the block that had been restart-searched.

Remedy

- Carry out program restart again.
  Travel command cannot be executed before the execution of the block that has been restart-searched.

P49 Invalid restart search

Details

Restart search was attempted for a block that comes after any of the following command blocks: 3-dimensional circular interpolation, cylindrical interpolation, polar coordinate interpolation, milling interpolation, tool center point control, simple tool center point control, inclined surface machining, simple inclined surface machining, workpiece installation error compensation, axis name switch, mixed control, machining condition selection I, sub part system control I, sub part system control II, or direct command mode.

Remedy

- Reconsider the restart search position.

P50 No spec: Inch/Metric change

Details

Inch/Metric changeover (G20/G21) command was issued while the function is out of specifications.

Remedy

- Check the specifications.

P60 Compensation length over

Details

The commanded movement distance is excessive (over 2^{31}).

Remedy

- Correct the command range for the axis address.

P61 No spec: Unidirectional posit.

Details

Unidirectional positioning (G60) was commanded while the function is out of specifications.

Remedy

- Check the specifications.

P62 No F command

Details

- No feed rate command has been issued.
- There is no F command in the cylindrical interpolation or polar coordinate interpolation immediately after the G95 mode is commanded.

Remedy

- The default movement modal command at power ON is G01. This causes the machine to move without a G01 command if a movement command is issued in the program, and an alarm results. Use an F command to specify the feed rate.
- Specify F with a thread lead command.

P65 No spec: High speed mode 3

Details

Remedy

- Check whether the specifications are provided for the high-speed mode III.

P67 F value is exceeding the limit

Details

F's value in an F or ,F command is exceeding the command range.

Remedy

- Check and correct F or ,F command in the program.

P70 Arc end point deviation large

Details

- There is an error in the arc start and end points as well as in the arc center.
- The difference of the involute curve through the start point and the end point is large.
- When arc was commanded, one of the two axes configuring the arc plane was a scaling valid axis.

Remedy

- Correct the numerical values of the addresses that specify the start and end points, arc center as well as the radius in the program.
- Correct the "+" and "-" directions of the address numerical values.
- Check for the scaling valid axis.

P71 Arc center error

Details

- An arc center cannot be obtained in R-specified circular interpolation.
- A curvature center of the involute curve cannot be obtained.

Remedy

- Correct the numerical values of the addresses in the program.
- Correct the start and end points if they are inside of the base circle for involute interpolation. When carrying out tool radius compensation, make sure that the start and end points after compensation will not be inside of the base circle for involute interpolation.
- Correct the start and end points if they are at an even distance from the center of the base circle for involute interpolation.

P72 No spec: Herical cutting

Details

A helical command has been issued though it is out of specifications.

Remedy

- Check whether the specifications are provided for the helical cutting.
- An Axis 3 command has been issued by the circular interpolation command. If there is no helical specification, move the linear axis to the next block.

P73 No spec: Spiral cutting

Details

A spiral command was issued though it is out of specifications.

Remedy

- Issue the G02.1 and G03.1 commands for circular interpolation.
- Check whether the specifications are provided for the spiral cutting.

P74 Can't calculate 3DIM arc

Details

The 3-dimension circular cannot be obtained because the end block was not specified during 3-dimension circular interpolation supplementary modal.
The 3-dimension circular cannot be obtained due to an interruption during 3-dimension circular interpolation supplementary modal.

Remedy

- Correct the program.

P75 3DIM arc illegal

Details

An illegal G code was issued during 3-dimension circular interpolation modal.
Otherwise, 3-dimension circular interpolation command was issued during a modal for which a 3-dimension circular interpolation command cannot be issued.

Remedy

- Correct the program.

P76 No spec: 3DIM arc interpolat

Details

G02.4/G03.4 was commanded though there is no 3-dimension circular interpolation specification.

Remedy

- Check the specifications.

P90 No spec: Thread cutting

Details

A thread cutting command was issued though it is out of specifications.

Remedy

- Check the specifications.

P93 Illegal pitch vaule

Details

An illegal thread lead (thread pitch) was specified at the thread cutting command.

Remedy

- Correct the thread lead for the thread cutting command.

P100 No spec: Cylindric interpolat

Details

A cylindrical interpolation command was issued though it is out of specifications.

Remedy

- Check the specifications.

P110 Plane select during figure rot

Details

Plane selection (G17/G18/G19) was commanded during figure rotation.

Remedy

- Correct the machining program.

P111 Plane selected while coord rot

Details

Plane selection commands (G17, G18, G19) were issued during a coordinate rotation was being commanded.

Remedy

- Always command coordinate rotation cancel after the coordinate rotation command, and then issue a plane selection command.

P112 Plane selected while R compen

Details

- Plane selection commands (G17, G18, G19) were issued while tool radius compensation (G41, G42) and nose R compensation (G41, G42, G46) commands were being issued.
- Plane selection commands were issued after completing nose R compensation commands when there were no further axis movement commands after G40, and compensation has not been cancelled.

Remedy

- Issue plane selection commands after completing (axis movement commands issued after G40 cancel command) tool radius compensation and nose R compensation commands.

P113 Illegal plane select

Details

The circular command axis does not correspond to the selected plane.

Remedy

- Select a correct plane before issuing a circular command.

P114 Plane axis command error

Details

- The axis specified in the fixed cycle for turning machining does not coincide with the selected plane.
- One or both of the selected plane axes have no travel when the fixed cycle for turning machining is commanded.

Remedy

- Correct the plane selection before issuing the fixed cycle for turning machining.
- Correct the program so that the two axes of the selected plane are involved in the movement of the fixed cycle for turning machining.

P120 No spec: Feed per rotation

Details

Feed per rotation (G95) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P121 F0 command during arc modal

Details

F0 (F 1-digit feed) was commanded during the arc modal (G02/G03).

Remedy

- Correct the machining program.

P122 No spec: Auto corner override

Details

An auto corner override command (G62) was issued though it is out of specifications.

Remedy

- Check the specifications.
- Delete the G62 command from the program.

P123 No spec: High-accuracy control

Details

High-accuracy control command was issued though it is out of specifications.

Remedy

- Check the specifications.

P124 No spec: Inverse time feed

Details

- The inverse time option is not provided.

Remedy

- Check the specifications.

P125 G93 mode error

Details

- The issued G code command is illegal during G93 mode.
- G93 command was issued during a modal for which inverse time feed cannot be performed.

Remedy

- Correct the program.

P126 Invalid cmnd in high-accuracy

Details

An illegal command was issued during the high-accuracy control mode.

- A G code group 13 command was issued during the high-accuracy control mode.
- Milling, cylindrical interpolation or pole coordinate interpolation was commanded during the high-accuracy control mode.

Remedy

- Correct the program.

P127 No spec: SSS Control

Details

The SSS control valid parameter has been set although there is no SSS control specification.

Remedy

- Check the specifications. Set "#8090 SSS ON" to "0" when there is no SSS control specification.

P128 Machin condtn select I disable

Details

Machining condition selection I was commanded during the mode where the selection command is unavailable.

Remedy

- Check the program and see whether any unavailable mode is included during machining condition selection I. If any, cancel that mode.

P129 Hi-speed Hi-accuracy both ON

Details

Both the high-accuracy control mode and high-speed machining mode are commanded simultaneously in a part system where the simultaneous use of the two modes is disabled.

Remedy

- Correct the setting of "#8040 High-speed high-accuracy control-enabled part system". Or correct the machining program so that the high-accuracy control mode is not used together with high-speed machining mode.

P130 2nd M function code illegal

Details

The 2nd miscellaneous function address, commanded in the program, differs from the address set in the parameters.

Remedy

- Correct the 2nd miscellaneous function address in the program.

P131 No spec: Cnst surface ctrl G96

Details

A constant surface speed control command (G96) was issued though it is out of specifications.

Remedy

- Check the specifications.
- Issue a rotation speed command (G97) instead of the constant surface speed control command (G96).

P132 Spindle rotation speed S=0

Details

No spindle rotation speed command has been issued.

Remedy

- Correct the program.

P133 Illegal P-No. G96

Details

The illegal No. was specified for the constant surface speed control axis.

Remedy

- Correct the parameter settings and program that specify the constant surface speed control axis.

P134 G96 Clamp Err.

Details

The constant surface speed control command (G96) was issued without commanding the spindle speed clamp (G92/G50).

Remedy

Press the reset key and carry out the remedy below.

- Check the program.
- Issue the G92/G50 command before the G96 command.
- Command the constant surface speed cancel (G97) to switch to the rotation speed command.

P140 No spec: Pos compen cmd

Details

The position compensation command (G45 to G48) is out of specifications.

Remedy

- Check the specifications.

P141 Pos compen during rotation

Details

Position compensation was commanded during the figure rotation or coordinate rotation command.

Remedy

- Correct the program.

P142 Pos compen invalid arc

Details

Position compensation cannot be executed with the issued arc command.

Remedy

- Correct the program.

P150 No spec: Nose R compensation

Details

- Tool radius compensation commands (G41 and G42) were issued though they are out of specifications.
- Nose R compensation commands (G41, G42, and G46) were issued though they are out of specifications.

Remedy

- Check the specifications.

P151 Radius compen during arc mode

Details

A compensation command (G40, G41, G42, G43, G44, or G46) has been issued in the arc modal (G02 or G03).

Remedy

- Issue the linear command (G01) or rapid traverse command (G00) in the compensation command block or cancel block.
  (Set the modal to linear interpolation.)

P152 No intersection

Details

- In interference block processing during execution of a tool radius compensation (G41 or G42) or nose R compensation (G41, G42, or G46) command, the intersection point after one block is skipped cannot be determined.
- The 3-dimensional tool radius compensation value (tool vertical direction compensation) (G41.2 or G42.2) cannot be determined.

Remedy

- Correct the program.

P153 Compensation interference

Details

An interference error has occurred while the tool radius compensation command (G41 or G42) or nose R compensation command (G41, G42 or G46) was being executed.

Remedy

- Correct the program.

P154 No spec: 3D compensation

Details

A three-dimensional compensation command was issued though it is out of specifications.

Remedy

- Check the specifications.

P155 Fixed cyc exec during compen

Details

A fixed cycle command has been issued in the radius compensation mode.

Remedy

- Issue a radius compensation cancel command (G40) to cancel the radius compensation mode that has been applied since the fixed cycle command was issued.

P156 R compen direction not defined

Details

A shift vector with undefined compensation direction was found at the start of G46 nose R compensation.

Remedy

- Change the vector to that which has the defined compensation direction.
- Change the tool to that which has a different tip point No.

P157 R compen direction changed

Details

During G46 nose R compensation, the compensation direction is reversed.

Remedy

- Change the G command to that which allows the reversed compensation direction (G00, G28, G30, G33, or G53).
- Change the tool to that which has a different tip point No.
- Enable "#8106 G46 NO REV-ERR".

P158 Illegal tip point

Details

An illegal tip point No. (other than 1 to 8) was found during G46 nose R compensation.

Remedy

- Correct the tip point No.

P161 No spec: 3D tool R comp

Details

3-dimensional tool radius compensation (tool vertical direction compensation) is not included in the specifications.

Remedy

- Check the specifications.

P162 Disable Cmd in 3D tool R comp

Details

A command (G or T command, etc.) was issued during 3-dimensional tool radius compensation (tool vertical direction compensation), although it is disabled during the compensation.

Remedy

- Cancel 3-dimensional tool radius compensation (tool vertical direction compensation).

P163 3D tool R comp is disabled

Details

3-dimensional tool radius compensation (tool vertical direction compensation) was commanded in a mode where the command is disabled.

Remedy

- Cancel the mode that disables the command.

P170 No offset number

Details

- No compensation No. (DOO, TOO or HOO) command was given when the radius compensation (G41, G42, G43 or G46) command was issued. Otherwise, the compensation No. is larger than the number of sets in the specifications.
- H99 or D99 is commanded with the parameter "#1227 aux11/bit1" enabled when the length compensation method and radius compensation method are set to "1" or "2" for the M system tool life management II.

Remedy

- Add the compensation No. command to the compensation command block.
- Check the number of sets for the tool compensation Nos. and correct the compensation No. command to be within the number of sets.
- H99 and D99 commands cannot be used when the length compensation method and radius compensation are set to "1" or "2". Set the length compensation method and radius compensation method to "0".

P171 No spec:Comp input by prog G10

Details

Compensation data input by program (G10) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P172 G10 L number error

Details

An address of G10 command is not correct.

Remedy

- Correct the address L No. of the G10 command.

P173 G10 P number error

Details

The compensation No. at the G10 command is not within the permitted number of sets in the specifications.

Remedy

- Check the number of sets for the tool compensation Nos. and correct the address P designation to be within the number of sets.

P174 No spec:Comp input by prog G11

Details

Compensation data input by program cancel (G11) was commanded though there is no specification of compensation data input by program.

Remedy

- Check the specifications.

P177 Tool life count active

Details

Registration of tool life management data with G10 was attempted when the "usage data count valid" signal was ON.

Remedy

- The tool life management data cannot be registered during the usage data count. Turn the "usage data count valid" signal OFF.

P178 Tool life data entry over

Details

The number of registration groups, total number of registered tools or the number of registrations per group exceeded the range in the specifications.

Remedy

- Correct the number of registrations.

P179 Illegal group No.

Details

- A duplicate group No. was found at the registration of the tool life management data with G10.
- A group No. that was not registered was designated during the T****99 command.
- An M code command, which must be issued as a single command, coexists in the same block as that of another M code command.
- The M code commands set in the same group exist in the same block.

Remedy

- Register the tool life data once for one group: commanding with a duplicate group No. is not allowed.
- Correct to the group No.

P180 No spec: Drilling cycle

Details

A fixed cycle command (G72 - G89) was issued though it is out of specifications.

Remedy

- Check the specifications.
- Correct the program.

P181 No spindle command (Tap cycle)

Details

Spindle rotation speed (S) has not been commanded in synchronous tapping.

Remedy

- Command the spindle rotation speed (S) in synchronous tapping.
- When "#8125 Check Scode in G84" is set to "1", enter the S command in the same block where the synchronous tapping command is issued.

P182 Synchronous tap error

Details

- Connection to the main spindle unit was not established.
- The synchronous tapping was attempted with the spindle not serially connected under the multiple-spindle control I.
- Synchronous tapping command was given to the analog spindle while analog spindle synchronous tapping was unavailable.

Remedy

- Check connection to the main spindle.
- Check that the main spindle encoder exists.
- Set 1 to the parameter #3024 (sout).
- Correct the program.

P183 No pitch/thread number

Details

The pitch or number of threads has not been commanded in the tap cycle of a fixed cycle for drilling command.

Remedy

- Specify the pitch data and the number of threads by F or E command.

P184 Pitch/thread number error

Details

- The pitch or the number of threads per inch is illegal in the tap cycle of the fixed cycle for drilling command.
- The pitch is too small for the spindle rotation speed.
- The thread number is too large for the spindle rotation speed.

Remedy

- Correct the pitch or the number of threads per inch.

P185 No spec: Sync tapping cycle

Details

Synchronous tapping cycle (G84/G74) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P186 Illegal S cmnd in synchro tap

Details

S command was issued during synchronous tapping modal.

Remedy

- Cancel the synchronous tapping before issuing the S command.

P190 No spec: Turning cycle

Details

A lathe cutting cycle command was issued though it is out of specifications.

Remedy

- Check the specification.
- Delete the lathe cutting cycle command.

P191 Taper length error

Details

In the lathe cutting cycle, the specified length of taper section is illegal.

Remedy

- Set the smaller radius value than the axis travel amount in the lathe cycle command.

P192 Chamfering error

Details

Chamfering in the thread cutting cycle is illegal.

Remedy

- Set a chamfering amount not exceeding the cycle.

P199 Tool selection is incorrect

Details

A turning tool shape compensation was commanded while a tool other than turning tool has been selected.

Remedy

- Select "Lathing" for tool type in tool management data before giving the turning tool shape compensation command.

P200 No spec: MRC cycle

Details

The compound type fixed cycle for turning machining I (G70 to G73) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P201 Program error (MRC)

Details

- The subprogram, called with a compound type fixed cycle for turning machining I command, has at least one of the following commands: reference position return command (G27, G28, G29, G30); thread cutting (G33, G34); fixed cycle skip-function (G31, G31.n).
- An arc command was found in the first movement block of the finished shape program in compound type fixed cycle for turning machining I.

Remedy

- Delete G27, G28, G29, G30, G31, G33, G34, and fixed cycle G codes from the subprogram called with the compound type fixed cycle for turning machining I commands (G70 to G73).
- Delete G02 and G03 from the first movement block of the finished shape program in compound type fixed cycle for turning machining I.

P202 Block over (MRC)

Details

The number of blocks in the shape program of the compound type fixed cycle for turning machining I is over 50 or 200 (the maximum number differs according to the model).

Remedy

- Set a 50/200 or less value for the number of blocks in the shape program called by the compound type fixed cycle for turning machining I commands (G70 to G73). (The maximum number differs according to the model).

P203 D cmnd figure error (MRC)

Details

A proper shape will not obtained by executing the shape program for the compound type fixed cycle for turning machining I (G70 to G73).

Remedy

- Correct the shape program for the compound type fixed cycle for turning machining I (G70 to G73).

P204 E cmnd fixed cycle error

Details

A command value of the compound type fixed cycle for turning machining (G70 to G76) is illegal.

Remedy

- Correct the command value of the compound type fixed cycle for turning machining (G70 to G76).

P210 No spec: Pattern cycle

Details

A compound type fixed cycle for turning machining II (G74 to G76) command was commanded though it is out of specifications.

Remedy

- Check the specifications.

P220 No spec: Special fixed cycle

Details

There are no special fixed cycle specifications.

Remedy

- Check the specifications.

P221 No. of special fixed holes = 0

Details

"0" has been specified for the number of holes in special fixed cycle mode.

Remedy

- Correct the program.

P222 G36 angle error

Details

A G36 command specifies "0" for angle intervals.

Remedy

- Correct the program.

P223 G12/G13 radius error

Details

The radius value specified with a G12 or G13 command is below the compensation amount.

Remedy

- Correct the program.

P224 No spec: Circular (G12/G13)

Details

There are no circular cutting specifications.

Remedy

- Check the specifications.

P230 Subprogram nesting over

Details

Over 10 times of subprogram calls have been done in succession from a subprogram.

- A M198 command was found in the program in the data server.

Remedy

- Correct the program so that the number of subprogram calls does not exceed 10 times.

P231 No sequence No.

Details

The sequence No., commanded at the return from the subprogram or by GOTO in the subprogram call, was not set.

Remedy

- Specify the sequence Nos. in the call block of the subprogram.

P232 No program No.

Details

- The machining program has not been found when the machining program is called.

Remedy

- Enter the machining program.
- Check the subprogram storage destination parameters.
- Ensure that the external device (including SD card/USB memory) that contains the file is mounted.

P235 Program editing

Details

Operation was attempted for the file under program editing.

Remedy

- Execute the program again after completion of program editing.

P240 No spec: Variable commands

Details

A variable command (with #) was issued though it is out of specifications.

Remedy

- Check the specifications.

P241 No variable No.

Details

The variable No. commanded is out of the range specified in the specifications.

Remedy

- Check the specifications.
- Correct the program variable No.

P242 = not defined at vrble set

Details

The "=" sign has not been commanded when a variable is defined.

Remedy

- Designate the "=" sign in the variable definition of the program.

P243 Can't use variables

Details

- An invalid variable has been specified in the left or right side of an operation expression.
- Assignment to a write-protected variable has been commanded.

Remedy

- Correct the program.

P244 Invalid set date or time

Details

Date or time was set earlier than current date or time in the system variables (#3011, #3012) when the system lock was valid.

Remedy

- Date or time cannot be changed.
- Correct the program.

P245 Tool No. error

Details

- Tool data read/write command has been executed without selecting the tool command method.
- Tool command method (#68000) or tool selection No. (#68001) is incorrect.
  (1) The tool specified as "Tool in use" is not installed.
  (2) Any unregistered tool No. has been designated.
  (3) Tool selection No. (#68001) has not been designated.
- Write of "Tool No." has been commanded using #68001 while tool No. is being designated.
- Write of "Tool No." has been commanded for an already registered tool No.

Remedy

- Check the program to make sure that the tool command method (#68000) and tool selection No. (#68001) are correct.
- Make sure, if you wish to designate a tool in use, that the said tool No. is nonzero and is already registered on the tool management screen.
- Make sure, if you wish to designate a tool No., that the tool No. registered on the tool management screen has been commanded using #68001.
- #68001 is unable to write the same tool No. as that already registered on the tool management screen.

P250 No spec: Figure rotation

Details

Figure rotation (M98 I_J_P_H_L_) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P251 Figure rotation overlapped

Details

Figure rotation command was issued during figure rotation.

Remedy

- Correct the program.

P252 Coord rotate in fig. rotation

Details

A coordinate rotation related command (G68, G69) was issued during figure rotation.

Remedy

- Correct the program.

P260 No spec: Coordinates rotation

Details

A coordinate rotation command was issued though it is out of specifications.

Remedy

- Check the specifications.

P261 G code illegal (Coord rot)

Details

Another G code or a T command has been issued in the block of coordinate rotation command.

Remedy

- Correct the program.

P262 Illegal modal (Coord rot)

Details

A coordinate rotation command has been issued during modal in which coordinate rotation is not allowed.

Remedy

- Correct the program.

P270 No spec: User macro

Details

A macro specification was commanded though it is out of specifications.

Remedy

- Check the specifications.

P271 No spec: Macro interrupt

Details

A macro interruption command has been issued though it is out of specifications.

Remedy

- Check the specifications.

P272 NC and macro texts in a block

Details

An executable statement and a macro statement exist together in the same block.

Remedy

- Place the executable statement and macro statement in separate blocks in the program.

P273 Macro call nesting over

Details

The number of macro call nests exceeded the limit imposed by the specifications.

Remedy

- Correct the program so that the macro calls do not exceed the limit imposed by the specifications.

P275 Macro argument over

Details

The number of argument sets in the macro call argument type II has exceeded the limit.

Remedy

- Correct the program.

P276 Illegal G67 command

Details

A G67 command was issued though it was not during the G66 command modal.

Remedy

- Correct the program.
- Issue G66 command before G67 command, which is a call cancel command.

P277 Macro alarm message

Details

An alarm command has been issued in #3000.

Remedy

- Refer to the operator messages on the diagnosis screen.
- Refer to the instruction manual issued by the machine tool builder.

P280 Brackets [ ] nesting over

Details

Over five times have the parentheses "[" or "]" been used in a single block.

Remedy

- Correct the program so that the number of "[" or "]" is five or less.

P281 Brackets [ ] not paired

Details

A single block does not have the same number of commanded parentheses "[" as that of "]".

Remedy

- Correct the program so that "[" and "]" parentheses are paired up properly.

P282 Calculation impossible

Details

The arithmetic formula is incorrect.

Remedy

- Correct the formula in the program.

P283 Divided by zero

Details

The denominator of the division is zero.

Remedy

- Correct the program so that the denominator for division in the formula is not zero.

P288 IF EXCESS

Details

The multiplicity of the IF statement exceeded 10 times.

Remedy

- The program is reviewed so that the multiplicity of the IF statement does not exceed 10 times.

P289 IF-ENDIF MMC.

Details

IF and ENDIF are not in pairs.
THEN/ELSE is ordered in the absence of IF command.

Remedy

- The program is reviewed so that IF and ENDIF become pairs.
- Before THEN/ELSE command, IF[<conditional expression>]command is given.

P290 IF sentence error

Details

There is an error in the "IF[<conditional>]GOTO(" statement.

Remedy

- Correct the program.

P291 WHILE sentence error

Details

There is an error in the "WHILE[<conditional>]DO(-END(" statement.

Remedy

- Correct the program.

P292 SETVN sentence error

Details

There is an error in the "SETVN(" statement when the variable name setting was made.

Remedy

- Correct the program.
- The number of characters in the variable name of the SETVN statement must be 7 or less.

P293 DO-END nesting over

Details

The number of DO-END nesting levels in the "WHILE[<conditional>]DO(-END(" statement has exceeded 27.

Remedy

- Correct the program so that the nesting levels of the DO-END statement does not exceed 27.

P294 DO and END not paired

Details

The DOs and ENDs are not paired off properly.

Remedy

- Correct the program so that the DOs and ENDs are paired off properly.

P295 WHILE/GOTO in tape

Details

There is a WHILE or GOTO statement on the tape during tape operation.

Remedy

- Apply memory mode operation instead of tape mode that does not allow the execution of the program with a WHILE or GOTO statement.

P296 No address (macro)

Details

A required address has not been specified in the user macro.

Remedy

- Correct the program.

P297 Address-A error

Details

The user macro does not use address A as a variable.

Remedy

- Correct the program.

P298 G200-G202 cmnd in tape

Details

User macro G200, G201, or G202 was specified during tape or MDI mode.

Remedy

- Correct the program.

P300 Variable name illegal

Details

The variable names have not been commanded properly.

Remedy

- Correct the variable names in the program.

P301 Variable name duplicated

Details

A duplicate variable name was found.

Remedy

- Correct the program so that no duplicate name exists.

P310 Not use GMSTB macro code

Details

G, M, S, T, or B macro code was called during fixed cycle.

Remedy

- Correct the program.
- Correct the parameter settings.

P350 No spec: Scaling command

Details

The scaling command (G50, G51) was issued though it is out of specifications.

Remedy

- Check the specifications.

P360 No spec: Program mirror

Details

A mirror image (G50.1 or G51.1) command has been issued though the programmable mirror image specifications are not provided.

Remedy

- Check the specifications.

P370 No spec: Facing t-post MR

Details

The facing turret mirror image specifications are not provided.

Remedy

- Check the specifications.

P371 Facing t-post MR illegal

Details

- Mirror image for facing tool posts was commanded to an axis in external mirror image or parameter mirror image.
- The commanded mirror image for facing tool posts enables the mirror image for a rotary axis.

Remedy

- Correct the program.
- Correct the parameter settings.

P380 No spec: Corner R/C

Details

The corner R/C was issued though it is out of specifications.

Remedy

- Check the specifications.
- Delete the corner chamfering/corner rounding command in the program.

P381 No spec: Arc R/C

Details

Corner chamfering II or corner rounding II was commanded in the arc interpolation block though it is out of specifications.

Remedy

- Check the specifications.

P382 No corner movement

Details

The block next to corner chamfering/ corner rounding is not a travel command.

Remedy

- Replace the block succeeding the corner chamfering/ corner rounding command by G01 command.

P383 Corner movement short

Details

The travel distance in the corner chamfering/corner rounding command was shorter than the value in the corner chamfering/corner rounding command.

Remedy

- Set the smaller value for the corner chamfering/corner rounding than the travel distance.

P384 Corner next movement short

Details

The travel distance in the following block in the corner chamfering/corner rounding command was shorter than the value in the corner chamfering/corner rounding command.

Remedy

- Set the smaller value for the corner chamfering/corner rounding than the travel distance in the following block.

P385 Corner during G00/G33

Details

A block with corner chamfering/corner rounding was given during G00 or G33 modal.

Remedy

- Correct the program.

P390 No spec: Geometric

Details

A geometric command was issued though it is out of specifications.

Remedy

- Check the specifications.

P391 No spec: Geometric arc

Details

There are no geometric IB specifications.

Remedy

- Check the specifications.

P392 Angle < 1 degree (GEOMT)

Details

The angular difference between the geometric line and line is 1° or less.

Remedy

- Correct the geometric angle.

P393 Inc value in 2nd block (GEOMT)

Details

The second geometric block has a command with an incremental value.

Remedy

- Issue a command with an absolute value in the second geometric block.

P394 No linear move command (GEOMT)

Details

The second geometric block contains no linear command.

Remedy

- Issue the G01 command.

P395 Illegal address (GEOMT)

Details

The geometric format is invalid.

Remedy

- Correct the program.

P396 Plane selected in GEOMT ctrl

Details

A plane switching command was issued during geometric command processing.

Remedy

- Complete the plane switching command before geometric command processing.

P397 Arc error (GEOMT)

Details

In geometric IB, the circular arc end point does not contact or cross the next block start point.

Remedy

- Correct the geometric circular arc command and the preceding and following commands.

P398 No spec: Geometric1B

Details

A geometric command was issued though the geometric IB specifications are not provided.

Remedy

- Check the specifications.

P411 Illegal modal G111

Details

- G111 was issued during milling mode.
- G111 was issued during nose R compensation mode.
- G111 was issued during constant surface speed.
- G111 was issued during mixed control (cross axis control).
- G111 was issued during fixed cycle.
- G111 was issued during polar coordinate interpolation.
- G111 was issued during cylindrical interpolation mode.

Remedy

- Before commanding G111, cancel the following commands.
- Milling mode
- Nose R compensation
- Constant surface speed
- Mixed control (cross axis control)
- Fixed cycle
- Polar coordinate interpolation
- Cylindrical interpolation

P412 No spec: Axis name switch

Details

Axis name switch (G111) was issued though it is out of specifications.

Remedy

- Check the specifications.

P420 No spec: Para input by program

Details

Parameter input by program (G10) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P421 Parameter input error

Details

- The specified parameter No. or set data is illegal.
- An illegal G command address was input in parameter input mode.
- A parameter input command was issued during fixed cycle modal or nose R compensation.
- G10L50, G10L70, G10L100, G11 were not commanded in independent blocks.

Remedy

- Correct the program.

P422 Tool/Work shape input error

Details

- G10 L100, G10 L101 or G11 has been given together with any other command in a block.
- Address P or T has been omitted from G10 L100.
- Address C has been omitted from G10 L101.

Remedy

- Correct the program.

P423 R-Navi input error

Details

- G10 L110, G10 L111 or G11 has been given together with any other command in a block.
- Address Q has been omitted from G10 L110.
- Address P, Q or D has been omitted from G10 L111.
- Machining surface parameter input command has been issued for an undefined workpiece.
- An index angle command has been given to any axis other than Z when using the coordinate axis direction setting method.
- Neither the workpiece registration No. nor surface registration No. has been selected when setting a machining surface.

Remedy

- Correct the program.
- Correct the setting of workpiece to machine.

P430 R-pnt return incomplete

Details

- A command was issued to move an axis, which has not returned to the reference position, away from that reference position.
- A command was issued to an axis removal axis.

Remedy

- Execute reference position return manually.
- Disable the axis removal on the axis for which the command was issued.

P431 No spec: 2,3,4th R-point ret

Details

A command for second, third or fourth reference position return was issued though there are no such command specifications.

Remedy

- Check the specifications.

P432 No spec: Start position return

Details

Start position return (G29) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P433 No spec: R-position check

Details

Reference position check (G27) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P434 Compare error

Details

One of the axes did not return to the reference position when the reference position check command (G27) was executed.

Remedy

- Correct the program.

P435 G27 and M commands in a block

Details

An M command was issued simultaneously in the G27 command block.

Remedy

- Place the M code command, which cannot be issued in a G27 command block, in separate block from G27 command block.

P436 G29 and M commands in a block

Details

An M command was issued simultaneously in the G29 command block.

Remedy

- Place the M code command, which cannot be issued in a G29 command block, in separate block from G29 command block.

P438 G52 invalid during G54.1

Details

A local coordinate system command was issued during execution of the G54.1 command.

Remedy

- Correct the program.

P450 No spec: Chuck barrier

Details

The chuck barrier on command (G22) was specified although the chuck barrier is out of specifications.

Remedy

- Check the specifications.

P451 No spec: Stroke chk bef travel

Details

Stroke check before travel (G22/G23) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P452 Limit before travel exists

Details

An illegal command, which places the axis travel start/end point in the prohibited area or moves the axis through the prohibited area, was detected when Stroke check before travel (G22) was commanded.

Remedy

- Correct the coordinate values of the axis address commanded in the program.

P460 Tape I/O error

Details

An error has occurred in the tape reader. Otherwise an error has occurred in the printer during macro printing.

Remedy

- Check the power and cable of the connected devices.
- Correct the I/O device parameters.

P461 File I/O error

Details

- A file of the machining program cannot be read.

Remedy

- In memory mode, the programs stored in memory may have been destroyed. Output all of the programs and tool data and then format the system.
- Ensure that the external device (including SD card/USB memory) that contains the file is mounted.
- Correct the parameter settings for HD operation, SD card operation or USB memory operation.

P462 Computer link commu error

Details

A communication error occurred during the BTR operation.

Remedy

- "L01 Computer link error" is displayed simultaneously. Take the remedy corresponding to the error No.

P480 No spec: Milling

Details

- Milling was commanded though it is out of specifications.
- Polar coordinate interpolation was commanded though it is out of specifications.

Remedy

- Check the specifications.

P481 Illegal G code (mill)

Details

- An illegal G code was used during the milling mode.
- An illegal G code was used during cylindrical interpolation or polar coordinate interpolation.
- The G07.1 command was issued during the tool radius compensation.

Remedy

- Correct the program.

P482 Illegal axis (mill)

Details

- A rotary axis was commanded during the milling mode.
- Milling was executed though an illegal value was set for the milling axis No.
- Cylindrical interpolation or polar coordinate interpolation was commanded during mirror image.
- Cylindrical interpolation or polar coordinate interpolation was commanded before the tool compensation was completed after the T command.
- G07.1 was commanded when cylindrical interpolation was not possible (there is no rotary axis, or external mirror image is ON).
- An axis other than a cylindrical coordinate system axis was commanded during cylindrical interpolation.

Remedy

- Correct the machining program, parameters and PLC interface signals.

P484 R-pnt ret incomplete (mill)

Details

- Movement was commanded to an axis that had not completed reference position return during the milling mode.
- Movement was commanded to an axis that had not completed reference position return during cylindrical interpolation or polar coordinate interpolation.

Remedy

- Carry out manual reference position return.

P485 Illegal modal (mill)

Details

- The milling mode was turned ON during nose R compensation or constant surface speed control.
- A T command was issued during the milling mode.
- The mode was switched from milling to cutting during tool compensation.
- Cylindrical interpolation or polar coordinate interpolation was commanded during the constant surface speed control mode (G96).
- The command unacceptable in the cylindrical interpolation was issued.
- A T command was issued during the cylindrical interpolation or polar coordinate interpolation mode.
- A movement command was issued when the plane was not selected just before or after the G07.1 command.
- A plane selection command was issued during the polar coordinate interpolation mode.
- Cylindrical interpolation or polar coordinate interpolation was commanded during tool radius compensation.
- The G16 plane in which the radius value of a cylinder is "0" was specified.
- A cylindrical interpolation or polar coordinate interpolation command was issued during coordinate rotation by program.

Remedy

- Correct the program.
- Issue G40 or G97 before issuing G12.1.
- Issue a T command before issuing G12.1.
- Issue G40 before issuing G13.1.
- Specify the radius value of a cylinder other than "0", or specify the X axis's current value other than "0" before issuing G12.1/G16.

P486 Milling error

Details

- The milling command was issued during the mirror image (when parameter or external input is turned ON).
- Polar coordinate interpolation, cylindrical interpolation or milling interpolation was commanded during mirror image for facing tool posts.
- The start command of the cylindrical interpolation or polar coordinate interpolation was issued during the normal line control.

Remedy

- Correct the program.

P501 Cross (G110) impossible

Details

Mixed control command (G110), Arbitrary axis exchange command (G140), Arbitrary axis exchange return command (G141) or Base axis configuration restore command (G142) has been given to a part system that is under any of the following state.

- Cylindrical interpolation mode
- Polar coordinate interpolation mode
- Milling interpolation mode
- Constant surface speed control mode
- Polygon cut mode
- Hob machining mode
- Nose R compensation mode
- Tool radius compensation mode
- During axis name switch
- Fixed drilling cycle mode
- Fixed cycle for lathe turning
- Compound-type fixed cycle mode
- Special fixed cycle mode
- Facing turret mirror image mode
- Balance cut mode
- Chuck barrier/Tailstock barrier
- Stroke check before travel
- During Macro modal call (G66.1)
- Hypothetical axis interpolation mode
- Figure rotation mode
- During scaling
- Coordinate rotation by parameter mode
- Polar coordinate command mode
- Normal line control mode
- Circular cutting mode
- Tool direction tool length compensation mode

Remedy

- Correct the program.

P503 Illegal G110 axis

Details

- The commanded axis does not exist.
- The mixed control (cross axis control) (G110) was commanded to the axis for which the mixed control (cross axis control) is disabled.
- The number of axes included in the mixed control (cross axis control) (G110) command is exceeding the maximum number of axes per part system.

Remedy

- Correct the program.

P511 Synchronization M code error

Details

- Two or more synchronization M codes were commanded in the same block.
- The synchronization M code and "!" code were commanded in the same block.
- Synchronization with the M code was commanded in 3rd part system or more. (Synchronization with the M code is valid only in 1st part system or 2nd part system.)

Remedy

- Correct the program.

P520 Control axis superimposition/Designated axis illegal

Details

- An axis which was impossible to superimpose was designated as a master axis or superimposing axis.

Remedy

Correct the program.

P521 Illegal synchronization axis

Details

The axis specified as a basic or synchronous axis of synchronization across part systems cannot be synchronized.

Remedy

- Correct the program.

P544 No spec: Wk instl err cmp

Details

The workpiece installation error compensation function is out of the specifications.

Remedy

- Check the specifications.

P545 Invld cmd in wk instl err cmp

Details

During workpiece installation error compensation, a command impossible to issue (such as G command) was issued.

Remedy

- Check the program. If you wish to issue a command impossible to issue (such as G command) during workpiece installation error compensation, cancel workpiece installation error compensation once.

P546 Wk instl err cmp cmd invalid

Details

- Workpiece installation error compensation was commanded in a G modal in which commanding it is not allowed.
- An illegal G command was issued in the block that has a workpiece installation error compensation command.

Remedy

- Check the program. Also check the G modals which were issued at commanding the workpiece installation error compensation, and cancel illegal ones.
- Issue the G command in a separate block.

P547 Illegal wk instl err cmp cmd

Details

A command in which the rotary axis's travel distance exceeds 180 degrees was issued.

Remedy

- Divide the travel command so that the rotary axis's travel distance per block is less than 180 degrees.

P550 No spec: G06.2(NURBS)

Details

There is no NURBS interpolation option.

Remedy

- Check the specifications.

P551 G06.2 knot error

Details

The knot (k) command value is smaller than the value for the previous block.

Remedy

- Correct the program.
- Specify the knot by monotone increment.

P552 Start point of 1st G06.2 err

Details

The block end point immediately before the G06.2 command and the G06.2 first block command value do not match.

Remedy

- Match the G06.2 first block coordinate command value with the previous block end point.

P554 Invld manual interrupt in G6.2

Details

Manual interruption was executed in a block that applies the G06.2 mode.

Remedy

- Execute the manual interruption in the block that does not apply the G06.2 mode.

P555 Invalid restart during G06.2

Details

Restart was attempted from the block that applies G06.2 mode.

Remedy

- Restart from the block other than in G06.2 mode.

P560 Fairing changeover disabled

Details

- A command to enable the fairing function was given while the smooth fairing function was ON.
- A command to enable the smooth fairing function was given while the fairing function was ON.

Remedy

- Correct the program.

P595 Skip axis illegal

Details

- No axis or more than 2 axes was/were issued to torque limitation skip command block.
- An axis during synchronous control was issued as the skip axis.
- An axis during inclined axis control was issued as the skip axis.
- Geometric command, corner R, or corner chamfering was issued in the same block as torque limitation skip command.
- A torque skip was commanded to the axis which is in the constant torque control or the proportional torque stopper control.

Remedy

- Issue only an axis to the skip axis.
- Review the program.

P600 No spec: Auto TLM

Details

An automatic tool length measurement command (G37) was issued though it is out of specifications.

Remedy

- Check the specifications.

P601 No spec: Skip

Details

A skip command (G31) was issued though it is out of specifications.

Remedy

- Check the specifications.

P602 No spec: Multi skip

Details

A multiple skip command (G31.1, G31.2, G31.3 or G31 Pn) was issued though it is out of specifications.

Remedy

- Check the specifications.

P603 Skip speed 0

Details

The skip speed is "0".

Remedy

- Specify the skip speed.

P604 TLM illegal axis

Details

No axis was specified in the automatic tool length measurement block. Otherwise, two or more axes were specified.

Remedy

- Specify only one axis.

P605 T & TLM command in a block

Details

The T code is in the same block as the automatic tool length measurement block.

Remedy

- Specify the T code before the automatic tool length measurement block.

P606 T cmnd not found before TLM

Details

The T code was not yet specified in automatic tool length measurement.

Remedy

- Specify the T code before the automatic tool length measurement block.

P607 TLM illegal signal

Details

The measurement position arrival signal turned ON before the area specified by the D command or "#8006 ZONE d". Otherwise, the signal remained OFF to the end.

Remedy

- Correct the program.

P608 Skip during radius compen

Details

A skip command was issued during radius compensation processing.

Remedy

- Issue a radius compensation cancel (G40) command or remove the skip command.

P610 Illegal parameter

Details

- The parameter setting is not correct.
  - G114.1 was commanded while the spindle synchronization was selected with the PLC interface signal.
  - G110 was commanded while the mixed control (cross axis control) was selected with the PLC interface signal.
  - G125 was commanded while the control axis synchronization across part systems was selected with the PLC interface signal.
  - G126 was commanded while the control axis superimposition was selected with the PLC interface signal.

Remedy

- Correct the settings of "#1514 expLinax (Exponential function interpolation linear axis)" and "#1515 expRotax (Exponential function interpolation rotary axis)".
  - Correct the program.
  - Correct the parameter settings.

P611 No spec: Exponential function

Details

There is no specification for the exponential interpolation.

Remedy

- Check the specifications.

P612 Exponential function error

Details

A travel command for exponential interpolation was issued during mirror image for facing tool posts.

Remedy

- Correct the program.

P650 Sub sys identification # error

Details

- The identification No. specified in the address B of G122 or G144 is that of the part system where G122 is given.
- The identification No. specified in the sub part system control I command (G122) is not set in the parameter #12049 SBS_no.

Remedy

- Change the address B of G122 or G144 to be any identification No. other than that of the part system where G122 is given.
- Select the identification No. for the sub part system control I command (G122) from among the available Nos.
- Specify the identification No. you wish to use for the sub part system control I command (G122) in the parameter #12049 SBS_no.

P651 Other G code in sub sys block

Details

G122 or G144 has been given together with any other G code command in a block.

Remedy

- Do not command G122 or G144 together with any other G code command in a block.

P652 Illegal mode (sub part system)

Details

G122 or G144 has been commanded in any of the following modes.

- User macro modal call (G66, G66.1)
- High-speed mode (G5, G5.1)

Remedy

Cancel the following modes before commanding G122 or G144.

- User macro modal call (G66, G66.1)
- Fixed cycle mode
- High-speed mode (G5, G5.1)

P653 Illegal G code (sub part sys)

Details

High-speed mode command (G5, G5.1) has been given in a sub part system.

Remedy

- Do not use the high-speed mode (G5, G5.1) in a sub part system.

P656 Illegal PLC device

Details

- Specified the device other than R register/D register.
- Specified the odd numbered device when 4 byte is specified.
- Specified the device number that is out of the command range.
- Specified the data length that is out of the command range.
- Specified the bit number that is out of the command range.
- Omitted the device number.
- Omitted the project number after ",P".
- Omitted the data length after ",".
- Omitted the bit number after ".".

Remedy

- Check the program.

P657 PLC Device too much

Details

Multiple assignment expressions which include the PLC direct interface command are commanded to the same block.

Remedy

- Command the assignment command using PLC direct interface by itself.

P700 Illegal command value

Details

Spindle synchronization was commanded to a spindle that is not connected serially.

Remedy

- Correct the program.
- Correct the parameter settings.

P705 Dia/Rad selection cmd invalid

Details

G10.9 was commanded during a modal in which diameter/radius designation selection is not available.

Remedy

- Check the program.

P706 Invld cmd in dia/rad selection

Details

A G code impossible to command was issued during switching between diameter and radius using the diameter/radius designation selection.

Remedy

- Check the program.

P801 Turning tool offset disabled

Details

Any of the following commands has been given during the G43.7 mode.

- Mirror image by G code
- Mirror image by parameter setting
- Mirror image by external input
- Tool length compensation along the tool axis
- Automatic tool length measurement

A G43.7 command has been given in any of the following modes.

- Mirror image by G code
- Mirror image by parameter setting
- Mirror image by external input
- Fixed cycle for drilling

Remedy

- Check the program. If you use the mirror image, tool length compensation along the tool axis, automatic tool length measurement or fixed cycle for drilling, use a G49 command to cancel the tool position offset.

P802 Nose R compensation disabled

Details

Any of the following commands has been given during nose R compensation for machining center system.

- Mirror image by G code
- Mirror image by parameter setting
- Mirror image by external input

Nose R compensation for machining center system has been executed in any of the following modes.

- Mirror image by G code
- Mirror image by parameter setting
- Mirror image by external input

Remedy

- Check the program. If you use the mirror image, use a G40 command to cancel the nose R compensation for machining center system.

P803 Proceed of prog check disabled

Details

The commanded G code has disabled the program check.

Remedy

Delete the G code that disables the program check, and then retry the program check.
(Note that deleting the G code may affect the operation of the subsequent blocks.)

P900 No spec: Normal line control

Details

A normal line control command (G40.1, G41.1, or G42.1) was issued though it is out of specifications.

Remedy

- Check the specifications.

P901 Normal line control axis G92

Details

A coordinate system preset command (G92) was issued to a normal line control axis during normal line control.

Remedy

- Correct the program.

P902 Normal line control axis error

Details

- The normal line control axis was set to a linear axis.
- The normal line control axis was set to the linear type rotary axis II axis.
- The normal line control axis has not been set.
- The normal line control axis is the same as the plane selection axis.

Remedy

- Correct the normal line control axis setting.

P903 Plane chg in Normal line ctrl

Details

The plane selection command (G17, G18, or G19) was issued during normal line control.

Remedy

- Delete the plane selection command (G17, G18, or G19) from the program of the normal line control.

P920 No spec: 3D coord conv

Details

There is no specification for 3-dimensional coordinate conversion.

Remedy

- Check the specifications.

P921 Illegal G code at 3D coord

Details

The commanded G code cannot be performed during 3-dimensional coordinate conversion modal.

Remedy

- Refer to the programming manual for usable G commands.
- When the parameter "#8158 Init const sur spd" is enabled, disable the parameter or issue the constant surface speed control cancel (G97) command.

P922 Illegal mode at 3D coord

Details

A 3-dimensional coordinate conversion command was issued during a modal for which 3-dimensional coordinate conversion cannot be performed.

Remedy

- Refer to the programming manual for usable G commands.

P923 Illegal addr in 3D coord blk

Details

A G code and G68 was commanded in a block though the G code cannot be commanded with G68.

Remedy

- Refer to the programming manual for usable G commands.

P924 Travel cmd error in 3Dconvert

Details

An incorrect travel command has been given during the 3D coordinate conversion mode.

Remedy

- Correct the program.

P925 End point err in 3D conversion

Details

The end point of a travel command given during G68.1 ,E1 is not on the tool path.

Remedy

- Correct the program.

P930 No spec: Tool axis compen

Details

A tool length compensation along the tool axis command was issued though it is out of specifications.

Remedy

- Check the specifications.

P931 Executing tool axis compen

Details

There is a G code that cannot be commanded during tool length compensation along the tool axis.

Remedy

- Correct the program.

P932 Rot axis parameter error

Details

There is an illegal orthogonal axis name or rotary axis name set in the rotary axis configuration parameters.
There is an illegal setting in the parameter concerning the configuration of the inclined surface machining axis.

Remedy

- Set the correct value and turn the power ON again.

P934 5-axis control config. error

Details

- The function cannot be executed under the axis configuration of the part system.
- The rotary axis is in the spindle mode of the spindle position control.

Remedy

- Correct the program.
- Check and correct the rotary axis configuration parameters so that the function can be executed in the axis configuration.

P940 No spec: Tool tip control

Details

There is no specification for tool tip center control.

Remedy

- Check the specifications.

P941 Invalid T tip control command

Details

A tool tip center control command was issued during a modal for which a tool tip center control command cannot be issued.

Remedy

- Correct the program.

P942 Invalid cmnd during T tip ctrl

Details

A G code that cannot be commanded was issued during tool tip center control.

Remedy

- Correct the program.

P943 Tool posture command illegal

Details

In tool tip center control type 1, if the signs at the tool-side rotary axis or table base-side rotary axis start and finish points differ, a tool base-side rotary axis or table workpiece-side rotary axis rotation exists for the same block, and does not pass a singular point.
In tool tip center control type 2, the posture vector command is incorrect.

Remedy

- Correct the program.

P950 No spec: Tilt face machining

Details

Inclined surface machining option is not supported.

Remedy

- Check the specifications.

P951 Ill cmd in tilt face machining

Details

A forbidden command (G command, etc.) was issued during inclined surface machining.

Remedy

- Check the program. If you want to execute a command (G command, etc.) that is unavailable during inclined surface machining, cancel the inclined surface machining.

P952 Inclined face cut prohibited

Details

Inclined surface machining was commanded during the mode where the machining is unavailable.
Inclined surface machining was commanded during interruption.

Remedy

- Check the program and see whether any unavailable mode is included during inclined surface machining command. If any, cancel that mode.

P953 Tool axis dir cntrl prohibited

Details

Tool axis direction control was commanded during the mode where the control is unavailable.

Remedy

- Check the program and see whether any unavailable mode is included during tool axis direction control. If any, cancel that mode.

P954 Inclined face command error

Details

The address to issue the inclined surface machining command is incorrect.

Remedy

- Check the program.

P955 Inclined face coord illegal

Details

Impossible to define an inclined surface with the values you specified.

Remedy

- Check the program.

P956 G68.2P10 surface not defined

Details

The coordinate system for the machining surface selected with G68.2P10 has not been defined.

Remedy

- Set the machining surface so that the coordinate system can be defined.

P957 Tool axis dir ctrl cmp amt 0

Details

When the tool axis direction control type 2 (G53.6) was commanded, a tool length compensation No. whose compensation amount is 0 was commanded.

Remedy

- Correct the program. Set the tool length compensation amount, or command a tool length compensation No. whose compensation amount is not 0.

P958 Tool axis dir ctrl axis illeg

Details

The command was issued with an angle with which tool axis direction control of 4-axis configuration is not available.

Remedy

- Check the feature coordinate system defined in inclined surface machining command.

P959 No spec: Simple inclined face

Details

Simple inclined surface machining is not included in the specifications.

Remedy

- Check the specifications.

P960 No spec: Direct command mode

Details

G05 P4 was commanded while direct command mode option is OFF.

Remedy

- Check the specifications.

P961 Invalid during dir cmnd mode

Details

- A G code other than G05 P0 was commanded in direct command mode.
- A sequence No. command, F code command, MSTB command or variable command was issued.
- A corner chamfering command or corner R command was issued.
- A travel command was issued to an axis that had not been command in the G05 P4 block.

Remedy

- Check the program.

P962 Dir cmnd mode cmnd invalid

Details

G05 P4 was commanded in a modal where direct command mode is not available.

Remedy

- Check the program.

P963 Illegal direct cmnd mode cmnd

Details

The commanded coordinate value was beyond the maximum travel distance in direct command mode.

Remedy

- Correct the coordinate value in direct command mode.

P990 PREPRO error

Details

Combining commands that required pre-reading (nose R offset, corner chamfering/corner rounding, geometric I, geometric IB, and compound type fixed cycle for turning machining) resulted in eight or more pre-read blocks.

Remedy

- Delete some or all of the combinations of commands that require pre-reading.

13 Smart Safety Observation Alarm (V)

13.1 Smart Safety Observation Error (V01/V02/V03/V04/V05/V06/V07)

V01 Safety watchdog error 0001

Details

Safety function is not carried out in specified cycle.

Remedy

- CPU may be faulty. Contact our service center.

V01 Cross-check error 0002

Details

Each operation result of redundant CPU is different value.

Remedy

- CPU may be faulty. Contact our service center.

V01 Safe sys internal process err 0003 Function No.

Details

An error has occurred in the NC's internal process during execution of a safety function.
The screen displays which safety function has been executed at the time of error, using the following numbers.
0001: Safely-limited speed (SLS)
0002: Safely-limited position (SLP)
0003: Safe speed monitor (SSM)
0004: Safe cam (SCA)
0005: Safe operating stop (SOS)
0006: Safe stop 1 (SS1)
0007: Safe stop 2 (SS2)
0008: Safe torque off (STO)
0009: Safe brake control (SBC)
000A: Diagnostic function
000B: Safety I/O-related observation

Remedy

- CPU may be faulty. Contact our service center.

V01 Safe para storage memory err 1 0004

Details

Safety parameter (for internal processing) which is saved in the memory is illegal value.

Remedy

- Input Safety parameter file and turn power ON again.
- Clear the memory. (All data on the memory will be initialized. Back up the data as needed.)
- When the above action does not help restoring, memory may be faulty. Contact our service center.

V01 Safe para storage memory err 2 0005

Details

Safety parameter which is saved in the memory is illegal value.

Remedy

- Input Safety parameter file and turn power ON again.
- Clear the memory. (All data on the memory will be initialized. Back up the data as needed.)
- When the above action does not help restoring, memory may be faulty. Contact our service center.

V01 Safety initial process timeout 0006

Details

The initialization process of the safety function at power ON is not completed within specified time.

Remedy

- CPU may be faulty. Contact our service center.

V01 NC-DRV initial safe comm error 0007 Axis name

Details

The initial communication between NC unit and drive unit is incorrect. Displays the name of axis with error.

Remedy

- Check if there is no contact failure or no cable fracture after NC/Drive power OFF.
- NC unit or drive unit may be faulty. Contact our service center.

V01 Safe IO init. process timeout 0008 Unit info

Details

The safety I/O initialization process at power-up has not completed within the specified time.
The screen shows the unit No. and RIO system in error.
bit24-27: Unit No.
bit16-17: Detected system

Remedy

- Safety I/O unit may be faulty. Exchange the safety I/O unit.

V02 Encoder error 0001 Axis name

Details

The feedback position received from drive unit is incorrect.
Displays the name of axis with error.

Remedy

- Encoder may be faulty. Contact our service center.

V02 NC-DRV safe communication err 0004 Axis name

Details

The communication between NC unit and drive unit is incorrect.
Displays the name of axis with error.

Remedy

- Check if there is no contact failure or no cable fracture after NC/Drive power OFF.
- NC unit or drive unit may be faulty. Contact our service center.

V02	Excess movement during pwr OFF	0005	Axis name

Details

[Saved position at power shut OFF] and [restored position at power ON] are inconsistent in SLP/SCA encoder diagnosis during power OFF.
Displays the name of axis with error.

Remedy

There are two causes of this alarm; one is "the axis being moved during power OFF" and the other is "the incorrect restoring of the position at power ON".
- When it is likely with the cause "the axis being moved during power OFF", the alarm can be cancelled by turning ON the Safety reset signal while the Special safety alarm cancel signal is ON.
- When it is likely with the cause "the incorrect restoring of the position at power ON", encoder may be faulty. Contact our service center.

V03	Slave station comm. error 1	0001	Unit info

Details

The data received by the safety I/O unit is incorrect. The screen displays the unit No. and RIO system with an error.
bit24-27: Unit No.
bit16-17: Detected system
Safety observation target axes are stopped, and all the DOs of the safety I/O unit concerned are turned OFF.

Remedy

- NC unit or safety I/O unit may be faulty. Exchange the NC unit or safety I/O unit.

V03	Slave station comm. error 2	0002	Unit info

Details

The data received by the safety I/O unit is incorrect. The screen displays the unit No. and RIO system with an error.
bit24-27: Unit No.
bit16-17: Detected system
Safety observation target axes are stopped, and all the DOs of the safety I/O unit concerned are turned OFF.

Remedy

- NC unit or safety I/O unit may be faulty. Exchange the NC unit or safety I/O unit.

V03	Slave station comm. error 3	0003	Unit info

Details

The data received by the safety I/O unit is incorrect. The screen displays the unit No. and RIO system with an error.
bit24-27: Unit No.
bit16-17: Detected system
Safety observation target axes are stopped, and all the DOs of the safety I/O unit concerned are turned OFF.

Remedy

- NC unit or safety I/O unit may be faulty. Exchange the NC unit or safety I/O unit.

V03	Slave station data compare err	0004	Unit info

Details

The data received by the safety I/O unit is inconsistent. The screen displays the unit No. and RIO system with an error.
bit24-27: Unit No.
bit16-17: Detected system
Safety observation target axes are stopped, and all the DOs of the safety I/O unit concerned are turned OFF.

Remedy

- Check the user safety sequence circuit to see if the output signal control circuit is correct.
- Data corruption may have been caused due to noise. Take anti-noise measures on the connection between the NC unit and safety I/O unit.
- NC unit or safety I/O unit may be faulty. Exchange the NC unit or safety I/O unit.

V03	Output OFF check error	0005	Unit info

Details

Output signal of the safety I/O unit fails to be OFF. The screen displays the unit No., RIO system and signal bit with an error.
[M8]
bit24-27: Unit No.
bit16-17: Detected system
bit0-15: Signal BIT
[C80]
bit0-31: Signal BIT
Safety observation target axes are stopped.

Remedy

- NC unit or safety I/O unit may be faulty. Exchange the NC unit or safety I/O unit.

V03	Output signal cross-check err	0006	Unit info

Details

Loop-back signals of the outputs from the safety I/O unit are inconsistent between PLC1 and PLC2. The screen displays the unit No., RIO system and signal bit with an error.
[M8]
bit24-27: Unit No.
bit16-17: Detected system
bit0-15: Signal BIT
[C80]
bit0-31: Signal BIT
Safety observation target axes are stopped.

Remedy

- Check the user safety sequence circuit to see if the output signal control circuit is correct.
- NC unit or safety I/O unit may be faulty. Exchange the NC unit or safety I/O unit.

V03	Transmission cross-check error	0007	Unit info

Details

Output signals are inconsistent between the user safety sequence and safety I/O unit. The screen displays the unit No., RIO system and signal bit with an error.
[M8]
bit24-27: Unit No.
bit16-17: Detected system
bit0-15: Signal BIT
[C80]
bit0-31: Signal BIT
Safety observation target axes are stopped.

Remedy

- Check the user safety sequence circuit to see if the output signal control circuit is correct.
- NC unit or safety I/O unit may be faulty. Exchange the NC unit or safety I/O unit.

V03	Reception cross-check error	0008	Unit info

Details

Input signals from the safety I/O unit are inconsistent between PLC1 and PLC2. The screen displays the unit No., RIO system and signal bit with an error.
[M8]
bit24-27: Unit No.
bit16-17: Detected system
bit0-15: Signal BIT
[C80]
bit0-31: Signal BIT
Safety observation target axes are stopped.

Remedy

- Any input device (emergency stop button, for example) connected to the safety I/O unit may be faulty. Check the input devices.
- NC unit or safety I/O unit may be faulty. Exchange the NC unit or safety I/O unit.

V03	Host station comm. error 1	0009	Unit info

Details

The data received from the safety I/O unit is incorrect. The screen displays the unit No. and RIO system with an error.
bit24-27: Unit No.
bit16-17: Detected system
Safety observation target axes are stopped.

Remedy

- Data corruption may have been caused due to noise. Take anti-noise measures on the connection between the NC unit and safety I/O unit.
- NC unit or safety I/O unit may be faulty. Exchange the NC unit or safety I/O unit.

V03	Host station comm. error 2	0010	Unit info

Details

The data received from the safety I/O unit is incorrect. The screen displays the unit No. and RIO system with an error.
bit24-27: Unit No.
bit16-17: Detected system
Safety observation target axes are stopped.

Remedy

- NC unit or safety I/O unit may be faulty. Exchange the NC unit or safety I/O unit.

V03	Host station comm. error 3	0011	Unit info

Details

The data received from the safety I/O unit is incorrect. The screen displays the unit No. and RIO system with an error.
bit24-27: Unit No.
bit16-17: Detected system
Safety observation target axes are stopped.

Remedy

- The cable connecting between the NC unit and safety I/O unit may be disconnected or loosened. Check the cable.
- NC unit or safety I/O unit may be faulty. Exchange the NC unit or safety I/O unit.

V03	Drv safe receive crosscheck er	0012	ZR device No.

Details

The input signals from the drive's safety function are inconsistent.
The screen displays the No. of device ZR with an error.
Safety observation target axes are stopped.

Remedy

- NC unit may be faulty. Exchange the NC unit.

V03	User safety sequence 1 error	0013	Error cause number

Details

An error has occurred in User safety sequence 1.
The screen displays the error cause by the number.
Safety observation target axes are stopped.
User safety sequences 1 and 2 are both stopped.
All the DOs of the connected safety I/O unit are turned OFF.

Remedy

- Refer to the list of user safety sequence error details in Smart safety observation Specification manual. Cancel the error based on the displayed error cause, and then turn OFF and ON the NC power.

V03	User safety sequence 2 error	0014	Error cause number

Details

An error has occurred in User safety sequence 2. The screen displays the error cause.
Safety observation target axes are stopped.
User safety sequences 1 and 2 are both stopped.
All the DOs of the connected safety I/O unit are turned OFF.

Remedy

- Refer to the list of user safety sequence error details in Smart safety observation Specification manual. Cancel the error based on the displayed error cause, and then turn OFF and ON the NC power.

V03	Output sig. cross check error	0015	Unit info

Details

The signals output to the safety I/O unit are unmatched between PLC1 and PLC2. The screen shows the unit No., RIO system and signal bit in error.
[M8]
bit24-27: Unit No.
bit16-17: Detected system
bit0-15: Signal BIT
[C80]
bit0-31: Signal BIT
The axes covered by safety function come to a standstill.

Remedy

- Check the user safety sequence to make sure the output signal control circuit is correct.
- Set tolerable time more than 300ms, when an output signal is controlled with 100ms timer.
- NC unit may be faulty. Replace the NC unit.

V04	Safety observation & Smart both ON	0001	

Details

The system has both an axis for which Safety observation is enabled (the parameter "#2313 SV113(SSF8)/bitF" or "#13229 SP229(SFNC9)/bitF" is ON) and an axis for which Smart safety observaiton is enabled (the parameter "#51101 SF_Disable" or "#51301 SF_SDisable" is OFF).

Remedy

- Disable Safety observation for all the axes (Set the parameters "#2313 SV113(SSF8)/bitF" and "#13229 SP229(SFNC9)/bitF" to OFF), and turn ON the NC reset signal.
- Disable Smart safety observation for all the axes (Set the parameters "#51101 SF_Disable" and "#51301 SF_SDisable" to OFF), and turn the power OFF and ON.

V04	Safety IO device unconnectable	0002	Safety I/O unit-connected channel

Details

A safety I/O unit has been connected with the smart safety observation option OFF or with the parameters "#51101 SF_Disable" and "#51301 SF_SDisable" set to ON for all the axes.The screen displays the channel to which the safety I/O unit is connected by the bit number.
bit0: Operation panel
bit1: RIO 1CH
bit2: RIO 2CH
bit3: RIO 3CH

Remedy

- Disconnect the safety I/O unit, and then turn OFF and ON the power.
- If you wish to use Smart safety observation, implement the following and then turn the power OFF and ON.
  - Enable the option.
  - Turn OFF the axis parameter of Smart safety observation ("#51101 SF_Disable" / "#51301 SF_SDisable").

V04	Safe IO disabled: connect err	0003	Safety I/O unit-connected channel

Details

A safety I/O unit has been connected to the I/O connection channel where RIO1.0 unit is connected. The screen displays the I/O connection channel to which the safety I/O unit is connected using a bit number.
bit0: Operation panel
bit1: RIO 1CH
bit2: RIO 2CH
bit3: RIO 3CH

Remedy

- For the I/O connection channel where the safety signal input/output is conducted, no devices other than RIO2.0 unit or safety I/O unit can be connected.
- If you are unable to change the I/O device configuration immediately, set the parameters "#51101 SF_Disable" and "#51301 SF_SDisable" to ON for all the axes, and turn OFF and ON the power. This prevents occurrence of this alarm.

V04	Safe IO disabled: no safe I/Os	0004	

Details

None of the I/O connection channels is connected to a safety I/O unit.

Remedy

- Connect a safety I/O unit to the I/O connection channel through which the safety signals are input/output.
- If you are unable to change the I/O device configuration immediately, set the parameters "#51101 SF_Disable" and "#51301 SF_SDisable" to ON for all the axes, and turn OFF and ON the power. This prevents occurrence of this alarm.

V04	Safety PLC is not yet written	0005	

Details

Safety PLC has not been written.

Remedy

- Write safety PLC and turn the power OFF and ON.
- If safety PLC is not ready, set the parameters "#51101 SF_Disable" and "#51301 SF_SDisable" to ON for all the axes, and then turn the power OFF and ON. This prevents occurrence of this alarm.

V04	NC-DRV safety comm. Disabled	0006	Optical channel No.

Details

The optical channel connected to an axis for which the parameter "#51101 SF_Disable" or "#51301 SF_SDisable" is set to OFF is configured with any drive unit other than MDS-E Series. (MDS-D Series drive unit is connected to the said channel.)
The screen displays the No. of optical communication channel of this error.

Remedy

- Do not connect any drive unit other than MDS-E Series to the optical channel of the axis for which the parameter "#51101 SF_Disable" or "#51301 SF_SDisable" is set to OFF.
- If an MDS-E Series drive unit is not ready, set the parameters "#51101 SF_Disable" / "#51301 SF_SDisable" to ON for all the axes of the said channel, and then turn OFF and ON the power. This prevents occurrence of this alarm.

V04	EMG stop signal device illegal	0007	Emergency stop device index No.

Details

The channel No. or station No. of the emergency stop signal device (set by parameters) does not coincide with any contact point (channel/station No. specified by the safety I/O assignment parameters RIO CH No and RIO Station No.) of the safety I/O unit. The screen displays the index No. of the incorrectly set emergency stop signal device.
0001: EMG_Dev1_ch to EMG_Dev1_bit
0002: EMG_Dev2_ch to EMG_Dev2_bit

Remedy

- Change the channel, station or bit No. of emergency stop signal device to be one of the contact points of the safety I/O unit. And then turn OFF and ON the power.
- When you change the setting of emergency stop signal device channel No. (EMG_Dev1_ch / EMG_Dev2_ch) to 0, and turn OFF and ON the power, the designation of emergency stop signal device is disabled, so this alarm is cleared.

V04	Safe IO assign para setting er	0009	Channel No.

Details

Safety I/O device assignment parameter is incorrect.
- The safety I/O device assignment parameter of the connected safety I/O unit is not set.
- The safety I/O device assignment parameter is set for any disconnected safety I/O unit.
- The set channel No. or station No. is overlapped.

Remedy

- Make sure which safety I/O unit is connected, set the safety I/O device assignment parameters, and then turn OFF and ON the power.

V04	Safety I/O param inconsistent	0011	

Details

There is a discrepancy between the PLC side parameter (I/O allocation setting) and CNC side parameter (safety I/O allocation).
- The setting of "Top XY" on the PLC side is different from "DI(DO) dev No." on the CNC side.
- The number of registered safety signal units is different between PLC and CNC sides.

Remedy

Correct the parameters to be consistent between PLC and CNC. After that turn OFF and ON the CNC power.

V05	SLS speed error	0001	Axis name

Details

During SLS observation, the command/FB speed has exceeded the safely-limited speed(*) and has not dropped below the speed limit within the SLS detection delay time (set by parameter).
The screen displays the name of axis of this error.
(*)Safely-limited speed = SLS speed tolerance x SLS speed override / 100

Remedy

- This error can be cancelled by the safety reset signal while motor speed is under SLS limit.
- If the SLS speed tolerance or SLS speed override (set by parameter) is lower than the assumption, change the parameter setting and turn OFF and ON the power.
- If the SLS detection delay time (set by parameter) is shorter than the assumption, change the parameter setting.
- Check the safety ladder to make sure that SLS speed tolerance and SLS speed override are changed in a timely manner.

V05	SLS deceleration error	0002	Axis name

Details

The command/FB speed has failed to decelerate to the safely-limited speed(*) or lower within a period of SLS deceleration observation time (set by parameter) after start of SLS observation.
The screen displays the name of axis of this error.
(*)Safely-limited speed = SLS speed tolerance x SLS speed override / 100

Remedy

- This error can be cancelled by the safety reset signal while motor speed is under SLS limit.
- If the SLS speed tolerance or SLS speed override (set by parameter) is lower than the assumption, change the parameter setting and turn OFF and ON the power.
- If the SLS deceleration observation time (set by parameter) is shorter than the assumption, change the parameter setting.

V05	SLP position error	0003	Axis name

Details

The command position/FB position has gone out of the SLP position tolerance range (set by parameter) during the SLP observation, and failed to return to the tolerance range within the SLP detection delay time (set by parameter).
The screen displays the name of axis of this error.

Remedy

- This error can be cancelled by the safety reset signal while the axis is in the SLP position range.
- If the axis is out of the SLP position range, deactivate SLP observation, cancel this error using the safety reset signal, and then move the axis to a safe position in a manual mode.
- If the safely-limited position range (specified by the SLP position tolerance parameters) is smaller than the assumption, change the parameter settings and turn OFF and ON the power.
- If the SLP detection delay time (set by parameter) is shorter than the assumption, change the parameter setting.
- Check the safety ladder to make sure that SLP position tolerance is changed in a timely manner.

V05 SOS speed error 0004 Axis name

Details

The command/FB speed, which had exceeded the SOS stop speed (set by parameter) during SOS, has failed to drop to the SOS stop speed or lower within the SOS_V detection delay time (set by parameter).
The screen displays the name of axis of this error.
*If the conditions of two or more SOS-related alarms are met at a time, the notification priority order is as follows: SOS position deviation error > SOS travel distance error > SOS speed error.

Remedy

- This error can be cancelled by the safety reset signal while In SOS stop is ON.
- If In SOS stop is OFF, deactivate SOS, cancel this error using the safety reset signal, and then move the axis to a safe position in a manual mode.
- If the parameter of SOS stop speed is lower than the assumption, change the setting and turn OFF and ON the power.
- If the SOS_V detection delay time (set by parameter) is shorter than the assumption, change the parameter setting.

V05 SOS position deviation error 0005 Axis name

Details

The position deviation (difference between the command and FB positions), which had exceeded the SOS position deviation tolerance (set by parameter) during SOS, has failed to reduce to the SOS position deviation tolerance or smaller within the SOS_PD detection delay time (set by parameter).
The screen displays the name of axis of this error.
*If the conditions of two or more SOS-related alarms are met at a time, the notification priority order is as follows: SOS position deviation error > SOS travel distance error > SOS speed error.

Remedy

- Refer to the corrective actions of "SOS speed error" for how to cancel this error.
- If the SOS position deviation tolerance (set by parameter) is smaller than the assumption, change the setting and turn OFF and ON the power.
- If the SOS_PD detection delay time (set by parameter) is shorter than the assumption, change the parameter setting.

V05 SOS travel distance error 0006 Axis name

Details

The command/FB travel distance, which had exceeded the SOS travel distance tolerance (+/-) (set by parameter) during SOS, has failed to reduce to the SOS travel distance tolerance (+/-) or smaller within the SOS_P detection delay time (set by parameter).
The screen displays the name of axis of this error.
*If the conditions of two or more SOS-related alarms are met at a time, the notification priority order is as follows: SOS position deviation error > SOS travel distance error > SOS speed error.

Remedy

- Refer to the corrective actions of "SOS speed error" for how to cancel this error.
- If the SOS travel distance tolerance (+/-) (set by parameter) is smaller than the assumption, change the setting and turn OFF and ON the power.
- If the SOS_P detection delay time (set by parameter) is shorter than the assumption, change the parameter setting.

V05 SS1 deceleration error 0007 Axis name

Details

The SS1 deceleration observation time (set by parameter) has elapsed with the command/FB speed exceeding the SOS stop speed (set by parameter) since the start of SS1.
The screen displays the name of axis of this error.

Remedy

- This error can be cancelled by the safety reset signal while In SS1 stop is ON.
- If the SS1 deceleration observation time (set by parameter) is shorter than the assumption, change the parameter setting.

V05 SS2 deceleration error 0008 Axis name

Details

The command/FB speed has been exceeding the SOS stop speed (set by parameter) for a period of SS2 deceleration observation time (set by parameter) since the start of SS2.
The screen displays the name of axis of this error.

Remedy

- Deactivate SS2, cancel this error using the safety reset signal, and then move the axis to a safe position in a manual mode.
- If the SS2 deceleration observation time (set by parameter) is shorter than the assumption, change the parameter setting.

V06 Safety external EMG stop is ON 0001

Details

Emergency stop signal is OFF (open status), although Safety external emergency stop is enabled.

Remedy

- Ensure the safety of the machine, and then turn the emergency stop signal ON (close status).

V07 DRV safe circuit error Error No. Axis name

Details

The drive unit's internal safety circuit has caused abnormal operation.
The error number corresponding to the contents of abnormal operation appears.

Remedy

- Drive unit may be damaged. Replace the drive unit.

13.2 Smart Safety Observation Warning (V50/V51/V52/V53/V54)

V50 SSM hysteresis setting error 0001 Axis name

Details

The SSM hysteresis width (set by parameter) is greater than the SSM speed (set by parameter).
The screen displays the name of axis of this error.

Remedy

- Change the SSM hysteresis width parameter to be a smaller value than the SSM speed.

V50 Safe absol. posn unestablished 0002 Axis name

Details

- After enabling SLP/SCA (Parameter SLP_Enable/SCA_Enable is 1), the Safety absolute position has never been established.
- In SLP/SCA encoder diagnosis during power OFF, [saved position at power shut OFF] and [restored position at power ON] are inconsistent.

While this alarm is ON, SLP/SCA will not operate. Displays the name of axis of this error.

Remedy

- This alarm can be cancelled by turning ON the Safety absolute position check signal. Before turning ON the Safety absolute position check signal, however, move the axis by manual operation to the position where the coordinate value is clear (the position that is marked or the reference position etc.) (When in the relative position detection system, it requires to operate reference position return to establish the reference position.) then compare the actual position and the displayed position to confirm the both position is corresponding.

V51 SBT start disabled 0001 Factor No.

Details

When turning ON the SBT start signal (SBTSTEXm / SBTSTMOm), the test start condition are not met.
Displays the factor why the brake test start is impossible
* When there are multiple factors, the smaller item is shown.

0001: part systems in automatic operation
0002: not in in-position
0003: in servo OFF state.
0004: in current limit
0005: the secondary axis in the synchronous control
0006: in superimposition control
0007: in arbitrary axis exchange control
0008: in mixed control
0009: Parameter for SBT error
000A: reference position establishment incomplete
000B: applies exclusive control of SBT
000C: the secondary axis SBT disabled
000D: the secondary axis SBT start disabled
000E: the secondary axis in single method

Remedy

- Check the start-enabled condition of the brake test. Eliminate the cause of the alarm, then enable the SBT start signal to start the brake test.

V51 SBT warning 1 0002 Axis name

Details

The axis movement amount exceeded the tolerable value in external brake test pattern 1.
Displays the name of axis with the error.

Remedy

- Move the axis to safe position by manual operation. Take corrective action to the brake after the power OFF. Then turn power ON and carry out the brake test again. This alarm will be cancelled when the test completes normally.
- This alarm can be cancelled with the safety reset signal. The external brake SBT incomplete signal (SBTNFEXm), however, remains ON.

V51 SBT warning 4 0005 Axis name

Details

The axis movement amount exceeded the tolerable value in the test pattern 1 of motor brake test.
Displays the name of axis with the error.

Remedy

- Move the axis to safe position by manual operation. Take corrective action to the brake after the power OFF. Then turn power ON and carry out the brake test again. This alarm will be cancelled when the test completes normally.
- This alarm can be cancelled with the safety reset signal. The external brake SBT incomplete signal (SBTNFEXm), however, remains ON.
  When this alarm is cancelled with the safety reset signal, however, the motor brake SBT incomplete signal (SBTNFMOm) remains ON.

V51 SBT warning 5 0006 Axis name

Details

The axis movement amount exceeded the tolerable value in the test pattern 2 of motor brake test.
Displays the name of axis with the error.

Remedy

- Move the axis to safe position by manual operation. Take corrective action to the brake after the power OFF. Then turn power ON and carry out the brake test again. This alarm will be cancelled when the test completes normally.
- This alarm can be cancelled with the safety reset signal. The external brake SBT incomplete signal (SBTNFEXm), however, remains ON.
  When this alarm is cancelled with the safety reset signal, however, the motor brake SBT incomplete signal (SBTNFMOm) remains ON.

V51 SBT warning 6 0007 Axis name

Details

The axis movement amount exceeded the tolerable value in the test pattern 3 of motor brake test.
Displays the name of axis with the error.

Remedy

- Move the axis to safe position by manual operation. Take corrective action to the brake after the power OFF. Then turn power ON and carry out the brake test again. This alarm will be cancelled when the test completes normally.
- This alarm can be cancelled with the safety reset signal. The external brake SBT incomplete signal (SBTNFEXm), however, remains ON.
  When this alarm is cancelled with the safety reset signal, however, the motor brake SBT incomplete signal (SBTNFMOm) remains ON.

V52 PLC safety stop is active 0001 Axis name

Details

A PLC input signal "Safe stop 1 request" or "Safe torque off request" is OFF (normal close).
The screen displays the name of axis for which the said signal is OFF.

Remedy

- Ensure the safety of the machine, and then turn ON either Safe stop 1 request signal or Safe torque off request signal.

V53 Warning on 24Hr continuous ON 0001 Unit info

Details

Output signal of the safety I/O unit has been kept ON for 24 hours or longer.
The screen displays the unit No., RIO system and signal BIT that are subject to the warning.
[M8]
bit28-31: None
bit24-27: Unit No.
bit18-23: None
bit16-17: Detected system
bit0-15: Signal BIT
[C80]
bit0-31: Signal BIT

Remedy

- Turn OFF the output signal concerned through the user safety sequence, or use the output OFF check function to make sure that the output signal turns OFF.

V54 Simple test mode is active 0001

Details

- Smart safety observation target axis (the parameters "#51101 SF_Disable" = 0 / "#51301 SF_S-Disable" = 0) is defined as a hypothetical axis (the parameter "#51015 safe_drv_test" = 1). In this case some alarms fail to occur, thus avoid this setting while a drive unit is being connected.
- NC system is set to a simulation mode (the parameter "#1168 test" = 1). During this mode some alarms fail to occur, thus do not use this mode while a safety I/O unit is connected.

Remedy

- Connect MDS-E Series drive to all the axes subject to safety observation, set the parameter ("#51015 safe_drv_test" = 0) and then turn OFF and ON the power.
- Connect a safety I/O unit, set the parameter ("#1168 test" = 0) and then turn OFF and ON the power.

14 Multi CPU Errors (A) [C80]

A01	**Power shutoff**	1000

Details

- A momentary power failure has occurred.
- The power supply has been shut off.

Remedy

- Check the power supply status.

A01	**ROM write count error**	1080

Details

- The number of writes to the flash ROM (data memory, program memory, and system memory*1) exceeded 100000 times.

Remedy

- Replace the CPU module.

A01	**Default gateway/GW IP address error**	1124

Details

- The default gateway is not set correctly.
- The gateway IP address is not set correctly.
- The default gateway/gateway IP address (network address after the subnet mask) is different from that of the IP address of the own node.

Remedy

- Correct the default gateway IP address.
- Set the same network address as that of the IP address.

A01	**Own node port number error**	1128

Details

- The port number is incorrect.

Remedy

- Correct the port number.

A01	**Open specification port num. error**	1129

Details

- The port number setting value of the external device is incorrect.

Remedy

- Correct the port number of the external device.

A01	**Specified IP address error**	112D

Details

- The IP address setting value of the external device for the open processing is incorrect.

Remedy

- Correct the IP addresses.
- Check if the class of the IP address is set to A/B/C.

A01	**Connection establishment failed**	112E

Details

- A connection could not be established in the open processing.

Remedy

- Check the operation of the external device.
- Check if the open processing has been performed in the external device.
- Correct the port number of the module, IP address/port number of the external device, and opening method.
- When the firewall is set in the external device, check if the access is permitted.
- Check if the Ethernet cable is disconnected.

A01	**Socket comm. response send error**	1133

Details

- The response send failed during socket communications.

Remedy

- Check the operation of the external device or switching hub.
- Since there may be congestion of packets on the line, send data after a certain period of time.
- Check if the connection cable is disconnected.
- Check that there is no connection failure with the switching hub.

A01	**TCP connection timeout**	1134

Details

- A TCP ULP timeout error has occurred in the TCP/IP communication. (The external device does not send an ACK response.)

Remedy

- Check the operation of the external device.
- Correct the TCP ULP timeout value.
- Since there may be congestion of packets on the line, send data after a certain period of time.
- Check if the connection cable is disconnected.

A01	**IP address error**	1152

Details

- The IP address is not set correctly.

Remedy

- Correct the IP addresses.

A01	**Connection number acquisition error**	1155

Details

- The specified connection was already closed in TCP/IP communications.
- Open processing is not performed.

Remedy

- Perform the open processing for the specified connection.
- Check if the open processing has been performed in the external device.

A01 Receive buffer securement error 1157

Details

- The specified connection was already closed in UDP/IP communications.
- Open processing is not performed.

Remedy

- Perform the open processing for the specified connection.
- Check if the open processing has been performed in the external device.

A01 UDP/IP send failed 1165

Details

- Data was not sent correctly with UDP/IP.

Remedy

- Check the settings for connection with the external device.
- Check the operation of the external device or switching hub.
- Since there may be congestion of packets on the line, send data after a certain period of time.
- Check if the connection cable is disconnected.
- Check that there is no connection failure with the switching hub.
- Execute the PING test, and if the test was completed with an error, take the corrective action.

A01 TCP/IP send failed 1166

Details

- Data was not sent correctly with TCP/IP.

Remedy

- Check the settings for connection with the external device.
- Check the operation of the external device or switching hub.
- Since there may be congestion of packets on the line, send data after a certain period of time.
- Check if the connection cable is disconnected.
- Check that there is no connection failure with the switching hub.
- Execute the PING test, and if the test was completed with an error, take the corrective action.

A01 Unsend data send error 1167

Details

- Unsent data found, but could not be sent.

Remedy

- Check the settings for connection with the external device.
- Check the operation of the external device or switching hub.
- Since there may be congestion of packets on the line, send data after a certain period of time.
- Check if the connection cable is disconnected.
- Check that there is no connection failure with the switching hub.
- Execute the PING test, and if the test was completed with an error, take the corrective action.

A01 Module moderate error 1200

Details

- A moderate error has been notified from the intelligent function module connected.

Remedy

- Check the detailed information (system configuration information) of the error by executing module diagnostics using the engineering tool, identify the error module, and eliminate the error cause.

A01 Module moderate error 1210

Details

- An inter-module synchronous signal error has been notified from the intelligent function module connected.

Remedy

- Check the detailed information (system configuration information) of the error by executing module diagnostics using the engineering tool, identify the error module, and eliminate the error cause.

A01 Another CPU module moderate error 1220

Details

- A moderate error has been notified from another CPU module.

Remedy

- Check the detailed information (system configuration information) of the error by executing module diagnostics using the engineering tool, identify the error module, and eliminate the error cause.
- Check the mounting status and reset status of other CPU modules.

A01 Multiple CPU synchronization processing error 1260

Details

- The execution interval of a synchronous interrupt program has exceeded the set value.
- The run of a multiple CPU synchronous interrupt program (I45) has not finished within the multiple CPU fixed scan communication period.

Remedy

- Check the detailed information (time information) in the module diagnostics to verify its value (time), and take the following actions:
  (1) Review the processing details on the multiple CPU synchronous interrupt program so that its processing is to be completed within the period specified in the fixed scan interval setting.
  (2) Set the period specified in the fixed scan interval setting to an appropriate value.

A01 Multiple CPU synchronization processing error 1262

Details

- The program run section of a synchronous interrupt program has been exceeded.
- The multiple CPU synchronous interrupt program (I45) has not been completed within the program run section.

Remedy

- Check the detailed information (time information) in the module diagnostics to verify its value (time), and take the following actions:
  (1) Review the processing details on the multiple CPU synchronous interrupt program so that its processing is to be completed within the period specified in the fixed scan interval setting.
  (2) Set the period specified in the fixed scan interval setting to an appropriate value.

A01 Receive queue full 1830

Details

- Number of reception requests of transient transmission exceeded upper limit of simultaneously processable requests.

Remedy

- Lower the transient transmission usage frequency, and then perform again.

A01 Receive processing error 1831

Details

- Transient reception failed.

Remedy

- Lower the transient transmission usage frequency, and then perform again.

A01 Transient data error 1832

Details

- Too many processings of transient transmission and cannot perform transient transmission.

Remedy

- Correct the transient transmission execution count.

A01 Constant scan time error 1900

Details

- The scan time exceeded the constant scan time set in the CPU parameters.

Remedy

- Check and correct the constant scan time setting.

A01 Module configuration error 2000

Details

- The module type set in the system parameters ("I/O Assignment Setting") differs from that of the module actually mounted.

Remedy

- Re-set the module type in the system parameters in accordance with the CPU module or intelligent function module actually mounted.

A01 Module configuration error 2001

Details

- The I/O numbers set in the system parameters ("I/O Assignment Setting") are overlapping between modules.

Remedy

- Re-set the I/O numbers in the system parameters in accordance with the intelligent function module or I/O module actually mounted.

A01 Module configuration error 2002

Details

- The number of points assigned to the intelligent function module in the system parameters ("I/O Assignment Setting") is smaller than that of the module actually mounted.

Remedy

- Re-set the number of points in the system parameters in accordance with the intelligent function module actually mounted.

A01 Module configuration error 2004

Details

- Nine or more CC-Link IE Controller Network modules* are mounted in the entire system.
- The CC-Link IE built-in Ethernet interface module is included if the module is used as a CC-Link IE Controller Network module.

Remedy

- Reduce the number of CC-Link IE Controller Network modules* to eight or less in the entire system.
- The CC-Link IE built-in Ethernet interface module is included if the module is used as a CC-Link IE Controller Network module.

A01 Module configuration error 2005

Details

- Two or more interrupt modules (QI60) with no interrupt pointer setting are mounted.
- The interrupt pointer numbers are overlapping in the interrupt module (QI60) with no interrupt pointer setting and a module with an nterrupt pointer setting.

Remedy

- Mount only one QI60 in the entire system.
- Configure the interrupt pointer setting for the QI60.
- Correct the interrupt pointer setting.

A01 Module configuration error 2006

Details

- A module is mounted on the 65th slot or later.

Remedy

- Remove the module mounted on the 65th slot or later.

A01 Module configuration error 2007

Details

- A module is mounted on the slot whose number is later than that specified in the system parameters ("I/O Assignment Setting").

Remedy

- Remove the module mounted on the slot whose number is later than that specified in the system parameters.

A01 Module configuration error 2008

Details

- A module is mounted over or across the maximum number of I/O points (4096).

Remedy

- Remove the module mounted over or across the maximum number of I/O points (4096).
- Replace the module mounted on the last slot to the one that does not exceed the maximum number of I/O points (4096).

A01 Module configuration error 2009

Details

- There is no response from the I/O module or intelligent function module accessed.

Remedy

- Check and correct the I/O assignment setting in the system parameters.
- The possible cause is a hardware failure of the I/O module or intelligent function module accessed. Please consult your local Mitsubishi representative.

A01 Module configuration error 2020

Details

- There is a mounted module that is not supported, or there is a mounted module that is not supported by the network type (module model name) set in system parameters ("I/O Assignment Setting").

Remedy

- Remove the unsupported module if any.
- Check whether modules are supported by the network type (module model name) set in the system parameters.
- If all the modules are supported, the possible cause is a hardware failure of the CPU module, base unit, I/O module, or intelligent function module. Please consult your local Mitsubishi representative.

A01 CPU module configuration error 2021

Details

- In the multiple CPU system, the control CPU of the Q series intelligent function module incompatible with the multiple CPU system is set to other than CPU No.1.

Remedy

- Replace the Q series intelligent function module with the one (function version B) compatible with the multiple CPU system.
- Set the control CPU of the Q series intelligent function module incompatible with the multiple CPU system to CPU No.1.

A01 CPU module configuration error 2040

Details

- The number of CPU modules set in the system parameters ("I/O Assignment Setting") differs from the number of CPU modules actually mounted.
- The CPU module is mounted on the slot different from the one specified in the system parameters (I/O assignment setting).

Remedy

- Correctly set the number of CPU modules (including the empty setting) in the system parameters in accordance with the number of CPU modules actually mounted.
- Correctly set the system parameters so that the setting and actual CPU module mounting status will be the same.

A01 CPU module configuration error 2041

Details

- The CPU module is not mounted on the slot that is set for the CPU module in the system parameters ("I/O Assignment Setting").
- The CPU module is mounted on the slot that is set for empty in the system parameters ("I/O Assignment Setting").
- An I/O module or intelligent function module is mounted between the CPU modules.

Remedy

- Correctly set the number of CPU modules (including the empty setting) in the system parameters in accordance with the number of CPU modules actually mounted.
- Remove the I/O module or intelligent function module mounted between the CPU modules.

A01 CPU module configuration error 2043

Details

- The CPU module is mounted on the inapplicable slot.

Remedy

- Mount the CPU module on the applicable slot (CPU slot or I/O slot 0 to 6).
- Remove the CPU module from the inapplicable slot.

A01 CPU module configuration error 2044

Details

- The host CPU No. set in the system parameters ("I/O Assignment Setting") differs from the one determined by the mounting position of the CPU module.

Remedy

- Re-set the host CPU No. in the system parameters in accordance with the mounting position of the CPU module.

A01 CPU module configuration error 2050

Details

- An unsupported CPU module is mounted.

Remedy

- Remove the unsupported CPU module. If all the CPU modules are supported, the possible cause is a hardware failure of the CPU module or base unit. Please consult your local Mitsubishi representative.

A01 Base unit A configuration error 2060

Details

- Eight or more extension base units are connected.

Remedy

- Reduce the number of extension base units to seven or less.

A01 Base unit A configuration error 2061

Details

- Any of the following base units is connected: QA1S3 B, QA1S5 B/QA1S6 B, QA6 B, QA6ADP+A5 B/A6 B, or QA1S6ADP+A1S5 B/A1S6 B.

Remedy

- Remove the inapplicable base unit: QA1S3 B,QA1S5 B/QA1S6 B, QA6 B, QA6ADP+A5 B/A6 B, and QA1S6ADP+A1S5 B/A1S6 B.

A01 Base unit A configuration error 2063

Details

- Extension base unit levels are overlapping.

Remedy

- Check and correct the level setting of the extension base units.

A01 Base unit A configuration error 2070

Details

- An unsupported base unit is connected.
- A GOT is bus-connected to the Q series extension base unit.

Remedy

- Disconnect the unsupported base unit. If all the base units are supported, the possible cause is a hardware failure of the CPU module or base unit. Please consult your local Mitsubishi representative.
- Disconnect the GOT bus-connected to the Q series extension base unit.

A01 Inter-module synch configure error 2080

Details

- An inter-module synchronization signal error has been detected.

Remedy

- The possible cause is a hardware failure of the CPU module, base unit, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 Module unrecognized 20E0

Details

- A module that the CPU module cannot recognize is mounted.
- The module cannot be recognized because the control CPU setting of the system parameter setting differs from that of other CPU modules in the multiple CPU system.

Remedy

- Mount only applicable modules.
- Correct the system parameter settings for the CPU No.2 and later. The settings need to be the same between all the CPU modules.
- The possible cause is a hardware failure of the I/O module or intelligent function module accessed. Please consult your local Mitsubishi representative.

A01 IP address duplication error 2160

Details

- Overlapping IP addresses have been detected.

Remedy

- Check and correct the IP addresses.

A01 Invalid file 2180

Details

- An invalid file has been detected.

Remedy

- Check the detailed information (drive/file information) of the error by executing module diagnostics using the engineering tool, select the correct file name, and write the specified file to the CPU module. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 File specification error 21A1

Details

- The file specified in parameter cannot be created.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the name and size of the file corresponding to the displayed number.
- Check the detailed information (drive/file information) of the error by executing module diagnostics using the engineering tool, and take either of the following action.
  (1) Format the corresponding drive.
  (2) Delete unnecessary files on the corresponding drive to increase free space.
  (3) Unlock the corresponding drive if it is locked.

A01 File specification error 21A2

Details

- The CPU module model set to the file using the engineering tool differs from that of the CPU module actually mounted.

Remedy

- Check the detailed information (drive/file information) of the error by executing module diagnostics using the engineering tool, and correct the CPU module model set to the file in accordance with that of the CPU module actually mounted.

A01 Parameter A error 2200

Details

- The system parameter file and CPU parameter file do not exist.
- The memory card parameter file or module extension parameter file stored in the memory card cannot be accessed because the memory card is disable by SM606 (SD memory card forced disable instruction).

Remedy

- Write the system parameter file and CPU parameter file to the CPU module.
- Turn off SM606. (Cancel the disabled state.)

A01 Parameter A error 2220

Details

- The parameter setting is corrupted.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and write the displayed parameter setting to the CPU module. If the same error code is displayed again, the possible cause is a hardware failure of the data memory in the CPU module, the memory card, or the module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 Parameter A error 2221

Details

- The set value is out of range.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number. If the same error code is displayed again, the possible cause is a hardware failure of the data memory in the CPU module, the memory card, or the module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 Parameter A error 2222

Details

- Use of the function that is not supported by the module is enabled in parameter.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number. If the same error code is displayed again, the possible cause is a hardware failure of the data memory in the CPU module, the memory card, or the module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 Parameter A error 2224

Details

- A memory area cannot be ensured.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, display the error-detected area by clicking the [Error Jump] button, and increase the capacity of the area. (If the capacity of the area cannot be increased, decrease the capacity of other areas.)
- Reduce the number of labels or local devices used.

A01 Parameter A error 2225

Details

- The CPU module model set to the project using the engineering tool differs from that of the CPU module actually mounted.
- The operation set in the memory card parameters cannot be performed. (The boot function cannot be executed.)

Remedy

- Correct the CPU module model set to the project in accordance with the CPU module actually mounted.
- Delete the memory card parameter settings.
- Remove the memory card so that the operation set in the memory card parameters will not be performed. (Do not execute the boot operation.)

A01 Parameter error (module) 2240

Details

- In the multiple CPU system, the I/O module or intelligent function module controlled by another CPU module is specified in the module parameters.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number. If the same error code is displayed again, the possible cause is a hardware failure of the data memory in the CPU module or the module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 Parameter error (module) 2241

Details

- The I/O numbers set in the system parameters differ from those of the module actually mounted.
- The target module is not mounted on the slot where the system parameters and module parameters are set.
- The module type set in parameter differs from that of the module actually mounted.

Remedy

- Check if the system configuration displayed on the system monitor window match the actual system configuration.
- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number. If the same error code is displayed again, the possible cause is a hardware failure of the data memory in the CPU module or the module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 Parameter error (module) 2242

Details

- The intelligent function module has detected a module parameter error.

Remedy

- Check the detailed information (system configuration information) of the error by executing module diagnostics using the engineering tool, and check the module corresponding to the displayed I/O number. If the same error code is displayed again, the possible cause is a hardware failure of the data memory in the CPU module or the intelligent function module connected. Please consult your local Mitsubishi representative.

A01 Parameter error (network) 2260

Details

- Network numbers are overlapping.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number. If the same error code is displayed again, the possible cause is a hardware failure of the data memory in the CPU module or the intelligent function module connected. Please consult your local Mitsubishi representative.

A01 Parameter error (network) 2261

Details

- Different network types (CC IE Control extended mode/normal mode) are set between the control station and the normal station.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number. If the same error code is displayed again, the possible cause is a hardware failure of the data memory in the CPU module or the intelligent function module connected. Please consult your local Mitsubishi representative.

A01 Parameter error (network) 2262

Details

- The station type set in the module parameters differs that of the module actually mounted.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number. If the same error code is displayed again, the possible cause is a hardware failure of the data memory in the CPU module or the intelligent function module connected. Please consult your local Mitsubishi representative.

A01 Parameter error (network) 2263

Details

- Even though the CC-Link IE module or MELSECNET/H network module is mounted, a different CC-Link IE module or MELSECNET/H network module is set in the system parameters ("I/O Assignment Setting"), or CC-Link IE module or MELSECNET/H network module parameters have not been set.

Remedy

- Set the system parameters and module parameters. If the same error code is displayed again, the possible cause is a hardware failure of the data memory in the CPU module or the intelligent function module connected. Please consult your local Mitsubishi representative.

A01 Parameter error (refresh) 2280

Details

- The refresh setting is not set correctly. (Data were refreshed exceeding the file register capacity.)
- The refresh settings (number of points) are different from those of other numbered CPU modules.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number so that the data are refreshed within the specified device range. (Take any of the following actions: increase the number of file register points, create a file register file having a capacity for all of the target data to be refreshed, or reduce the refresh device range.)
- Rewrite the refresh settings (number of points) in the CPU parameters for all the CPU modules. (Use the same number of points in the refresh settings for all the CPU modules.)

A01 Parameter error (refresh) 2281

Details

- A device that cannot be used as a refresh device is specified.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number.

A01 Parameter error (refresh) 2282

Details

- The number of specified refresh points is invalid.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number.

A01 Parameter error (refresh) 2283

Details

- The total number of refresh points exceeded the maximum limit.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the parameter setting corresponding to the displayed number.

A01 Parameter verification error 22E0

Details

- In the multiple CPU system, the system parameter settings of the host CPU module differ from those of other CPU modules.
- In the multiple CPU system, the system parameter settings are overwritten only to the host CPU module, and the settings differ from those of other CPU modules.

Remedy

- Check the detailed information (parameter information) of the error by executing module diagnostics using the engineering tool, and correct the system parameter settings corresponding to the displayed number for the CPU No.2 and later. The settings need to be the same between all the CPU modules. (The module synchronization setting and fixed scan communication setting need to be the same between the CPU modules that use these functions.)
- When the system parameter settings are changed, update the settings of all the CPU modules connected. (The system parameter settings must be same in all the CPU modules.)

A01 Security key authentication error 2300

Details

- The security key set to the program does not match the one registered to the CPU module (or extended SRAM cassette).

Remedy

- Check and correct the security key setting.

A01 Security key authentication error 2301

Details

- The security key is set to the program, but it is not registered to the CPU module (or extended SRAM cassette).

Remedy

- Check and correct the security key setting.

A01 Security key authentication error 2302

Details

- The security key set to the file is corrupted and does not match the one registered to the CPU module.
- The security key registered to the CPU module is corrupted and does not match the one set to the file.

Remedy

- Write the file to the CPU module again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 Security key authentication error 2303

Details

- The security key is registered to the CPU module and extended SRAM cassette.

Remedy

- Check and correct the security key setting.

A01 Remote A password setting error 2320

Details

- The start I/O number of the remote password target module is set to other than 0H to 0FF0H.
- There is a problem on the slot specified by the start I/O number of the remote password setting.
  (1) No module is mounted.
  (2) The mounted intelligent function module does not support the remote password setting.

Remedy

- Set the start I/O number of the remote password target module within the range 0H to 0FF0H.
- On the specified slot, mount an intelligent function module that supports the remote password setting.

A01 Remote A password setting error 2321

Details

- In the multiple CPU system, the module controlled by another CPU module is specified by the start I/O number of the remote password setting.

Remedy

- Check and correct the remote password setting.

A01 Module verification error 2400

Details

- The module information at power-on differs from the information of modules actually mounted.
- The I/O module or intelligent function module is not mounted properly or was removed during operation.

Remedy

- Check the detailed information (system configuration information) of the error by executing module diagnostics using the engineering tool, and check the module corresponding to the displayed number.

A01 Module verification error 2401

Details

- A CPU module, I/O module, or intelligent function module was mounted on the base unit during operation.

Remedy

- Check the detailed information (system configuration information) of the error by executing module diagnostics using the engineering tool, and check the module corresponding to the displayed number.
- Do not mount a CPU module, I/O module, nor intelligent function module during operation.

A01 Fuse blown error 2420

Details

- The output module with a blown fuse has been detected.

Remedy

- Check the FUSE LED of each output module, and replace the one with the FUSE LED on.
- Check the detailed information (system configuration information) of the error by executing module diagnostics using the engineering tool, and replace the module corresponding to the displayed number.

A01 Module major error 2440

Details

- In the multiple CPU system, the control CPU setting in the system parameters is different from that of other numbered CPU modules.
- An error has been detected in the I/O module or intelligent function module during the initial processing.

Remedy

- Correct the system parameter settings for the CPU No.2 and later. The settings need to be the same between all the CPU modules.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please consult your local Mitsubishi representative.

A01 Module major error 2442

Details

- An error has been detected in the I/O module or intelligent function module during the END processing.

Remedy

- The possible cause is a hardware failure of the error module. Please consult your local Mitsubishi representative.

A01 Module major error 2443

Details

- An error has been detected in the I/O module or intelligent function module.

Remedy

- The possible cause is a hardware failure of the error module. Please consult your local Mitsubishi representative.

A01 Module major error 2450

Details

- A major error has been notified from the intelligent function module connected.
- The I/O module or intelligent function module is not mounted properly or was removed during operation.

Remedy

- Check the connection status of the extension cable.
- Check the detailed information (system configuration information) of the error by executing module diagnostics using the engineering tool, and check the module corresponding to the displayed number.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please consult your local Mitsubishi representative.

A01 Another CPU module major error 2460

Details

- An error has been detected in another CPU module during the initial processing.

Remedy

- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the host CPU module or another CPU module where the error has been detected. Please consult your local Mitsubishi representative.

A01 Another CPU module major error 2463

Details

- An error has been detected in another CPU module.

Remedy

- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the host CPU module or another CPU module where the error has been detected. Please consult your local Mitsubishi representative.

A01 Another CPU module major error 2470

Details

- A major error has been notified from another CPU module.

Remedy

- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the host CPU module or another CPU module where the error has been detected. Please consult your local Mitsubishi representative.

A01 Multiple CPU error 2480

Details

- In the multiple CPU system, an error has been detected in the CPU module where "Stop" is set in the operation mode setting parameter.
- Any CPU module other than CPU No.1 is mounted in the inapplicable slot. (An error occurs in the CPU module mounted in the inapplicable slot.)

Remedy

- Check the detailed information (system configuration information) of the error by executing module diagnostics using the engineering tool, identify the error CPU module, and eliminate the error cause.
- Remove the CPU module from the inapplicable slot.

A01 Multiple CPU error 2481

Details

- In the multiple CPU system, any CPU module other than CPU No.1 was disconnected from the base unit during operation. Or, any CPU module other than CPU No.1 was reset.

Remedy

- Check the mounting status and reset status of the CPU modules other than CPU No.1.

A01 System bus error 24C0

Details

- An error was detected on the system bus.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module, base unit, extension cable, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 System bus error 24C1

Details

- An error was detected on the system bus.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module, base unit, extension cable, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 System bus error 24C2

Details

- An error was detected on the system bus.

Remedy

- Check the connection status of the extension cable.
- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module, base unit, extension cable, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 System bus error 24C3

Details

- An error was detected on the system bus.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module, base unit, extension cable, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 System bus error 24C4

Details

- An error was detected on the system bus.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the base unit, extension cable, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi epresentative.

A01 System bus error 24C5

Details

- An error was detected on the system bus.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the base unit, extension cable, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi epresentative.

A01 System bus error 24C6

Details

- An error was detected on the system bus.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module or extension cable. Please consult your local Mitsubishi representative.

A01 System bus error 24C8

Details

- An error was detected on the system bus.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the extension cable, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 System bus error 24D0

Details

- The extension level setting of the Q series extension base unit is overlapping with that of any other extension base units.
- An error was detected on the system bus.

Remedy

- Check and correct the level setting of the Q series extension base unit.
- Check the connection status of the extension cable.
- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module, base unit, or extension cable. Please consult your local Mitsubishi representative.

A01 System bus error 24E0

Details

- An error was detected on the system bus.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module or base unit. Please consult your local Mitsubishi representative.

A01 WDT error 2500

Details

- The scan time exceeded the execution monitoring time set in parameter.
- The initial (1st) scan time exceeded the execution monitoring time set in the CPU parameters.
- The execution time of the fixed scan interrupt program exceeded the interrupt execution interval.

Remedy

- Check the detailed information (time information) of the error by executing module diagnostics using the engineering tool, check the time setting, and take either of the following actions.
  (1) Check and correct the program so that it can be executed within the execution monitoring time set in parameter.
  (2) Change the execution monitoring time setting to an appropriate value.
- Check and correct the fixed scan interrupt program so that the processing completes within the interrupt execution interval. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 WDT error 2501

Details

- The scan time exceeded the execution monitoring time set in parameter.
- The 2nd or later scan time exceeded the execution monitoring time set in the CPU parameters.
- The execution time of the fixed scan interrupt program exceeded the interrupt execution interval.

Remedy

- Check the detailed information (time information) of the error by executing module diagnostics using the engineering tool, check the time setting, and take either of the following actions.
  (1) Check and correct the program so that it can be executed within the execution monitoring time set in parameter.
  (2) Change the execution monitoring time setting to an appropriate value.
- Check and correct the fixed scan interrupt program so that the processing completes within the interrupt execution interval. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 Invalid interrupt 2520

Details

- Even though an interrupt was requested, there is no interrupt factor.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module, base unit, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 Invalid interrupt 2521

Details

- Even though an interrupt was requested, there is no interrupt factor.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module, base unit, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 Invalid interrupt 2522

Details

- An interrupt was requested from the module with no interrupt pointer setting.

Remedy

- Check and correct the interrupt pointer setting in the module parameters.
- Take measures so that no interrupt is requested from the module with no interrupt pointer setting.
- Check and correct the interrupt setting in the buffer memory of the intelligent function module.
- Correct the BASIC program executed in the QD51.

A01 Inter-module synch signal error 2610

Details

- An execution interval error of the synchronization interrupt program has been detected.
- An inter-module synchronization error has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module, base unit, extension cable, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 Inter-module synch signal error 2611

Details

- An inter-module synchronization error has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module, base unit, extension cable, or module (I/O module or intelligent function module) connected. Please consult your local Mitsubishi representative.

A01 Multiple CPU synch signal error 2630

Details

- An execution interval error of the synchronization interrupt program has been detected.
- A multiple CPU synchronization error has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module or base unit. Please consult your local Mitsubishi representative.

A01 Multiple CPU synch signal error 2631

Details

- A multiple CPU synchronization error has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module or base unit. Please consult your local Mitsubishi representative.

A01 Boot function execution error 3001

Details

- When the boot function was executed, the file format processing failed.

Remedy

- Reset the CPU module, and execute the boot function again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 Boot function execution error 3003

Details

- When the boot function was executed, the file passwords did not match.

Remedy

- Check and correct the file password settings of the transfer source and transfer destination files.
- Delete the boot setting.

A01 Boot function execution error 3004

Details

- When the boot function was executed, the CPU built-in memory capacity was exceeded.

Remedy

- Check and correct the boot setting.
- Delete unnecessary files in the CPU built-in memory.
- Clear the CPU built-in memory by selecting "Clear" to "Operation Setting at CPU Built-in Memory Boot" in the memory card parameters, and execute the boot function.

A01 Boot function execution error 3005

Details

- When the boot function is executed, the security key registered in the CPU module (or extended SRAM cassette) does not match the one that locks the boot source program.
- When the boot function is executed, the security key is not registered in the CPU module (or extended SRAM cassette) even though the boot source program is locked with the security key.

Remedy

- Check and correct the security key setting.
- Delete the boot setting.

A01 Pointer setting error 3300

Details

- The total number of points of local and global pointers used in the program exceeded the points set in the CPU parameters (pointer device area).

Remedy

- Check the detailed information (error location information) of the error by executing module diagnostics using the engineering tool, display the error program (step) by clicking the [Error Jump] button, and correct the program.
- Check and correct the pointer device area point setting in the CPU parameters.

A01 Pointer setting error 3301

Details

- The total number of points of pointertype labels used in the program exceeded the points set in the CPU parameters (label assignment area).

Remedy

- Check the detailed information (error location information) of the error by executing module diagnostics using the engineering tool, display the error program (step) by clicking the [Error Jump] button, and correct the program.
- Check and correct the pointer-type label assignment area point setting in the CPU parameters.

A01 Pointer setting error 3302

Details

- Multiple global pointers with the same number are used in the program. (The pointer numbers are overlapping.)

Remedy

- Check the detailed information (error location information) of the error by executing module diagnostics using the engineering tool, display the error program (step) by clicking the [Error Jump] button, and correct the program.

A01 Pointer setting error 3303

Details

- Multiple local pointers with the same number are used in the program. (The pointer numbers are overlapping.)

Remedy

- Check the detailed information (error location information) of the error by executing module diagnostics using the engineering tool, display the error program (step) by clicking the [Error Jump] button, and correct the program.

A01 Interrupt pointer setting error 3320

Details

- The interrupt pointer numbers used in the files are overlapping.

Remedy

- Check the detailed information (error location information) of the error by executing module diagnostics using the engineering tool, display the error program (step) by clicking the [Error Jump] button, and correct the program.

A01 Hardware failure 3C00

Details

- A hardware failure has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 Hardware failure 3C01

Details

- A hardware failure has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 Hardware failure 3C02

Details

- A hardware failure has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 Hardware failure 3C03

Details

- A hardware failure has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 **Hardware failure** 3C0F

Details

- A hardware failure has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module or extended SRAM cassette. Please consult your local Mitsubishi representative.

A01 **Hardware failure** 3C10

Details

- A hardware failure has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 **Hardware failure** 3C12

Details

- The waveform of the voltage out of the specified range has been detected in the power supply module.
- A hardware failure has been detected in the power supply module, CPU module, base unit, or extension cable.

Remedy

- Check the waveform of the voltage applied to the power supply module.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the power supply module, CPU module, base unit, or extension cable. Please consult your local Mitsubishi representative.

A01 **Hardware failure** 3C13

Details

- A hardware failure has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 **Hardware failure** 3C14

Details

- A hardware failure has been detected.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 **Memory error** 3C20

Details

- An error has been detected in the memory.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 **Memory error** 3C21

Details

- An error has been detected in the memory.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 **Memory error** 3C22

Details

- An error has been detected in the memory.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 **Memory error** 3C2F

Details

- An error has been detected in the memory.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01 **Memory error** 3C31

Details

- An error has been detected in the memory.

Remedy

- Take measures to reduce noise.
- Format the memory. Write all files to the CPU module. Then, reset the CPU module, and run it again If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01	Memory error	3C32

Details

- An error has been detected in the memory.

Remedy

- Take measures to reduce noise.
- Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

A01	Operation circuit error	3E00

Details

- An error has been detected in the CPU module.

Remedy

- Take measures to reduce noise.
- Format the memory. Write all files to the CPU module. Then, reset the CPU module, and run it again If the same error code is displayed again, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.

II Parameters

1 User Parameters

The parameters with "(PR)" requires the CNC to be turned OFF after the settings. Turn the power OFF and ON to enable the parameter settings.

1.1 Machining Parameters

#1026 base_I Base axis I

Set the names of the basic axes that compose the plane.
Set the axis name set in "#1013 axname".
If all three items ("base_I", "base_J" and "base_K") do not need to be set, such as for 2-axis specifications, input "0", and the parameter will be blank.
Normally, when X, Y and Z are specified respectively for base_I, _J, _K, the following relation will be established:
G17: X-Y
G18: Z-X
G19: Y-Z
Specify the desired axis name to set an axis address other than above.

---Setting range---

Axis names such as X, Y or Z

#1027 base_J Base axis J

Set the names of the basic axes that compose the plane.
Set the axis name set in "#1013 axname".
If all three items ("base_I", "base_J" and "base_K") do not need to be set, such as for 2-axis specifications, input "0", and the parameter will be blank.
Normally, when X, Y and Z are specified respectively for base_I, _J, _K, the following relation will be established:
G17: X-Y
G18: Z-X
G19: Y-Z
Specify the desired axis name to set an axis address other than above.

---Setting range---

Axis names such as X, Y or Z

#1028 base_K Base axis K

Set the names of the basic axes that compose the plane.
Set the axis name set in "#1013 axname".
If all three items ("base_I", "base_J" and "base_K") do not need to be set, such as for 2-axis specifications, input "0", and the parameter will be blank.
Normally, when X, Y and Z are specified respectively for base_I, _J, _K, the following relation will be established:
G17: X-Y
G18: Z-X
G19: Y-Z
Specify the desired axis name to set an axis address other than above.

---Setting range---

Axis names such as X, Y or Z

#1029 aux_I Flat axis I

Set the axis name when there is an axis parallel to "#1026 base_I".

---Setting range---

Axis names such as X, Y or Z

#1030 aux_J Flat axis J

Set the axis name when there is an axis parallel to "#1027 base_J".

---Setting range---

Axis names such as X, Y or Z

#1031 aux_K Flat axis K

Set the axis name when there is an axis parallel to "#1028 base_K".

---Setting range---

Axis names such as X, Y or Z

#1084 RadErr Arc error

Set the tolerable error range when the end point deviates from the center coordinate in the circular command.

---Setting range---

0 to 1.000 (mm)

#1171 taprov Tap return override

Set the tap return override value for the synchronous tapping.
When "0" is set, it will be regarded as 100%.

---Setting range---

0 to 100 (%)

#1185 spd_F1 F1 digit feedrate F1

Set the feedrate for the F command in the F 1-digit command ("#1079 F1digit" is set to "1").
Feedrate when F1 is issued (mm/min)

When "#1246 set08/bit6" is set to "1" and F 1-digit feed is commanded, the feedrate can be increased/decreased by operating the manual handle.

---Setting range---

0 to 1000000 (mm/min)

#1186 spd_F2 F1 digit feedrate F2

Set the feedrate for the F command in the F 1-digit command ("#1079 F1digit" is set to "1").
Feedrate when F2 is issued (mm/min)

When "#1246 set08/bit6" is set to "1" and F 1-digit feed is commanded, the feedrate can be increased/decreased by operating the manual handle.

---Setting range---

0 to 1000000 (mm/min)

#1187 spd_F3 F1 digit feedrate F3

Set the feedrate for the F command in the F 1-digit command ("#1079 F1digit" is set to "1").
Feedrate when F3 is issued (mm/min)

When "#1246 set08/bit6" is set to "1" and F 1-digit feed is commanded, the feedrate can be increased/decreased by operating the manual handle.

---Setting range---

0 to 1000000 (mm/min)

#1188 spd_F4 F1 digit feedrate F4

Set the feedrate for the F command in the F 1-digit command ("#1079 F1digit" is set to "1").
Feedrate when F4 is issued (mm/min)

When "#1246 set08/bit6" is set to "1" and F 1-digit feed is commanded, the feedrate can be increased/decreased by operating the manual handle.

---Setting range---

0 to 1000000 (mm/min)

#1189 spd_F5 F1 digit feedrate F5

Set the feedrate for the F command in the F 1-digit command ("#1079 F1digit" is set to "1").
Feedrate when F5 is issued (mm/min)

When "#1246 set08/bit6" is set to "1" and F 1-digit feed is commanded, the feedrate can be increased/decreased by operating the manual handle.

---Setting range---

0 to 1000000 (mm/min)

#1506 F1_FM Upper limit of F1-digit feedrate

Set the maximum value up to which the F 1-digit feedrate can be changed.

---Setting range---

0 to 1000000 (mm/min)

#1507 F1_K F 1-digit feedrate change constant

Set the constant that determines the speed change rate per manual handle graduation in F 1-digit feedrate change mode.

---Setting range---

0 to 32767

#8001 WRK COUNT M

Set the M code for counting the number of the workpiece repeated machining.
The number of the M-codes set by this parameter is counted.
The No. will not be counted when set to "0".

---Setting range---

0 to 999

#8002 WRK COUNT

Set the initial value of the number of workpiece machining. The number of current workpiece machining is displayed.

---Setting range---

0 to 999999

#8003 WRK COUNT LIMIT

Set the maximum number of workpiece machining.
A signal will be output to PLC when the number of machining times is counted to this limit.

---Setting range---

0 to 999999

#8004 SPEED

Set the feedrate during automatic tool length measurement.

---Setting range---

1 to 1000000 (mm/min)

#8005 ZONE r

Set the distance between the measurement point and deceleration start point.

---Setting range---

0 to 99999.999 (mm)

#8006 ZONE d

Set the tolerable range of the measurement point.
An alarm will occur when the sensor signal turns ON before the range, set by this parameter, has not been reached from the measurement point, or when the signal does not turn ON after the range is passed.

---Setting range---

0 to 99999.999 (mm)

#8007 OVERRIDE

Set the override value for automatic corner override.

---Setting range---

0 to 100 (%)

#8008 MAX ANGLE

Set the maximum corner opening angle where deceleration should start automatically.
When the angle is larger than this value, deceleration will not start.

---Setting range---

0 to 180 (°)

#8009 DSC. ZONE

Set the position where deceleration starts at the corner.
Designate at which length point before the corner deceleration should start.

---Setting range---

0 to 99999.999 (mm)

#8010 ABS. MAX.

Set the maximum value when inputting the tool compensation amount.
A value exceeding this setting value cannot be set.
Absolute value of the input value is set.
(If a negative value is input, it is treated and set as a positive value.)
If "0" is input, this parameter will be disabled.

---Setting range---

0 to 9999.999 (mm)
(Input setting increment applies)

#8011 INC. MAX.

Set the maximum value for when inputting the tool compensation amount in the incremental mode.
A value exceeding this setting value cannot be set.
Absolute value of the input value is set.
(If a negative value is input, it is treated and set as a positive value.)
If "0" is input, this parameter will be disabled.

---Setting range---

0 to 9999.999 (mm)
(Input setting increment applies)

#8038 Path recog. range

Path recognition range
Specify the range to recognize the tool paths adjoining to the command position when the smooth fairing function is ON.
If "0" is set, the range will be 1.000 (mm).

---Setting range---

0 to 100.000 (mm)

#8039 Comp. range limit

Compensation distance tolerance
Specify the upper limit of the distance between the command position and compensation position when the smooth fairing function is ON.
If you specify a negative value, operation is conducted with no tolerance limit.
If "0" is set, the tolerance will be 0.005 (mm).

---Setting range---

-1.000 to 100.000 (mm)

#8041 C-rot.R

Set the length from the center of the normal line control axis to the tool tip. This is used to calculate the turning speed at the block joint.
This is enabled during the normal line control type II.

---Setting range---

0.000 to 99999.999 (mm)

#8042 C-ins.R

Set the radius of the arc to be automatically inserted into the corner during normal line control.
This is enabled during the normal line control type I.

---Setting range---

0.000 to 99999.999 (mm)

#8043 Tool HDL FD OFS

Set the length from the tool holder to the tool tip.

---Setting range---

0.000 to 99999.999 (mm)

#8044 UNIT*10

Set the command increment scale.
The scale will be "1" when "0" is set.

---Setting range---

0 to 10000 (fold)
0: One fold

#8045 Varying spd thread

Select whether to enable the variable speed thread cutting function.

0: Disable
1: Enable

#8060 G71 ERR

Set the tolerable error range to avoid a program error (a shape change at pocket machining) against minute inversion when the finished shape's Z axis (or X axis at G72 command) does not move monotonously.

---Setting range---

0.000 to 0.010 (mm)

#8061 G76 THICK

Set the minimum cutting amount for compound type thread cutting cycle (G76).
The value set in this parameter will be applied when the cutting amount in compound thread cutting cycle (G76) without Q command is smaller than that in this parameter.
This parameter is valid only when "#1222 aux06/bit4" is set to "1".

---Setting range---

0.000 to 99999.999 (mm)

#8069 G76G78in-posn wdt.

Specify the in-position check width to be used for deceleration check of G0-G0 blocks in thread cutting cycle (G76 or G78).
When this parameter is set to "0", or when the option "Programmable in-position check" is OFF, normal deceleration check method is applied.

---Setting range---

0.000 to 99.999 (mm)
0.0000 to 9.9999 (inch)

#8070 Turning cycle mode

1: If a zero-travel distance block is given during turning cycle mode (G90, G92 or G94), the turning cycle is executed again.
0: If a zero-travel distance block is given during turning cycle mode (G90, G92 or G94), the turning cycle is not executed.

#8071 3-D CMP (for M system only)

Set the value of the denominator constants for 3-dimensional tool radius compensation.
Set the value of "p" in the following formula.
Vx = i x r/p, Vy = j x r/p, Vz = k x r/p
Vx, Vy, Vz : X, Y, and Z axes or vectors of horizontal axes
i, j, k : Program command value
r : Offset
$p = \sqrt{(i^2 + j^2 + k^2)}$ when the set value is "0".

---Setting range---

0 to 99999.999

#8072 SCALING P (for M system only)

Set the scale factor for reduction or magnification in the machining program specified by G50 or G51 command.
This parameter will be valid when the program specifies no scale factor.

---Setting range---

-99.999999 to 99.999999

#8075 SpiralEndErr (for M system only)

Set the tolerable error range (absolute value) when the end point position, commanded by the spiral or conical interpolation command with the command format type 2, differs from the end point position obtained from the speed and increment/decrement amount.

---Setting range---

0 to 99999.999 (mm)

#8077 Involute error

Set the tolerable error between the involute curve through the start point and the involute curve through the end point.

---Setting range---

0.000 to 99999.999 (mm)

#8078 Screen Saver Timer

[M8]
Set the period of time before turn-OFF of the display unit backlight.
When "0" is set, the backlight is not turned OFF.
It is possible to turn OFF the backlight of the monitor screen as well by using the [SHIFT] + [C.B] keys, unless its window is displayed.

---Setting range---

1 to 60 (min)
0: The backlight is not turned OFF

[C80]
Not used.

#8081 Gcode Rotat (for L system only)

Set the rotation angle for the program coordinate rotation command.
This parameter is enabled when "1" is set in "#1270 ext06/bit5 (Coordinate rotation angle without command)".
This parameter is set as absolute value command regardless of the "#8082 G68.1 R INC" setting. If the rotation angle is designated by an address R in G68.1 command, the designation by program will be applied.

---Setting range---

-360.000 to +360.000 (°)

#8082 G68.1 R INC (for L system only)

Select absolute or increment command to use for the rotation angle command R at L-system coordinate rotation.
0: Use absolute value command in G90 modal, incremental value command in G91 modal
1: Always use incremental value command

(Note) If G91 does not exist in the G code system, the command type is decided by this parameter only.

#8621 Coord rot plane (H)

Set the plane (horizontal axis) for coordinate rotation control.
Usually, set the name of the 1st axis.

When this parameter is not set, the coordinate rotation function will not work.

---Setting range---

Axis name

#8622 Coord rot plane (V)

Set the plane (vertical axis) for coordinate rotation control.
Usually, set the name of the 2nd axis.

When this parameter is not set, the coordinate rotation function will not work.

---Setting range---

Axis name

#8623 Coord rot centr (H)

Set the center coordinates (horizontal axis) for coordinate rotation control.

---Setting range---

-999999.999 to 999999.999 (mm)

#8624 Coord rot centr (V)

Set the center coordinates (vertical axis) for coordinate rotation control.

---Setting range---

-999999.999 to 999999.999 (mm)

#8625 Coord rot vctr (H)

Set the vector components (horizontal axis) for coordinate rotation control.
When this parameter is set, the coordinate rotation control angle (#8627) will be automatically calculated.

---Setting range---

-999999.999 to 999999.999 (mm)

#8626 Coord rot vctr (V)

Set the vector components (vertical axis) for coordinate rotation control.
When this parameter is set, the coordinate rotation control angle (#8627) will be automatically calculated.

---Setting range---

-999999.999 to 999999.999 (mm)

#8627 Coord rot angle

Set the rotation angle for coordinate rotation control.
When this parameter is set, the coordinate rotation vector (#8625, #8626) will be "0".

---Setting range---

-360.000 to 360.000 (°)

#8701 Tool length

Set the length to the touch tool tip.

---Setting range---

-99999.999 to 99999.999 (mm)

#8702 Tool Dia

Set the diameter of the sphere at the touch tool tip.

---Setting range---

-99999.999 to 99999.999 (mm)

#8703 OFFSET X

This sets the deviation amount (X direction) from the touch tool center to the spindle center.

---Setting range---

-99999.999 to 99999.999 (mm)

#8704 OFFSET Y

Set the deviation amount (Y direction) from the touch tool center to the spindle center.

---Setting range---

-99999.999 to 99999.999 (mm)

#8705 RETURN

Set the one-time return distance for contacting again.

---Setting range---

0 to 99999.999 (mm)

#8706 FEED

Set the feedrate when contacting again.

---Setting range---

1 to 60000 (mm/min)

#8707 Skip past amout (H)

Set the difference (horizontal axis direction) between the skip read value and actual skip position.

---Setting range---

-99999.999 to 99999.999 (mm)

#8708 Skip past amout (V)

Set the difference (vertical axis direction) between the skip read value and actual skip position.

---Setting range---

-99999.999 to 99999.999 (mm)

#8709 EXT work sign rvs

Reverse the sign of external workpiece coordinate.
Select when using the external workpiece coordinate system with Z shift.

0: External workpiece offset without sign reversal
1: External workpiece offset with sign reversal

#8710 EXT work ofs invld

Set whether to enable external workpiece offset subtraction when setting the workpiece coordinate offset.

0: Not subtract the external workpiece offset. (Conventional specification)
1: Subtract the external workpiece offset.

#8711 TLM L meas axis

Set the tool length measurement axis.
Set the "#1022 axname2" axis name.

---Setting range---

Axis name

(Note) If the axis name is illegal or not set, the 3rd axis name will be set as default.

#8712 TLM D meas axis

Set the tool diameter measurement axis.
Set the "#1022 axname2" axis name.

---Setting range---

Axis name

(Note) If the axis name is illegal or not set, the 1st axis name will be set as default.

#8713 Skip coord. Switch (For M system only)

Select the coordinate system for reading skip coordinate value.
Select whether to read the skip coordinate in the workpiece coordinate system or in the feature coordinate system during inclined surface machining command.
Select whether to read the skip coordinate in the workpiece coordinate system or in the workpiece installation coordinate system during workpiece installation error compensation.

0: Workpiece coordinate system
1: Feature coordinate system/Workpiece installation coordinate system

#8714 Thrdrecut lead ax

Specify the name of lead axis that performs thread recutting.
If any nonexistent axis name is specified, the 1st axis of the part system is used as a lead axis for thread recutting.
If the parameter "#8714 Thrdrecut lead ax" is unspecified, Z axis is set as the parameter value at power ON.

---Setting range---

A,B,C,U,V,W,X,Y,Z

#8715 Thread recut SP#

Specify the No. or name of spindle that performs thread recutting.
If 0 or any nonexistent spindle No. or name is specified, the 1st spindle is used for thread recutting.

---Setting range---

Spindle No. method: 0 to 8
Spindle name method: 0 to 9
(Default: 0)

(PR) #8716 EXT/Wrksft Share (for L system only)

Set this parameter to "1" if you wish to disable the external workpiece coordinate system offset.
This parameter is enabled when "#11056 Workshift invalid (worksft invalid)" is "0".

0: Use the external work coordinate offset (EXT) to implement compensation
1: Implement compensation without using the external work coordinate offset (EXT)

#8717 WE measure wk zero

[M8]
Specify the workpiece zero position that is used for measuring the workpiece installation error.

0: Workpiece center
1: Apex in X-, Y- direction
2: Apex in X+, Y- direction
3: Apex in X+, Y+ direction
4: Apex in X-, Y+ direction

#8718 WE meas. wk coord

[M8]
Specify the workpiece coordinate system in which you input the workpiece coordinates for workpiece installation error measurement.
Set the number part of the coordinate system modal. (54, 54.1, 55, 56, 57, 58 or 59)

---Setting range---

0, 54 to 59

#8719 WE meas. ext wk No

[M8]
If workpiece installation error measurement is performed in the extended workpiece coordinate system, specify the address P value of G54.1.
If “#8718 WE meas. wk coord” is not 54.1, there is no need for setting this parameter.

---Setting range---

0 to 300

#8720 WE mea. wk X-width

[M8]
Specify the X direction width of the rectangular workpiece for which workpiece installation error measurement is performed.
If the sensor's accessible range is small due to jig etc., specify the width of the portion that is stuck out of the jig.

---Setting range---

0.000 to 99999.999 (mm)

#8721 WE mea. wk Y-width

[M8]
Specify the Y direction width of the rectangular workpiece for which workpiece installation error measurement is performed.
If the sensor's accessible range is small due to jig etc., specify the width of the portion that is stuck out of the jig.

---Setting range---

0.000 to 99999.999 (mm)

#8722 WE mea. wk Z-width

[M8]
Specify the Z direction width of the rectangular workpiece for which workpiece installation error measurement is performed.
If the sensor's accessible range is small due to jig etc., specify the width of the portion that is stuck out of the jig.

---Setting range---

0.000 to 99999.999 (mm)

#8723 WK inst. err comp#

[M8]
Specify the workpiece installation error No. for write during the workpiece installation error measurement.
Set 1 for G54.4 P1.

---Setting range---

0 to 7

#8724 Sensor T L comp No

[M8]
Specify the tool length compensation No. of touch probe that is used for measurement of rotation center error or workpiece installation error.
Set the touch probe offset in the said number before measurement.
If the specified offset is significantly different, the sensor may be damaged.
---Setting range---
0 to 999

#12066 Tolerance ctrl ON

Select whether to enable the tolerance control.
0: Disable
1: Enable
(Note) Tolerance control is available only under SSS control.
To enable SSS control, set #8090 to 1.

#12067 Smth Corn spd coef

Set the compensation coefficient to adjust a path error or clamp speed in the corner while tolerance control is ON.
This parameter is enabled during tolerance control. Thus set this parameter if you wish to use different clamp speed according to ON/OFF of tolerance control.
When "0" is set in this parameter, the standard value (100%) is applied.
---Setting range---
0 to 2000(%)

#12068 Smoothing range

Spline interpolation 2: Smoothing range
Normally set 0 in this parameter.
If you run a program with short line segments and its reciprocating paths are uneven, set the parameter to about 3 to 5 times the length of the programmed line segments.
---Setting range---
0.000 to 10.000 (mm)

#12069 Corner angle

Tolerance control: Corner recognition angle
Specify the corner recognition angle. Normally set 0 in this parameter.
---Setting range---
0.000 to 180.000 (°)

#19001 Syn.tap(,S)cancel

0: Retain the spindle speed (,S) in synchronous tap return
1: Cancel the spindle speed (,S) in synchronous tap return with G80
The same value as "#1223 aux07/bit6" will be reflected. When either setting changes, the other will change accordingly.

#19002 Zero-point mark

[M8]
Select the position for displaying the zero point mark in the graphic trace and 2D check.
0: Machine coordinates zero point (same as conventional method)
1: Workpiece coordinate zero point
The same value as "#1231 set03/bit4" will be reflected. When either setting changes, the other will change accordingly.
[C80]
Not used.

#19003 PRG coord rot type

Select the start point of the initial travel command after program coordinate rotation command.
0: Calculate the end position using the current position on the local coordinate system before rotating, without rotating the start point in accordance with the coordinates rotation.
1: Calculate the end position, assuming that the start point rotates in accordance with the coordinates rotation.

#19004 Tap feedrate limit

Set the upper limit of the cutting feed rate in synchronous tapping.
---Setting range---
0 to 1000(mm/rev)

(Note) Setting "0" disables this parameter.
When the commanded cutting feed rate in synchronous tapping exceeds this setting, a program error (P184) will occur.

#19005 manual Fcmd2 clamp

Set a clamp speed coefficient (%) for manual speed command 2.
The feed rate is clamped at the command feed rate or rapid traverse rate for automatic operation, which was multiplied by this parameter's value.
(Note) This setting is valid only for manual speed command 2.
---Setting range---
0 to 1000 (%)
0: 100% (Default value)

(PR) #19006 EOR Disable

Set whether to handle an EOR(%) in machining program as the end of program in automatic operation, graphic check, program transfer to NC memory, program editing, and buffer correction. Tape operation, Computer Link B, and serial input/output are not included.
0: An EOR(%) is handled as the end of machining program.
1: An EOR(%) is not handled as the end of machining program. The program will be read to the end of file.

#19007 Prg check constant

Program check speed constant
Set the speed constant to be used for the program check operation function.
---Setting range---
0 to 60000

#19008 PRM coord rot type

Select the start point of the initial travel command after parameter coordinate rotation.

0: Calculate the end position, assuming that the start point rotates in accordance with the coordinates rotation.

1: Calculate the end position using the current position on the local coordinate system before rotating, without rotating the start point in accordance with the coordinates rotation.

#19009 Corner check angle

Corner deceleration check angle

Specify the internal angle formed by two blocks, at or below which the block joint is determined as a corner and the latter block's start timing is controlled accordingly while the automatic error detect is ON.

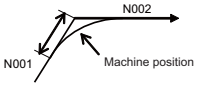
---Setting range---

0 to 180 (°)

#19010 Corner check width

Corner deceleration check width

When deceleration of the currently executed block has started and a position error width between the programmed end point and machine position has reduced to this parameter or less, the control starts execution of the next block.



---Setting range---

0 to 99.999 (mm)

#19012 Ana-Tap-Voltage1

[M8]

Analog spindle synch tap: Voltage output magnification (at cutting)

Specify the spindle speed magnification to be applied during cutting in analog spindle synchronous tapping.

When 0 is set, the magnification is taken as 100%.

If the spindle fails to rotate as commanded due to such as cutting load, set this parameter to correct the speed.

---Setting range---

0 to 200 (%)

#19013 Ana-Tap-Voltage2

[M8]

Analog spindle synch tap: Voltage output magnification (at retract)

Specify the spindle speed magnification to be applied during retract in analog spindle synchronous tapping.

When 0 is set, the magnification is taken as 100%.

If the spindle fails to rotate as commanded due to such as cutting load, set this parameter to correct the speed.

---Setting range---

0 to 200 (%)

#19101 Stylus sphere dia.

[M8]

Specify the diameter of stylus sphere that is used for measurement of rotation center error or workpiece installation error.

If the set value is significantly different from the actual diameter, the sensor may be damaged.

---Setting range---

0.000, 0.100 to 10.000 (mm)

#19102 Stylus length

[M8]

Specify the length of stylus that is used for workpiece installation error measurement.

If the set value is significantly different from the actual length, the sensor may be damaged.

---Setting range---

0.000 to 99999.999 (mm)

#19103 Sensor over-travel

[M8]

Specify the over-travel distance of the sensor that is used for measurement of rotation center error or workpiece installation error. (allowable excess of sensor, over-stroke)

Set the smallest over-travel distance among all the axes.

The initial approaching speed to the reference sphere is determined according to the over-travel distance.

If the set over-travel distance is greater than the actual distance, the sensor may be damaged.

---Setting range---

0.000 to 100.000 (mm)

#19401 G33.n chamfer spd

Not used.

#19405 Rotary ax drawing

[M8]
Specify this parameter to draw a path of C axis (rotary axis) according to its rotation in the graphic trace and 2D graphic trace.
When "#1013 axname" is set to "C", the axis is handled as a rotary axis.
By setting this parameter to "C", a rotation path around the Z axis on actual workpiece can be expressed.
When the Graphic check rotary axis drawing option or Graphic trace rotary axis drawing option is disabled, this parameter is ignored.
C: Enable this function
0: Disable this function
(Setting is cleared when "0" is set)
[C80]
Not used.

#19406 Hob retract ON at alarm

Select whether to enable the retract at an alarm during hobbing.
0: Disable
1: Enable
(Standard value: 0)

#19407 Hob retract acceleration deceleration OFF

Select whether to disable the acceleration/deceleration of a retract.
0: Enable
1: Disable
(Standard value: 0)

#19417 Hole dec check 2

This is enabled when #1253 set25 bit2 is 1.
The operation at the hole bottom and the hole drilling stop position is as below.
0: Perform no deceleration check.
1: Perform command deceleration check.
2: Perform in-position check.
<Target fixed cycles>
Machining center: G81, G82, G83, G73
Lathe : G83, G87, G83.2

#19418 Arc inside min ovr (for M system only)

[M8]
Set the minimum value of arc inside override.
R1/R2 come close to zero and the tool feed stops when the radius of tool center path(R1) is very smaller than the radius of program path (R2).
When this parameter is set and R1/R2<=(parameter setting value), tool feed is F* (parameter setting value).
When this parameter is "0" or "100", the arc inside override is disabled.
---Setting range---
0 to 100 (%)
[C80]
Not used.

#19419 Timing sync system

Specify the counterpart part system for timing synchronization or for balance cut when the part system No. is omitted.
Set the part system No. in a way that reflects the combination of two part systems as follows.

(Example) Timing synchronization between Part systems 1 and 3
Enter 3 for the 1st part system, and enter 1 for the 3rd part system.

(Note) When 0 is set, timing synchronization is carried out between Part systems 1 and 2.
---Setting range---
0 to 8

#19420 Arc inside ovr ON (for M system only)

[M8]
Select the enable conditions for the arc inside override.
0: Enable during tool radius compensation
1: Enable during tool radius compensation and automatic corner override
(Note) When M2 format is in use, the arc inside override enables during tool radius compensation, regardless of the setting value of this parameter.
[C80]
Not used.

#19421 Arc inside ovr typ (for M system only)

[M8]
Specify the type of arc inside override.
0: Type 1
Arc inside override during circular cutting is invalid.
1: Type 2
Arc inside override during circular cutting is valid.
[C80]
Not used.

#19425 ManualB Std R1

Set a radius used as standard for the rotary axis speed.
When the setting value of #19425 is larger than that of "#19427 ManualB Std R2", #19425 setting will be used as surface speed control standard radius 2: #19427 setting will be used as surface speed control standard radius 1.
---Setting range---
0 to 99999.999 (mm)

#19426 ManualB Std F1

This sets the rotary axis speed for surface speed control standard radius 1 (ManualB Std R1).
When the setting value of #19426 is larger than that of "#19428 ManualB Std F2", #19426 setting will be used as surface speed control standard speed 2: #19427 setting will be used as surface speed control standard speed 1.

---Setting range---

1 to 1000000 (°/min)

#19427 ManualB Std R2

Set a radius used as standard for the rotary axis speed.
When the same value is set as "#19425 ManualB Std R1", the surface speed control standard speed 1 (ManualB Std F1) will be selected as the rotary axis speed if the radius is less than that value. The surface speed control standard speed 2 (ManualB Std F2) is selected if larger than the set value.

---Setting range---

0 to 99999.999 (mm)

#19428 ManualB Std F2

Set the rotary axis speed for surface speed control standard radius 2 (ManualB Std R2).

---Setting range---

1 to 1000000 (°/min)

1.2 Fixed Cycle Parameters

#8012 G73n (for M system only)
Set the return amount for G73 (step cycle).
---Setting range---
0 to 99999.999 (mm)

#8013 G83 n
Set the return amount for G83 (deep hole drilling cycle).
---Setting range---
0 to 99999.999 (mm)

#8014 CDZ-VALE (for L system only)
Set the chamfering amount for G76, G78 (thread cutting cycle).
---Setting range---
0 to 127 (0.1 lead)

#8015 CDZ-ANGLE (for L system only)
Set the chamfering angle for G76, G78 (thread cutting cycle).
---Setting range---
0 to 89 (°)

#8016 G71 MINIMUM (for L system only)
Set the minimum value of the last cutting amount by the rough cutting cycle (G71, G72).
The cutting amount of the last cutting will be the remainder. When the remainder is smaller than this parameter setting, the last cycle will not be executed.
---Setting range---
0 to 999.999 (mm)

#8017 G71 DELTA-D (for L system only)
Set the change amount of the rough cutting cycle.
The rough cutting cycle (G71, G72) cutting amount repeats x+dx, x, x-dx using the value (x) commanded with D as a reference. Set the change amount dx.
---Setting range---
0 to 999.999 (mm)

#8018 G84/G74 n
Set the retract amount m in a G84/G74/G88 pecking tapping cycle.
(Note) In the case of a normal tapping cycle, set to "0".
---Setting range---
0 to 999.999 (mm)

#8051 G71 THICK
Set the amount of cut-in by the rough cutting cycle (G71, G72)
---Setting range---
0 to 99999.999 (mm)

#8052 G71 PULL UP
Set the amount of pull-up when returning to the cutting start point for the rough cutting cycle (G71. G72).
---Setting range---
0 to 99999.999 (mm)

#8053 G73 U
Set the X-axis cutting margin of the forming rough cutting cycle (G73).
---Setting range---
-99999.999 to 99999.999 (mm)

#8054 G73 W
Set the Z-axis cutting margin of the forming rough cutting cycle (G73).
---Setting range---
-99999.999 to 99999.999 (mm)

#8055 G73 R
Set how many times cutting will be performed in the forming rough cutting cycle (G73).
---Setting range---
0 to 99999 (times)

#8056 G74 RETRACT
Set the amount of retract in the cut-off cycle (G74, G75).
---Setting range---
0 to 999.999 (mm)

#8057 G76 LAST-D
Set the amount of final cut-in by the compound type thread cutting (G76).
---Setting range---
0 to 999.999 (mm)

#8058 G76 TIMES
Set how many times the amount of final cut-in cycle (G76 finish margin) will be divided in the compound type thread cutting (G76).
---Setting range---
0 to 99 (times)

#8059 G76 ANGLE
Set the angle (thread angle) of the tool nose in the compound type thread cutting (G76).
---Setting range---
0 to 99 (°)

#8083 G83S modeM (for M system only)
Set the M command code for changing to the small diameter deep hole drilling cycle mode.
---Setting range---
1 to 99999999

#8084 G83S Clearance (for M system only)

Set the clearance amount for the small diameter deep hole drilling cycle (G83).

---Setting range---

0 to 999.999 (mm)

#8085 G83S Forward F (for M system only)

Set the feedrate from the R point to the cutting start position in the small diameter deep hole drilling cycle (G83).

---Setting range---

0 to 99999 (mm/min)

#8086 G83S Back F (for M system only)

Set the speed for returning from the hole bottom during the small diameter deep hole drilling cycle (G83).

---Setting range---

0 to 99999 (mm/min)

1.3 Control Parameters 1

(PR) #1041 I_inch **Initial state (inch)**

Select the unit system for the program travel amount when the power is turned ON or reset and for position display.
0: Metric system
1: Inch system

(Note) The units of the following data are converted by "#1041 I_inch".
- Command unit at power ON and reset (Inch/metric command mode)
  But under the following conditions, the unit will follow G20/G21 command modal even at reset.
  When reset modal is retained ("#1151 rstint"="0")
  When G code group 06 reset modal is retained ("#1210 RstGmd/bit5" ON)
- Unit system for position display (counter, user parameter, tool, work offset)
- User parameter I/O unit
- Parameter unit of user parameters concerning length and speed
- Arc error parameter (#1084 RadErr)

#1078 Decpt2 **Decimal point type 2**

Select the increment of position commands that do not have a decimal point.
0: Minimum input command unit (follows "#1015 cunit")
1: 1mm (or 1inch) unit (For the dwell time, 1s unit is used.)

#1080 Dril_Z **Drilling Z fixed**

Select a fixed cycle hole drilling axis.
0: Use an axis vertical to the selected plane as hole drilling axis.
1: Use the Z axis as the hole drilling axis regardless of the selected plane.

#1091 Mpoint **Ignore middle point**

Select how to handle the middle point during G28 and G30 reference position return.
0: Pass the middle point designated in the program and move to the reference position.
1: Ignore the middle point designated in the program and move straight to the reference position.

#1103 T_Life **Validate life management**

Select whether to use the tool life management.
0: Not use
1: Use

#1104 T_Com2 **Tool command method 2**

Select how to handle the tool command in the program when "#1103 T_Life" is set to "1".
0: Handle the command as group No.
1: Handle the command as tool No.
(Note) In the case of the tool life management III, the program tool command will be handled as the tool No. regardless of the setting.

#1105 T_Sel2 **Tool selection method 2**

Select the tool selection method when "#1103 T_Life" is set to "1".
0: Select in order of registered No. from the tools used in the same group.
1: Select the tool with the longest remaining life from the tools used or unused in the same group.

#1106 Tcount **Life management (for L system only)**

Select the input method when address N is omitted in inputting the data (G10 L3 command) for tool life management function II.
0: Time specified input
1: Number of times specified input

#1126 PB_G90 **Playback G90**

Select the method to command the playback travel amount in the playback editing.
0: Incremental value
1: Absolute value

#1128 RstVCl **Clear variables by resetting**

Select how to handle the common variables when resetting.
0: Common variables won't change after resetting.
1: Common variables will be cleared #100 to #199 by resetting.

#1129 PwrVCl **Clear variables by power-ON**

Select how to handle the common variables when the power is turned ON.
0: The common variables are in the same state as before turning the power OFF.
1: Common variables will be cleared #100 to #199 when the power is turned ON.

#1302 AutoRP **Automatic return by program restart**

Select the method to move to the restart position when restarting the program.
0: Move the system manually to the restart position and then restart the program.
1: The system automatically moves to the restart position at the first activation after the program restarts.

#8101 MACRO SINGLE

Select how to control the blocks where the user macro command continues.
0: Do not stop while macro blocks continue.
1: Stop every block during signal block operation.

#8102 COLL. ALM OFF

Select the interference (bite) control to the workpiece from the tool diameter during tool radius compensation and nose R compensation.
0: An alarm will be output and operation stops when an interference is judged.
1: Changes the path to avoid interference.

#8103 COLL. CHK OFF

Select the interference (bite) control to the workpiece from the tool diameter during tool radius compensation and nose R compensation.
0: Performs interference check.
1: Does not perform interference check.

#8105 EDIT LOCK B

Select the edit lock for program Nos. 8000 to 9999 in the memory.
0: Enable the editing.
1: Prohibit the editing of above programs.

When "1" is set, the file cannot be opened.

#8106 G46 NO REV-ERR (for L system only)

Select the control for the compensation direction reversal in G46 (nose R compensation).
0: An alarm will be output and operation will stop when the compensation direction is reversed (G41 -> G42' G42 -> G41).
1: An alarm won't occur when the compensation direction is reversed, and the current compensation direction will be maintained.

#8107 R COMPENSATION

Select whether to move to the inside because of a delay in servo response to a command during arc cutting mode.
0: Move to the inside, making the arc smaller than the command value.
1: Compensate the movement to the inside.

#8108 R COMP Select

Select the arc radius error compensation target.
0: Perform compensation over all axes.
1: Perform compensation axis by axis.

(Note) This parameter is effective only when "#8107 R COMPENSATION" is "1".

#8109 HOST LINK

[M8]
Select whether to enable computer link B instead of the RS-232C port.
0: Disable (Enable normal RS-232C communication.)
1: Enable (Disable normal RS-232C communication.)
[C80]
Not used.

#8110 G71/G72 POCKET

Select whether to enable the pocket machining when there is a dimple (pocket) in the rough cutting cycle (G71, G72) finishing program.
0: OFF
1: ON

#8111 Milling Radius

Select the diameter and radius of the linear axis for milling (cylindrical/pole coordinate) interpolation.
0: All axes radius command
1: Each axis setting (follows "#1019 dia")

(Note) This parameter is valid only in the milling (cylindrical/polar coordinate) interpolation mode.

#8112 DECIMAL PNT-P

Select whether to enable the decimal point command for G04 address P.
0: Disable
1: Enable

#8113 Milling Init G16

Set which plane to execute for milling machining after the power is turned ON or reset.

#8113:0, #8114:0 ---> G17 plane
#8113:0, #8114:1 ---> G19 plane
#8113:1, #8114:0 ---> G16 plane
#8113:1, #8114:1 ---> G16 plane

0: Not G16 plane
1: G16 plane

(Note) This parameter is valid for the G code system 2, 3, 4 or 5 ("#1037 cmdtyp"="3", "4", "5" or "6").

#8114 Milling Init G19

Set which plane to execute for milling machining after the power is turned ON or reset.

#8113:0, #8114:0 ---> G17 plane
#8113:0, #8114:1 ---> G19 plane
#8113:1, #8114:0 ---> G16 plane
#8113:1, #8114:1 ---> G16 plane

0: Not G19 plane
1: G19 plane

(Note) This parameter is valid for the G code system 2, 3, 4 or 5 ("#1037 cmdtyp"="3", "4", "5" or "6").

#8115 G83/87 RAPID

Select the operation upon the completion of each step in deep hole drilling cycle (G83, G87).
0: Returns to R point before performing next step.
1: Returns by the amount of d (parameter setting) setting value before performing next step.

#8116 CoordRotPara invd

Select whether to enable the coordinate rotation by the parameters.
0: Enable
1: Disable

#8117 OFS Diam DESIGN

Select tool radius or tool diameter compensation amount to be specified.
0: Tool radius compensation amount
1: Tool diameter compensation amount

#8119 Comp. unit switch

Select the setting unit of compensation amount that has no decimal point.
0: 1mm (or 1inch) unit
1: The minimum command unit (follows "#1003 iunit")

#8120 FONT SELECTION

[M8]
Select the font when Simplified Chinese is selected for "#1043 lang".
0: MITSUBISHI CNC GOTHIC font
1: Standard Windows font
*This parameter is available for M800W only.
[C80]
Not used.

#8121 Screen Capture

[M8]
Select whether to enable the screen capture function.
0: Disable
1: Enable

(Note 1) By setting this parameter to "1", and by keeping pushing the [SHIFT] key, screen capture will be executed.
[C80]
Not used.

#8122 Keep G43 MDL M-REF

Select whether to keep the tool length offset by high speed manual reference position return during tool length offset.
0: Will not be kept (Cancel)
1: Kept

#8123 H-spd retract ON

Select whether to enable the drilling cycle at high-speed retract in fixed cycle for drilling.
0: Disable
1: Enable

#8124 Mirr img at reset

Select the operation type of the mirror image by parameter setting and the mirror image by external input.
0: The current mirror image is canceled, and new mirror image will start with the machine position at reset as the mirror center.
1: The mirror center is kept to continue the mirror image.

#8125 Check Scode in G84

Select how to operate when there is no S command in synchronous tapping block.
0: Use the spindle function modal value as S-command value.
1: Output a program error (P181).

#8126 Disable op tone

[M8]
Disable operation tones when operating the keyboard/touch panel.
0: Enable the operation tones
1: Disable the operation tones
[C80]
Not used.

#8127 R-Navi manu F coor

[M8]
Select the initial value of the coordinate system for a manual feed while a machining surface is selected in the R-Navi function.
0: Feature coordinate system
1: Machine coordinate system
[C80]
Not used.

#8129 Subpro No. select

Select the subprogram No. to be called preferentially in subprogram control.
0: Commanded program No.
1: Four-digit program No. beginning with O No.
2: Eight-digit program No. beginning with O No.
(Note) The program to be called in user macro, figure rotation, macro interruption and compound type fixed cycle also follows this setting.

#8130 Per-revol. dwell

Select the dwell operation to be carried out when G04 command is given.
0: Apply per-second dwell, irrespective of the synchronous feed mode (G95) or asynchronous feed mode (G94)
1: Apply per-revolution dwell when synchronous feed mode (G95) is ON, but per-second dwell when asynchronous feed mode (G94) is ON

---Setting range---
0/1

#8131 High speed/accu 3

Switch to high-speed high-accuracy 3
Select whether to treat high-speed high-accuracy control II command as high-speed high-accuracy control III command.
0 : Treat G05P10000 as high-speed high-accuracy control II command (G05P10000).
1 : Treat G05P10000 as high-speed high-accuracy control III command (G05P20000).

#8132 G53.6 block stop

Select whether to execute a single block stop at the completion of rotation of each axis when G53.6 is given with the number of simultaneous contour control axes limited to 4.
0 : Not execute a single block stop
1 : Execute a single block stop

#8133 Intrctv macro call

[M8]
Specify the interactive macro to call from the cycle of interactive cycle insertion.
0: Call standard interactive macro
1: Call interactive macro in the machining program area

When a program, whose name is same as standard interactive macro, exists in the machining program area, the program in the machining program area is called preferentially if "1" is set to this parameter.
When a program, whose name is same as standard interactive macro, does not exist in the machining program area, standard interactive macro is called even if "1" is set to this parameter.
[C80]
Not used.

#8134 Email send disable

[M8]
E-mail sending by the email notification to operator can be disabled.
0: Enable
1: Disable
[C80]
Not used.

#8135 G5P4 single block

Single block stop is disabled during direct command mode.
0: Not disable single block stop
1: Disable single block stop

#8137 T. tool shape comp

[M8]
Select whether to enable the turning-tool shape compensation in compound type fixed cycle for turning machining I.
0: Disable
1: Enable

#8138 Pre-compens. shape

[M8]
Select whether to display the pre-compensation finish shape of the turning-tool shape compensation for compound type fixed cycle for turning machining I in 2D graphic check.
0: Display
1: Not display

#8145 Validate F1 digit

Select whether to execute the F command with a 1-digit code command or with a direct numerical command.
(The same value as "#1079 F1digt" will be reflected. When either setting changes, the other will change accordingly.)
0: Direct numerical command (command feedrate during feed per minute or rotation)
1: 1-digit code command (with the feedrate specified by the parameters "#1185 spd_F1" to "#1189 spd_F5")

#8155 Sub-pro interrupt

Select the method for the user macro interrupt.
(The same value as "#1229 set01/bit0" will be reflected. When either setting changes, the other will change accordingly.)
0: The user macro interrupt of macro type
1: The user macro interrupt of sub-program type

#8156 Fine thread cut E

Select the address E type when cutting an inch screw.
(The same value as "#1229 set01/bit1" will be reflected. When either setting changes, the other will change accordingly.)
0: Specify the number of threads per inch for inch screw cutting.
1: Specify the precision lead for inch screw cutting.

#8157 Radius comp type B (M system) / Nose R comp type B (L system)

For M system
Select the method of the arithmetic processing for the intersection point when the start-up or cancel commands are operated during radius compensation.
(The same value as "#1229 set01/bit2" will be reflected. When either setting changes, the other will change accordingly.)
0: The processing does not handle the start-up or cancel command block: handle the offset vector in the direction vertical to that of the command instead.
1: The processing is executed for the intersection point between the command block and the next block.

For L system
Select the method of the arithmetic processing for the intersection point when the start-up or cancel commands are operated during nose R or radius compensation.
(The same value as "#1229 set01/bit2" will be reflected. When either setting changes, the other will change accordingly.)
0: The processing does not handle the start-up or cancel command block: handle the offset vector in the direction vertical to that of the command instead.
1: The processing is executed for the intersection point between the command block and the next block.

#8158 Init const sur spd

Select the initial state after power-ON.
(The same value as "#1229 set01/bit3" will be reflected. When either setting changes, the other will change accordingly.)
0: Constant surface speed control cancel mode.
1: Constant surface speed control mode.

#8159 Synchronous tap

Select whether to use the floating tap chuck in G74 and G84 tap cycles.
(The same value as "#1229 set01/bit4" will be reflected. When either setting changes, the other will change accordingly.)

0: With a floating tapping chuck
1: Without a floating tapping chuck

#8160 Start point alarm

Select an operation when the operation start point cannot be found while moving to the next block of G117.
(The same value as "#1229 set01/bit5" will be reflected. When either setting changes, the other will change accordingly.)

0: The auxiliary function is enabled after the block for the movement has finished.
1: The program error (P33) occurs.

1.4 Control Parameters 2

#1025 l_plane Initial plane selection

Select the plane to be selected when the power is turned ON or reset.
When 0 is specified, 1 is assumed (X-Y plane).e model and specifications.
1: X-Y plane (G17 command state)
2: Z-X plane (G18 command state)
3: Y-Z plane (G19 command state)

(PR) #1037 cmdtyp Command type

Set the G code list and compensation type for programs.
1 : List1(for M) Type I (one compensation amount for one compensation No.)
2 : List1(for M) Type II (shape and wear compensation amounts for one comp. No.)
3 : List2(for L) Type III (shape and wear compensation amounts for one comp. No.)
4 : List3(for L) Ditto
5 : List4(for special L) Ditto
6 : List5(for special L) Ditto
7 : List6(for special L) Ditto
8 : List7(for special L) Ditto
9 : List8(for M) M2 form at type Type I
(one compensation amount for one compensation No.)
10 : List8(for M) M2 form at type Type II
(shape and wear compensation amounts for one compensation No.)

There are some items in the specifications that can be used or cannot be used according to the value set in this parameter.
The file structure may also change depending on the compensation data type.

(Note) When this parameter is changed, the file system will be changed after the power is turned ON. So always execute format.
The new format will be enabled after turning the power ON again.
Setting order
(1) cmdtyp changeover -> (2) Turn power ON again -> (3) Format -> (4) Turn power ON again
(Note) Compensation type III can be selected for M system by setting #1046.

#1073 l_Absm Initial absolute setting

Select the mode (absolute or incremental) at turning ON the power or reset.
0: Incremental setting
1: Absolute setting

#1074 l_Sync Initial synchronous feed

Select the feedrate mode at turning ON the power or reset.
0: Asynchronous feed (feed per minute)
1: Synchronous feed (feed per revolution)

#1075 l_G00 Initial G00

Select the linear command mode at turning ON the power or reset.
0: Linear interpolation (G01 command state)
1: Positioning (G00 command state)

#1076 AbsInc ABS/INC address (for L system only)

Select the command method for the absolute and incremental commands.
The absolute command/incremental command can be issued by using the absolute command address and incremental command address for the same axis.
0: Use G command for the absolute and incremental commands.
1: Use axis name for the absolute and incremental commands.
(The axis name in "#1013 axname" will be the absolute command, "#1014 incax" will be the incremental command.)

#1085 G00Drn G00 dry run

Select whether to apply dry run (feed at manual setting speed instead of command feedrate) to the G00 command.
0: Not apply to G00. (move at rapid traverse rate)
1: Apply to G00. (move at manual setting speed)

#1086 G0Intp G00 non-interpolation

Select the G00 travel path type.
0: Move linearly toward the end point. (interpolation type)
1: Move to the end point of each axis at the rapid traverse feedrate for each axis. (non-interpolation)

(Note) If this parameter is set to "1", neither of the following functions will be available: rapid traverse constant inclination acceleration/deceleration and rapid traverse constant inclination multi-step acceleration/deceleration.

#1148 l_G611 Initial hi-precis

Select the modal state at power ON from among the following: high-accuracy control mode, high-speed high-accuracy control I mode, high-speed high-accuracy control II mode or high-speed high-accuracy control III mode.
0: G08P0/G64 (cutting) mode
1: G08P1/G61.1 (high-accuracy control) mode
2: G05.1Q1 (high-speed high-accuracy control I) mode
3: G05P10000 (high-speed high-accuracy control II) mode
4: G05P20000 (high-speed high-accuracy control III) mode

#8173 Hold intr amount

Select whether to clear or hold the interruption amount after the "NC reset 1 (or 2)" signal is ON when the manual ABS switch is OFF.
0: Clear (Reset the coordinate deviation due to the interruption)
1: Hold

#8174 T meas. in mirror

Select the measurement operation for mirror-imaged axes during the manual tool length measurement 1 or 2.

0: Set the measurement result as the tool length.

1: Reverse the sign of measurement result and set it as the tool length.

1.5 I/O Parameters [M8]

#9001 DATA IN PORT

[M8]
Select the port for inputting the data such as machine program and parameters.
1: ch1
2: ch2

#9002 DATA IN DEV.

[M8]
Select the device No. for inputting the data. (The device Nos. correspond to the input/output device parameters.)
---Setting range---
0 to 4

#9003 DATA OUT PORT

[M8]
Select the port for outputting the data such as machine program and parameters.
1: ch1
2: ch2

#9004 DATA OUT DEV.

[M8]
Select the device No. for outputting the data. (The device Nos. correspond to the input/output device parameters.)
---Setting range---
0 to 4

#9005 TAPE MODE PORT

[M8]
Select the input port for running with the tape mode.
1: ch1
2: ch2

#9006 TAPE MODE DEV.

[M8]
Select the device No. to be run with the tape mode. (The device Nos. correspond to the input/output device parameters.)
---Setting range---
0 to 4

#9007 MACRO PRINT PORT

[M8]
Select the output port used for the user macro DPRINT command.
1: ch1
2: ch2
9: Memory card

#9008 MACRO PRINT DEV.

[M8]
Select the device No. used for the DPRINT command. (The device Nos. correspond to the input/output device parameters.)
---Setting range---
0 to 4

#9009 PLC IN/OUT PORT

[M8]
Select the port for inputting/outputting various data with PLC.
1: ch1
2: ch2

#9010 PLC IN/OUT DEV.

[M8]
Select the device No. used for the PLC input/output. (The device Nos. correspond to the input/output device parameters.)
---Setting range---
0 to 4

#9011 REMOTE PRG IN PORT

[M8]
Select the port for inputting remote programs.
1: ch1
2: ch2

#9012 REMOTE PRG IN DEV.

[M8]
Select the device No. used to input remote programs. The device Nos. correspond to the input/output device parameters.
---Setting range---
0 to 4

#9013 EXT UNIT PORT

[M8]
Select the port for communication with an external unit.
1: ch1
2: ch2

#9014 EXT UNIT DEV.

[M8]
Select the unit No. used for communication with an external unit(The unit Nos. correspond to the input/output device parameters.)
---Setting range---
0 to 4

#9017 HANDY TERMINAL PORT

[M8]
Select the port for communication with a handy terminal.
1: ch1
2: ch2

#9018 HANDY TERMINAL DEV.

[M8]
Select the device No. used for communication with a handy terminal. (The device Nos. correspond to the input/output device parameters.)

---Setting range---
0 to 4

#9053 M2 macro converter

[M8]
Not used.

#9054 MACRO PRINT FILE

[M8]
Set the file name to save the output data to a memory card with the DRPNT command for the user macro.
If this parameter is not set, the data will be output under the following name.
dprt$-MMDDhhmmssff
$ is the part system No. in which DPRNT is commanded, MMDDhhmmssff is the current date.
(MM: month, DD: day, hh: hour, mm: minute, ss: second, ff: millisecond)
(Note) This parameter is enabled when "#9007 Macro print directory" is set to "9".

---Setting range---
Program name or file name (32 characters)

#9101 DEV0 DEVICE NAME

[M8]
Set the device name corresponding to the device No.
Set a simple name for quick identification.

---Setting range---
Use alphabet characters, numerals and symbols to set a name within 3 characters.

#9102 DEV0 BAUD RATE

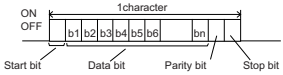
[M8]
Select the serial communication speed.
0: 19200 (bps)
1: 9600
2: 4800
3: 2400
4: 1200
5: 600
6: 300
7: 110

#9103 DEV0 STOP BIT

[M8]
Select the stop bit length used in the start-stop system.
Refer to "#9104 DEV0 PARITY CHECK". At the output of data, the number of characters is always adjusted for the parity check.
1: 1 (bit)
2: 1.5
3: 2

#9104 DEV0 PARITY CHECK

[M8]
Select whether to add the parity check bit to the data.



Set this parameter in accordance with the I/O device specifications.
0: Not add a parity bit in I/O mode
1: Add a parity bit in I/O mode

#9105 DEV0 EVEN PARITY

[M8]
Select odd or even when parity is added to the data. This parameter is ignored when no parity is added.
0: Odd parity
1: Even parity

#9106 DEV0 CHR. LENGTH

[M8]
Set the length of the data bit.
Refer to "#9104 DEV0 PARITY CHECK".
0: 5 (bit)
1: 6
2: 7 (NC connection not supported)
3: 8

#9107 DEV0 TERMINATR TYP

[M8]
Select the code to terminate data reading.
0, 3: EOR
1, 2: EOB or EOR

#9108 DEV0 HAND SHAKE

[M8]
Select the transmission control method.
No handshaking will be used when a value except 1 to 3 is set.
1: RTS/CTS method
2: No handshaking
3: DC code method

#9109 DEV0 DC CODE PRTY

[M8]
Select the DC code type when the DC code method is selected.
0: Not add parity to DC code (DC3 = 13H)
1: Add parity to DC code (DC3 = 93H)

#9111 DEV0 DC2/4 OUTPUT

[M8]
Select the DC code handling when outputting data to the output device.
DC2 / DC4
0: None / None
1: Yes / None
2: None / Yes
3: Yes / Yes

#9112 DEV0 CR OUTPUT

[M8]
Select whether to add the (CR) code just before the EOB (L/F) code during output.
0: Not add
1: Add

#9113 DEV0 EIA OUTPUT

[M8]
Select ISO or EIA code for data output.
In data input mode, the ISO and EIA codes are identified automatically.
0: ISO code output
1: EIA code output

#9114 DEV0 FEED CHR.

[M8]
Set the length of the tape feed to be output at the start and end of the data during tape output.
---Setting range---
0 to 999 (characters)

#9115 DEV0 PARITY V

[M8]
Select whether to perform the parity check for the number of characters in a block at the input of data.
At the output of data, the number of characters is always adjusted to for the parity check.
0: Not perform parity V check
1: Perform parity V check

#9116 DEV0 TIME-OUT (sec)

[M8]
Set the time out time to detect an interruption in communication.
Time out check will not be executed when set to "0".
---Setting range---
0 to 30 (s)

#9117 DEV0 DR OFF

[M8]
Select whether to enable the DR data check in data I/O mode.
0: Enable
1: Disable

#9118 DEV0 DATA ASCII

[M8]
Select the code of the output data.
0: ISO/EIA code (Depends on whether #9113, #9213, #9313, #9413 or #9513 EIA output parameter is set up.)
1: ASCII code

#9119 DEV0 INPUT TYPE

[M8]
Select the mode for input (verification).
0: Standard input (Data from the very first EOB is handled as significant information.)
1: EOBs following the first EOB of the input data are skipped until data other than EOB is input

#9120 DEV0 OUT BUFFER

[M8]
Select the buffer size of the output data which is output to output device using NC side serial port.
If the output device has a data receiving error (overrun error), decrease the buffer size with this parameter.
If the buffer size is decreased, output time will prolong according to the size.
0: 250 bytes (default)
1: 1 byte
2: 4 bytes
3: 8 bytes
4: 16 bytes
5: 64 bytes

#9121 DEV0 EIA CODE [

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code " [". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9122 DEV0 EIA CODE]

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "] ". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9123 DEV0 EIA CODE #

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "#". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9124 DEV0 EIA CODE *

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "*". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9125 DEV0 EIA CODE =

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "=". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9126 DEV0 EIA CODE :

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code " : ". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9127 DEV0 EIA CODE $

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "$". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9128 DEV0 EIA CODE !

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "!". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9201 DEV1 DEVICE NAME

[M8]
Set the device name corresponding to the device No.
Set a simple name for quick identification.

---Setting range---
Use alphabet characters, numerals and symbols to set a name within 3 characters.

#9202 DEV1 BAUD RATE

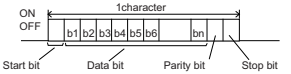
[M8]
Select the serial communication speed.
0: 19200 (bps)
1: 9600
2: 4800
3: 2400
4: 1200
5: 600
6: 300
7: 110

#9203 DEV1 STOP BIT

[M8]
Select the stop bit length used in the start-stop system.
Refer to "#9204 DEV1 PARITY CHECK". At the output of data, the number of characters is always adjusted to for the parity check.
1: 1 (bit)
2: 1.5
3: 2

#9204 DEV1 PARITY CHECK

[M8]
Select whether to add a parity check bit to the data.



Set this parameter in accordance with the I/O device specifications.
0: Not add a parity bit in I/O mode
1: Add a parity bit in I/O mode

#9205 DEV1 EVEN PARITY

[M8]
Select whether even or odd parity will be used when parity is used. This parameter is ignored when no parity is added.
0: Odd parity
1: Even parity

#9206 DEV1 CHR. LENGTH

[M8]
Select the length of the data bit.
Refer to "#9204 DEV1 PARITY CHECK".
0: 5 (bit)
1: 6
2: 7 (NC connection not supported)
3: 8

#9207 DEV1 TERMINATR TYP

[M8]
Select the code to terminate data reading.
0 and 3: EOR
1 and 2: EOB or EOR
* When M800W display side serial port is selected
0: No terminator
1: EOR
2: EOB
3: EOB or EOR

#9208 DEV1 HAND SHAKE

[M8]
Select the transmission control method.
No handshaking will be used when a value except 1 to 3 is set.
1: RTS/CTS method
2: No handshaking
3: DC code method

#9209 DEV1 DC CODE PRTY

[M8]
Select the DC code type when the DC code method is selected.
0: Not add parity to DC code (DC3 = 13H)
1: Add parity to DC code (DC3 = 93H)

#9211 DEV1 DC2/4 OUTPUT

[M8]
Select the DC code handling when outputting data to the output device.
DC2 / DC4
0: None / None
1: Yes / None
2: None / Yes
3: Yes / Yes

#9212 DEV1 CR OUTPUT

[M8]
Select whether to add the (CR) code just before the EOB (L/F) code during output.
0: Not add
1: Add

#9213 DEV1 EIA OUTPUT

[M8]
Select ISO or EIA code for data output.
In data input mode, the ISO and EIA codes are identified automatically.
0: ISO code output
1: EIA code output

#9214 DEV1 FEED CHR.

[M8]
Set the length of the tape feed to be output at the start and end of the data during tape output.
---Setting range---
0 to 999 (characters)

#9215 DEV1 PARITY V

[M8]
Select whether to perform the parity check for the number of characters in a block at the input of data. At the output of data, the number of characters is always adjusted to for the parity check.
0: Not perform parity V check
1: Perform parity V check

#9216 DEV1 TIME-OUT (sec)

[M8]
Set the time out time to detect an interruption in communication.
Time out check will not be executed when set to "0".

---Setting range---

0 to 30 (s)

#9217 DEV1 DR OFF

[M8]
Select whether to enable the DR data check in data I/O mode.

0: Enable
1: Disable

#9218 DEV1 DATA ASCII

[M8]
Select the code of the output data.

0: ISO/EIA code (Depends on whether #9113, #9213, #9313, #9413 or #9513 EIA output parameter is set up.)
1: ASCII code

#9219 DEV1 INPUT TYPE

[M8]
Select the mode for input (verification).

0: Standard input (Data from the very first EOB is handled as significant information.)
1: EOBs following the first EOB of the input data are skipped until data other than EOB is input

#9220 DEV1 OUT BUFFER

[M8]
Select the buffer size of the output data which is output to output device using NC side serial port.
If the output device has a transmission error (overrun error), decrease the buffer size with this parameter.
If the buffer size is decreased, output time will prolong according to the size.

0: 250 bytes (default)
1: 1 byte
2: 4 byte
3: 8 byte
4: 16 byte
5: 64 byte

#9221 DEV1 EIA CODE [

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code " [".
When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9222 DEV1 EIA CODE]

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "] ".
When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9223 DEV1 EIA CODE #

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "**#**".
When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified. .

---Setting range---

0 to FF (hexadecimal)

#9224 DEV1 EIA CODE *

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "*".
When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9225 DEV1 EIA CODE =

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "=".
When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9226 DEV1 EIA CODE :

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code " : ".
When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9227 DEV1 EIA CODE $

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "$". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9228 DEV1 EIA CODE !

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "!". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9301 DEV2 DEVICE NAME

[M8]
Set the device name corresponding to the device No.
Set a simple name for quick identification.

---Setting range---

Use alphabet characters, numerals and symbols to set a name within 3 characters.

#9302 DEV2 BAUD RATE

[M8]
Select the serial communication speed.

0: 19200 (bps)
1: 9600
2: 4800
3: 2400
4: 1200
5: 600
6: 300
7: 110

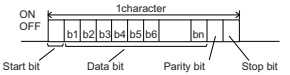
#9303 DEV2 STOP BIT

[M8]
Select the stop bit length used in the start-stop system.
Refer to "#9304 DEV2 PARITY CHECK". At the output of data, the number of characters is always adjusted to for the parity check.

1: 1 (bit)
2: 1.5
3: 2

#9304 DEV2 PARITY CHECK

[M8]
Select whether to add a parity check bit to the data.



Set this parameter in accordance with the I/O device specifications.

0: Not add a parity bit in I/O mode
1: Add a parity bit in I/O mode

#9305 DEV2 EVEN PARITY

[M8]
Select whether even or odd parity will be used when parity is used. This parameter is ignored when no parity is added.

0: Odd parity
1: Even parity

#9306 DEV2 CHR. LENGTH

[M8]
Select the length of the data bit.
Refer to "#9304 DEV2 PARITY CHECK".

0: 5 (bit)
1: 6
2: 7 (NC connection not supported)
3: 8

#9307 DEV2 TERMINATR TYP

[M8]
Select the code to terminate data reading.

0 and 3: EOR
1 and 2: EOB or EOR

* When M800W display side serial port is selected

0: No terminator
1: EOR
2: EOB
3: EOB or EOR

#9308 DEV2 HAND SHAKE

[M8]
Select the transmission control method.
No handshaking will be used when a value except 1 to 3 is set.

1: RTS/CTS method
2: No handshaking
3: DC code method

#9309 DEV2 DC CODE PRTY

[M8]
Select the DC code type when the DC code method is selected.
0: Not add parity to DC code (DC3 = 13H)
1: Add parity to DC code (DC3 = 93H)

#9311 DEV2 DC2/4 OUTPUT

[M8]
Select the DC code handling when outputting data to the output device.
DC2 / DC4
0: None / None
1: Yes / None
2: None / Yes
3: Yes / Yes

#9312 DEV2 CR OUTPUT

[M8]
Select whether to add the (CR) code just before the EOB (L/F) code during output.
0: Not add
1: Add

#9313 DEV2 EIA OUTPUT

[M8]
Select ISO or EIA code for data output.
In data input mode, the ISO and EIA codes are identified automatically.
0: ISO code output
1: EIA code output

#9314 DEV2 FEED CHR.

[M8]
Set the length of the tape feed to be output at the start and end of the data during tape output.
---Setting range---
0 to 999 (characters)

#9315 DEV2 PARITY V

[M8]
Select whether to perform the parity check for the number of characters in a block at the input of data.
At the output of data, the number of characters is always adjusted to for the parity check.
0: Not perform parity V check
1: Perform parity V check

#9316 DEV2 TIME-OUT (sec)

[M8]
Set the time out time to detect an interruption in communication.
Time out check will not be executed when set to "0".
---Setting range---
0 to 30 (s)

#9317 DEV2 DR OFF

[M8]
Select whether to enable the DR data check in data I/O mode.
0: Enable
1: Disable

#9318 DEV2 DATA ASCII

[M8]
Select the code of the output data.
0: ISO/EIA code (Depends on whether #9113, #9213, #9313, #9413 or #9513 EIA output parameter is set up.)
1: ASCII code

#9319 DEV2 INPUT TYPE

[M8]
Select the mode for input (verification).
0: Standard input (Data from the very first EOB is handled as significant information.)
1: EOBs following the first EOB of the input data are skipped until data other than EOB is input

#9320 DEV2 OUT BUFFER

[M8]
Select the buffer size of the output data which is output to output device using NC side serial port.
If the output device has a transmission error (overrun error), decrease the buffer size with this parameter.
If the buffer size is decreased, output time will prolong according to the size.
0: 250 bytes (default)
1: 1 byte
2: 4 byte
3: 8 byte
4: 16 byte
5: 64 byte

#9321 DEV2 EIA CODE [

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code " [".
When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.
---Setting range---
0 to FF (hexadecimal)

#9322 DEV2 EIA CODE]

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "] ". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9323 DEV2 EIA CODE #

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "#". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9324 DEV2 EIA CODE *

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "*". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9325 DEV2 EIA CODE =

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "=". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9326 DEV2 EIA CODE :

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code " : ". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9327 DEV2 EIA CODE $

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "$". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9328 DEV2 EIA CODE !

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "!". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---
0 to FF (hexadecimal)

#9401 DEV3 DEVICE NAME

[M8]
Set the device name corresponding to the device No.
Set a simple name for quick identification.

---Setting range---
Use alphabet characters, numerals and symbols to set a name within 3 characters.

#9402 DEV3 BAUD RATE

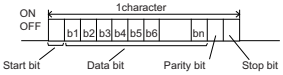
[M8]
Select the serial communication speed.
0: 19200 (bps)
1: 9600
2: 4800
3: 2400
4: 1200
5: 600
6: 300
7: 110

#9403 DEV3 STOP BIT

[M8]
Select the stop bit length used in the start-stop system.
Refer to "#9404 DEV3 PARITY CHECK". At the output of data, the number of characters is always adjusted to for the parity check.
1: 1 (bit)
2: 1.5
3: 2

#9404 DEV3 PARITY CHECK

[M8]
Select whether to add a parity check bit to the data.



Set this parameter in accordance with the I/O device specifications.
0: Not add a parity bit in I/O mode
1: Add a parity bit in I/O mode

#9405 DEV3 EVEN PARITY

[M8]
Select whether even or odd parity will be used when parity is used. This parameter is ignored when no parity is added.
0: Odd parity
1: Even parity

#9406 DEV3 CHR. LENGTH

[M8]
Select the length of the data bit.
Refer to "#9404 DEV3 PARITY CHECK".
0: 5 (bit)
1: 6
2: 7 (NC connection not supported)
3: 8

#9407 DEV3 TERMINATR TYP

[M8]
Select the code to terminate data reading.
0, 3: EOR
1, 2: EOB or EOR

#9408 DEV3 HAND SHAKE

[M8]
Select the transmission control method.
No handshaking will be used when a value except 1 to 3 is set.
1: RTS/CTS method
2: No handshaking
3: DC code method

#9409 DEV3 DC CODE PRTY

[M8]
Select the DC code type when the DC code method is selected.
0: Not add parity to DC code (DC3 = 13H)
1: Add parity to DC code (DC3 = 93H)

#9411 DEV3 DC2/4 OUTPUT

[M8]
Select the DC code handling when outputting data to the output device.
DC2 / DC4
0: None / None
1: Yes / None
2: None / Yes
3: Yes / Yes

#9412 DEV3 CR OUTPUT

[M8]
Select whether to add the (CR) code just before the EOB (L/F) code during output.
0: Not add
1: Add

#9413 DEV3 EIA OUTPUT

[M8]
Select ISO or EIA code for data output.
In data input mode, the ISO and EIA codes are identified automatically.
0: ISO code output
1: EIA code output

#9414 DEV3 FEED CHR.

[M8]
Set the length of the tape feed to be output at the start and end of the data during tape output.
---Setting range---
0 to 999 (characters)

#9415 DEV3 PARITY V

[M8]
Select whether to perform the parity check for the number of characters in a block at the input of data.
At the output of data, the number of characters is always adjusted to for the parity check.
0: Not perform parity V check
1: Perform parity V check

#9416 DEV3 TIME-OUT (sec)

[M8]
Set the time out time to detect an interruption in communication.
Time out check will not be executed when set to "0".
---Setting range---
0 to 30 (s)

#9417 DEV3 DR OFF

[M8]
Select whether to enable the DR data check in data I/O mode.
0: Enable
1: Disable

#9418 DEV3 DATA ASCII

[M8]
Select the code of the output data.
0: ISO/EIA code (Depends on whether #9113, #9213, #9313, #9413 or #9513 EIA output parameter is set up.)
1: ASCII code

#9419 DEV3 INPUT TYPE

[M8]
Select the mode for input (verification).
0: Standard input (Data from the very first EOB is handled as significant information.)
1: EOBs following the first EOB of the input data are skipped until data other than EOB is input.

#9420 DEV3 OUT BUFFER

[M8]
Select the buffer size of the output data which is output to output device using NC side serial port.
If the output device has a data receiving error (overrun error), decrease the buffer size with this parameter.
If the buffer size is decreased, output time will prolong according to the size.
0: 250 bytes (default)
1: 1 byte
2: 4 bytes
3: 8 bytes
4: 16 bytes
5: 64 bytes

#9421 DEV3 EIA CODE [

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code " [". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.
---Setting range---
0 to FF (hexadecimal)

#9422 DEV3 EIA CODE]

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "] ". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.
---Setting range---
0 to FF (hexadecimal)

#9423 DEV3 EIA CODE #

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "#". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.
---Setting range---
0 to FF (hexadecimal)

#9424 DEV3 EIA CODE *

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "*". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.
---Setting range---
0 to FF (hexadecimal)

#9425 DEV3 EIA CODE =

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "=". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.
---Setting range---
0 to FF (hexadecimal)

#9426 DEV3 EIA CODE :

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code " : ". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.
---Setting range---
0 to FF (hexadecimal)

#9427 DEV3 EIA CODE $

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "$". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.
---Setting range---
0 to FF (hexadecimal)

#9428 DEV3 EIA CODE !

[M8]

Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "!". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9501 DEV4 DEVICE NAME

[M8]

Set the device name corresponding to the device No.

Set a simple name for quick identification.

---Setting range---

Use alphabet characters, numerals and symbols to set a name within 3 characters.

#9502 DEV4 BAUD RATE

[M8]

Select the serial communication speed.

0: 19200 (bps)
1: 9600
2: 4800
3: 2400
4: 1200
5: 600
6: 300
7: 110

#9503 DEV4 STOP BIT

[M8]

Select the stop bit length used in the start-stop system.

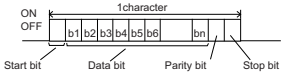
Refer to "#9504 DEV4 PARITY CHECK". At the output of data, the number of characters is always adjusted to for the parity check.

1: 1 (bit)
2: 1.5
3: 2

#9504 DEV4 PARITY CHECK

[M8]

Select whether to add a parity check bit to the data.



Set this parameter in accordance with the I/O device specifications.

0: Not add a parity bit in I/O mode
1: Add a parity bit in I/O mode

#9505 DEV4 EVEN PARITY

[M8]

Select whether even or odd parity will be used when parity is used. This parameter is ignored when no parity is added.

0: Odd parity
1: Even parity

#9506 DEV4 CHR. LENGTH

[M8]

Select the length of the data bit.

Refer to "#9504 DEV4 PARITY CHECK".

0: 5 (bit)
1: 6
2: 7 (NC connection not supported)
3: 8

#9507 DEV4 TERMINATR TYP

[M8]

Select the code to terminate data reading.

0, 3: EOR
1, 2: EOB or EOR

#9508 DEV4 HAND SHAKE

[M8]

Select the transmission control method.

No handshaking will be used when a value except 1 to 3 is set.

1: RTS/CTS method
2: No handshaking
3: DC code method

#9509 DEV4 DC CODE PRTY

[M8]

Select the DC code type when the DC code method is selected.

0: Not add parity to DC code (DC3 = 13H)
1: Add parity to DC code (DC3 = 93H)

#9511 DEV4 DC2/4 OUTPUT

[M8]
Select the DC code handling when outputting data to the output device.
DC2 / DC4
0: None / None
1: Yes / None
2: None / Yes
3: Yes / Yes

#9512 DEV4 CR OUTPUT

[M8]
Select whether to add the (CR) code just before the EOB (L/F) code during output.
0: Not add
1: Add

#9513 DEV4 EIA OUTPUT

[M8]
Select ISO or EIA code for data output.
In data input mode, the ISO and EIA codes are identified automatically.
0: ISO code output
1: EIA code output

#9514 DEV4 FEED CHR.

[M8]
Set the length of the tape feed to be output at the start and end of the data during tape output.
---Setting range---
0 to 999 (characters)

#9515 DEV4 PARITY V

[M8]
Select whether to perform the parity check for the number of characters in a block at the input of data.
At the output of data, the number of characters is always adjusted to for the parity check.
0: Not perform parity V check
1: Perform parity V check

#9516 DEV4 TIME-OUT (sec)

[M8]
Set the time out time to detect an interruption in communication.
Time out check will not be executed when set to "0".
---Setting range---
0 to 30 (s)

#9517 DEV4 DR OFF

[M8]
Select whether to enable the DR data check in data I/O mode.
0: Enable
1: Disable

#9518 DEV4 DATA ASCII

[M8]
Select the code of the output data.
0: ISO/EIA code (Depends on whether #9113, #9213, #9313, #9413 or #9513 EIA output parameter is set up.)
1: ASCII code

#9519 DEV4 INPUT TYPE

[M8]
Select the mode for input (verification).
0: Standard input (Data from the very first EOB is handled as significant information.)
1: EOBs following the first EOB of the input data are skipped until data other than EOB is input.

#9520 DEV4 OUT BUFFER

[M8]
Select the buffer size of the output data which is output to output device using NC side serial port.
If the output device has a transmission error (overrun error), decrease the buffer size with this parameter.
If the buffer size is decreased, output time will prolong according to the size.
0: 250 bytes (default)
1: 1 byte
2: 4 byte
3: 8 byte
4: 16 byte
5: 64 byte

#9521 DEV4 EIA CODE [

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code " [".
When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.
---Setting range---
0 to FF (hexadecimal)

#9522 DEV4 EIA CODE]

[M8]
Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "] ".
When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.
---Setting range---
0 to FF (hexadecimal)

#9523 DEV4 EIA CODE #

[M8]

Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "#". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9524 DEV4 EIA CODE *

[M8]

Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "*". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9525 DEV4 EIA CODE =

[M8]

Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "=". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9526 DEV4 EIA CODE :

[M8]

Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code " : ". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9527 DEV4 EIA CODE $

[M8]

Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "$". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

#9528 DEV4 EIA CODE !

[M8]

Set the code in hexadecimal, which does not duplicate the existing EIA codes, for the special code "!". When output with EIA code, data can be output using the alternate code in which the special ISO code, not included in EIA, is specified.

---Setting range---

0 to FF (hexadecimal)

1.6 Axis Parameters

#1063 mandog Manual dog-type

Select the manual reference position return method for the second return (after the coordinate system is established) and later.
The initial reference position return after the power ON is performed with dog-type return, and the co-ordinate system will be established.
(This setting is not required when the absolute position detection is used.)
0: High speed return
1: Dog-type

#8201 AX. RELEASE

Select the function to remove the control axis from the control target.
0: Control as normal.
1: Remove from control target.

#8202 OT-CHECK OFF

Select whether to enable the stored stroke limit II function set in #8204 and #8205.
0: Enable
1: Disable

#8203 OT-CHECK-CANCEL

When the simple absolute position method ("#2049 type" is "9") is selected, the stored stroke limits I, II (or IIB) and IB can be disabled until the first reference position return is executed after the power is turned ON.
0: Enable (according to #8202)
1: Temporarily cancel

(Note) "#8203 OT-CHECK-CANCEL" affects all the stored stroke limits.

#8204 OT-CHECK-N

Set the coordinates of the (-) direction in the movable range of the stored stroke limit II or the lower limit coordinates of the prohibited range of stored stroke limit IIB.
If the sign and value are the same as #8205, the stored stroke limit II (or IIB) will be invalid.
If the stored stroke limit IIB function is selected, the prohibited range will be between two points even when #8204 and #8205 are set in reverse. When II is selected, the entire range will be prohibited if #8204 and #8205 are set in reverse.
---Setting range---
-99999.999 to 99999.999 (mm)

#8205 OT-CHECK-P

Set the coordinates of the (+) direction in the movable range of the stored stroke limit II or the upper limit coordinates of the prohibited range of stored stroke limit IIB.
---Setting range---
-99999.999 to 99999.999 (mm)

#8206 TOOL CHG. P

Set the coordinates of the tool change position for G30. n (tool change position return).
Set with coordinates in the basic machine coordinate system.
---Setting range---
-99999.999 to 99999.999 (mm)

#8207 G76/87 IGNR (for M system only)

Select whether to enable the shift operation at G76 (fine boring) and G87 (back boring).
0: Enable
1: Disable

#8208 G76/87 (-) (for M system only)

Select the shift direction at G76 and G87.
0: Shift to (+) direction
1: Shift to (-) direction

#8209 G60 SHIFT (for M system only)

Set the last positioning direction and distance for a G60 (unidirectional positioning) command.
---Setting range---
-99999.999 to 99999.999 (mm)

#8210 OT INSIDE

Select whether the stored stoke limit function set by #8204 and #8205 prevents the machine from moving to the inside or outside of the specified range.
0: Inhibits outside area (Select stored stroke limit II.)
1: Inhibits inside area (Select stored stroke limit IIB.)

#8211 MIRR. IMAGE

Select whether to enable the parameter mirror image function.
0: Disable
1: Enable

(PR) #8213 Rotation axis type

Select the rotation type (short-cut valid/invalid) or linear type (workpiece coordinate linear type/all coordinate linear type).
This parameter is enabled only when "#1017 rot" is set to "1". (Note)
0: Short-cut invalid
1: Short-cut valid
2: Workpiece coordinate linear type
3: All coordinate linear type

(Note) The movement method is as follows by the specified rotation axis type.

<Workpiece coordinate value>
0,1 : Display range 0° to 359.999°
2,3 : Display range 0° to ±99999.999°
<Machine coordinate value/relative position>
0,1,2 : Display range 0° to 359.999°
3 : Display range 0° to ±99999.999°
<ABS command>
0 : The incremental amount from the end point to the current position is divided by 360, and the axis moves by the remainder amount according to the sign.
1 : Moves with a short-cut to the end point.
2,3 : In the same manner as the normal linear axis, moves according to the sign by the amount obtained by subtracting the current position from the end point.
<INC command>
0,1,2,3 : Moves in the direction of the commanded sign by the commanded incremental amount starting at the current position.
<Reference position return>
0,1,2 : The movement to the middle point applies to the ABS command or the INC command. Returns with movement within 360 degrees from the middle point to reference position.
3 : The movement to the middle point applies to the ABS command or the INC command. Moves and returns in the reference position direction for the difference from the current position to the reference position.

#8215 TLM std length

Set the TLM standard length.
TLM standard length is the distance from a tool replacement point (reference position) to the measurement basic point (surface) which is used to measure the tool length.
(The same value as "#2016 tlml+" will be reflected. When either setting changes, the other will change accordingly.)

---Setting range---

-99999.999 to 99999.999 (mm)

#8216 Type in G28 return

Select the performance after establishing the reference position in reference position return command.
0: Moves to the reference position.
1: Won't move to the reference position.

#8217 Check start point

[M8]
Set a drawing start position in graphic check of each axis.
Set a distance from actual machine position by an incremental value.
When "0" is set, an actual machine position will be regarded as a start point in graphic check.

---Setting range---

-99999.999 to 99999.999 (mm)

[C80]
Not used.

#8218 Dir cmd retrct amt

Set in which direction and how much the tool escapes when the operation is halted during direct command mode. (Radius value)
The tool does not escape when "0" is set.

---Setting range---

-99999.999 to 99999.999 (mm)

#8219 Hob retract amount 1

Set the retract amount using the radius value when the Hob retract amount selection signal is OFF.
Retract is carried out in the negative direction if a negative value is set.

---Setting range---

-99999.999 to 99999.999 (mm)

#8220 Hob retract amount 2

Set the retract amount using the radius value when the Hob retract amount selection signal is ON.
Retract is carried out in the negative direction if a negative value is set.

---Setting range---

-99999.999 to 99999.999 (mm)

#8221 Hob retract speed

Set the retract speed during hobbing.

---Setting range---

1 to 1000000 (mm/min)

(PR) #8224 Posn display range

Current position display range
Select the display range of the current position.
0: 0 to 359.999 deg
1: -99999.999 to 99999.999 deg

(PR) #8225 Wk coord at R ret.

Workpiece coordinate position displayed right after automatic reference position return

Select whether to apply a range of 0 to 360 degrees to the workpiece coordinate position displayed right after automatic reference position return if the said position is out of the range of 0 to 360 degrees.

0: Display the position in a range of 0 to 360 degrees
1: Not display the position in a range of 0 to 360 degrees

#8226 Wk position check

Workpiece position check

Select whether to check a difference of workpiece coordinate position between when NC is reset and when program operation is started, when both High-speed simple program check mode ON (X712) and High-speed simple program check: Coordinate position check ON (X713) are set to ON.

0: Disable the check
1: Enable the check

#8227 Machine posn check

Machine position check

Select whether to check a difference of machine coordinate command position between when NC is reset and when program operation is started, when both High-speed simple program check mode ON (X712) and High-speed simple program check: Coordinate position check ON (X713) are set to ON.

0: Disable the check
1: Enable the check

1.7 Ethernet Parameters

(PR) #1926 Global IP address IP address

Set the main CPU's IP address.
Set the NC IP address seen from an external source.

---Setting range---

Set these parameters in accordance with the network rules in the connection environment.

(PR) #1927 Global Subnet mask Subnet mask

Set the subnet mask for the IP address.

---Setting range---

Set these parameters in accordance with the network rules in the connection environment.

(PR) #1928 Global Gateway Gateway

Set the IP address for the gateway.

---Setting range---

Set these parameters in accordance with the network rules in the connection environment.

(PR) #1934 Local IP address

[M8]
Set the HMI side CPU's IP address.

---Setting range---

Set these parameters in accordance with the network rules in the connection environment.

[C80]
Not used.

(PR) #1935 Local Subnet mask

[M8]
Set the HMI side CPU's subnet mask.

---Setting range---

0.0.0.0 to 255.255.255.255

[C80]
Not used.

(PR) #1937 NET1 IP Address NET1 IP address

[M8]
Specify the IP address of the file server (NFS server).
If "0.0.0.0" is set in this parameter, network drive (NET1) cannot be used (disabled).

---Setting range---

0.0.0.0 to 255.255.255.255

[C80]
Not used.

(PR) #1938 NET2 IP Address NET2 IP address

[M8]
Specify the IP address of the file server (NFS server).
If "0.0.0.0" is set in this parameter, network drive (NET2) cannot be used (disabled).

---Setting range---

0.0.0.0 to 255.255.255.255

[C80]
Not used.

(PR) #1939 NET3 IP Address NET3 IP address

[M8]
Specify the IP address of the file server (NFS server).
If "0.0.0.0" is set in this parameter, network drive (NET3) cannot be used (disabled).

---Setting range---

0.0.0.0 to 255.255.255.255

[C80]
Not used.

(PR) #1940 NET4 IP Address NET4 IP address

[M8]
Specify the IP address of the file server (NFS server).
If "0.0.0.0" is set in this parameter, network drive (NET4) cannot be used (disabled).

---Setting range---

0.0.0.0 to 255.255.255.255

[C80]
Not used.

#1941 Local time compen Local time correction

[M8]
Files stored on file server are managed based on the system time (GMT: Greenwich Mean Time).
This parameter is used to specify the correction time for converting the time obtained through custom API library from the system time basis to local time basis.
When this parameter is set to 0, the NC determines the correction time based on the language selected by "#1043 lang".

---Setting range---

-12 to 12 [hour]

[C80]
Not used.

(PR) #1953 Intra IP address IP address on windows-less display unit (LAN1) side

[M8]
Specify the IP address on the windows-less display unit (LAN1) side.

---Setting range---

Set these parameters in accordance with the network rules in the connection environment.

[C80]
Not used.

(PR) #1954 Intra Subnet mask — **Subnet mask on windows-less display unit (LAN1) side**

[M8]
Specify the IP address of subnet mask on the windows-less display unit (LAN1) side.
---Setting range---
Set these parameters in accordance with the network rules in the connection environment.
[C80]
Not used.

(PR) #1955 Intra Gateway — **Gateway on windows-less display unit (LAN1) side**

[M8]
Specify the gateway IP address on the windows-less display unit (LAN1) side.
---Setting range---
Set these parameters in accordance with the network rules in the connection environment.
[C80]
Not used.

(PR) #9701 IP addr auto set

[M8]
The IP address is automatically assigned from the server.
0: Manual setting
1: Automatic setting
(Note) When the automatic setting is selected, "#11005 PC IP address, PC Subnet, PC Gateway" will be invalid.
[C80]
Not used.

#9706 Host No.

[M8]
Select the No. of the host to be used from host 1 to host 4.
---Setting range---
1 to 4 : Host No.
[C80]
Not used.

#9711 Host1 host name

[M8]
Set the host computer name.
This parameter allows the NC to easily recognize the host computer on the network. Set the host computer's name (name registered in C:\windows\hosts) or the IP address.
<Setting example>
For host name: mspc160
For IP address: 150.40.0.111
(Note) Set the host computer's TCP/IP address if communication is not carried out correctly.
---Setting range---
15 characters (alphanumeric) or less
[C80]
Not used.

#9712 Host1 user name

[M8]
Set the user name when logging into the host computer.
---Setting range---
15 characters (alphanumeric) or less
[C80]
Not used.

#9713 Host1 password

[M8]
Set the password when logging into the host computer.
---Setting range---
15 characters (alphanumeric) or less
[C80]
Not used.

#9714 Host1 directory

[M8]
Set the directory name of the host computer.
The directory released to the client (NC unit) with the host computer's server is handled as root directory by the NC unit.
---Setting range---
31 characters (alphanumeric) or less
[C80]
Not used.

#9715 Host1 host type

[M8]
Select the type of the host computer.
0: UNIX/PC automatic judgment
1: UNIX
2: PC (DOS)

(Note) When "0" is set, the settings for the following parameters will be invalid.
- #9716 Wrd pos: name
- #9717 Wrd pos: size
- #9718 Wrd pos: Dir
- #9719 Wrd pos: cmnt
- #9720 Wrd num: cmnt

[C80]
Not used.

#9716 Host 1 Wrd pos: name

[M8]
Set the file name display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9717 Host 1 Wrd pos: size

[M8]
Set the size display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9718 Host 1 Wrd pos: Dir

[M8]
Set the <DIR> display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9719 Host 1 Wrd pos: cmnt

[M8]
Set the comment (date, time, etc.) display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9720 Host 1 Wrd num: cmnt

[M8]
Set the number of words to be displayed as a comment.

(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9721 Host 1 no total siz

[M8]
Set whether to display the total number of characters registered in the machining programs of host1 when displaying the file list.
If there are many files in the directory to be referred to, the list can be updated quickly by setting "1".

0: Display
1: Not display

[C80]
Not used.

#9731 Host2 host name

[M8]
Set the host computer name.
This parameter allows the NC to easily recognize the host computer on the network. Set the host computer's name (name registered in C:\windows\hosts) or the IP address.
<Setting example>
For host name: mspc160
For IP address: 150.40.0.111
(Note) Set the host computer's TCP/IP address if communication is not carried out correctly.

---Setting range---

15 characters (alphanumeric) or less

[C80]
Not used.

#9732 Host2 user name

[M8]
Set the user name when logging into the host computer.

---Setting range---

15 characters (alphanumeric) or less

[C80]
Not used.

#9733 Host2 password

[M8]
Set the password when logging into the host computer.
---Setting range---
15 characters (alphanumeric) or less
[C80]
Not used.

#9734 Host2 directory

[M8]
Set the directory name of the host computer.
The directory released to the client (NC unit) with the host computer's server is handled as the root directory by the NC unit.
---Setting range---
31 characters (alphanumeric) or less
[C80]
Not used.

#9735 Host2 host type

[M8]
Select the type of the host computer.
0: UNIX/PC automatic judgment
1: UNIX
2: PC (DOS)

(Note) When "0" is set, the settings for the following parameters will be invalid.
- #9736 Wrd pos: name
- #9737 Wrd pos: size
- #9738 Wrd pos: Dir
- #9739 Wrd pos: cmnt
- #9740 Wrd num: cmnt

[C80]
Not used.

#9736 Host 2 Wrd pos: name

[M8]
Set the file name display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.
---Setting range---
0 to 100
0: Default value
[C80]
Not used.

#9737 Host 2 Wrd pos: size

[M8]
Set the size display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.
---Setting range---
0 to 100
0: Default value
[C80]
Not used.

#9738 Host 2 Wrd pos: Dir

[M8]
Set the <DIR> display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.
---Setting range---
0 to 100
0: Default value
[C80]
Not used.

#9739 Host 2 Wrd pos: cmnt

[M8]
Set the comment (date, time, etc.) display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.
---Setting range---
0 to 100
0: Default value
[C80]
Not used.

#9740 Host 2 Wrd num: cmnt

[M8]
Set the number of words to be displayed as a comment.

(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9741 Host 2 no total siz

[M8]
Set whether to display the total number of characters registered in the machining programs of host1 when displaying the file list.
If there are many files in the directory to be referred to, the list can be updated quickly by setting "1".
0: Display
1: Not display

[C80]
Not used.

#9751 Host3 host name

[M8]
Set the host computer name.
This parameter allows the NC to easily recognize the host computer on the network. Set the host computer's name (name registered in C:\windows\hosts) or the IP address.
<Setting example>
For host name: mspc160
For IP address: 150.40.0.111
(Note) Set the host computer's TCP/IP address if communication is not carried out correctly.

---Setting range---

15 characters (alphanumeric) or less

[C80]
Not used.

#9752 Host3 user name

[M8]
Set the user name when logging into the host computer.

---Setting range---

15 characters (alphanumeric) or less

[C80]
Not used.

#9753 Host3 password

[M8]
Set the password when logging into the host computer.

---Setting range---

15 characters (alphanumeric) or less

[C80]
Not used.

#9754 Host3 directory

[M8]
Set the directory name of the host computer.
The directory released to the client (NC unit) with the host computer's server is handled as the root directory by the NC unit.

---Setting range---

31 characters (alphanumeric) or less

[C80]
Not used.

#9755 Host3 host type

[M8]
Select the type of the host computer.
0: UNIX/PC automatic judgment
1: UNIX
2: PC (DOS)

(Note) When "0" is set, the settings for the following parameters will be invalid.
- #9756 Wrd pos: name
- #9757 Wrd pos: size
- #9758 Wrd pos: Dir
- #9759 Wrd pos: cmnt
- #9760 Wrd num: cmnt

[C80]
Not used.

#9756 Host 3 Wrd pos: name

[M8]
Set the file name display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9757 Host 3 Wrd pos: size

[M8]
Set the size display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.
---Setting range---
0 to 100
0: Default value
[C80]
Not used.

#9758 Host 3 Wrd pos: Dir

[M8]
Set the <DIR> display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.
---Setting range---
0 to 100
0: Default value
[C80]
Not used.

#9759 Host 3 Wrd pos: cmnt

[M8]
Set the comment (date, time, etc.) display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.
---Setting range---
0 to 100
0: Default value
[C80]
Not used.

#9760 Host 3 Wrd num: cmnt

[M8]
Set the number of words to be displayed as a comment.

(Note) One word designates a character string divided by one or more spaces.
---Setting range---
0 to 100
0: Default value
[C80]
Not used.

#9761 Host 3 no total siz

[M8]
Set whether to display the total number of characters registered in the machining programs of host1 when displaying the file list.
If there are many files in the directory to be referred to, the list can be updated quickly by setting "1".
0: Display
1: Not display
[C80]
Not used.

#9771 Host4 host name

[M8]
Set the host computer name.
This parameter allows the NC to easily recognize the host computer on the network. Set the host computer's name (name registered in C:\windows\hosts) or the IP address.
<Setting example>
For host name: mspc160
For IP address: 150.40.0.111
(Note) Set the host computer's TCP/IP address if communication is not carried out correctly.
---Setting range---
15 characters (alphanumeric) or less
[C80]
Not used.

#9772 Host4 user name

[M8]
Set the user name when logging into the host computer.
---Setting range---
15 characters (alphanumeric) or less
[C80]
Not used.

#9773 Host4 password

[M8]
Set the password when logging into the host computer.
---Setting range---
15 characters (alphanumeric) or less
[C80]
Not used.

#9774 Host4 directory

[M8]
Set the directory name of the host computer.
The directory released to the client (NC unit) with the host computer's server is handled as the root directory by the NC unit.

---Setting range---

31 characters (alphanumeric) or less

[C80]
Not used.

#9775 Host4 host type

[M8]
Select the type of the host computer.

0: UNIX/PC automatic judgment
1: UNIX
2: PC (DOS)

(Note) When "0" is set, the settings for the following parameters will be invalid.
- #9776 Wrd pos: name
- #9777 Wrd pos: size
- #9778 Wrd pos: Dir
- #9779 Wrd pos: cmnt
- #9780 Wrd num: cmnt

[C80]
Not used.

#9776 Host 4 Wrd pos: name

[M8]
Set the file name display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9777 Host 4 Wrd pos: size

[M8]
Set the size display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9778 Host 4 Wrd pos: Dir

[M8]
Set the <DIR> display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9779 Host 4 Wrd pos: cmnt

[M8]
Set the comment (date, time, etc.) display position (nth word from left) of the list displayed when the ftp command "dir" is executed.

(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9780 Host 4 Wrd num: cmnt

[M8]
Set the number of words to be displayed as a comment.
(Note) One word designates a character string divided by one or more spaces.

---Setting range---

0 to 100
0: Default value

[C80]
Not used.

#9781 Host 4 no total siz

[M8]
Set whether to display the total number of characters registered in the machining programs of host1 when displaying the file list.
If there are many files in the directory to be referred to, the list can be updated quickly by setting "1".
0: Display
1: Not display
[C80]
Not used.

(PR) #9800 MES-IF DB IP addr DB IP address

[M8]
Set the IP address of the connection destination database.
---Setting range---
0.0.0.0 to 255.255.255.255
[C80]
Not used.

(PR) #9801 MES-IF DB Port No DB PORT No.

[M8]
Set the service port No. of the connection destination database connector.
---Setting range---
1024 to 65535
[C80]
Not used.

(PR) #9802 MES-IF DB timeout DB communication time-out (sec)

[M8]
Set the communication timeout time (in seconds) with the connection destination database.
When "0" is set, the time will be regarded as 60 seconds.
---Setting range---
0 to 3600
[C80]
Not used.

(PR) #9803 MES-IF DB Type DB type

[M8]
Select the type of the connection destination database.
0: Oracle or none specified
1: Microsoft SQL Server
2: Microsoft Access
---Setting range---
0 to 2
[C80]
Not used.

(PR) #9804 MES-IF DB Name Database name

[M8]
Set the name of the connection destination database.
---Setting range---
Up to 15 characters including alphanumeric characters and '_' (underscore)
[C80]
Not used.

(PR) #9805 MES-IF DB User User name

[M8]
Set the user name for connecting the database.
(The omission of the user name is possible in MS Access. Enter "0" if omitted.)
---Setting range---
Up to 15 characters including alphanumeric characters and '_' (underscore)
[C80]
Not used.

(PR) #9806 MES-IF DB Password Password

[M8]
Set the password for the user name.
(The omission of the user name is possible in MS Access. Enter "0" if omitted.)
---Setting range---
Up to 15 characters including alphanumeric characters and '_' (underscore)
[C80]
Not used.

(PR) #9807 MES-IF DB Table DB table name

[M8]
Set the table name registered by the registration function of each database. Register the table name to which the following suffix is added in the database.
_FIN: Machining information database registration
_ALM: Alarm information database registration
_USR: User arbitrary information database registration
---Setting range---
Up to 15 characters including alphanumeric characters and '_' (underscore)
[C80]
Not used.

(PR) #11005 PC IP address IP address setting

[M8]
Set the IP address for the display unit or PC in which machining programs are stored.
Set the IP address for the display unit of which power is turned OFF with automatic power OFF.
When the 3D machine interference check function is enabled, set the IP address of the display unit that is used for the 3D machine interference check (for M800W only).
(Note) When "0.0.0.0" is input, "192.168.100.2" is automatically set.
* This parameter is dedicated to M800W/M80W with Windows-based display.

PC Subnet
Set the subnet mask for the display unit or PC in which machining programs are stored.

PC Gateway
Set the gateway for the display unit or PC in which machining programs are stored.

---Setting range---
0.0.0.0 to 255.255.255.255

[C80]
Not used.

1.8 Computer Link Parameters [M8]

#9601 BAUD RATE

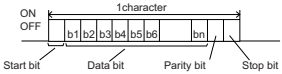
[M8]
Select the rate at which data is transferred.
0: 19200 (bps)
1: 9600
2: 4800
3: 2400
4: 1200
5: 600
6: 300
7: 110
8: 38400

#9602 STOP BIT

[M8]
Select the stop bit length used in the start-stop system.
Refer to "#9603 PARITY EFFECTIVE". At the output of data, the number of characters is always adjusted to for the parity check.
1: 1 (bit)
2: 1.5
3: 2

#9603 PARITY EFFECTIVE

[M8]
Select whether to add the parity bit to the data.
The parameter is set when using a parity bit separately from the data bit.



Set this parameter according to the specifications of input/output device.
0: Not add a parity bit at the input/output
1: Add a parity bit at the input/output

#9604 EVEN PARITY

[M8]
Select odd or even when parity is added to the data. This parameter is ignored when no parity is added.
0: Odd parity
1: Even parity

#9605 CHR. LENGTH

[M8]
Select the length of the data bit.
Refer to "#9603 PARITY EFFECTIVE".
0: 5 (bit)
1: 6
2: 7 (NC connection not supported)
3: 8

#9606 HAND SHAKE

[M8]
Select the transmission control method.
"3" (DC code method) should be set for computer link B.
0: No control
1: RTS/CTS method
2: No handshaking
3: DC code method

#9607 TIME-OUT SET

[M8]
Set the time-out time at which an interruption of data transfer during data input/output should be detected.
"0" means infinite time-out.
---Setting range---
0 to 999 (1/10s)

#9608 DATA CODE

[M8]
Set the code to be used for the data description.
Refer to "#9603 PARITY EFFECTIVE".
0: ASCII code
1: ISO code

#9609 LINK PARAM. 1

[M8]
bit1: DC1 output after NAK or SYN
Select whether to output the DC1 code after the NAK or SYN code is output.
0: Not output the DC1 code.
1: Output the DC1 code.
bit7: Enable/disable resetting
Select whether to enable the resetting in the computer link.
0: Enable
1: Disable

#9610 LINK PARAM. 2

[M8]

Bit 2: Specify the control code parity (even parity for the control code).

Select whether to add an even parity to the control code, in accordance with the I/O device specifications.

0: Not add a parity bit to the control code
1: Add a parity bit to the control code

Bit 3: Parity V

Select whether to enable checking of parity V in one block at the input of the data.

0: Disable
1: Enable

#9611 Link PARAM. 3

[M8]

Not used. Set to "0".

#9612 Link PARAM. 4

[M8]

Not used. Set to "0".

#9613 Link PARAM. 5

[M8]

Not used. Set to "0".

#9614 START CODE

[M8]

Select the code used to command the first transfer of file data.
This parameter is used for a specific user. Normally set "0".

0: DC1 (11H)
1: BEL (07H)

#9615 CTRL. CODE OUT

[M8]

bit 0: NAK output

Select whether to send the NAK code to the host if a communication error occurs in computer link B.

0: Not output the NAK code
1: Output the NAK code.

bit 1: SYN output

Select whether to send the SYN code to the host if NC resetting or an emergency stop occurs in computer link B.

0: Not output the SYN code.
1: Output the SYN code.

bit 3: DC3 output

Select whether to send the DC3 code to the host when the communication ends in computer link B.

0: Not output the DC3 code.
1: Output the DC3 code.

#9616 CTRL. INTERVAL

[M8]

Not used. Set to "0".

#9617 WAIT TIME

[M8]

Not used. Set to "0".

#9618 PACKET LENGTH

[M8]

Not used. Set to "0".

#9619 BUFFER SIZE

[M8]

Not used. Set to "0".

#9620 START SIZE

[M8]

Not used. Set to "0".

#9621 DC1 OUT SIZE

[M8]

Not used. Set to "0".

#9622 POLLING TIMER

[M8]

Not used. Set to "0".

#9623 TRANS. WAIT TMR

[M8]

Not used. Set to "0".

#9624 RETRY COUNTER

[M8]

Not used. Set to "0".

1.9 Subprogram Storage Location Parameters [M8]

#8880 Subpro stor D0: dev

[M8]
If ",D1" to ",D4" is designated in a subprogram call, the called program will be searched from the storage (device and directory) set by this parameter.
(Example) M98 P (program No.), D0
[Device] "#8880 Subpro stor D0: dev", [Directory] "#8881 Subpro stor D0: dir"
The device and directory above will be searched.
(Note 1) If the called subprogram is not found, a program error will occur.
(Note 2) If there is no designation of D0 to D4, search is done according to the settings #8890 to #8894.
(Note 3) G:HD are available for M800W only.

---Setting range---
M: Memory
G: HD
R: Memory card
D: Data server
N: USB Memory

#8881 Subpro stor D0: dir

[M8]
Select the storage destination (directory) for the subprogram.
When D0 is designated at a subprogram call, the subprogram to be called will be searched from the directory selected with this parameter.
Refer to "#8880 Subpro stor D0: dev".

---Setting range---
Directory 48 characters

#8882 Subpro stor D1: dev

[M8]
If ",D1" to ",D4" is designated in a subprogram call, the called program will be searched from the storage (device and directory) set by this parameter.
(Example) M98 P (program No.), D0
[Device] "#8880 Subpro stor D0: dev", [Directory] "#8881 Subpro stor D0: dir"
The device and directory above will be searched.
(Note 1) If the called subprogram is not found, a program error will occur.
(Note 2) If there is no designation of D0 to D4, search is done according to the settings #8890 to #8894.
(Note 3) G:HD are available for M800W only.

---Setting range---
M: Memory
G: HD
R: Memory card
D: Data server
N: USB Memory

#8883 Subpro stor D1: dir

[M8]
Select the storage destination (directory) for the subprogram.
When D1 is designated at a subprogram call, the subprogram to be called will be searched from the directory selected with this parameter.
Refer to "#8882 Subpro stor D1: dev".

---Setting range---
Directory 48 characters

#8884 Subbro stor D2: dev

[M8]
If ",D1" to ",D4" is designated in a subprogram call, the called program will be searched from the storage (device and directory) set by this parameter.
(Example) M98 P (program No.), D0
[Device] "#8880 Subpro stor D0: dev", [Directory] "#8881 Subpro stor D0: dir"
The device and directory above will be searched.
(Note 1) If the called subprogram is not found, a program error will occur.
(Note 2) If there is no designation of D0 to D4, search is done according to the settings #8890 to #8894.
(Note 3) G:HD are available for M800W only.

---Setting range---
M: Memory
G: HD
R: Memory card
D: Data server
N: USB Memory

#8885 Subpro stor D2: dir

[M8]
Select the storage destination (directory) for the subprogram.
When D2 is designated at a subprogram call, the subprogram to be called will be searched from the directory selected with this parameter.
Refer to "#8884 Subpro stor D2: dev".

---Setting range---
Directory 48 characters

#8886 Subbro stor D3: dev

[M8]
If ",D1" to ",D4" is designated in a subprogram call, the called program will be searched from the storage (device and directory) set by this parameter.
(Example) M98 P (program No.), D0
[Device] "#8880 Subpro stor D0: dev", [Directory] "#8881 Subpro stor D0: dir"
The device and directory above will be searched.
(Note 1) If the called subprogram is not found, a program error will occur.
(Note 2) If there is no designation of D0 to D4, search is done according to the settings #8890 to #8894.
(Note 3) G:HD are available for M800W only.

---Setting range---

M: Memory
G: HD
R: Memory card
D: Data server
N: USB Memory

#8887 Subpro stor D3: dir

[M8]
Select the storage destination (directory) for the subprogram.
When D3 is designated at a subprogram call, the subprogram to be called will be searched from the directory selected with this parameter.
Refer to "#8886 Subpro stor D3: dev".

---Setting range---

Directory 48 characters

#8888 Subbro stor D4: dev

[M8]
If ",D1" to ",D4" is designated in a subprogram call, the called program will be searched from the storage (device and directory) set by this parameter.
(Example) M98 P (program No.), D0
[Device] "#8880 Subpro stor D0: dev", [Directory] "#8881 Subpro stor D0: dir"
The device and directory above will be searched.
(Note 1) If the called subprogram is not found, a program error will occur.
(Note 2) If there is no designation of D0 to D4, search is done according to the settings #8890 to #8894.
(Note 3) G:HD are available for M800W only.

---Setting range---

M: Memory
G: HD
R: Memory card
D: Data server
N: USB Memory

#8889 Subpro stor D4: dir

[M8]
Select the storage destination (directory) for the subprogram.
When D4 is designated at a subprogram calling, the subprogram to be called will be searched from the directory selected with this parameter.
Refer to "#8888 Subpro stor D4: dev".

---Setting range---

Directory 48 characters

#8890-8894 Subpro srch odr D0 to D4

[M8]
Specify the search order of D0 to D4 (devices and directories storing subprograms) when ",D0" to ",D4" are omitted from subprogram call.
Search is performed in the order from 1 to 5. When "0" is set, the device is excluded from search.
If the same value is set for more than one device, search is carried out in the order from the one with a smaller parameter number.
If "0" is set for all the devices, the memory is searched.

---Setting range---

0 to 5

1.10 Barrier Data (for L system only)

#8300 P0 (for L system only)

Set the reference X-coordinates of the chuck and the tail stock barrier.
Set the center coordinate (radius value) of workpiece by the basic machine coordinate system.

---Setting range---

-99999.999 to 99999.999 (mm)

#8301 P1 (for L system only)

Set the area of the chuck and tail stock barrier.
Set the coordinate from the center of workpiece (P0) for X-axis. (radius value)
Set the coordinate value by basic machine coordinate system for Z-axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#8302 P2 (for L system only)

Set the area of the chuck and tail stock barrier.
Set the coordinate from the center of workpiece (P0) for X-axis. (radius value)
Set the coordinate value by basic machine coordinate system for Z-axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#8303 P3 (for L system only)

Set the area of the chuck and tail stock barrier.
Set the coordinate from the center of workpiece (P0) for X-axis. (radius value)
Set the coordinate value by basic machine coordinate system for Z-axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#8304 P4 (for L system only)

Set the area of the chuck and tail stock barrier.
Set the coordinate from the center of workpiece (P0) for X-axis. (radius value)
Set the coordinate value by basic machine coordinate system for Z-axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#8305 P5 (for L system only)

Set the area of the chuck and tail stock barrier.
Set the coordinate from the center of workpiece (P0) for X-axis. (radius value)
Set the coordinate value by basic machine coordinate system for Z-axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#8306 P6 (for L system only)

Set the area of the chuck and tail stock barrier.
Set the coordinate from the center of workpiece (P0) for X-axis. (radius value)
Set the coordinate value by basic machine coordinate system for Z-axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#8310 Barrier ON (for L system only)

Select whether to enable the chuck and tailstock barrier.

0: Disable (Setting from special display unit will be enabled)
1: Enable

#8311 P7 (for L system only)

Set the area of the left spindle section.
Set the coordinate from the center of workpiece (P0) for X-axis. (radius value)
Set the coordinate value by basic machine coordinate system for Z-axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#8312 P8 (for L system only)

Set the area of the left spindle section.
Set the coordinate from the center of workpiece (P0) for X-axis. (radius value)
Set the coordinate value by basic machine coordinate system for Z-axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#8313 P9 (for L system only)

Set the area of the right spindle section.
X axis: Set the coordinate from the workpiece center (P0). (radius value)
Z axis: Set the coordinates in the basic machine coordinate system.

---Setting range---

-99999.999 to 99999.999 (mm)

#8314 P10 (for L system only)

Set the area of the right spindle section.
Set the coordinate from the center of workpiece (P0) for X-axis. (radius value)
Set the coordinate value by basic machine coordinate system for Z-axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#8315 Barrier Type (L) (for L system only)

Select the shape of the left chuck and tailstock barrier.

0: No area
1: Chuck
2: Tailstock

#8316 Barrier Type (R) (for L system only)

Select the shape of the right chuck and tailstock barrier.

0: No area
1: Chuck
2: Tailstock

#8317 ELIV. AX. Name (for L system only)

Set the name of the delivery axis when the right chuck and tailstock barrier is movable.
When using the multi-part system method and the delivery axis is an axis in the other part system, designate the axis including the part system as 1A, 1B or 2A, 2B. If the part system is not designated as A and B, the set part system will be used.

---Setting range---

A/B/.. (axis name)

1A/1B/..
2A/2B/.. (with part system designated)

0: Cancel

#8318 Stock Angle (L) (for L system only)

Set the angle for the left tailstock end section.
The angle will be interpreted as 90° if there is no setting (when "0" is set).

---Setting range---

0 to 180 (°)
0: 90° (default)

#8319 Stock Angle (R) (for L system only)

Set the angle for the right tailstock end section.
The angle will be interpreted as 90° if there is no setting (when "0" is set).

---Setting range---

0 to 180 (°)
0: 90° (default)

1.11 High-accuracy Control Parameters

#1149 cireft Arc deceleration speed change

Select whether to decelerate at the arc entrance or exit.
0: Not decelerate
1: Decelerate

#1205 G0bdcc Acceleration and deceleration before G0 interpolation

0: Post-interpolation acceleration/deceleration is applied to G00.
1: Pre-interpolation acceleration/deceleration is applied to G00 even in the high accuracy control mode.
2: Rapid traverse constant inclination multi-step acceleration/deceleration is enabled.

When the multi-part system simultaneous high-accuracy control option is enabled, "1" can be set for the 2nd part system and the following.

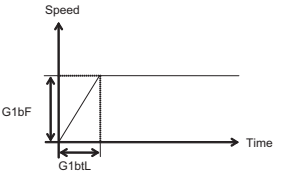
#1206 G1bF Maximum speed

Set a cutting feedrate when applying pre-interpolation acceleration/deceleration.
When high-accuracy control time constant expansion is valid, set the maximum of cutting feed clamp speed of each axis.

---Setting range---
1 to 999999 (mm/min)

#1207 G1btL Time constant

Set a cutting feed time constant when applying pre-interpolation acceleration/deceleration.
When set to "0", the time constant will be clamped at 1ms.



---Setting range---
Without high-accuracy control time constant expansion: 1 to 5000 (ms)
With high-accuracy control time constant expansion: 1 to 30000 (ms)

Cutting feed Acc Cutting feed acceleration

Displays cutting feed acceleration.

#1209 cirdcc Arc deceleration speed

Set the deceleration speed at the arc entrance or exit.

---Setting range---
1 to 999999 (mm/min)

#1568 SfiltG1 G01 soft acceleration/deceleration filter

Set the filter time constant for smoothly changing the acceleration rate for the cutting feed acceleration/deceleration in pre-interpolation acceleration/deceleration.
- Notch frequency Hz
Displays the notch frequency (Hz) for the S-pattern filter set in "#1568 SfiltG1" (G01 soft acceleration/deceleration filter).

---Setting range---
0 to 200 (ms)

#1569 SfiltG0 G00 soft acceleration/deceleration filter

Set the filter time constant for smoothly changing the acceleration rate for the rapid traverse acceleration/deceleration in pre-interpolation acceleration/deceleration.

---Setting range---
0 to 200 (ms)

#1570 Sfilt2 Soft acceleration/deceleration filter 2

Set the filter time constant for smoothly changing the acceleration rate in pre-interpolation acceleration/deceleration.
This will be disabled when "0" or "1" is set.
- Notch frequency Hz
Displays the notch frequency (Hz) for the S-shape filter set in "#1570 Sfilt2" (Soft acceleration/deceleration filter 2).

---Setting range---
0 to 200 (ms)

#1571 SSSdis SSS control adjustment coefficient fixed value selection

Fix the shape recognition range for SSS control.

---Setting range---
0/1

#7914 ROT_PREFILT Rotary axis prefilter time constant

Set the time constant for rotary axis prefilter.
Setting this parameter can smoothen the tool angle change (rotary axis' motion) under tool center point control.
Possible to do this setting on [High-accuracy parameter] screen, which you can reach by going to [Setup] Screen and selecting [User parameter].
When set to "0", "Rotary axis prefiltering" will be disabled.

---Setting range---
0 to 200 (ms)

#8019 R COMP

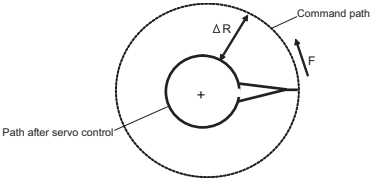
Set a compensation coefficient for reducing a control error in the reduction of a corner roundness and arc radius.
The larger the set value is, the smaller the theoretical error will be. However, since the speed at the corner goes down, the cycle time will be extended.
Coefficient = 100 - set value
(Note) This function will be enabled when "#8021 COMP_CHANGE" is set to "0".

---Setting range---

0 to 99 (%)

Theoretical radius decrease error amount

Displays the theoretical radius decrease error amount, ΔR(mm), from the automatic calculation by NC.



Theoretical radius decrease amount in arc

R5mm arc deceleration speed

Displays a deceleration speed(mm/min) along an arc of 5(mm) radius.

R1mm arc deceleration speed

Displays a deceleration speed(mm/min) along an arc of 1(mm) radius.

#8020 DCC ANGLE

Set the minimum value of an angle (external angle) that should be assumed to be a corner.
When an inter-block angle (external angle) in high-accuracy mode is larger than the set value, it will be determined as a corner and the speed will go down to sharpen the edge.

If the set value is smaller than θ, the speed goes down to optimize the corner.

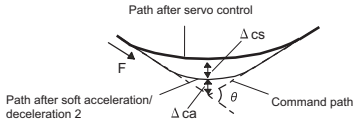
(Note) If "0" is set, it will be handled as "5" degrees.

---Setting range---

0 to 89 (°)
0: 5 degree (Equals to setting "5")

Theoretical corner dull amount

Displays the corner dull amount Δc(mm) in respect to the corner's angle (external angle) θ(°).



Theoretical roundness amount at corner

ca(mm): Error (Δ) caused by the soft acceleration/deceleration 2
cs(mm): Error (Δ) caused by the servo system

Corner deceleration speed

Display corner deceleration speed c (mm/min) for the corner of the angle (external angle) with θ(°).

Theoretical dull amount at 90 degree

Display corner dull amount when the angle is 90 degree.

Corner deceleration speed at 90 degree

Display corner deceleration speed when the angle is 90 degree.

#8021 COMP_CHANGE

Select whether to share or separate the compensation coefficient at the corner/curve during the high-accuracy control mode.
0: Share ("#8019 R COMP" is applied.)
1: Separate
* Corner: #8022 CORNER COMP
* Curve : #8023 CURVE COMP
(Note) Set "1" when using SSS/EasySSS control.

#8022 CORNER COMP

Set the compensation coefficient to further reduce or increase the roundness at the corner during the high-accuracy control mode.
Coefficient = 100 - setting value
(Note) This is valid when "#8021 COMP CHANGE" is set to "1".

Reference to "#8020 Corner decreasing speed "for theoretical corner roundness amount, corner decreasing speed, theoretical 90 degree dull amount, 90 degree corner decreasing speed.

---Setting range---

-1000 to 99 (%)

#8023 CURVE COMP

Set the compensation coefficient to further reduce or increase the radius reduction amount at the curve (arc, involute, spline) during the high-accuracy control mode.
Coefficient = 100 - setting value
(Note) This is valid when "#8021 COMP CHANGE" is set to "1".

For theoretical radius reduction error amount, R5mm arc deceleration speed and R1mm arc deceleration speed, refer to "#8019 R COMP".

---Setting range---

-1000 to 99 (%)

#8025 SPLINE ON

For M system only.
Specify whether to enable the fine spline function.

0: Disable the fine spline function.
1: Enable the fine spline function.

Spline interpolation will be valid during G61.2 modal regardless of this setting.

#8026 CANCEL ANG. (for M system only)

Set the angle where the spline interpolation is temporarily canceled.
When the angle made by blocks exceeds this parameter setting value, spline interpolation will be canceled temporarily. In consideration of the pick feed, set a value a little smaller than the pick feed angle.

---Setting range---

0 to 180 (°)
0: 180 (°)

#8027 Toler-1 (for M system only)

Set the maximum chord error (tolerance) in a block that includes an inflection point. Set the tolerance applicable when the applicable block is developed to fine segments by CAM. (normally about 10 µm)
When "0.000" is set, the applicable block will be linear.

---Setting range---

0.000 to 100.000 (mm)

#8028 Toler-2 (for M system only)

Set the maximum chord error (tolerance) in a block that includes no inflection point. Set the tolerance applicable when the applicable block is developed to fine segments by CAM. (normally about 10 µm)
When "0.000" is set, the applicable block will be linear.

---Setting range---

0.000 to 100.000 (mm)

#8029 FairingL (for M system only)

Set the length of the block subject to fairing.
(Enabled when "#8033 Fairing ON" is set to "1".)

---Setting range---

0 to 100.000 (mm)

#8030 MINUTE LENGS (for M system only)

Set the fine-segment length where the spline interpolation is temporarily canceled.
When the length of one block exceeds this parameter setting value, spline interpolation is canceled temporarily and linear interpolation is performed. Set a value a little smaller than one block length of the program.
If "-1" is set, spline interpolation will be performed regardless of block length.

---Setting range---

-1 to 127 (mm)
0: 1 (mm)

#8033 Fairing ON (for M system only)

Select whether or not to use the fairing or smooth fairing function.

0: Use neither of them
1: Use the fairing function
2: Use the smooth fairing function

#8034 AccClamp ON (for M system only)

Select the method for clamping the cutting speed.

0: Clamp with parameter "#2002 clamp" or the corner deceleration function.
1: Clamp the cutting speed with acceleration judgment.
(Enabled when "#8033 Fairing ON" is set to "1".)

#8036 CordecJudge (for M system only)

Select the condition to decide a corner.

0: A corner is decided from the angle of the neighboring block.
1: A corner is decided from the angle of the neighboring block, excluding minute blocks.
(Enabled when "#8033 Fairing ON" is set to "1".)

#8037 CorJudgeL (for M system only)

Set the length of the block to be excluded when deciding a corner.
(Enabled when "#8036 CordecJudge" is set to "1".)

---Setting range---

0 to 99999.999 (mm)

#8038 Path recog. range

Path recognition range
Specify the range to recognize the tool paths adjoining to the command position when the smooth fairing function is ON.
If "0" is set, the range will be 1.000 (mm).

---Setting range---

0 to 100.000 (mm)

#8039 Comp. range limit

Compensation distance tolerance

Specify the upper limit of the distance between the command position and compensation position when the smooth fairing function is ON.

If you specify a negative value, operation is conducted with no tolerance limit.

If "0" is set, the tolerance will be 0.005 (mm).

---Setting range---

-1.000 to 100.000 (mm)

(PR) #8040 High-SpeedAcc

High-speed high-accuracy control-enabled part system

Select whether to enable the simultaneous use of the high-accuracy control and high-speed machining mode (including the high-speed high-accuracy control I and II) for each part system.

0: Not enable

1: Enable

"1" can be set for up to two part systems. If you set "1" for three or more part systems, the alarm (Y51 0032) will result.

#8090 SSS ON (for M system only)

Set whether to enable the SSS control with G05 P10000.

0: Disable

1: Enable

#8091 StdLength (for M system only)

Set the maximum value of the range for recognizing the shape.

To eliminate the effect of steps or errors, etc., set a large value. To enable sufficient deceleration, set a small value.

If "0.000" is set, the standard value (1.000mm) will be applied.

---Setting range---

0 to 100.000 (mm)

#8092 ClampCoeff (for M system only)

Set the clamp speed at the curved section configured of fine segments.

Coefficient = √setting value

---Setting range---

1 to 100

#8093 StepLeng (for M system only)

Set the width of the step at which the speed is not to be decelerated. (Approximately the same as the CAM path difference [Tolerance].)

If "0" is set, the standard value (5μm) will be applied.

If a minus value is set, the speed will decelerate at all minute steps.

---Setting range---

-1.000 to 0.100 (mm)

#8094 DccWaitAdd (for M system only)

Set the time to wait for deceleration when the speed FB does not drop to the clamp speed.

---Setting range---

0 to 100 (ms)

#8096 Deceler. coeff. ON

Deceleration coefficient for SSS control ON

Select whether to enable the speed coefficients ("#8097 Corner deceleration coefficient for SSS control", "#8098 Arc clamp speed coefficient for SSS control") that are used for compensating for a path error and clamp speed under SSS control.

0: Disable

1: Enable

#8097 Corner decel coeff

Corner deceleration coefficient for SSS control

Specify the compensation coefficient to be used for adjusting a path error and clamp speed at a corner under SSS control. This parameter is enabled during SSS control. Thus set this parameter if you wish to use different compensation coefficients according to ON/OFF of SSS control (If you wish to adjust a path error and clamp speed at a corner, use "#8022 CORNER COMP").

If the setting value is smaller, the theoretical path error will decrease, but the cycle time may be longer because the corner deceleration speed will slow down.

Note that this parameter is enabled when "#8096 Deceleration coefficient for SSS control ON" is "1". When "0" is set in this parameter, the standard value (300%) is applied.

---Setting range---

0 to 2000 (%)

#8098 Arc clamp spd coef

Arc clamp speed coefficient for SSS control

Specify the compensation coefficient to be used for adjusting a path error and clamp speed on an arc under SSS control. This parameter is enabled during SSS control. Thus set this parameter if you wish to use different compensation coefficients according to ON/OFF of SSS control (If you wish to adjust a path error and clamp speed on an arc, use "#8023 CURVE COMP").

If the setting value is smaller, the theoretical path error will decrease, but the cycle time may be longer because the arc clamp speed will slow down.

Note that this parameter is enabled when "#8096 Deceleration coefficient for SSS control ON" is "1". When "0" is set in this parameter, the standard value (100%) is applied.

---Setting range---

0 to 2000 (%)

#12051 Jerk_filtG1 G01 jerk filter

Specify the time constant of filter that is used for smoothing the change of jerk when pre-interpolation acceleration/deceleration is performed in cutting feed.
This filter causes no path error, as the filter is applied to the total speed calculated before interpolation.
If you specify the jerk filter time constant, the time constants of each filter will be as follows:
* S-shape filter time constant
"#1568 SfiltG1" - "Jerk_filtG1"
* Jerk filter time constant
"Jerk_filtG1"

---Setting range---

0 to 50 (ms)

#12052 Jerk_filtG0 G00 jerk filter

Specify the time constant of filter that is used for smoothing the change of jerk when pre-interpolation acceleration/deceleration is performed in cutting feed.
This filter causes no path error, as the filter is applied to the total speed calculated before interpolation.
If you specify the jerk filter time constant, the time constants of each filter will be as follows:
* S-shape filter time constant
"#1569 SfiltG0" - "Jerk_filtG0"
* Jerk filter time constant
"Jerk_filtG0"

---Setting range---

0 to 50 (ms)

#12053 EachAxAccCntrl Enable per-axis acceleration tolerance control

Select how to calculate the deceleration speed for a corner between the blocks where the high-accuracy control is enabled.

0: Optimal corner deceleration
(calculate the deceleration speed using the acceleration tolerance common for all the axes determined by G1bF and G1btL)

1: Per-axis acceleration tolerance control
(calculate the deceleration speed using acceleration tolerances of each axis determined by G1bFx and G1btLx)

#12060 VblAccPreInt Variable-acceleration pre-interpolation acceleration/deceleration ON

Select whether to enable variable-acceleration pre-interpolation acceleration/deceleration control while high-accuracy control is ON.

0: Pre-interpolation acceleration/deceleration
(Apply the acceleration rate that is determined by G1bF and G1btL and is common for all the axes)

1: Variable-acceleration pre-interpolation acceleration/deceleration
(Apply the acceleration rate that is determined by G1bFx and G1btLx for each axis)

(Note) Variable-acceleration pre-interpolation acceleration/deceleration is a function available under SSS control. To enable this function, set "#8090 SSS ON" to 1.

#12066 Tolerance ctrl ON

Select whether to enable the tolerance control.

0: Disable
1: Enable

(Note) Tolerance control is available only under SSS control.
To enable SSS control, set #8090 to 1.

#12067 Smth Corn spd coef

Set the compensation coefficient to adjust a path error or clamp speed in the corner while tolerance control is ON.
This parameter is enabled during tolerance control. Thus set this parameter if you wish to use different clamp speed according to ON/OFF of tolerance control.
When "0" is set in this parameter, the standard value (100%) is applied.

---Setting range---

0 to 2000(%)

#12068 Smoothing range

Spline interpolation 2: Smoothing range
Normally set 0 in this parameter.
If you run a program with short line segments and its reciprocating paths are uneven, set the parameter to about 3 to 5 times the length of the programmed line segments.

---Setting range---

0.000 to 10.000 (mm)

#12069 Corner angle

Tolerance control: Corner recognition angle
Specify the corner recognition angle. Normally set 0 in this parameter.

---Setting range---

0.000 to 180.000 (°)

#12070 Sfilt2_tol Tolerance control: Soft acceleration/deceleration filter 2

Specify the time constant of the filter that smoothes out fluctuations in acceleration under the tolerance control.
Basically set to 0.

---Setting range---

0 to 200 (ms)

1.12 High-accuracy Control Axis Parameters

#2001 rapid — **Rapid traverse rate**

Set the rapid traverse feedrate for each axis.
(Note) The maximum value to be set depends on the machine specifications.

---Setting range---
1 to 1000000 (mm/min)

#2002 clamp — **Cutting feedrate for clamp function**

Set the maximum cutting feedrate for each axis.
Even if the feedrate in G01 exceeds this value, the clamp will be applied at this feedrate.

---Setting range---
1 to 1000000 (mm/min)

#2010 fwd_g — **Feed forward gain**

Set a feed forward gain for pre-interpolation acceleration/deceleration.
The larger the set value, the smaller the theoretical control error will be. However, if a machine vibration occurs, set the smaller value.

---Setting range---
0 to 200 (%)

#2068 G0fwdg — **G00 feed forward gain**

Set a feed forward gain for G00 pre-interpolation acceleration/deceleration.
The larger the setting value, the shorter the positioning time during in-position checking.
If a machine vibration occurs, set the smaller value.

---Setting range---
0 to 200 (%)

#2096 crncsp — **Minimum corner deceleration speed**

Set the minimum clamp speed for corner deceleration in the high-accuracy control mode. Normally set "0".

(Note) This parameter is invalid during SSS control.

---Setting range---
0 to 1000000 (mm/min)

#2109 Rapid (H-precision) — **Rapid traverse rate for high-accuracy control mode**

Set the rapid traverse rate for each axis in the high-accuracy control mode. "#2001 rapid" will be used when "0" is set.

---Setting range---
0 to 1000000 (mm/min)

#2110 Clamp (H-precision) — **Cutting feed clamp speed for high-accuracy control mode**

Set the cutting feed maximum speed for each axis in the high-accuracy control mode. "#2002 clamp" will be used when "0" is set.

---Setting range---
0 to 1000000 (mm/min)

#2157 G1bFx — **Maximum per-axis pre-interpolation cutting feed rate**

When per-axis acceleration tolerance control is ON:
Specify the maximum speed to be used for calculating each axis' acceleration tolerance. When 0 is set, "#2001 rapid" is used.

When variable-acceleration pre-interpolation acceleration/deceleration is ON:
Specify the maximum speed to be used for calculating each axis' acceleration. When 0 is set, "#1206 G1bF" is used.

When both per-axis acceleration tolerance control and variable-acceleration pre-interpolation acceleration/deceleration are ON:
Specify the maximum speed to be used for calculating each axis' acceleration. When 0 is set, "#1206 G1bF" is used.

When neither per-axis acceleration tolerance control nor variable-acceleration pre-interpolation acceleration/deceleration is ON:
This parameter is disabled.

---Setting range---
0 to 999999(mm/min)

#2158 G1btLx — **Per-axis pre-interpolation cutting feed time constant**

When per-axis acceleration tolerance control is ON:
Specify the time constant (a time to be taken until reaching the maximum speed) to be used for calculating each axis' acceleration tolerance. When 0 is set, "#2004 G0tL" is used.

When variable-acceleration pre-interpolation acceleration/deceleration is ON:
Specify the time constant (a time to be taken until reaching the maximum speed) to be used for calculating each axis' acceleration. When 0 is set, "#1207 G1btL" is used.

When both per-axis acceleration tolerance control and variable-acceleration pre-interpolation acceleration/deceleration are ON:
Specify the time constant (a time to be taken until reaching the maximum speed) to be used for calculating each axis' acceleration. When 0 is set, "#1207 G1btL" is used.

When neither per-axis acceleration tolerance control nor variable-acceleration pre-interpolation acceleration/deceleration is ON:
This parameter is disabled.

---Setting range---
0 to 5000(ms)

#2159	compx	Accuracy coefficient for each axis

Specify the compensation coefficient to be used for adjusting a path error and clamp speed at a corner for each axis during the high-accuracy control mode.
If the setting value is larger, the edge accuracy will improve, but the cycle time may be longer because the corner speed will slow down.
This parameter is disabled when the per-axis acceleration tolerance control is OFF.

---Setting range---

-1000 to 99 (%)

1.13 Operation Parameters

#8901 Counter type 1

Select the type of the following counters on the Monitor screen.
- ♦Normal display: Upper-left counter
- •2-, 3- or 4-part system simultaneous display (four counters): Upper-left counter
- •2-, 3- or 4-part system simultaneous display (two counters): Upper counter
- •2-, 3- or 4-part system simultaneous display (one counter): Counter

Either relative position or tip work position is displayed by default.
(Note 1) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only.
[C80] 3- or 4-part system simultaneous display is not available.
(Note 2) Tip work position is displayed when 5-axis-related option is ON.
(Note 3) PLC axis position is displayed when "#11091 PLC counter valid" is "1". [M8]
1: Current position
2: Workpiece coordinate position
3: Machine position
4: Program position
8: Remain command
9: Manual interrupt amount
10: Next command
11: Restart position
12: Remain distance
16: Tip workpiece coordinate position
18: Tool axis movement
19: Tip machine position
20: Relative position
21: Table coordinate position
22: Workpiece installation position
23: Inclined surface coordinate position
[M8]
27: PLC axis position

---Setting range---
1 to 27

#8902 Counter type 2

Select the type of the following counters on the Monitor screen.
- ♦Normal display: Lower-left counter
- •2-, 3- or 4-part system simultaneous display (four counters): Lower-left counter
- •2-, 3- or 4-part system simultaneous display (two counters): Lower counter

Programmed position is displayed by default.
(Note 1) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only.
[C80] 3- or 4-part system simultaneous display is not available.
(Note 2) PLC axis position is displayed when "#11091 PLC counter valid" is "1". [M8]
1: Current position
2: Workpiece coordinate position
3: Machine position
4: Program position
8: Remain command
9: Manual interrupt amount
10: Next command
11: Restart position
12: Remain distance
16: Tip workpiece coordinate position
18: Tool axis movement
19: Tip machine position
20: Relative position
21: Table coordinate position
22: Workpiece installation position
23: Inclined surface coordinate position
[M8]
27: PLC axis position

---Setting range---
1 to 27

#8903 Counter type 3

Select the type of the following counters on the Monitor screen.
- •Normal display: Upper-right counter
- •2-, 3- or 4-part system simultaneous display (four counters): Upper-right counter

Remaining command is displayed by default.
(Note 1) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only.
[C80] 3- or 4-part system simultaneous display is not available.
(Note 2) PLC axis position is displayed when "#11091 PLC counter valid" is "1". [M8]
1: Current position
2: Workpiece coordinate position
3: Machine position
4: Program position
8: Remain command
9: Manual interrupt amount
10: Next command
11: Restart position
12: Remain distance
16: Tip workpiece coordinate position
18: Tool axis movement
19: Tip machine position
20: Relative position
21: Table coordinate position
22: Workpiece installation position
23: Inclined surface coordinate position
[M8]
27: PLC axis position

---Setting range---
1 to 27

#8904 Counter type 4

Select the type of the following counters on the Monitor screen.
- •Normal display: Lower-right counter
- •2-, 3- or 4-part system simultaneous display (four counters): Lower-right counter

Next command is displayed by default.
(Note 1) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only.
[C80] 3- or 4-part system simultaneous display is not available.
(Note 2) PLC axis position is displayed when "#11091 PLC counter valid" is "1". [M8]
1: Current position
2: Workpiece coordinate position
3: Machine position
4: Program position
8: Remain command
9: Manual interrupt amount
10: Next command
11: Restart position
12: Remain distance
16: Tip workpiece coordinate position
18: Tool axis movement
19: Tip machine position
20: Relative position
21: Table coordinate position
22: Workpiece installation position
23: Inclined surface coordinate position
[M8]
27: PLC axis position

---Setting range---
1 to 27

#8905 Counter type 5

Select the type of counter on the Monitor screen (Simple display).
Either relative position or tip work position is displayed by default.
(Note 1) Tip work position is displayed when 5-axis-related option or program format switch option is ON.
(Note 2) PLC axis position is displayed when "#11091 PLC counter valid" is "1". [M8]
1: Current position
2: Workpiece coordinate position
3: Machine position
4: Program position
8: Remain command
9: Manual interrupt amount
10: Next command
11: Restart position
12: Remain distance
16: Tip workpiece coordinate position
18: Tool axis movement
19: Tip machine position
20: Relative position
21: Table coordinate position
22: Workpiece installation position
23: Inclined surface coordinate position
[M8]
27: PLC axis position

---Setting range---
1 to 27

#8906 Counter type 6

Not used. Set to "0".

(PR) #8909 Aut/Manual switch

Select the counter display method on Monitor screen.
0: "AUTO/MDI" and "Manual" display is switched by the mode selection switch.
1: Display AUTO/MDI counter only.
2: Display Manual counter only.
3: Display the enlarged counter of "#8901 Counter type 1".

(Note) This parameter is disabled when "#11019 2-system display (2-part system simultaneous display)" is set to "1" or "2".

#8910 Edit undo

Set whether to enable the Undo function during program edit on the Monitor screen or Edit screen.
0: Disable
1: Enable

(Note) This parameter is valid for M800W/M800S Series.

#8911 NAVI-Message ON

[M8]
Select whether or not to display a confirmation message upon rewrite of common variable in NAVI operation.
0: Not display a confirmation message
1: Display a confirmation message

#8912 NAVI operate type

[M8]
Select the NAVI operation during automatic operation.
0: NAVI is unable to start during automatic operation.
1: NAVI is able to start during automatic operation. (An operation involving common variable rewrite is disabled.)

#8913 Touch panel sense

[M8]
Set the sensibility of the touch panel.
The smaller the setting value is, the more sensitive the panel will be.
(1: sensitive, 4: insensitive)
When set to 0, the sensibility will be the same as when the standard setting of 2 is applied.
---Setting range---
0 to 4
[C80]
Not used.

#8914 Auto Top search

Select the operation method for restart search type 2.
0: It is necessary to set the top search position arbitrarily.
1: The restart search is executed from O No. that is designated as head.

#8915 Auto backup day 1

[M8]
The automatic backup is executed at the first power ON of the NC in the period between the designated date and the end of that month.
When "-1" is set to this parameter, the automatic backup is executed every turning NC power ON.
When "0" is set to all on "Auto backup day 1" to "4", the automatic backup is not executed.
It is possible to specify the designated date up to 4 days for a month.
---Setting range---
-1 to 31
("-1" can be set only for Automatic backup day 1)
[C80]
Not used.

#8916 Auto backup day 2

[M8]
The automatic backup is executed at the first power ON of the NC in the period between the designated date and the end of that month.
When "-1" is set to "Auto backup day 1", the automatic backup is executed every turning NC power ON.
When "0" is set to all on "Auto backup day 1" to "4", the automatic backup is not executed.
It is possible to specify the designated date up to 4 days for a month.
---Setting range---
-1 to 31
("-1" can be set only for Automatic backup day 1)
[C80]
Not used.

#8917 Auto backup day 3

[M8]
The automatic backup is executed at the first power ON of the NC in the period between the designated date and the end of that month.
When "-1" is set to "Auto backup day 1", the automatic backup is executed every turning NC power ON.
When "0" is set to all on "Auto backup day 1" to "4", the automatic backup is not executed.
It is possible to specify the designated date up to 4 days for a month.
---Setting range---
-1 to 31
("-1" can be set only for Automatic backup day 1)
[C80]
Not used.

#8918 Auto backup day 4

[M8]
The automatic backup is executed at the first power ON of the NC in the period between the designated date and the end of that month.
When "-1" is set to "Auto backup day 1", the automatic backup is executed every turning NC power ON.
When "0" is set to all on "Auto backup day 1" to "4", the automatic backup is not executed.
It is possible to specify the designated date up to 4 days for a month.

---Setting range---

-1 to 31
("-1" can be set only for Automatic backup day 1)

[C80]
Not used.

#8919 Auto backup device

[M8]
Select the automatic backup target device.
[M800W/M80W with Windows-based display]
0: DS
1: HD
2: Memory card
3: USB Memory
[M800S/M80 Series and E80]
[M800W/M80W with Windows-less display]
0: DS
2: Memory card
3: USB Memory
(Note) The setting range differs according to the model.
[C80]
Not used.

#8920 3D tool ofs select

[M8]
Select the method to calculate the drawing position when drawing a solid.
With 3D drawing, the drawing position (tool tip position) is calculated with the method designated with this parameter, and the image is drawn.
0: For tool radius compensation, use the tool compensation amount set in tool compensation screen. For tool length, use the value in tool set window. (for tool length measurement type I)
1: Use the tool compensation amount set in tool compensation screen for both tool radius and tool length compensation. (for tool length measurement type II)
2: Use the value set in tool set window for both tool radius and tool length compensation. (for tool length measurement type I)
3: Use the value set in tool set window for both tool radius and tool length compensation. (for tool length measurement type II)
[C80]
Not used.

#8921 Mass Edit select

[M8]
Select the editing mode for the machining programs saved in HD, FD, and memory card.
When the program size is 1.0MB (When "#8910 Edit Undo" is invalid, 2.0MB) or more, mass-editing will be applied.
0: Regular editing mode
1: Mass-editing mode
[C80]
Not used.

#8922 T-reg-dup check

Set whether to enable the duplication check in registering tools to magazine pots, and in setting tool Nos. for spindle/standby.
0: Duplication check valid for all valid magazines
1: Duplication check invalid
2: Duplication check valid only for the selected magazine

(PR) #8923 Hide Edit-IO menu

Set whether to enable the edit-in/out menu. When disabled, the edit-input/output menu won't appear. However, the maintenance-in/out menu is always enabled regardless of this parameter setting.
0: Enable
1: Disable

#8924 MEAS. CONFIRM MSG

Select whether to display a confirming message when attempting to write compensation data for tool measurement, or coordinate system data for workpiece measurement.
However, the confirmation message will not appear in L system tool measurement simple mode "#8957 T meas (L)-Simple".
0: Not display a confirming message
1: Display a confirming message

#8925 SP on 1st part sys

Select which spindle to display in the 1st part system window for the 2-, 3- or 4-part system simultaneous display.
(Note 1) If you select "00" for the 2-, 3- or 4-part system simultaneous display, the default display is used (1st spindle on the upper side and 2nd spindle on the lower side).
(Note 2) If you set the same number as, or a greater number than the setting of "#1039 spinno", or if the high- or low-order setting is "0", the 1st spindle is displayed.
(Note 3) If you set the low-order to F, the screen shows the actual rotation speed, command speed and load meter of the high-order spindle.
Note that for the 4-counter display in 4-part system simultaneous display, even if the low-order is not F, the screen shows the actual rotation speed, command speed and load meter of the high-order and low-order spindles.
(Note 4) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only. [C80] 3- or 4-part system simultaneous display is not available.

---Setting range---

High-order (Select an upper side spindle.): 0 to 8
Low-order (Select a lower side spindle.): 0 to 8, F

#8926 SP on 2nd part sys

Select which spindle to display in the 2nd part system window for the 2-, 3- or 4-part system simultaneous display.
(Note 1) If you select "00" for the 2-, 3- or 4-part system simultaneous display, the default display is used (1st spindle on the upper side and 2nd spindle on the lower side).
(Note 2) If you set the same number as, or a greater number than the setting of "#1039 spinno", or if the high- or low-order setting is "0", the 1st spindle is displayed.
(Note 3) If you set the low-order to F, the screen shows the actual rotation speed, command speed and load meter of the high-order spindle.
Note that for the 4-counter display in 4-part system simultaneous display, even if the low-order is not F, the screen shows the actual rotation speed, command speed and load meter of the high-order and low-order spindles.
(Note 4) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only. [C80] 3- or 4-part system simultaneous display is not available.

---Setting range---

High-order (Select an upper side spindle.): 0 to 8
Low-order (Select a lower side spindle.): 0 to 8, F

#8927 SP on 3rd part sys

Select which spindle to display in the 3rd part system window for the 2-, 3- or 4-part system simultaneous display.
(Note 1) If you select "00" for the 2-, 3- or 4-part system simultaneous display, the default display is used (1st spindle on the upper side and 2nd spindle on the lower side).
(Note 2) If you set the same number as, or a greater number than the setting of "#1039 spinno", or if the high- or low-order setting is "0", the 1st spindle is displayed.
(Note 3) If you set the low-order to F, the screen shows the actual rotation speed, command speed and load meter of the high-order spindle.
Note that for the 4-counter display in 4-part system simultaneous display, even if the low-order is not F, the screen shows the actual rotation speed, command speed and load meter of the high-order and low-order spindles.
(Note 4) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only. [C80] 3- or 4-part system simultaneous display is not available.

---Setting range---

High-order (Select an upper side spindle.): 0 to 8
Low-order (Select a lower side spindle.): 0 to 8, F

#8928 SP on 4th part sys

Select which spindle to display in the 4th part system window for the 2-, 3- or 4-part system simultaneous display.
(Note 1) If you select "00" for the 2-, 3- or 4-part system simultaneous display, the default display is used (1st spindle on the upper side and 2nd spindle on the lower side).
(Note 2) If you set the same number as, or a greater number than the setting of "#1039 spinno", or if the high- or low-order setting is "0", the 1st spindle is displayed.
(Note 3) If you set the low-order to F, the screen shows the actual rotation speed, command speed and load meter of the high-order spindle.
Note that for the 4-counter display in 4-part system simultaneous display, even if the low-order is not F, the screen shows the actual rotation speed, command speed and load meter of the high-order and low-order spindles.
(Note 4) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only. [C80] 3- or 4-part system simultaneous display is not available.

---Setting range---

High-order (Select an upper side spindle.): 0 to 8
Low-order (Select a lower side spindle.): 0 to 8, F

#8929 Disable=INPUT:comp

Disable [=INPUT] menu for tool compensation and workpiece coordinate offset values. Fix the setting method to the incremental value input.
0: Enable
1: Disable

#8930 Disable=INPUT:var

Disable [=INPUT] menu for common variables.
0: Enable
1: Disable

#8931 Display/Set limit

Select the restriction of the connected NC's screen display/settings on/from the remote control tool (NC Monitor2).
0: Permit the screen display/settings
1: Permit the screen display only
2: Restrict the connection

(PR) #8932 Hide measure scrn

Select whether to display the tool measurement screen and workpiece measurement screen.
0: Display
1: Not display
(Note) If the "#11056 Workpiece coordinate system shift OFF" is "0" for the L system, the screen is displayed as the workpiece coordinate system shift screen even when this parameter is set to "1".

#8933 Disable lngth comp

Set whether to disable the setting of tool shape compensation amount.
0: Not disable
1: Disable

The shape compensation amount covers the following data according to the tool compensation type.
- Compensation type I ("1" in "#1037 cmdtyp(command type)")
  ... Compensation amount (the sum of shape compensation and wear compensation amount)
- Compensation type II ("2" in "#1037 cmdtyp(command type)")
  ... Length dimension and radius dimension
- Compensation type III ("3" in "#1037 cmdtyp(command type)")
  ... Tool length and tool nose R

#8934 Disable wear comp

Select whether to disable the setting of tool wear compensation amount.
0: Not disable
1: Disable

The wear compensation amount covers the following data according to the tool compensation type.
- Compensation type I ("1" in "#1037 cmdtyp(command type)")
  ... This parameter is disabled.
- Compensation type II ("2" in "#1037 cmdtyp(command type)")
  ... Length wear and radius wear
- Compensation type III ("3" in "#1037 cmdtyp(command type)")
  ... Tool wear and tool nose wear

#8935 W COORD CONFIRM

Select whether to display confirmation message when setting workpiece coordinate system offset in [Easy setting] menu.
0: Not display
1: Display

#8936 Delete leading 0

In creating a file, or in transferring a file, if the file name of the new file, or the file name of the transfer destination consists only of numerical figures, 0 of the file name head will be deleted from the name.
0: Designated file name (0 remains in the file name)
1: 0 will be deleted from the file name

#8937 File sort volume

[M8]
Set the maximum number of files to sort in the memory card, USB memory and DS lists.
If the setting is large, update of the list may take longer.
---Setting range---
64 to 1000 (M800W/M80W with Windows-based display)
64 to 250 (M800S, or M800W/M80W with Windows-less display)
64 to 128 (M80 Series and E80)
Standard: 128
[C80]
Not used.

#8938 Edit-Not show Prg

Select whether to enable the automatic display on the Edit screen, when selected, of the programs searched by operation/check search or the MDI programs in MDI mode.
0: Enable the automatic display
1: Disable the automatic display

#8939 Undo confirm msg

Display a confirming message when operating the [Undo] menu.
0: Not display a confirming message
1: Display a confirming message

#8940 Set select display

Select what to display in the selectable display area.
0: Common variable
1: Local variable
2: Workpiece coordinate system offset
3: All spindles' rotation speed
4: Expanded counters
5: Tool center coordinate display
6: Tool compensation amount
(Note1) Tool center coordinate display is available only when any of the 5-axis related options is enabled.

(PR) #8941 ABS/INC for T-ofs

Enable switching the method to set tool compensation data (absolute/incremental value) with INPUT key.
0: Fix it to the absolute value input.
1: Enable to switch between absolute and incremental value input.

(PR) #8942 $1 color

Set the color to be shown on the top-left of screen and window title for the 1st part system. This enables switching the color patterns for each part system.
When set to the values "1" to "8", the part system name is shown in the form of button image.
When set to "0", the settings between #8943 (#8962) and #8945 (#8965) is disabled and the screen is shown by the default color pattern for all the part systems.
(Note) When set to "0" or "1", the color is determined by the setting of "#11060 Screen theme color".

0: Theme color (no button image) (default)
1: Theme color
2: Pink
3: Light blue
4: Orange
5: Green
6: Fuchsia
7: YellowGreen
8: Brown

(PR) #8943 $2 color

Set the color to be shown on the top-left of screen and window title for the 2nd part system. This enables switching the color patterns for each part system.
When set to the values "1" to "8", the part system name is shown in the form of button image.
(Note 1) Enabled when "#8942 $1 color" is set to the values "1" to "8".
(Note 2) When set to "1", the color is determined by the setting of "#11060 Screen theme color".

1: Theme color (default)
2: Pink
3: Light blue
4: Orange
5: Green
6: Fuchsia
7: YellowGreen
8: Brown

(PR) #8944 $3 color

Set the color to be shown on the top-left of screen and window title for the 3rd part system. This enables switching the color patterns for each part system.
When set to the values "1" to "8", the part system name is shown in the form of button image.
(Note 1) Enabled when "#8942 $1 color" is set to the values "1" to "8".
(Note 2) When set to "1", the color is determined by the setting of "#11060 Screen theme color".

1: Theme color (default)
2: Pink
3: Light blue
4: Orange
5: Green
6: Fuchsia
7: YellowGreen
8: Brown

(PR) #8945 $4 color

Set the color to be shown on the top-left of screen and window title for the 4th part system. This enables switching the color patterns for each part system.
When set to the values "1" to "8", the part system name is shown in the form of button image.
(Note 1) Enabled when "#8942 $1 color" is set to the values "1" to "8".
(Note 2) When set to "1", the color is determined by the setting of "#11060 Screen theme color".

1: Theme color (default)
2: Pink
3: Light blue
4: Orange
5: Green
6: Fuchsia
7: YellowGreen
8: Brown

#8951 No Tab counter sw.

Disable Tab key to change the counter type.

0: Enable Tab key to change counter type
(The value of #8905 also changes.)
1: Disable Tab key to change counter type

#8952 Edit-win $ switch

Select whether to enable switching of program displayed in the edit window on Monitor screen according to the displayed part system when part system switch is performed.

0: Not switch
1: Switch

#8953 2$ disp switch typ

Select how to switch the part system to display when the 2-, 3- or 4-part system simultaneous display is enabled.

0, 1: The No. of part system to display is incremented by one. The operation target is switched when the part system displayed in the non-active area is selected.
2: The operation target on the left side is fixed to $1. When $1 is selected for the part system switch, the left side is the operation target. When $2 or after is selected, the displayed part system on the right side is incremented by one.

(Note) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only.
[C80] 3- or 4-part system simultaneous display is not available.

#8954 Initial type

[M8]
Select the default setting of the coordinate axis direction designation method to be displayed on the [Surface detail] screen of R-Navi.
0,1: Point (+) on the axis
2: Latitude/Longitude
3: Latitude/Projection angle
4: Start point/End point
5: Index angle
[C80]
Not used.

#8955 Init axis pair

[M8]
Select the default coordinate axis combination to be displayed on the [Surface detail] screen of R-Navi.
0,1: Z/X
2: Z/Y
3: X/Y
[C80]
Not used.

(PR) #8956 User key type

[M8]
Select the definition type of the user-defined keys.
There are two user-defined keys.
•Type 1:
It is the same as the conventional specification. A line feed between "[ ]" is not dealt as ";".
It is dealt as an upper case/lower case letter depending on the CapsLock status.
A symbolic character may be converted into a specific character.
•Type 2:
A line break inside square brackets "[ ]" is dealt as ";".
Regardless of the CapsLock status, the defined character is input.
A symbolic character is also input as defined.

0 : Type 1 (Conventional specification)
1 : Type 2
[C80]
Not used.

(PR) #8957 T meas (L)-Simple

Select the operation mode of the manual tool length measurement 1 for L system.
0: Normal operation mode (Conventional specification)
Select an axis to measure using the cursor position.
1: Simple operation mode
Select an axis to measure using an axis address key or menu.
More than one axis can be selected.

#8958 SP on 5th part sys

Select which spindle to display in the 5th part system window for the 2-, 3- or 4-part system simultaneous display.
(Note 1) If you select "00" for the 2-, 3- or 4-part system simultaneous display, the default display is used (1st spindle on the upper side and 2nd spindle on the lower side).
(Note 2) If you set the same number as, or a greater number than the setting of "#1039 spinno", or if the high- or low-order setting is "0", the 1st spindle is displayed.
(Note 3) If you set the low-order to F, the screen shows the actual rotation speed, command speed and load meter of the high-order spindle.
Note that for the 4-counter display in 4-part system simultaneous display, even if the low-order is not F, the screen shows the actual rotation speed, command speed and load meter of the high-order and low-order spindles.
(Note 4) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only.
[C80] 3- or 4-part system simultaneous display is not available.
---Setting range---
High-order(Select an upper side spindle.): 0 to 8
Low-order(Select a lower side spindle.): 0 to 8, F

#8959 SP on 6th part sys

Select which spindle to display in the 6th part system window for the 2-, 3- or 4-part system simultaneous display.
(Note 1) If you select "00" for the 2-, 3- or 4-part system simultaneous display, the default display is used (1st spindle on the upper side and 2nd spindle on the lower side).
(Note 2) If you set the same number as, or a greater number than the setting of "#1039 spinno", or if the high- or low-order setting is "0", the 1st spindle is displayed.
(Note 3) If you set the low-order to F, the screen shows the actual rotation speed, command speed and load meter of the high-order spindle.
Note that for the 4-counter display in 4-part system simultaneous display, even if the low-order is not F, the screen shows the actual rotation speed, command speed and load meter of the high-order and low-order spindles.
(Note 4) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only.
[C80] 3- or 4-part system simultaneous display is not available.
---Setting range---
High-order(Select an upper side spindle.): 0 to 8
Low-order(Select a lower side spindle.): 0 to 8, F

#8960 SP on 7th part sys

Select which spindle to display in the 7th part system window for the 2-, 3- or 4-part system simultaneous display.
(Note 1) If you select "00" for the 2-, 3- or 4-part system simultaneous display, the default display is used (1st spindle on the upper side and 2nd spindle on the lower side).
(Note 2) If you set the same number as, or a greater number than the setting of "#1039 spinno", or if the high- or low-order setting is "0", the 1st spindle is displayed.
(Note 3) If you set the low-order to F, the screen shows the actual rotation speed, command speed and load meter of the high-order spindle.
Note that for the 4-counter display in 4-part system simultaneous display, even if the low-order is not F, the screen shows the actual rotation speed, command speed and load meter of the high-order and low-order spindles.
(Note 4) [M8] 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only.
[C80] 3- or 4-part system simultaneous display is not available.

---Setting range---

High-order(Select an upper side spindle.): 0 to 8
Low-order(Select a lower side spindle.): 0 to 8, F

#8961 SP on 8th part sys

[M8]
Select which spindle to display in the 8th part system window for the 2-, 3- or 4-part system simultaneous display.
(Note 1) If you select "00" for the 2-, 3- or 4-part system simultaneous display, the default display is used (1st spindle on the upper side and 2nd spindle on the lower side).
(Note 2) If you set the same number as, or a greater number than the setting of "#1039 spinno", or if the high- or low-order setting is "0", the 1st spindle is displayed.
(Note 3) If you set the low-order to F, the screen shows the actual rotation speed, command speed and load meter of the high-order spindle.
Note that for the 4-counter display in 4-part system simultaneous display, even if the low-order is not F, the screen shows the actual rotation speed, command speed and load meter of the high-order and low-order spindles.
(Note 4) 3- or 4-part system simultaneous display is enabled for a 15- or 19-type display unit only.

---Setting range---

High-order(Select an upper side spindle.): 0 to 8
Low-order(Select a lower side spindle.): 0 to 8, F

[C80]
Not used.

(PR) #8962 $5 color

Set the color to be shown on the top-left of screen and window title for the 5th part system. This enables switching the color patterns for each part system.
When set to the values "1" to "8", the part system name is shown in the form of button image.
(Note 1) Enabled when "#8942 $1 color" is set to the values "1" to "8".
(Note 2) When set to "1", the color is determined by the setting of "#11060 Screen theme color".

---Setting range---

1: Theme color (default)
2: Pink
3: Light blue
4: Orange
5: Green
6: Fuchsia
7: YellowGreen
8: Brown

(PR) #8963 $6 color

Set the color to be shown on the top-left of screen and window title for the 6th part system. This enables switching the color patterns for each part system.
When set to the values "1" to "8", the part system name is shown in the form of button image.
(Note 1) Enabled when "#8942 $1 color" is set to the values "1" to "8".
(Note 2) When set to "1", the color is determined by the setting of "#11060 Screen theme color".

---Setting range---

1: Theme color (default)
2: Pink
3: Light blue
4: Orange
5: Green
6: Fuchsia
7: YellowGreen
8: Brown

(PR) #8964 $7 color

Set the color to be shown on the top-left of screen and window title for the 7th part system. This enables switching the color patterns for each part system.
When set to the values "1" to "8", the part system name is shown in the form of button image.
(Note 1) Enabled when "#8942 $1 color" is set to the values "1" to "8".
(Note 2) When set to "1", the color is determined by the setting of "#11060 Screen theme color".

---Setting range---

1: Theme color (default)
2: Pink
3: Light blue
4: Orange
5: Green
6: Fuchsia
7: YellowGreen
8: Brown

(PR) #8965 $8 color

[M8]
Set the color to be shown on the top-left of screen and window title for the 8th part system. This enables switching the color patterns for each part system.
When set to the values "1" to "8", the part system name is shown in the form of button image.
(Note 1) Enabled when "#8942 $1 color" is set to the values "1" to "8".
(Note 2) When set to "1", the color is determined by the setting of "#11060 Screen theme color".

---Setting range---

1: Theme color (default)
2: Pink
3: Light blue
4: Orange
5: Green
6: Fuchsia
7: YellowGreen
8: Brown

[C80]
Not used.

(PR) #8966 Edit: INS or OVR

Select whether to insert or overwrite during edit.
Insert or overwrite mode can also be changed temporarily using the INS key.

0: Overwrite mode
1: Insert mode

(PR) #8967 Delete key action

Select the [DELETE] key operation during edit.

0: The key serves as a Delete key (erases the character after the cursor).
1: The key serves as a Back Space key (erases the character before the cursor).

#8968 Tool shape radius

Tool shape radius designation
Select the tool shape designation method.

0: Diameter designation
1: Radius designation

#8969 Tool offset type 1

Specify the display item for the 1st column (type) and 2nd column (compensation amount) on the right side of the tool management screen list display.
The setting value and display item are specified as follows.
(Setting value): (1st column) / (2nd column)

· Tool compensation type I
0-11 : H (Compensation No.) / Length compensation

· Tool compensation type II
0,5-11 : H (Compensation No.) / Length compensation
1 : H (Compensation No.) / Length compensation
2 : D (Compensation No.) / Radius compensation
3 : +H (Compensation No.) / Length wear
4 : +D (Compensation No.) / Radius wear

· Tool compensation type III
0 : (Axis name (1st axis))(Compensation No.) / 1st axis tool length
1 : (Axis name (1st axis))(Compensation No.) / 1st axis tool length
2 : (Axis name (2nd axis))(Compensation No.) / 2nd axis tool length
3 : (Axis name (Additional axis))(Compensation No.) / Additional axis tool length
4 : +(Axis name (1st axis))(Compensation No.) / 1st axis wear
5 : +(Axis name (2nd axis))(Compensation No.) / 2nd axis wear
6 : +(Axis name (Additional axis))(Compensation No.) / Additional axis wear
7 : R / Nose R
8 : +R / R wear
9 : P / Point
10 : (Axis name (2nd additional axis))(Compensation No.) / 2nd additional axis tool length
11 : +(Axis name (2nd additional axis))(Compensation No.) / 2nd additional axis wear

---Setting range---

0 to 11

#8970 Tool offset type 2

Specify the display item for the 3rd column (type) and 4th column (compensation amount) on the right side of the tool management screen list display.
The setting value and display item are specified as follows.
(Setting value): (3rd column) / (4th column)

· Tool compensation type I
0-11 : Set to blank / Set to blank

· Tool compensation type II
0,5-11 : D (Compensation No.) / Radius compensation
1 : H (Compensation No.) / Length compensation
2 : D (Compensation No.) / Radius compensation
3 : +H (Compensation No.) / Length wear
4 : +D (Compensation No.) / Radius wear

· Tool compensation type III
0 : (Axis name (2nd axis))(Compensation No.) / 2nd axis tool length
1 : (Axis name (1st axis))(Compensation No.) / 1st axis tool length
2 : (Axis name (2nd axis))(Compensation No.) / 2nd axis tool length
3 : (Axis name (Additional axis))(Compensation No.) / Additional axis tool length
4 : +(Axis name (1st axis))(Compensation No.) / 1st axis wear
5 : +(Axis name (2nd axis))(Compensation No.) / 2nd axis wear
6 : +(Axis name (Additional axis))(Compensation No.) / Additional axis wear
7 : R / Nose R
8 : +R / R wear
9 : P / Point
10 : (Axis name (2nd additional axis))(Compensation No.) / 2nd additional axis tool length
11 : +(Axis name (2nd additional axis))(Compensation No.) / 2nd additional axis wear

---Setting range---
0 to 11

#8971 Alarm window ON

Select whether to enable the alarm display window.
0: Disable
1: Enable

#8972 T code offset disp

For L system only
Select whether to display tool offset data with the address T's offset No. at the head when the tool offset screen is opened after a manual value command.
<Monitor screen>
* Open the tool offset screen (window)
<Setup screen>
* Display the tool offset screen
(Note) The display is unchanged if you change a tool offset No. with the tool offset screen displayed.
0: Not display tool offset data with the address T's offset No. at the head
1: Display tool offset data with the address T's offset No. at the head

(PR) #8973 Selective display

Select whether to enable selective display on an 8.4- or 10.4-type display terminal.
0: Disable selective display
1: Enable selective display. Select what to display using the parameter "#8940 Set select display".

#8974 Simple PLC switch

Select whether to enable ON/OFF of PLC switch without a press of the [Setting valid] menu.
0: Enable ON/OFF of PLC switch after a press of the [Setting valid] menu.
1: Enable ON/OFF of PLC switch without a press of the [Setting valid] menu.

#8975 No. search process

Select how the [XXX No search] menu works on screens including the parameter and tool offset screens.
0: When you press [No search], enter the No. to display and then press [INPUT], the data on the display is ordered to start from the designated No.
1: When you enter the No. to display and then press [No. search], the data on the display is ordered to start from the designated No.

#8976 Menu animation OFF

[M8]
Select whether to disable animated graphics of the menus.
0: Enable
1: Disable
[C80]
Not used.

#8977 Multi-$ simul edit

Select whether to open the same named programs of different part systems simultaneously for each editing area upon a press of Open on Edit screen while Multi-part system program management is enabled.
0: Disable (Not open the programs simultaneously for each editing area)
1: Enable (Open the programs simultaneously for each editing area)

#8979 Touch op noise res

[M8]
Set the noise tolerance of touch operation.
The larger setting value gives the higher noise tolerance, but the operation response becomes dull.
0: Select this when the motions are normal at one and two points in the stable environment of the power supply.
1 to 4: If the touch detection position is unstable, increase the setting value according to the cursor blur level.
(Note) Do not execute touch operation for two seconds after changing this parameter.
[C80]
Not used.

#8980 R-Navi graphic dir

[M8]
Specify the coordinate system direction of the workpiece graphics (machining surface graphics) to be displayed on the R-Navi surface list screen or surface selection screen.
(Note) The angle (degrees) is a CCW rotation when viewed from the positive end of the height axis.
---Setting range---
0: XYZ 0°
1: YZX 0°
2: ZXY 0°
3: XYZ 90°
4: YZX 90°
5: ZXY 90°
6: XYZ 180°
7: YZX 180°
8: ZXY 180°
9: XYZ 270°
10: YZX 270°
11: ZXY 270°
[C80]
Not used.

#8981 NCmemory date disp

[M8]
Specify the display items when displaying the updated time and date of the file on the "Date / Comment" if NC memory is selected on the program list display.
0: Displays the program comment. (Conventional operation)
1: Displays the updated time and date.
(Note) When multi-part system program management is valid, program comment display is specified, regardless of this setting.
[C80]
Not used.

#8982 CheckSmltns$1Invld

[M8]
In the check method 2 of graphic check, checking for 1st part system is invalid.
0: Enable the check. (1st part system is the check target)
1: Disable the check. (1st part system is not the check target)

#8983 CheckSmltns$2Invld

[M8]
In the check method 2 of graphic check, checking for 2nd part system is invalid.
0: Enable the check. (2nd part system is the check target)
1: Disable the check. (2nd part system is not the check target)

#8984 CheckSmltns$3Invld

[M8]
In the check method 2 of graphic check, checking for 3rd part system is invalid.
0: Enable the check. (3rd part system is the check target)
1: Disable the check. (3rd part system is not the check target)

#8985 CheckSmltns$4Invld

[M8]
In the check method 2 of graphic check, checking for 4th part system is invalid.
0: Enable the check. (4th part system is the check target)
1: Disable the check. (4th part system is not the check target)

#8986 CheckSmltns$5Invld

[M8]
In the check method 2 of graphic check, checking for 5th part system is invalid.
0: Enable the check. (5th part system is the check target)
1: Disable the check. (5th part system is not the check target)

#8987 CheckSmltns$6Invld

[M8]
In the check method 2 of graphic check, checking for 6th part system is invalid.
0: Enable the check. (6th part system is the check target)
1: Disable the check. (6th part system is not the check target)

#8988 CheckSmltns$7Invld

[M8]
In the check method 2 of graphic check, checking for 7th part system is invalid.
0: Enable the check. (7th part system is the check target)
1: Disable the check. (7th part system is not the check target)

#8989 CheckSmltns$8Invld

[M8]
In the check method 2 of graphic check, checking for 8th part system is invalid.
0: Enable the check. (8th part system is the check target)
1: Disable the check. (8th part system is not the check target)

(PR) #8990 Edit-up/down keys

[M8]
At the time of normal edit, specify the operation with up and down cursor keys in the block on the several lines.
0: Moves by line number
1: Moves by line on display
(Note) For mass-editing, the operation is always as "1" setting.
[C80]
Not used.

(PR) #8991 Interactive cycle

[M8]
Select whether to enable the interactive cycle insertion function.
0: Disable
1: Enable
[C80]
Not used.

(PR) #8992 Cycle switch

[M8]
Switch the selectable cycle type.
0: Standard/Extended cycle
1: Not used
2: Not used
[C80]
Not used.

#8993 Cycle highlight

[M8]
Select whether to highlight the program cycle (from the cycle header to the footer) inserted through the interactive cycle insertion.
0: Not highlight
1: Highlight
[C80]
Not used.

#8994 =InputOFF:Interact

[M8]
Select whether to disable the [=Input] menu for interactive cycle insertion.
Setting is available with incremental input only.
0: Enable [=Input] menu
1: Disable [=Input] menu
[C80]
Not used.

#8995 Touchop longtaptim

[M8]
Set the time until recognized as long press (long tap).
When releasing a finger within the set time, it is recognized as tap.
0: 800 (ms)
1: 1000
2: 1500
3: 2000
[C80]
Not used.

(PR) #8996 Simple program ON

[M8]
Select whether to enable the simple programming function.
0: Disable
1: Enable
[C80]
Not used.

#8997 Hi-speed grph chck

[M8]
Select whether to increase the graphic check speed.
When you select 1 to 3, graphic check becomes faster.
Note however that the workpiece shape is drawn more inward than the programmed path.
The greater the setting value, the faster the graphic check will be.
0: Disable
1: Level 1
2: Level 2
3: Level 3
High-speed graphic check is enabled for the check method 1 only.

#8998 Finish shape view

[M8]
Select whether to enable the finished shape display.
0 : Disable
1 : Enable
[C80]
Not used.

(PR) #8999 Simul edit - View

[M8]
Select the display format for simultaneous program edit (3 or 4 Edit), which can be selected with the [Display setting] menu.
0: [2 Edit] and [3 Edit] are selectable.
1: [2 Edit] and [4 Edit] are selectable.

(PR) #19701 Restrain VNCserver

[M8]

Select whether to restrain the VNC client from connecting to the NC, displaying the NC screen or performing setting to the NC.

Menu selection may be disabled depending on the set value.

0: Disable the VNC server function.

1: Enable the VNC server function, and allow the VNC client to display the NC screen and to perform setting operation.

2: Enable the VNC server function, and allow the VNC client to display the NC screen, but the available setting operation is INPUT key only.

#19702 VNC password

[M8]

Specify the password for connecting to the VNC server.

The password is needed for VNC client of an external PC to connect to the server.

---Setting range---

Up to 8 alphanumeric letters

(PR) #19703 VNC server port

[M8]

Specify the port number for connecting to the VNC server.

The recommended value is 5901.

(Note) If you use the remote desktop function, do not set 5900.

---Setting range---

0 to 65535

#19704 VNC color depth

[M8]

Specify the color depth of the screen displayed by the VNC client via VNC server connection.

0: 16-bit color depth

1: 8-bit color depth

#19705 VNC transmit cycle

[M8]

Specify the transmission cycle for the VNC server to send screen data to the VNC client.

0: Standard transmission cycle

1: Increase the cycle two-fold.

2: Increase the cycle four-fold.

(Note) If you increase the transmission cycle, the NC screen refresh may be delayed.

#19710 Edit-Upward search

[M8]

Enable upward search for the text search function in the edit window and edit screen.

0: Search downward from the cursor position.

1: Enable upward and downward search from the cursor position.

1.14 Machining Condition Selection Parameters

(Note) The machining condition parameter groups which can be set through the machining condition setting screen are stored according to the application. The guidance display and parameter input/output on the screen follow the machining condition parameter numbers in the following table. These parameters can only be set through the machining condition setting screen.

Nos. on the machining condition setting screen	Machining Condition Parameters (Application 1)	Machining Condition Parameters (Application 2)	Machining Condition Parameters (Application 3)
#1207	#42001	#42301	#42601
#1568	#42002	#42302	#42602
#1570	#42003	#42303	#42603
#2010	#42007	#42307	#42607
#8019	#42004	#42304	#42604
#8020	#42008	#42308	#42608
#8022	#42005	#42305	#42605
#8023	#42006	#42306	#42606
#8026	#42009	#42309	#42609
#8027	#42010	#42310	#42610
#8028	#42011	#42311	#42611
#8030	#42012	#42312	#42612
#8033	#42013	#42313	#42613
#8029	#42014	#42314	#42614
#8037	#42015	#42315	#42615
#8090	#42016	#42316	#42616
#8091	#42017	#42317	#42617
#8093	#42018	#42318	#42618
#2659	#42019	#42319	#42619
#1206	#42020	#42320	#42620
#12070	#42021	#42321	#42621

#1206 G1bF Maximum speed

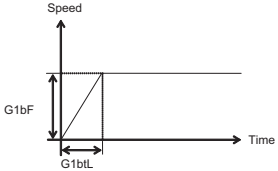
Set a cutting feedrate when applying pre-interpolation acceleration/deceleration.
When high-accuracy control time constant expansion is valid, set the maximum of cutting feed clamp speed of each axis.

---Setting range---

1 to 999999 (mm/min)

#1207 G1btL Time constant

Set a cutting feed time constant when applying pre-interpolation acceleration/deceleration.
When set to "0", the time constant will be clamped at 1ms.



---Setting range---

Without high-accuracy control time constant expansion: 1 to 5000 (ms)
With high-accuracy control time constant expansion: 1 to 30000 (ms)

Cutting feed Acc Cutting feed acceleration

Displays cutting feed acceleration.

#1568 SfiltG1 G01 soft acceleration/deceleration filter

Set the filter time constant for smoothly changing the acceleration rate for the cutting feed acceleration/deceleration in pre-interpolation acceleration/deceleration.
- Notch frequency Hz
Displays the notch frequency (Hz) for the S-pattern filter set in "#1568 SfiltG1" (G01 soft acceleration/deceleration filter).

---Setting range---

0 to 200 (ms)

#1570 Sfilt2 Soft acceleration/deceleration filter 2

Set the filter time constant for smoothly changing the acceleration rate in pre-interpolation acceleration/deceleration.
This will be disabled when "0" or "1" is set.
- Notch frequency Hz
Displays the notch frequency (Hz) for the S-shape filter set in "#1570 Sfilt2" (Soft acceleration/deceleration filter 2).

---Setting range---

0 to 200 (ms)

#2010 fwd_g Feed forward gain

Set a feed forward gain for pre-interpolation acceleration/deceleration.
The larger the set value, the smaller the theoretical control error will be. However, if a machine vibration occurs, set the smaller value.

---Setting range---

0 to 200 (%)

#2659 tolerance Tolerance

Specify a tolerance (tolerable error) to be used under tolerance control.
Set a tolerable error for fine segment program created by CAM.
(Usually around 0.01(mm))
If 0.000 is set, it is operated with the tolerance of 0.01(mm).
When designating the tolerance amount with the ", K address", this parameter is not used.

---Setting range---

0.000 to 100.000 (mm)

#8019 R COMP

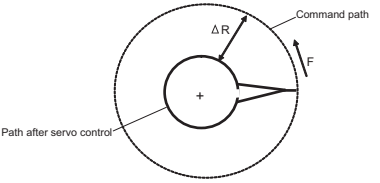
Set a compensation coefficient for reducing a control error in the reduction of a corner roundness and arc radius.
The larger the set value is, the smaller the theoretical error will be. However, since the speed at the corner goes down, the cycle time will be extended.
Coefficient = 100 - set value
(Note) This function will be enabled when "#8021 COMP_CHANGE" is set to "0".

---Setting range---

0 to 99 (%)

Theoretical radius decrease error amount

Displays the theoretical radius decrease error amount, ΔR(mm), from the automatic calculation by NC.



Theoretical radius decrease amount in arc

R5mm arc deceleration speed

Displays a deceleration speed(mm/min) along an arc of 5(mm) radius.

R1mm arc deceleration speed

Displays a deceleration speed(mm/min) along an arc of 1(mm) radius.

#8020 DCC ANGLE

Set the minimum value of an angle (external angle) that should be assumed to be a corner.
When an inter-block angle (external angle) in high-accuracy mode is larger than the set value, it will be determined as a corner and the speed will go down to sharpen the edge.

If the set value is smaller than θ, the speed goes down to optimize the corner.

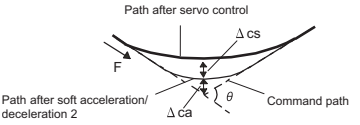
(Note) If "0" is set, it will be handled as "5" degrees.

---Setting range---

0 to 89 (°)
0: 5 degree (Equals to setting "5")

Theoretical corner dull amount

Displays the corner dull amount Δc(mm) in respect to the corner's angle (external angle) θ(°).



Theoretical roundness amount at corner

ca(mm): Error (Δ) caused by the soft acceleration/deceleration 2
cs(mm): Error (Δ) caused by the servo system

Corner deceleration speed

Display corner deceleration speed c (mm/min) for the corner of the angle (external angle) with θ(°).

Theoretical dull amount at 90 degree

Display corner dull amount when the angle is 90 degree.

Corner deceleration speed at 90 degree

Display corner deceleration speed when the angle is 90 degree.

#8021 COMP_CHANGE

Select whether to share or separate the compensation coefficient at the corner/curve during the high-accuracy control mode.
0: Share ("#8019 R COMP" is applied.)
1: Separate
* Corner: #8022 CORNER COMP
* Curve : #8023 CURVE COMP
(Note) Set "1" when using SSS/EasySSS control.

#8022 CORNER COMP

Set the compensation coefficient to further reduce or increase the roundness at the corner during the high-accuracy control mode.
Coefficient = 100 - setting value
(Note) This is valid when "#8021 COMP CHANGE" is set to "1".

Reference to "#8020 Corner decreasing speed "for theoretical corner roundness amount, corner decreasing speed, theoretical 90 degree dull amount, 90 degree corner decreasing speed.

---Setting range---
-1000 to 99 (%)

#8023 CURVE COMP

Set the compensation coefficient to further reduce or increase the radius reduction amount at the curve (arc, involute, spline) during the high-accuracy control mode.
Coefficient = 100 - setting value
(Note) This is valid when "#8021 COMP CHANGE" is set to "1".

For theoretical radius reduction error amount, R5mm arc deceleration speed and R1mm arc deceleration speed, refer to "#8019 R COMP".

---Setting range---
-1000 to 99 (%)

#8025 SPLINE ON

For M system only.
Specify whether to enable the fine spline function.
0: Disable the fine spline function.
1: Enable the fine spline function.
Spline interpolation will be valid during G61.2 modal regardless of this setting.

#8026 CANCEL ANG. (for M system only)

Set the angle where the spline interpolation is temporarily canceled.
When the angle made by blocks exceeds this parameter setting value, spline interpolation will be canceled temporarily. In consideration of the pick feed, set a value a little smaller than the pick feed angle.

---Setting range---
0 to 180 (°)
0: 180 (°)

#8027 Toler-1 (for M system only)

Set the maximum chord error (tolerance) in a block that includes an inflection point. Set the tolerance applicable when the applicable block is developed to fine segments by CAM. (normally about 10 µm)
When "0.000" is set, the applicable block will be linear.

---Setting range---
0.000 to 100.000 (mm)

#8028 Toler-2 (for M system only)

Set the maximum chord error (tolerance) in a block that includes no inflection point. Set the tolerance applicable when the applicable block is developed to fine segments by CAM. (normally about 10 µm)
When "0.000" is set, the applicable block will be linear.

---Setting range---
0.000 to 100.000 (mm)

#8029 FairingL (for M system only)

Set the length of the block subject to fairing.
(Enabled when "#8033 Fairing ON" is set to "1".)

---Setting range---
0 to 100.000 (mm)

#8030 MINUTE LENGS (for M system only)

Set the fine-segment length where the spline interpolation is temporarily canceled.
When the length of one block exceeds this parameter setting value, spline interpolation is canceled temporarily and linear interpolation is performed. Set a value a little smaller than one block length of the program.
If "-1" is set, spline interpolation will be performed regardless of block length.

---Setting range---
-1 to 127 (mm)
0: 1 (mm)

#8033 Fairing ON (for M system only)

Select whether or not to use the fairing or smooth fairing function.
0: Use neither of them
1: Use the fairing function
2: Use the smooth fairing function

#8037 CorJudgeL (for M system only)

Set the length of the block to be excluded when deciding a corner.
(Enabled when "#8036 CordecJudge" is set to "1".)

---Setting range---
0 to 99999.999 (mm)

#8090 SSS ON (for M system only)

Set whether to enable the SSS control with G05 P10000.
0: Disable
1: Enable

#8091 StdLength (for M system only)

Set the maximum value of the range for recognizing the shape.
To eliminate the effect of steps or errors, etc., set a large value. To enable sufficient deceleration, set a small value.
If "0.000" is set, the standard value (1.000mm) will be applied.

---Setting range---
0 to 100.000 (mm)

#8093 StepLeng (for M system only)

Set the width of the step at which the speed is not to be decelerated. (Approximately the same as the CAM path difference [Tolerance].)
If "0" is set, the standard value (5μm) will be applied.
If a minus value is set, the speed will decelerate at all minute steps.

---Setting range---

-1.000 to 0.100 (mm)

#12070 Sfilt2_tol Tolerance control: Soft acceleration/deceleration filter 2

Specify the time constant of the filter that smoothes out fluctuations in acceleration under the tolerance control.
Basically set to 0.

---Setting range---

0 to 200 (ms)

#42001 P1-G1btL Time constant for machining condition selection I

Time constant for machining condition selection I
Set the time constant for the machining condition selection I function. This is equivalent to the parameter #1207 G1btL.

---Setting range---

Without high-accuracy control time constant expansion: 0 to 5000 (ms)
With high-accuracy control time constant expansion: 0 to 30000 (ms)

#42002 P1-SfiltG1 G01soft acceleration/deceleration filter for machining condition selection I

G01soft acceleration/deceleration filter for machining condition selection I
Set the G01 soft acceleration/deceleration filter's time constant for the machining condition selection I function. This is equivalent to the parameter #1568 SfiltG1.

---Setting range---

0 to 200 (ms)

#42003 P1-Sfilt2 Soft acceleration/deceleration filter 2 for machining condition selection I

Soft acceleration/deceleration filter 2 for machining condition selection I
Set the soft acceleration/deceleration filter 2's time constant for the machining condition selection I function. This is equivalent to the parameter #1570 Sfilt2.

---Setting range---

0 to 50 (ms)

#42004 P1-rcomp Accuracy coefficient for machining condition selection I

Accuracy coefficient for machining condition selection I
Set the accuracy coefficient for the machining condition selection I function. This is equivalent to the parameter #8019 R COMP.
* This setting is enabled when "#8021 COMP_CHANGE" is set to "0".

---Setting range---

0 to 99 (%)

#42005 P1-cor_comp Corner accuracy coefficient for machining condition selection I

Corner accuracy coefficient for machining condition selection I
Set the corner accuracy coefficient for the machining condition selection I function. This is equivalent to the parameter #8022 CORNER COMP.
* This setting is enabled when "#8021 COMP_CHANGE" is set to "1".

---Setting range---

-1000 to 99 (%)

#42006 P1-cur_comp Curve accuracy coefficient for machining condition selection I

Curve accuracy coefficient for machining condition selection I
Set the curve accuracy coefficient for the machining condition selection I function. This is equivalent to the parameter #8023 CURVE COMP.
* This setting is enabled when "#8021 COMP_CHANGE" is set to "1".

---Setting range---

-1000 to 99 (%)

#42007 P1-fwd_g Feed forward gain for machining condition selection I

Feed forward gain for machining condition selection I
Set the feed forward gain for the machining condition selection I function. This is equivalent to the parameter #2010 fwd_g.

---Setting range---

0 to 200 (%)

#42008 P1-fcorn Corner deceleration angle for machining condition selection I

Corner deceleration angle for machining condition selection I
Set the corner deceleration angle for the machining condition selection I function. This is equivalent to the parameter #8020 DCC ANGLE.

---Setting range---

0 to 89 (deg)

#42009 P1-spcanag Cancel angle for machining condition selection I

Cancel angle for machining condition selection I
Set the cancel angle for the machining condition selection I function.This is equivalent to the parameter #8026 CANCEL ANG.

---Setting range---

0 to 180 (deg)

#42010 P1-distth1 Chord error 1 for machining condition selection I

Chord error 1 for machining condition selection I
Set the chord error 1 for the machining condition selection I function. This is equivalent to the parameter #8027 Toler-1.
---Setting range---
0.000 to 100.000 (mm)

#42011 P1-distth2 Chord error 2 for machining condition selection I

Chord error 2 for machining condition selection I
Set the chord error 2 for the machining condition selection I function. This is equivalent to the parameter #8028 Toler-2.
---Setting range---
0.000 to 100.000 (mm)

#42012 P1-minute Fine segment length for machining condition selection I

Fine segment length for machining condition selection I
Set the fine segment length for the machining condition selection I function. This is equivalent to the parameter #8030 MINUTE LENGS.
---Setting range---
-1 to 127 (mm)

#42013 P1-fairing Fairing ON for machining condition selection I

Fairing ON for machining condition selection I
Set whether to enable the fairing function for the machining condition selection I function. This is equivalent to the parameter #8033 Fairing ON.
---Setting range---
0/1

#42014 P1-minleng Fairing L for machining condition selection I

Fairing L for machining condition selection I
Set the fairing length for the machining condition selection I function. This is equivalent to the parameter #8029 FairingL.
---Setting range---
0 to 100.000 (mm)

#42015 P1-cordeclen Corner judgment length for machining condition selection I

Corner judgment length for machining condition selection I
Set the corner judgment length for the machining condition selection I function. This is equivalent to the parameter #8037 CorJudgeL.
---Setting range---
0 to 99999.999 (mm)

#42016 P1-sss_prcm SSS/EasySSS control ON for machining condition selection I

SSS/EasySSS control ON for machining condition selection I
Set whether to enable the SSS/EasySSS control for the machining condition selection I function. This is equivalent to the parameter #8090 SSS ON.
---Setting range---
0/1

#42017 P1-std_length Standard length for machining condition selection I

Standard length for machining condition selection I
Set the standard length for the machining condition selection I function. This is equivalent to the parameter #8091 StdLength.
---Setting range---
0 to 100.000 (mm)

#42018 P1-step_length Step width for machining condition selection I

Step width for machining condition selection I
Set the width of the step for the machining condition selection I function. This is equivalent to the parameter #8093 StepLeng.
---Setting range---
-1.000 to 0.100 (mm)

#42019 P1-tolerance Tolerance for machining condition selection I

Set the tolerance for machining condition selection parameter group for machining condition selection I function.
This is equivalent to the parameter "#2659 tolerance".
---Setting range---
0 to 100.000 (mm)

#42020 P1-G1bF Machining condition selection I: maximum speed

[M8]
Specify the maximum speed for the machining condition parameters of the machining condition selection I function (equivalent to #1206 G1bF).
---Setting range--
1 to 1000000 (mm/min)

#42021 P1-Sfilt2_tol Machining condition selection I: tolerance control soft accel/decel filter 2

[M8]
Specify the tolerance control soft acceleration/deceleration filter 2 for the machining condition parameters of the machining condition selection I function (equivalent to #12070 Sfilt2_tol).
---Setting range---
0 to 200 (ms)

#42301 P2-G1btL Time constant for machining condition selection I

Time constant for machining condition selection I
Set the time constant for the machining condition selection I function. This is equivalent to the parameter #1207 G1btL.
---Setting range---
Without high-accuracy control time constant expansion: 0 to 5000 (ms)
With high-accuracy control time constant expansion: 0 to 30000 (ms)

#42302 P2-SfiltG1 G01soft acceleration/deceleration filter for machining condition selection I

G01soft acceleration/deceleration filter for machining condition selection I
Set the G01 soft acceleration/deceleration filter's time constant for the machining condition selection I function. This is equivalent to the parameter #1568 SfiltG1.
---Setting range---
0 to 200 (ms)

#42303 P2-Sfilt2 Soft acceleration/deceleration filter 2 for machining condition selection I

Soft acceleration/deceleration filter 2 for machining condition selection I
Set the soft acceleration/deceleration filter 2's time constant for the machining condition selection I function. This is equivalent to the parameter #1570 Sfilt2.
---Setting range---
0 to 50 (ms)

#42304 P2-rcomp Accuracy coefficient for machining condition selection I

Accuracy coefficient for machining condition selection I
Set the accuracy coefficient for the machining condition selection I function. This is equivalent to the parameter #8019 R COMP.
* This setting is enabled when "#8021 COMP_CHANGE" is set to "0".
---Setting range---
0 to 99 (%)

#42305 P2-cor_comp Corner accuracy coefficient for machining condition selection I

Corner accuracy coefficient for machining condition selection I
Set the corner accuracy coefficient for the machining condition selection I function. This is equivalent to the parameter #8022 CORNER COMP.
* This setting is enabled when "#8021 COMP_CHANGE" is set to "1".
---Setting range---
-1000 to 99 (%)

#42306 P2-cur_comp Curve accuracy coefficient for machining condition selection I

Curve accuracy coefficient for machining condition selection I
Set the curve accuracy coefficient for the machining condition selection I function. This is equivalent to the parameter #8023 CURVE COMP.
* This setting is enabled when "#8021 COMP_CHANGE" is set to "1".
---Setting range---
-1000 to 99 (%)

#42307 P2-fwd_g Feed forward gain for machining condition selection I

Feed forward gain for machining condition selection I
Set the feed forward gain for the machining condition selection I function. This is equivalent to the parameter #2010 fwd_g.
---Setting range---
0 to 200 (%)

#42308 P2-fcorn Corner deceleration angle for machining condition selection I

Corner deceleration angle for machining condition selection I
Set the corner deceleration angle for the machining condition selection I function. This is equivalent to the parameter #8020 DCC ANGLE.
---Setting range---
0 to 89 (deg)

#42309 P2-spcanag Cancel angle for machining condition selection I

Cancel angle for machining condition selection I
Set the cancel angle for the machining condition selection I function. This is equivalent to the parameter #8026 CANCEL ANG.
---Setting range---
0 to 180 (deg)

#42310 P2-distth1 Chord error 1 for machining condition selection I

Chord error 1 for machining condition selection I
Set the chord error 1 for the machining condition selection I function. This is equivalent to the parameter #8027 Toler-1.
---Setting range---
0.000 to 100.000 (mm)

#42311 P2-distth2 Chord error 2 for machining condition selection I

Chord error 2 for machining condition selection I
Set the chord error 2 for the machining condition selection I function. This is equivalent to the parameter #8028 Toler-2.
---Setting range---
0.000 to 100.000 (mm)

#42312 P2-minute Fine segment length for machining condition selection I

Fine segment length for machining condition selection I
Set the fine segment length for the machining condition selection I function. This is equivalent to the parameter #8030 MINUTE LENGS.
---Setting range---
-1 to 127 (mm)

#42313 P2-fairing Fairing ON for machining condition selection I

Fairing ON for machining condition selection I
Set whether to enable the fairing function for the machining condition selection I function. This is equivalent to the parameter #8033 Fairing ON.
---Setting range---
0/1

#42314 P2-minleng Fairing L for machining condition selection I

Fairing L for machining condition selection I
Set the fairing length for the machining condition selection I function. This is equivalent to the parameter #8029 FairingL.
---Setting range---
0 to 100.000 (mm)

#42315 P2-cordeclen Corner judgment length for machining condition selection I

Corner judgment length for machining condition selection I
Set the corner judgment length for the machining condition selection I function. This is equivalent to the parameter #8037 CorJudgeL.
---Setting range---
0 to 99999.999 (mm)

#42316 P2-sss_prcm SSS/EasySSS control ON for machining condition selection I

SSS/EasySSS control ON for machining condition selection I
Set whether to enable the SSS/EasySSS control for the machining condition selection I function. This is equivalent to the parameter #8090 SSS ON.
---Setting range---
0/1

#42317 P2-std_length Standard length for machining condition selection I

Standard length for machining condition selection I
Set the standard length for the machining condition selection I function. This is equivalent to the parameter #8091 StdLength.
---Setting range---
0 to 100.000 (mm)

#42318 P2-step_length Step width for machining condition selection I

Step width for machining condition selection I
Set the width of the step for the machining condition selection I function. This is equivalent to the parameter #8093 StepLeng.
---Setting range---
-1.000 to 0.100 (mm)

#42319 P2-tolerance Tolerance for machining condition selection I

Set the tolerance for machining condition selection parameter group for machining condition selection I function.
This is equivalent to the parameter "#2659 tolerance".
---Setting range---
0 to 100.000 (mm)

#42320 P2-G1bF Machining condition selection I: maximum speed

[M8]
Specify the maximum speed for the machining condition parameters of the machining condition selection I function (equivalent to #1206 G1bF).
---Setting range---
1 to 1000000 (mm/min)

#42321 P2-Sfilt2_tol Machining condition selection I: tolerance control soft accel/decel filter 2

[M8]
Specify the tolerance control soft acceleration/deceleration filter 2 for the machining condition parameters of the machining condition selection I function (equivalent to #12070 Sfilt2_tol).
---Setting range---
0 to 200 (ms)

#42601 P3-G1btL Time constant for machining condition selection I

Time constant for machining condition selection I
Set the time constant for the machining condition selection I function. This is equivalent to the parameter #1207 G1btL.
---Setting range---
Without high-accuracy control time constant expansion: 0 to 5000 (ms)
With high-accuracy control time constant expansion: 0 to 30000 (ms)

#42602 P3-SfiltG1 G01soft acceleration/deceleration filter for machining condition selection I

G01soft acceleration/deceleration filter for machining condition selection I
Set the G01 soft acceleration/deceleration filter's time constant for the machining condition selection I function. This is equivalent to the parameter #1568 SfiltG1.
---Setting range---
0 to 200 (ms)

#42603 P3-Sfilt2 Soft acceleration/deceleration filter 2 for machining condition selection I

Soft acceleration/deceleration filter 2 for machining condition selection I
Set the soft acceleration/deceleration filter 2's time constant for the machining condition selection I function. This is equivalent to the parameter #1570 Sfilt2.
---Setting range---
0 to 50 (ms)

#42604 P3-rcomp Accuracy coefficient for machining condition selection I

Accuracy coefficient for machining condition selection I
Set the accuracy coefficient for the machining condition selection I function. This is equivalent to the parameter #8019 R COMP.
* This setting is enabled when "#8021 COMP_CHANGE" is set to "0".
---Setting range---
0 to 99 (%)

#42605 P3-cor_comp Corner accuracy coefficient for machining condition selection I

Corner accuracy coefficient for machining condition selection I
Set the corner accuracy coefficient for the machining condition selection I function. This is equivalent to the parameter #8022 CORNER COMP.
* This setting is enabled when "#8021 COMP_CHANGE" is set to "1".
---Setting range---
-1000 to 99 (%)

#42606 P3-cur_comp Curve accuracy coefficient for machining condition selection I

Curve accuracy coefficient for machining condition selection I
Set the curve accuracy coefficient for the machining condition selection I function. This is equivalent to the parameter #8023 CURVE COMP.
* This setting is enabled when "#8021 COMP_CHANGE" is set to "1".
---Setting range---
-1000 to 99 (%)

#42607 P3-fwd_g Feed forward gain for machining condition selection I

Feed forward gain for machining condition selection I
Set the feed forward gain for the machining condition selection I function. This is equivalent to the parameter #2010 fwd_g.
---Setting range---
0 to 200 (%)

#42608 P3-fcorn Corner deceleration angle for machining condition selection I

Corner deceleration angle for machining condition selection I
Set the corner deceleration angle for the machining condition selection I function. This is equivalent to the parameter #8020 DCC ANGLE.
---Setting range---
0 to 89 (deg)

#42609 P3-spcanag Cancel angle for machining condition selection I

Cancel angle for machining condition selection I
Set the cancel angle for the machining condition selection I function. This is equivalent to the parameter #8026 CANCEL ANG.
---Setting range---
0 to 180 (deg)

#42610 P3-distth1 Chord error 1 for machining condition selection I

Chord error 1 for machining condition selection I
Set the chord error 1 for the machining condition selection I function. This is equivalent to the parameter #8027 Toler-1.
---Setting range---
0.000 to 100.000 (mm)

#42611 P3-distth2 Chord error 2 for machining condition selection I

Chord error 2 for machining condition selection I
Set the chord error 2 for the machining condition selection I function. This is equivalent to the parameter #8028 Toler-2.
---Setting range---
0.000 to 100.000 (mm)

#42612 P3-minute Fine segment length for machining condition selection I

Fine segment length for machining condition selection I
Set the fine segment length for the machining condition selection I function. This is equivalent to the parameter #8030 MINUTE LENGS.
---Setting range---
-1 to 127 (mm)

#42613 P3-fairing Fairing ON for machining condition selection I

Fairing ON for machining condition selection I
Set whether to enable the fairing function for the machining condition selection I function. This is equivalent to the parameter #8033 Fairing ON.
---Setting range---
0/1

#42614 P3-minleng Fairing L for machining condition selection I

Fairing L for machining condition selection I
Set the fairing length for the machining condition selection I function. This is equivalent to the parameter #8029 FairingL.
---Setting range---
0 to 100.000 (mm)

#42615 P3-cordeclen Corner judgment length for machining condition selection I

Corner judgment length for machining condition selection I
Set the corner judgment length for the machining condition selection I function. This is equivalent to the parameter #8037 CorJudgeL.
---Setting range---
0 to 99999.999 (mm)

#42616 P3-sss_prcm SSS/EasySSS control ON for machining condition selection I

SSS/EasySSS control ON for machining condition selection I
Set whether to enable the SSS/EasySSS control for the machining condition selection I function. This is equivalent to the parameter #8090 SSS ON.
---Setting range---
0/1

#42617 P3-std_length Standard length for machining condition selection I

Standard length for machining condition selection I
Set the standard length for the machining condition selection I function. This is equivalent to the parameter #8091 StdLength.
---Setting range---
0 to 100.000 (mm)

#42618 P3-step_length Step width for machining condition selection I

Step width for machining condition selection I
Set the width of the step for the machining condition selection I function. This is equivalent to the parameter #8093 StepLeng.
---Setting range---
-1.000 to 0.100 (mm)

#42619 P3-tolerance Tolerance for machining condition selection I

Set the tolerance for machining condition selection parameter group for machining condition selection I function.
This is equivalent to the parameter "#2659 tolerance".
---Setting range---
0 to 100.000 (mm)

#42620 P3-G1bF Machining condition selection I: maximum speed

[M8]
Specify the maximum speed for the machining condition parameters of the machining condition selection I function (equivalent to #1206 G1bF).
---Setting range---
1 to 1000000 (mm/min)

#42621 P3-Sfilt2_tol Machining condition selection I: tolerance control soft accel/decel filter 2

[M8]
Specify the tolerance control soft acceleration/deceleration filter 2 for the machining condition parameters of the machining condition selection I function (equivalent to #12070 Sfilt2_tol).
---Setting range---
0 to 200 (ms)

1.15 Menu Selection Parameters

(PR) #10501-10530 Monitr main menu 1 to 30

Select the menu Nos. to be displayed on Monitor screen's main menus.
Set the menu No. (numbered in the initial order) which you wish to set first from the left of Monitor's main menus in #10501, second in the next parameter and likewise afterwards.
(Ex.) When you set the parameter #10501 to 11, the menu initially displayed at the left end of Monitor main menu's 2nd page is displayed at the left end of the 1st page.
(Note) If you set the No. of menu which is not displayed in the initial state (without setting the menu selection parameters), the menu won't be displayed after this parameter setting.

[M8]
The menu position of each parameter and the menu when "0" is set are as follows.
•#10501: First from left in the page 1 (when "0" is set: Search)
•#10502: Second from left in the page 1 (when "0" is set: Reserch)
•#10503: Third from left in the page 1 (when "0" is set: Edit)
•#10504: Fourth from left in the page 1 (when "0" is set: Trace)
•#10505: Fifth from left in the page 1 (when "0" is set: Check)
•#10506: Sixth from left in the page 1 (when "0" is set: Offset)
•#10507: Seventh from left in the page 1 (when "0" is set: Coord)
•#10508: Eighth from left in the page 1 (when "0" is set: W-shift)
•#10509: Ninth from left in the page 1 (when "0" is set: Not display)
•#10510: Tenth from left in the page 1 (when "0" is set: Dsp sw.)
•#10511: First from left in the page 2 (when "0" is set: Modal)
•#10512: Second from left in the page 2 (when "0" is set: Tree)
•#10513: Third from left in the page 2 (when "0" is set: Time)
•#10514: Fourth from left in the page 2 (when "0" is set: Com var)
•#10515: Fifth from left in the page 2 (when "0" is set: Loc var)
•#10516: Sixth from left in the page 2 (when "0" is set: P corr)
•#10517: Seventh from left in the page 2 (when "0" is set: PLC SW)
•#10518: Eighth from left in the page 2 (when "0" is set: G92 set)
•#10519: Ninth from left in the page 2 (when "0" is set: Col stp)
•#10520: Tenth from left in the page 2 (when "0" is set: LdMeter)
•#10521: First from left in the page 3 (when "0" is set: Sp-stby)
•#10522: Second from left in the page 3 (when "0" is set: TipDisp)
•#10523: Third from left in the page 3 (when "0" is set: All sp)
•#10524: Fourth from left in the page 3 (when "0" is set: Not display)
•#10525: Fifth from left in the page 3 (when "0" is set: Not display)
•#10526: Sixth from left in the page 3 (when "0" is set: S-sel)
•#10527: Seventh from left in the page 3 (when "0" is set: Next Ax)
•#10528: Eighth from left in the page 3 (when "0" is set: Cnt exp)
•#10529: Ninth from left in the page 3 (when "0" is set: Cnt set)
•#10530: Tenth from left in the page 3 (when "0" is set: MST)

-- Menu No. --
-1: Not display
0: Default
1: Search
2: Reserch
3: Edit
4: Trace
5: Check
6: Offset
7: Coord
8: W-shift
10: Dsp sw.
11: Modal
12: Tree
13: Time
14: Com var
15: Loc var
16: P corr
17: PLC SW
18: G92 set
19: Col stp
20: LdMeter
21: Sp-stby
22: TipDisp
23: All sp
26: S-sel
27: Next Ax
28: Cnt exp
29: Cnt set
30: MST

[C80]
The menu position of each parameter and the menu when "0" is set are as follows.
•#10501: First from left in the page 1 (when "0" is set: Search)
•#10502: Second from left in the page 1 (when "0" is set: Reserch)
•#10503: Third from left in the page 1 (when "0" is set: Edit)
•#10504: Fourth from left in the page 1 (when "0" is set: Not display)
•#10505: Fifth from left in the page 1 (when "0" is set: Not display)
•#10506: Sixth from left in the page 1 (when "0" is set: Offset)
•#10507: Seventh from left in the page 1 (when "0" is set: Coord)
•#10508: Eighth from left in the page 1 (when "0" is set: W-shift)
•#10509: Ninth from left in the page 1 (when "0" is set: Not display)
•#10510: Tenth from left in the page 1 (when "0" is set: Dsp sw.)
•#10511: First from left in the page 2 (when "0" is set: Modal)
•#10512: Second from left in the page 2 (when "0" is set: Tree)
•#10513: Third from left in the page 2 (when "0" is set: Time)

♦#10514: Fourth from left in the page 2 (when "0" is set: Com var)
♦#10515: Fifth from left in the page 2 (when "0" is set: Loc var)
♦#10516: Sixth from left in the page 2 (when "0" is set: P corr)
♦#10517: Seventh from left in the page 2 (when "0" is set: Not display)
♦#10518: Eighth from left in the page 2 (when "0" is set: G92 set)
♦#10519: Ninth from left in the page 2 (when "0" is set: Col stp)
♦#10520: Tenth from left in the page 2 (when "0" is set: LdMeter)
♦#10521: First from left in the page 3 (when "0" is set: Sp-stby)
♦#10522: Second from left in the page 3 (when "0" is set: TipDisp)
♦#10523: Third from left in the page 3 (when "0" is set: All sp)
♦#10524: Fourth from left in the page 3 (when "0" is set: Not display)
♦#10525: Fifth from left in the page 3 (when "0" is set: Not display)
♦#10526: Sixth from left in the page 3 (when "0" is set: Not display)
♦#10527: Seventh from left in the page 3 (when "0" is set: Not display)
♦#10528: Eighth from left in the page 3 (when "0" is set: Cnt exp)
♦#10529: Ninth from left in the page 3 (when "0" is set: Cnt set)
♦#10530: Tenth from left in the page 3 (when "0" is set: MST)

-- Menu No. --
-1: Not display
0: Default
1: Search
2: Reserch
3: Edit
6: Offset
7: Coord
8: W-shift
10: Dsp sw.
11: Modal
12: Tree
13: Time
14: Com var
15: Loc var
16: P corr
18: G92 set
19: Col stp
20: LdMeter
21: Sp-stby
22: TipDisp
23: All sp
28: Cnt exp
29: Cnt set
30: MST

(PR) #10551-10580 Setup main menu 1 to 30

Select the menu Nos. to be displayed on Setup screen's main menus.
Set the menu No. (numbered in the initial order) which you wish to set first from the left of Setup's main menus in #10551, second in the next parameter and likewise afterwards.
(Ex.) When you set the parameter #10551 to 11, the menu initially displayed at the left end of Setup main menu's 2nd page is displayed at the left end of the 1st page.
(Note) If you set the No. of menu which is not displayed in the initial state (without setting the menu selection parameters), the menu won't be displayed after this parameter setting.

[M8]
The menu position of each parameter and the menu when "0" is set are as follows.
•#10551: First from left in the page 1 (when "0" is set: T-ofs)
•#10552: Second from left in the page 1 (when "0" is set: T-meas)
•#10553: Third from left in the page 1 (when "0" is set: T-reg)
•#10554: Fourth from left in the page 1 (when "0" is set: T-life)
•#10555: Fifth from left in the page 1 (when "0" is set: Coord)
•#10556: Sixth from left in the page 1 (when "0" is set: W-meas)
•#10557: Seventh from left in the page 1 (when "0" is set: T-Mng.)
•#10558: Eighth from left in the page 1 (when "0" is set: MDI)
•#10559: Ninth from left in the page 1 (when "0" is set: Cnt set)
•#10560: Tenth from left in the page 1 (when "0" is set: MST)
•#10561: First from left in the page 2 (when "0" is set: T-list)
•#10562: Second from left in the page 2 (when "0" is set: Pallet)
•#10563: Third from left in the page 2 (when "0" is set: User)
•#10564: Fourth from left in the page 2 (when "0" is set: Not display)
•#10565: Fifth from left in the page 2 (when "0" is set: Storage)
•#10566: Sixth from left in the page 2 (when "0" is set: Surf)
•#10567: Seventh from left in the page 2 (when "0" is set: MacCond)
•#10568: Eighth from left in the page 2 (when "0" is set: Not display)
•#10569: Ninth from left in the page 2 (when "0" is set: Not display)
•#10570: Tenth from left in the page 2 (when "0" is set: Not display)
•#10571: First from left in the page 3 (when "0" is set: Not display)
•#10572: Second from left in the page 3 (when "0" is set: Barrier)
•#10573: Third from left in the page 3 (when "0" is set: Not display)
•#10574: Fourth from left in the page 3 (when "0" is set: Not display)
•#10575: Fifth from left in the page 3 (when "0" is set: Not display)
•#10576: Sixth from left in the page 3 (when "0" is set: E-mail)
•#10577: Seventh from left in the page 3 (when "0" is set: Not display)
•#10578: Eighth from left in the page 3 (when "0" is set: Not display)
•#10579: Ninth from left in the page 3 (when "0" is set: Not display)
•#10580: Tenth from left in the page 3 (when "0" is set: Not display)

-- Menu No. --
-1: Not display
0: Default
1: T-ofs
2: T-meas
3: T-reg
4: T-life
5: Coord
6: W-meas
7: T-Mng.
8: MDI
9: Cnt set
10: MST
11: T-list
12: Pallet
13: User
15: Storage
16: Surf
17: MacCond
22: Barrier
26: E-mail

[C80]
The menu position of each parameter and the menu when "0" is set are as follows.
•#10551: First from left in the page 1 (when "0" is set: T-ofs)
•#10552: Second from left in the page 1 (when "0" is set: T-meas)
•#10553: Third from left in the page 1 (when "0" is set: T-reg)
•#10554: Fourth from left in the page 1 (when "0" is set: T-life)
•#10555: Fifth from left in the page 1 (when "0" is set: Coord)
•#10556: Sixth from left in the page 1 (when "0" is set: W-meas)
•#10557: Seventh from left in the page 1 (when "0" is set: T-Mng.)
•#10558: Eighth from left in the page 1 (when "0" is set: MDI)
•#10559: Ninth from left in the page 1 (when "0" is set: Cnt set)
•#10560: Tenth from left in the page 1 (when "0" is set: MST)
•#10561: First from left in the page 2 (when "0" is set: Not display)
•#10562: Second from left in the page 2 (when "0" is set: Not display)
•#10563: Third from left in the page 2 (when "0" is set: User)
•#10564: Fourth from left in the page 2 (when "0" is set: Not display)
•#10565: Fifth from left in the page 2 (when "0" is set: Not display)
•#10566: Sixth from left in the page 2 (when "0" is set: Not display)
•#10567: Seventh from left in the page 2 (when "0" is set: MacCond)
•#10568: Eighth from left in the page 2 (when "0" is set: Not display)
•#10569: Ninth from left in the page 2 (when "0" is set: Not display)
•#10570: Tenth from left in the page 2 (when "0" is set: Not display)
•#10571: First from left in the page 3 (when "0" is set: Not display)
•#10572: Second from left in the page 3 (when "0" is set: Barrier)
•#10573: Third from left in the page 3 (when "0" is set: Not display)
•#10574: Fourth from left in the page 3 (when "0" is set: Not display)
•#10575: Fifth from left in the page 3 (when "0" is set: Not display)

♦#10576: Sixth from left in the page 3 (when "0" is set: Not display)
♦#10577: Seventh from left in the page 3 (when "0" is set: Not display)
♦#10578: Eighth from left in the page 3 (when "0" is set: Not display)
♦#10579: Ninth from left in the page 3 (when "0" is set: Not display)
♦#10580: Tenth from left in the page 3 (when "0" is set: Not display)

-- Menu No. --
-1: Not display
0: Default
1: T-ofs
2: T-meas
3: T-reg
4: T-life
5: Coord
6: W-meas
7: T-Mng.
8: MDI
9: Cnt set
10: MST
13: User
17: MacCond
22: Barrier

(PR) #10601-10630 Edit main menu 1 to 30

Select the menu Nos. to be displayed on Edit screen's main menus.
Set the menu No. (numbered in the initial order) which you wish to set first from the left of Edit's main menus in #10601, second in the next parameter and likewise afterwards.
(Ex.) When you set the parameter #10601 to 11, the menu initially displayed at the left end of Edit main menu's 2nd page is displayed at the left end of the 1st page.
(Note) If you set the No. of menu which is not displayed in the initial state (without setting the menu selection parameters), the menu won't be displayed after this parameter setting.

[M8]
The menu position of each parameter and the menu when "0" is set are as follows.
•#10601: First from left in the page 1 (when "0" is set: Edit)
•#10602: Second from left in the page 1 (when "0" is set: Check)
•#10603: Third from left in the page 1 (when "0" is set: NAVI (NAVI MILL))
•#10604: Fourth from left in the page 1 (when "0" is set: NAVI (NAVI LATHE))
•#10605: Fifth from left in the page 1 (when "0" is set: I/O)
•#10606: Sixth from left in the page 1 (when "0" is set: Not display)
•#10607: Seventh from left in the page 1 (when "0" is set: Not display)
•#10608: Eighth from left in the page 1 (when "0" is set: Not display)
•#10609: Ninth from left in the page 1 (when "0" is set: Not display)
•#10610: Tenth from left in the page 1 (when "0" is set: Not display)
•#10611: First from left in the page 2 (when "0" is set: Not display)
•#10612: Second from left in the page 2 (when "0" is set: Not display)
•#10613: Third from left in the page 2 (when "0" is set: Not display)
•#10614: Fourth from left in the page 2 (when "0" is set: Not display)
•#10615: Fifth from left in the page 2 (when "0" is set: Not display)
•#10616: Sixth from left in the page 2 (when "0" is set: Not display)
•#10617: Seventh from left in the page 2 (when "0" is set: Not display)
•#10618: Eighth from left in the page 2 (when "0" is set: Not display)
•#10619: Ninth from left in the page 2 (when "0" is set: Not display)
•#10620: Tenth from left in the page 2 (when "0" is set: Not display)
•#10621: First from left in the page 3 (when "0" is set: Not display)
•#10622: Second from left in the page 3 (when "0" is set: Not display)
•#10623: Third from left in the page 3 (when "0" is set: Not display)
•#10624: Fourth from left in the page 3 (when "0" is set: Not display)
•#10625: Fifth from left in the page 3 (when "0" is set: Not display)
•#10626: Sixth from left in the page 3 (when "0" is set: Not display)
•#10627: Seventh from left in the page 3 (when "0" is set: Not display)
•#10628: Eighth from left in the page 3 (when "0" is set: Not display)
•#10629: Ninth from left in the page 3 (when "0" is set: Not display)
•#10630: Tenth from left in the page 3 (when "0" is set: Not display)

-- Menu No. --
-1: Not display
0: Default
1: Edit
2: Check
3: NAVI (NAVI MILL)
4: NAVI (NAVI LATHE)
5: I/O

[C80]
The menu position of each parameter and the menu when "0" is set are as follows.
•#10601: First from left in the page 1 (when "0" is set: Edit)
•#10602: Second from left in the page 1 (when "0" is set: Not display)
•#10603: Third from left in the page 1 (when "0" is set: Not display)
•#10604: Fourth from left in the page 1 (when "0" is set: Not display)
•#10605: Fifth from left in the page 1 (when "0" is set: I/O)
•#10606: Sixth from left in the page 1 (when "0" is set: Not display)
•#10607: Seventh from left in the page 1 (when "0" is set: Not display)
•#10608: Eighth from left in the page 1 (when "0" is set: Not display)
•#10609: Ninth from left in the page 1 (when "0" is set: Not display)
•#10610: Tenth from left in the page 1 (when "0" is set: Not display)
•#10611: First from left in the page 2 (when "0" is set: Not display)
•#10612: Second from left in the page 2 (when "0" is set: Not display)
•#10613: Third from left in the page 2 (when "0" is set: Not display)
•#10614: Fourth from left in the page 2 (when "0" is set: Not display)
•#10615: Fifth from left in the page 2 (when "0" is set: Not display)
•#10616: Sixth from left in the page 2 (when "0" is set: Not display)
•#10617: Seventh from left in the page 2 (when "0" is set: Not display)
•#10618: Eighth from left in the page 2 (when "0" is set: Not display)
•#10619: Ninth from left in the page 2 (when "0" is set: Not display)
•#10620: Tenth from left in the page 2 (when "0" is set: Not display)
•#10621: First from left in the page 3 (when "0" is set: Not display)
•#10622: Second from left in the page 3 (when "0" is set: Not display)
•#10623: Third from left in the page 3 (when "0" is set: Not display)
•#10624: Fourth from left in the page 3 (when "0" is set: Not display)
•#10625: Fifth from left in the page 3 (when "0" is set: Not display)
•#10626: Sixth from left in the page 3 (when "0" is set: Not display)
•#10627: Seventh from left in the page 3 (when "0" is set: Not display)
•#10628: Eighth from left in the page 3 (when "0" is set: Not display)
•#10629: Ninth from left in the page 3 (when "0" is set: Not display)
•#10630: Tenth from left in the page 3 (when "0" is set: Not display)

-- Menu No. --
-1: Not display
0: Default
1: Edit
5: I/O

1.16 Tolerance Parameters[M8]

#2659 tolerance **Tolerance**

Specify a tolerance (tolerable error) to be used under tolerance control.
Set a tolerable error for fine segment program created by CAM.
(Usually around 0.01(mm))
If 0.000 is set, it is operated with the tolerance of 0.01(mm).
When designating the tolerance amount with the ", K address", this parameter is not used.

---Setting range---
0.000 to 100.000 (mm)

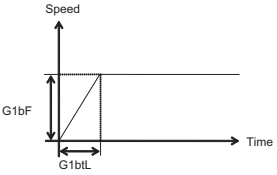
#1206 G1bF **Maximum speed**

Set a cutting feedrate when applying pre-interpolation acceleration/deceleration.
When high-accuracy control time constant expansion is valid, set the maximum of cutting feed clamp speed of each axis.

---Setting range---
1 to 999999 (mm/min)

#1207 G1btL **Time constant**

Set a cutting feed time constant when applying pre-interpolation acceleration/deceleration.
When set to "0", the time constant will be clamped at 1ms.



---Setting range---
Without high-accuracy control time constant expansion: 1 to 5000 (ms)
With high-accuracy control time constant expansion: 1 to 30000 (ms)

Cutting feed Acc Cutting feed acceleration

Displays cutting feed acceleration.

#1568 SfiltG1 **G01 soft acceleration/deceleration filter**

Set the filter time constant for smoothly changing the acceleration rate for the cutting feed acceleration/deceleration in pre-interpolation acceleration/deceleration.
- Notch frequency Hz
Displays the notch frequency (Hz) for the S-pattern filter set in "#1568 SfiltG1" (G01 soft acceleration/deceleration filter).

---Setting range---
0 to 200 (ms)

#12051 Jerk_filtG1 **G01 jerk filter**

Specify the time constant of filter that is used for smoothing the change of jerk when pre-interpolation acceleration/deceleration is performed in cutting feed.
This filter causes no path error, as the filter is applied to the total speed calculated before interpolation.
If you specify the jerk filter time constant, the time constants of each filter will be as follows:
* S-shape filter time constant
"#1568 SfiltG1" - "Jerk_filtG1"
* Jerk filter time constant
"Jerk_filtG1"

---Setting range---
0 to 50 (ms)

#12066 Tolerance ctrl ON

Select whether to enable the tolerance control.
0: Disable
1: Enable
(Note) Tolerance control is available only under SSS control.
To enable SSS control, set #8090 to 1.

#12070 Sfilt2_tol **Tolerance control: Soft acceleration/deceleration filter 2**

Specify the time constant of the filter that smoothes out fluctuations in acceleration under the tolerance control.
Basically set to 0.

---Setting range---
0 to 200 (ms)

2 Machine Parameters

The parameters with "(PR)" requires the CNC to be turned OFF after the settings. Turn the power OFF and ON to enable the parameter settings.

2.1 Base System Parameters

(PR) #1001 SYS_ON System validation setup

Select the existence of PLC axes and part systems.
0: Not exist
1: Exist

(PR) #1002 axisno Number of axes

Set the number of control axes and PLC axes.
A total of 32 axes can be set.
Control axis: 0 to 16
PLC axis: 0 to 8
When set to "0", the number of control axes in the part system will be "0". Do not set the number of control axes of the first part system to "0".

(Note) The setting range differs according to the model.

(PR) #1003 iunit Input setup unit

Select the input setting value for each part system and the PLC axis.
Increments in parameters will follow this selection.
---Setting range---
[M8]
B : 1 μm
C : 0.1 μm
D : 0.01 μm (10nm)
E : 0.001 μm (1nm)
[C80]
B : 1 μm
C : 0.1 μm

(PR) #1004 ctrl_unit Control unit

Set the unit for the NC internal position data, data communciated between the NC and drive unit, and the servo movement data.
Some parameter units, such as the pitch error and backlash, follow this specification.
The standard value is "D", however, set the optimum value according to the machine model and specifications.
B : 1 μm
C : 0.1 μm
D : 0.01 μm (10nm)
E : 0.001 μm (1nm)

(PR) #1005 plcunit PLC unit

Select the PLC interface setting and display increment.
The PLC interface setting and display increment will follow this specification. Note that the PLC axis will follow "#1003 iunit".
---Setting range---
[M8]
B : 1 μm
C : 0.1 μm
D : 0.01 μm (10nm)
E : 0.001 μm (1nm)
[C80]
B : 1 μm
C : 0.1 μm

(PR) #1006 mcmpunit Machine error compensation unit

Select the machine error compensation setting and display increment.
The parameters related to machine error compensation (backlash, pitch error compensation, etc.) and PLC interface (external machine coordinate system compensation) will follow this selection.
---Setting range---
[M8]
B : 1 μm
C : 0.1 μm
D : 0.01 μm (10nm)
E : 0.001 μm (1nm)
[C80]
B : 1 μm
C : 0.1 μm

(PR) #1007 System type select System type select

Select the NC system type.
0: Machining center system (M system)
1: Lathe system (L system)

(Note 1) If the setting value is out of range, M system will be selected.

#1025 l_plane Initial plane selection

Select the plane to be selected when the power is turned ON or reset.
When 0 is specified, 1 is assumed (X-Y plane).e model and specifications.
1: X-Y plane (G17 command state)
2: Z-X plane (G18 command state)
3: Y-Z plane (G19 command state)

#1026 base_I **Base axis I**

Set the names of the basic axes that compose the plane.
Set the axis name set in "#1013 axname".
If all three items ("base_I", "base_J" and "base_K") do not need to be set, such as for 2-axis specifications, input "0", and the parameter will be blank.
Normally, when X, Y and Z are specified respectively for base_I, _J, _K, the following relation will be established:
G17: X-Y
G18: Z-X
G19: Y-Z
Specify the desired axis name to set an axis address other than above.

---Setting range---

Axis names such as X, Y or Z

#1027 base_J **Base axis J**

Set the names of the basic axes that compose the plane.
Set the axis name set in "#1013 axname".
If all three items ("base_I", "base_J" and "base_K") do not need to be set, such as for 2-axis specifications, input "0", and the parameter will be blank.
Normally, when X, Y and Z are specified respectively for base_I, _J, _K, the following relation will be established:
G17: X-Y
G18: Z-X
G19: Y-Z
Specify the desired axis name to set an axis address other than above.

---Setting range---

Axis names such as X, Y or Z

#1028 base_K **Base axis K**

Set the names of the basic axes that compose the plane.
Set the axis name set in "#1013 axname".
If all three items ("base_I", "base_J" and "base_K") do not need to be set, such as for 2-axis specifications, input "0", and the parameter will be blank.
Normally, when X, Y and Z are specified respectively for base_I, _J, _K, the following relation will be established:
G17: X-Y
G18: Z-X
G19: Y-Z
Specify the desired axis name to set an axis address other than above.

---Setting range---

Axis names such as X, Y or Z

#1029 aux_I **Flat axis I**

Set the axis name when there is an axis parallel to "#1026 base_I".

---Setting range---

Axis names such as X, Y or Z

#1030 aux_J **Flat axis J**

Set the axis name when there is an axis parallel to "#1027 base_J".

---Setting range---

Axis names such as X, Y or Z

#1031 aux_K **Flat axis K**

Set the axis name when there is an axis parallel to "#1028 base_K".

---Setting range---

Axis names such as X, Y or Z

(PR) #1037 cmdtyp **Command type**

Set the G code list and compensation type for programs.
1 : List1(for M) Type I (one compensation amount for one compensation No.)
2 : List1(for M) Type II (shape and wear compensation amounts for one comp. No.)
3 : List2(for L) Type III (shape and wear compensation amounts for one comp. No.)
4 : List3(for L) Ditto
5 : List4(for special L) Ditto
6 : List5(for special L) Ditto
7 : List6(for special L) Ditto
8 : List7(for special L) Ditto
9 : List8(for M) M2 form at type Type I
(one compensation amount for one compensation No.)
10 : List8(for M) M2 form at type Type II
(shape and wear compensation amounts for one compensation No.)

There are some items in the specifications that can be used or cannot be used according to the value set in this parameter.
The file structure may also change depending on the compensation data type.

(Note) When this parameter is changed, the file system will be changed after the power is turned ON. So always execute format.
The new format will be enabled after turning the power ON again.
Setting order
(1) cmdtyp changeover -> (2) Turn power ON again -> (3) Format -> (4) Turn power ON again
(Note) Compensation type III can be selected for M system by setting #1046.

#1073 I_Absm **Initial absolute setting**

Select the mode (absolute or incremental) at turning ON the power or reset.
0: Incremental setting
1: Absolute setting

#1074 I_Sync **Initial synchronous feed**

Select the feedrate mode at turning ON the power or reset.
0: Asynchronous feed (feed per minute)
1: Synchronous feed (feed per revolution)

#1075 I_G00 Initial G00

Select the linear command mode at turning ON the power or reset.
0: Linear interpolation (G01 command state)
1: Positioning (G00 command state)

#1076 AbsInc ABS/INC address (for L system only)

Select the command method for the absolute and incremental commands.
The absolute command/incremental command can be issued by using the absolute command address and incremental command address for the same axis.
0: Use G command for the absolute and incremental commands.
1: Use axis name for the absolute and incremental commands.
(The axis name in "#1013 axname" will be the absolute command, "#1014 incax" will be the incremental command.)

#1085 G00Drn G00 dry run

Select whether to apply dry run (feed at manual setting speed instead of command feedrate) to the G00 command.
0: Not apply to G00. (move at rapid traverse rate)
1: Apply to G00. (move at manual setting speed)

#1086 G0Intp G00 non-interpolation

Select the G00 travel path type.
0: Move linearly toward the end point. (interpolation type)
1: Move to the end point of each axis at the rapid traverse feedrate for each axis. (non-interpolation)

(Note) If this parameter is set to "1", neither of the following functions will be available: rapid traverse constant inclination acceleration/deceleration and rapid traverse constant inclination multi-step acceleration/deceleration.

#1109 subs_M Validate alternate M code

Select the user macro interrupt with the substitute M code.
0: Disable alternate M code
1: Enable alternate M code

#1110 M96_M M96 alternate M code

Set an M code to replace M96 when "#1109 subs_M" is set to "1".
---Setting range---
3 to 97 (excluding 30)

#1111 M97_M M97 alternate M code

Specify an M code to replace M97 when #1109 subs_M is set to "1".
---Setting range---
3 to 97 (excluding 30)

#1148 I_G611 Initial hi-precis

Select the modal state at power ON from among the following: high-accuracy control mode, high-speed high-accuracy control I mode, high-speed high-accuracy control II mode or high-speed high-accuracy control III mode.
0: G08P0/G64 (cutting) mode
1: G08P1/G61.1 (high-accuracy control) mode
2: G05.1Q1 (high-speed high-accuracy control I) mode
3: G05P10000 (high-speed high-accuracy control II) mode
4: G05P20000 (high-speed high-accuracy control III) mode

#1151 rstint Reset initial

Select whether to initialize (power ON state) the modals by resetting.
0: Not initialize modal state
1: Initialize modal state

#1169 part system name Part system name

Set the name of each part system.
This must be set only when using multi-part system.
This name will be displayed on the screen only when the part systems must be identified.
Use a max. of four alphabetic characters or numerals.
---Setting range---
A max. of four alphabetic characters or numerals.

#1170 M2name Second miscellaneous code

Set this address code when using the 2nd miscellaneous command. Set an address with A, B or C that is not used for "#1013 axname" or "#1014 incax".
---Setting range---
A, B, C

#1171 taprov Tap return override

Set the tap return override value for the synchronous tapping.
When "0" is set, it will be regarded as 100%.
---Setting range---
0 to 100 (%)

#1172 tapovr Tap return override

Set the override value when leaving the tap end point in the synchronous tapping cycle.
When "0" is set, 100 % is applied for the operation.
---Setting range---
0 to 999 (%)

#1173 dwlskp **G04 skip condition**

Set the skip signal for ending the G04 (dwell) command.

PLC interface input signal

	Skip3	Skip2	Skip1
0 :	-	-	-
1 :	-	-	*
2 :	-	*	-
3 :	-	*	*
4 :	*	-	-
5 :	*	-	*
6 :	*	*	-
7 :	*	*	*

(* : Enable - : Disable)

#1174 skip_F **G31 skip speed**

Set the feedrate when there is no F command in the program at G31 (skip) command.

---Setting range---

1 to 999999 (mm/min)

#1175 skip1 **G31.1 skip condition**

Designate the skip signal in multi-step skip G31.1.

The setting method is same as "#1173 dwlskp".

#1176 skip1f **G31.2 skip speed**

Set the skip feedrate in multi-step skip G31.1.

---Setting range---

1 to 999999 (mm/min)

#1177 skip2 **G31.2 skip condition**

Set the skip signal in multi-step skip G31.2.

The setting method is same as "#1173 dwlskp".

#1178 skip2f **G31.2 skip speed**

Set the skip signal in multi-step skip G31.2.

---Setting range---

1 to 999999 (mm/min)

#1179 skip3 **G31.3 skip condition**

Set the skip signal in multi-step skip G31.3

The setting method is same as "#1173 dwlskp".

#1180 skip3f **G31.3 skip speed**

Set the skip signal in multi-step skip G31.3.

---Setting range---

1 to 999999 (mm/min)

#1181 G96_ax **Constant surface speed axis**

Select the axis to be targeted for constant surface speed control.

0: Program setting will be disabled, and the axis will always be fixed to the 1st axis
1: 1st axis
2: 2nd axis
3: 3rd axis
:
16: 16th axis

However, when set to other than "0", the priority will be on the program setting.

#1182 thr_F **Thread cutting speed**

Set the retract speed when not using chamfering in the thread cutting cycle.

0: Cutting feed clamp feedrate
1 to 60000 mm/min: Setting feedrate

---Setting range---

0 to 60000 (mm/min)

#1183 clmp_M **M code for clamp**

Set the M code for C axis clamp in hole drilling cycle.

---Setting range---

0 to 99999999

#1184 clmp_D **Dwelling time after outputting M code for unclamp**

Set the dwell time after outputting the M code for C axis unclamp in hole drilling cycle.

---Setting range---

0.000 to 99999.999 (s)

#1185 spd_F1 **F1 digit feedrate F1**

Set the feedrate for the F command in the F 1-digit command ("#1079 F1digit" is set to "1").
Feedrate when F1 is issued (mm/min)

When "#1246 set08/bit6" is set to "1" and F 1-digit feed is commanded, the feedrate can be increased/decreased by operating the manual handle.

---Setting range---

0 to 1000000 (mm/min)

#1186 spd_F2 **F1 digit feedrate F2**

Set the feedrate for the F command in the F 1-digit command ("#1079 F1digit" is set to "1").
Feedrate when F2 is issued (mm/min)

When "#1246 set08/bit6" is set to "1" and F 1-digit feed is commanded, the feedrate can be increased/decreased by operating the manual handle.

---Setting range---

0 to 1000000 (mm/min)

#1187 spd_F3 F1 digit feedrate F3

Set the feedrate for the F command in the F 1-digit command ("#1079 F1digit" is set to "1").
Feedrate when F3 is issued (mm/min)

When "#1246 set08/bit6" is set to "1" and F 1-digit feed is commanded, the feedrate can be increased/decreased by operating the manual handle.

---Setting range---

0 to 1000000 (mm/min)

#1188 spd_F4 F1 digit feedrate F4

Set the feedrate for the F command in the F 1-digit command ("#1079 F1digit" is set to "1").
Feedrate when F4 is issued (mm/min)

When "#1246 set08/bit6" is set to "1" and F 1-digit feed is commanded, the feedrate can be increased/decreased by operating the manual handle.

---Setting range---

0 to 1000000 (mm/min)

#1189 spd_F5 F1 digit feedrate F5

Set the feedrate for the F command in the F 1-digit command ("#1079 F1digit" is set to "1").
Feedrate when F5 is issued (mm/min)

When "#1246 set08/bit6" is set to "1" and F 1-digit feed is commanded, the feedrate can be increased/decreased by operating the manual handle.

---Setting range---

0 to 1000000 (mm/min)

(PR) #1190 s_xcnt Validate inclined axis control (for L system only)

Select whether to enable or disable inclined axis control.
0: Disable inclined axis control
1: Enable inclined axis control

(PR) #1191 s_angl Inclination angle (for L system only)

Set the inclination angle (θ).
(Note) When set to "0", the angle determined by three-side setting will be applied.

---Setting range---

-80.000 to 80.000 (°)

(PR) #1192 s_zrmv Compensation at reference position return (for L system only)

Select whether to perform compensation for the base axis corresponding to the inclined axis at reference position return.
0: Perform compensation
1: Not perform compensation

#1193 inpos Deceleration check method 1

The setting is selected with the parameter "#1306 InpsTyp".
0: Deceleration check method 1
Select the deceleration check method for G0.
0: Command deceleration check
1: In-position check
2: Smoothing check
1: Validate in-position check
0: G0, G1+G9 Command deceleration check
1: G0, G1+G9 In-position check
2: G0, G1+G9 Smoothing check

#1194 H_acdc Time constant 0 for handle feed

Select the time constant for manual handle feed.
0: Use time constant for G01
1: Time constant 0 (step)

#1195 Mmac Macro call for M command

Select whether to enable or disable M command macro call of user macro.
0: Disable
1: Enable

#1196 Smac Macro call for S command

Select whether to enable or disable S command macro call of user macro.
0: Disable
1: Enable

#1197 Tmac Macro call by command T

Select whether to enable a call of user macro using command T.
0: Disable macro call
1: Enable macro call, irrespective of the number of command T digits
2: Enable macro call when a tool No. (excluding 0) is given to the upper digit of command T
3: Enable macro call when a tool No. (including 0) is given to the upper digit of command T.

#1198 M2mac Macro call with 2nd miscellaneous code

Select whether to enable or disable 2nd miscellaneous command macro call of user macro.
0: Disable
1: Enable

	#1199	Sselect	Select initial spindle control

Select the initial condition of spindle control after power is turned ON.
0: 1st spindle control mode (G43.1)
1: 2nd spindle control mode (G44.1)
2: All spindle simultaneously control mode (G47.1)

(Note) While G43.1 or G44.1 command is given, the spindle No. is selected with "#12090 SnG43.1" or "#1534 SnG44.1".

(PR)	#1200	G0_acc	Validate acceleration and deceleration with inclination constant G0

Select the acceleration and deceleration type when a rapid traverse command is issued.
0: Acceleration and deceleration with constant time (conventional type)
1: Acceleration and deceleration with a constant angle of inclination

(Note) When rapid traverse constant inclination multi-step acceleration/deceleration is valid, this parameter will be invalid.

(PR)	#1201	G1_acc	Validate acceleration and deceleration with inclination constant G1

Select the acceleration and deceleration type when a linear interpolation command is issued.
0: Acceleration and deceleration with constant time (conventional type)
1: Acceleration and deceleration with a constant angle of inclination

	#1202	mirofs	Distance between facing turrets (for L system only)

Set the distance between tools (edges) (between facing turrets).
---Setting range---
0 to 99999.999 (mm)

	#1203	TmirS1	Select turrets as facing turrets with T command (for L system only)

Select the turrets, which correspond to the tool Nos. 1 to 32, as facing turrets for T code mirror image.
---Setting range---
0 to FFFFFFFF

	#1204	TmirS2	Select turrets as facing turrets with T command (for L system only)

Select the turrets, which correspond to the tool Nos. 33 to 64, as facing turrets for T code mirror image.
---Setting range---
0 to FFFFFFFF

	#1205	G0bdcc	Acceleration and deceleration before G0 interpolation

0: Post-interpolation acceleration/deceleration is applied to G00.
1: Pre-interpolation acceleration/deceleration is applied to G00 even in the high accuracy control mode.
2: Rapid traverse constant inclination multi-step acceleration/deceleration is enabled.

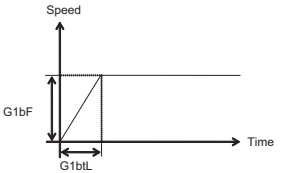
When the multi-part system simultaneous high-accuracy control option is enabled, "1" can be set for the 2nd part system and the following.

	#1206	G1bF	Maximum speed

Set a cutting feedrate when applying pre-interpolation acceleration/deceleration.
When high-accuracy control time constant expansion is valid, set the maximum of cutting feed clamp speed of each axis.
---Setting range---
1 to 999999 (mm/min)

	#1207	G1btL	Time constant

Set a cutting feed time constant when applying pre-interpolation acceleration/deceleration.
When set to "0", the time constant will be clamped at 1ms.



---Setting range---
Without high-accuracy control time constant expansion: 1 to 5000 (ms)
With high-accuracy control time constant expansion: 1 to 30000 (ms)

Cutting feed Acc Cutting feed acceleration
Displays cutting feed acceleration.

	#1208	RCK	Arc radius error compensation factor

Set a coefficient for arc radius error compensation.
An arc radius error compensation amount can be increased or decreased between -60.0 and +20.0%.
---Setting range---
-60.0 to +20.0 (%)

	#1209	cirdcc	Arc deceleration speed

Set the deceleration speed at the arc entrance or exit.
---Setting range---
1 to 999999 (mm/min)

#1210	RstGmd	Modal G code reset

Select whether to initialize G code group modals and H and D codes, which corresponds to bits as follows, when the system is reset.

0: Initialize.
1: Not initialize.

<Description of bits for M system>

1F	1E	1D	1C	1B	1A	19	18	17	16	15	14	13	12	11	10
0	0	0	0	0	0	*	*	0	0	0	0	*	*	*	*

F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
*	*	0	*	*	0	*	0	*	*	*	*	0	*	*	*

bit 1F: (Not used)
bit 1E: (Not used)
bit 1D: (Not used)
bit 1C: (Not used)
bit 1B: (Not used)
bit 1A: (Not used)
bit 19: Spindle clamp rotation speed initialization
bit 18: H, D codes initialization
bit 17: (Not used)
bit 16: (Not used)
bit 15: (Not used)
bit 14: (Not used)
bit 13: Group 20 2nd spindle control modal initialization
bit 12: Group 19 G command mirror modal initialization
bit 11: Group 18 Polar coordinate command modal initialization
bit 10: Group 17 Constant surface speed control command modal initialization
bit F: Group 16 Retains inclined surface machining modal
bit E: Group 15 Normal line control modal initialization
bit D: (Not used)
bit C: Group 13 Cutting modal initialization
bit B: Group 12 Workpiece coordinate system modal initialization
bit A: (Not used)
bit 9: Group 10 Fixed cycle return command modal initialization
bit 8: (Not used)
bit 7: Group 8 Length compensation modal initialization
bit 6: Group 7 Radius compensation modal initialization
bit 5: Group 6 Inch/metric modal initialization
bit 4: Group 5 Feed G modal initialization
bit 3: (Not used)
bit 2: Group 3 Absolute/incremental command modal initialization
bit 1: Group 2 Plane selection modal initialization
bit 0: Group 1 Move G modal initialization

The H code indicates the tool length offset number, and the D code indicates the tool radius compensation number.
When bit 18 is set to ON, the H and D codes and group 8 G modal are retained.
When bit 7 is set to ON, the H code and group 8 G modal are retained.

<Description of bits for L system>

1F	1E	1D	1C	1B	1A	19	18	17	16	15	14	13	12	11	10
0	0	0	0	0	0	*	0	0	0	0	0	*	0	*	*

F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
*	*	0	*	*	0	*	0	0	*	*	*	*	*	*	*

bit 1F: (Not used)
bit 1E: (Not used)
bit 1D: (Not used)
bit 1C: (Not used)
bit 1B: (Not used)
bit 1A: (Not used)
bit 19: Spindle clamp rotation speed initialization
bit 18: (Not used)
bit 17: (Not used)
bit 16: (Not used)
bit 15: (Not used)
bit 14: (Not used)
bit 13: Group 20 2nd spindle control modal initialization
bit 12: (Not used)
bit 11: Group 18 Balance cut initialization
bit 10: Group 17 Constant surface speed control command modal initialization
bit F: Group 16 Retains inclined surface machining modal
bit E: Group 15 Facing turret mirror image initialization
bit D: (Not used)
bit C: Group 13 Cutting modal initialization
bit B: Group 12 Workpiece coordinate system modal initialization
bit A: (Not used)
bit 9: Group 10 Fixed cycle return command modal initialization
bit 8: (Not used)
bit 7: (Not used)
bit 6: Group 7 Nose R compensation modal initialization
bit 5: Group 6 Inch/metric modal initialization
bit 4: Group 5 Feed G modal initialization

bit 3: Group 4 Barrier check modal initialization
bit 2: Group 3 Absolute/incremental command modal initialization
bit 1: Group 2 Plane selection modal initialization
bit 0: Group 1 Move G modal initialization

(PR) #1213 proaxy Side 1 of inclination angle (for L system only)

Set the length within the orthogonal coordinate of the inclined axis, a side of the triangle formed with the inclination angle.

---Setting range---

-9999.999 to 9999.999

(PR) #1214 macaxy Side 2 of inclination angle (for L system only)

Set the actual length of the base axis corresponding to the inclined axis, a side of the triangle formed with the inclination angle.

---Setting range---

-9999.999 to 9999.999

(PR) #1215 macaxx Side 3 of inclination angle (for L system only)

Set the actual length of the inclined axis, a side of the triangle formed with the inclination angle.

---Setting range---

-9999.999 to 9999.999

#1216 extdcc External deceleration level

Set the upper limit value of the feedrate when the external deceleration signals are enabled.

---Setting range---

1 to 999999 (mm/min)

#1501 polyax Rotational tool axis number (for L system only)

Specify the number of the rotational tool axis (servo axis) used for polygon machining (G51.2).
Set "0" when not using polygon machining (spindle-servo axis), or when using spindle-spindle polygon machining.
A value exceeding the base specification parameter "#1002 axisno" cannot be specified.
This parameter is valid when the G code system is 6 or 7 ("7" or "8" is set in base specification parameter "#1037 cmdtyp").

---Setting range---

0 to controlled axis number

#1502 G0lpfg G1 -> G0 deceleration check

Select whether to perform a deceleration check when the travel direction is changed from G1 to G0.
0: Not perform
1: Perform

#1503 G1lpfg G1 -> G1 deceleration check

Select whether to perform a deceleration check when the travel direction is changed from G1 to G1.
0: Not perform
1: Perform

#1505 ckref2 Second reference position return check

Select whether the check is carried out at the specified position in manual second reference position return mode upon completion of spindle orientation or at second reference position return interlock signal.
0: Upon completion of spindle orientation
1: At second reference position return interlock signal

#1506 F1_FM Upper limit of F1-digit feedrate

Set the maximum value up to which the F 1-digit feedrate can be changed.

---Setting range---

0 to 1000000 (mm/min)

#1507 F1_K F 1-digit feedrate change constant

Set the constant that determines the speed change rate per manual handle graduation in F 1-digit feedrate change mode.

---Setting range---

0 to 32767

#1510 DOOR_H Shorten door interlock II axis stop time

Select whether to shorten the time during which the axis is stopped when the door is opened.
0 : Use the conventional axis stop time.
1 : Shorten the axis stop time.

(Note) When the door interlock II signal is input via a ladder, the conventional axis stop time will be used.

#1511 DOORPm Signal input device 1 for door interlock II: for each part system

Set the fixed device number for door interlock II signal input for each part system.
A device number from X01 to XFF can be specified.(Except X100.)
Device number "000" is invalid.
Set device number "100" when using no fixed device number for door interlock II signal input.
Related parameter: "#1154 pdoor" (Door interlock II for each part system)

---Setting range---

000 to 2FF (hexadecimal)

#1512 DOORPs Signal input device 2 for door interlock II: for each part system

Set the fixed device number for door interlock II signal input for each part system.
(Set the same value as that of "#1155 DOOR_m".)
Related parameter: "#1154 pdoor" (Door interlock II for each part system)

---Setting range---

000 to 2FF (hexadecimal)

#1513 stapM **M code for synchronous tap selection**

Set the M code for the synchronous tapping selection.
Select the synchronous tapping mode using the miscellaneous function code of the value set in this parameter. The M function command can be issued immediately before the tap command or in the same block. This function is valid only when "1" is set in "#1272 ext08/bit1" (M-function synchronous tap cycle).
(Note) Do not use M00, 01 02, 30, 98, and 99.

---Setting range---

0 to 99999999

#1514 expLinax **Exponential function interpolation linear axis**

Set the axis name for the linear axis used in exponential function interpolation.

---Setting range---

A to Z

#1515 expRotax **Exponential function interpolation rotary axis**

Set the axis name for the rotary axis used in exponential function interpolation.

---Setting range---

A to Z

#1516 mill_ax **Milling axis name**

Set the name of the rotary axis used in milling interpolation. Only one rotary axis can be set.
When there is no E command in issuing the G12.1 command, this parameter will be followed.

---Setting range---

A to Z

#1517 mill_C **Milling interpolation hypothetical axis name**

Select the hypothetical axis command name for milling interpolation.
When there is no D command in issuing the milling interpolation command, this parameter will be followed.

0: Y axis command
1: Command rotary axis name.

#1518 polm **Spindle-spindle polygon Workpiece spindle No.**

Set the spindle No. or spindle name of workpiece axis used in spindle-spindle polygon machining.
(Note 1) The 1st spindle will be selected when "0" is set.
(Note 2) There are 2 spindle designation methods: spindle No. method and spindle name method. When the name (1 to 9) is set to the spindle name parameter(#3077 Sname) for all the spindles, the commands are issued with for each spindle name, other than that, the commands are issued with the spindle number.

---Setting range---

0 to 9

#1519 pols **Spindle-spindle polygon Tool spindle No.**

Set the spindle number or spindle name of the rotary tool axis used in spindle-spindle polygon machining.
(Note 1) The 2nd spindle will be selected when "0" is set.
(Note 2) There are 2 spindle designation methods: spindle No. method and spindle name method. When the name (1 to 9) is set to the spindle name parameter(#3077 Sname) for all the spindles, the commands are issued with for each spindle name, other than that, the commands are issued with the spindle number.

---Setting range---

0 to 9

(PR) #1520 Tchg34 **Additional axis tool compensation operation (for L system only)**

Select axis to carry out the additional axis' tool compensation function.

0: 3rd axis.
1: 4th axis.

#1521 C_min **Minimum turning angle**

Set the minimum turning angle of the normal line control axis at the block joint during normal line control.

---Setting range---

0.000 to 360.000 (°) (Input setting increment applies)

(PR) #1522 C_axis **Normal line control axis**

Set the number of the axis for normal line control.
Set a rotary axis No.

0: Normal line control disabled
1 to 16: Axis No. (number of control axes)

#1523 C_feed **Normal line control axis turning speed**

Set the turning speed of the normal line control axis at the block joint during normal line control.
Set a value that does not exceed the normal line control axis' clamp speed ("#2002 clamp").
This is valid with normal line control type I.

---Setting range---

0 to 1000000 (°/min)

#1524 C_type **Normal line control type**

Select the normal line control type.

0: Normal line control type I
1: Normal line control type II

#1533 millPax **Pole coordinate linear axis name**

Set the linear axis name used for pole coordinate interpolation.

---Setting range---

Axis name such as X, Y or Z

(PR) #1534 SnG44.1 Spindle No. for G44.1 command

Specify which spindle to be selected when G44.1 is commanded.
<Spindle No. type>
Specify by the spindle No. 1 to 8.
The 2nd spindle is selected if you specify a nonexistent spindle No.
<Spindle name type>
Specify by the spindle name 1 to 9.
The 2nd spindle is selected if you specify a nonexistent spindle name.

(Note) If names (1 to 9) have been set in the spindle name parameter "#3077 Sname" for all spindles, <Spindle name type> is used.

---Setting range---
0 to 9

#1535 C_leng Minimum turning movement amount

Set the minimum turning movement amount of the normal line control axis at the block joint during normal line control.

---Setting range---
0.000 to 99999.999 (mm) (Input setting increment applies)

#1537 crsax[1] Mixed control (cross axis control) axis

Set the axis to be interchanged during the mixed control (cross axis control).
Using two digits, set the name of the axis to be interchanged with the axis in the part system where the mixed control (cross axis control) request signal is input, or the name of the axis to be shifted to that part system.

---Setting range---
Two digits between A to Z and 1 to 9
(Setting will be cleared when "0" is set)

#1538 crsax[2]

Set the axis to be interchanged during the mixed control (cross axis control).
Using two digits, set the name of the axis to be interchanged with the axis in the part system where the mixed control (cross axis control) request signal is input, or the name of the axis to be shifted to that part system.

---Setting range---
Two digits between A to Z and 1 to 9
(Setting will be cleared when "0" is set)

#1539 crsax[3]

Set the axis to be interchanged during the mixed control (cross axis control).
Using two digits, set the name of the axis to be interchanged with the axis in the part system where the mixed control (cross axis control) request signal is input, or the name of the axis to be shifted to that part system.

---Setting range---
Two digits between A to Z and 1 to 9
(Setting will be cleared when "0" is set)

#1540 crsax[4]

Set the axis to be interchanged during the mixed control (cross axis control).
Using two digits, set the name of the axis to be interchanged with the axis in the part system where the mixed control (cross axis control) request signal is input, or the name of the axis to be shifted to that part system.

---Setting range---
Two digits between A to Z and 1 to 9
(Setting will be cleared when "0" is set)

#1541 crsax[5]

Set the axis to be interchanged during the mixed control (cross axis control).
Using two digits, set the name of the axis to be interchanged with the axis in the part system where the mixed control (cross axis control) request signal is input, or the name of the axis to be shifted to that part system.

---Setting range---
Two digits between A to Z and 1 to 9
(Setting will be cleared when "0" is set)

#1542 crsax[6]

Set the axis to be interchanged during the mixed control (cross axis control).
Using two digits, set the name of the axis to be interchanged with the axis in the part system where the mixed control (cross axis control) request signal is input, or the name of the axis to be shifted to that part system.

---Setting range---
Two digits between A to Z and 1 to 9
(Setting will be cleared when "0" is set)

#1543 crsax[7]

Set the axis to be interchanged during the mixed control (cross axis control).
Using two digits, set the name of the axis to be interchanged with the axis in the part system where the mixed control (cross axis control) request signal is input, or the name of the axis to be shifted to that part system.

---Setting range---
Two digits between A to Z and 1 to 9
(Setting will be cleared when "0" is set)

#1544 crsax[8]

Set the axis to be interchanged during the mixed control (cross axis control).
Using two digits, set the name of the axis to be interchanged with the axis in the part system where the mixed control (cross axis control) request signal is input, or the name of the axis to be shifted to that part system.

---Setting range---
Two digits between A to Z and 1 to 9
(Setting will be cleared when "0" is set)

#1558 IvOMin **Involute interpolation override lower limit value**

Set the lower limit of the override for involute interpolation override.

---Setting range---

0 to 100 (%)

#1559 IvAMax **Involute interpolation allowable acceleration speed**

Set the maximum acceleration (time constant) for the acceleration clamping during involute interpolation.

---Setting range---

0 to 32767 (ms)

#1560 IvFMin **Involute interpolation minimum feedrate**

Set the minimum feedrate for the acceleration clamping during involute interpolation.

---Setting range---

0 to 999999 (mm/min)

#1561 3Dcdc **Switch workpiece coordinate display during 3D coordinate conversion**

The workpiece coordinate display during 3D coordinate conversion is switched to the workpiece coordinate system or G68 program coordinate system.

0: Workpiece coordinate system

1: G68 program coordinate system

(Note) The special display unit's absolute coordinates also follow this parameter setting.

#1562 3Dremc **Switch remaining command display during 3D coordinate conversion**

The remaining command display during 3D coordinate conversion is switched to the workpiece coordinate system or G68 program coordinate system.

0: Workpiece coordinate system

1: G68 program coordinate system

#1563 3Dcdrc **Switch coordinate reading during 3D coordinate conversion**

The coordinate system of the workpiece/skip coordinate read value in the 3D coordinate conversion modal is switched.

0: G68 program coordinate system

1: Workpiece (local) coordinate system

#1564 3Dspd **Hole drilling speed during 3D coordinate conversion**

Set the rapid traverse rate for the hole drilling cycle during 3D coordinate conversion.

0: The cutting feed clamp speed is used.

Other than 0: The set speed is used.

Note that if the rapid traverse rate is exceeded, the speed will be clamped at the rapid traverse rate.

---Setting range---

0 to 1000000mm/min

#1565 helgear **Helical machining base axis**

Set the base axis for helix angle calculation in helical machining. When no setting, Z axis will be used.

---Setting range---

Axis name such as X, Y, Z, U, V, W, A, B, and C

#1566 3DSelctDrillaxMode **Switch drill axis's mode from rapid traverse during 3D coordinate conversion**

Switch the rapid traverse mode in non-drilling blocks among a drilling cycle to the cutting feed mode during 3-dimensional coordinate conversion.

0: Rapid traverse mode. The speed follows the setting of "#2001 rapid".

1: Cutting feed mode. The speed follows the setting of "#1564 3Dspd".

#1568 SfiltG1 **G01 soft acceleration/deceleration filter**

Set the filter time constant for smoothly changing the acceleration rate for the cutting feed acceleration/deceleration in pre-interpolation acceleration/deceleration.

- Notch frequency Hz

Displays the notch frequency (Hz) for the S-pattern filter set in "#1568 SfiltG1" (G01 soft acceleration/deceleration filter).

---Setting range---

0 to 200 (ms)

#1569 SfiltG0 **G00 soft acceleration/deceleration filter**

Set the filter time constant for smoothly changing the acceleration rate for the rapid traverse acceleration/deceleration in pre-interpolation acceleration/deceleration.

---Setting range---

0 to 200 (ms)

#1570 Sfilt2 **Soft acceleration/deceleration filter 2**

Set the filter time constant for smoothly changing the acceleration rate in pre-interpolation acceleration/deceleration.

This will be disabled when "0" or "1" is set.

- Notch frequency Hz

Displays the notch frequency (Hz) for the S-shape filter set in "#1570 Sfilt2" (Soft acceleration/deceleration filter 2).

---Setting range---

0 to 200 (ms)

#1571 SSSdis **SSS control adjustment coefficient fixed value selection**

Fix the shape recognition range for SSS control.

---Setting range---

0/1

#1572 Cirorp Arc command overlap

This eliminates speed fluctuations at the joint of the arc and straight line and arc and arc.
Set as a bit unit.
0: Do not overlap the arc command blocks
1: Overlap the arc command blocks
bit0 : Arc command during high-speed high-accuracy control II
bit1 : Arc command during high-speed machining mode II
bit2 : Arc command during high-accuracy control (G61.1)
bit3 : Arc command during cutting mode (G64)
The line command block and arc command block won't be overlapped during G61.2 modal regardless of this setting.
(Note) This parameter is invalid during SSS control.

---Setting range---
0 to F (hexadecimal)

#1573 Ret1 Return type 1

Select the axis to be moved later after tool return.
This is referred to with the movement path (transit point #1 -> interrupt point).
Up to eight axes can be specified by expressing one axis with one bit.
bit0 : Transit point #1 1st axis
bit1 : Transit point #1 2nd axis
bit2 : Transit point #1 3rd axis
bit3 : Transit point #1 4th axis
bit4 : Transit point #1 5th axis
bit5 : Transit point #1 6th axis
bit6 : Transit point #1 7th axis
bit7 : Transit point #1 8th axis

---Setting range---
00000000 to 11111111 (Binary)

#1574 Ret2 Return type 2

Select the axis to be moved later after tool return.
This is referred to with the movement path (return start point -> transit point #2).
Up to eight axes can be specified by expressing one axis with one bit.
bit0 : Transit point #2 1st axis
bit1 : Transit point #2 2nd axis
bit2 : Transit point #2 3rd axis
bit3 : Transit point #2 4th axis
bit4 : Transit point #2 5th axis
bit5 : Transit point #2 6th axis
bit6 : Transit point #2 7th axis
bit7 : Transit point #2 8th axis

---Setting range---
00000000 to 11111111 (Binary)

#1595 hobm Hobbing rotary tool axis No.

Specify the spindle No. or spindle name of rotary tool in "MITSUBISHI CNC Special Format(G81.4)" of hobbing command.
(Note) There are 2 spindle designation methods: spindle No. method and spindle name method.
When the name (1 to 9) is set to the spindle name parameter(#3077 Sname) for all the spindles, the commands are issued with for each spindle name, other than that, the commands are issued with the spindle number.

---Setting range---
0 to 9

#1596 hobs Hobbing workpiece axis No.

Specify the NC axis No. of workpiece axis (in a part system) in "MITSUBISHI CNC Special Format (G81.4)" of hobbing command.
This parameter is valid when "#1292 ext28/bit4 (Hobbing workpiece axis selection switch)" is "0".

---Setting range---
1 to the number of NC axes (in a part system)

#1599 3DEndPointErr End point error in 3D coordinate conversion

[M8]
Specify the tolerable range for an error of the end point of travel command which is deviated from the tool path direction during the G68.1 ,E1 command.

---Setting range---
0.000 to 100.000 (mm)

[C80]
Not used.

#12001 ManualB RectanA xH Manual feed rate B constant surface control intersecting part system axis name (horizontal)

Set the part system axis name ("#1013 axname") for the two axes that intersect with the rotary axis direction. When one of the two axes is blank, a constant speed will be applied without using constant surface speed control.

---Setting range---
Axis addresses such as X, Y, Z, U, V, W, A, B, and C

#12002 ManualB RectanA xV Manual feed rate B constant surface control intersecting part system axis name (vertical)

Set the part system axis name ("#1013 axname") for the two axes that intersect with the rotary axis direction. When one of the two axes is blank, a constant speed will be applied without using constant surface speed control.

---Setting range---
Axis addresses such as X, Y, Z, U, V, W, A, B, and C

#12003 ManualB RotCent erH Manual feed rate B constant surface control rotation center machine position (horizontal)

Set the machine coordinate position (horizontal axis) at the center of the rotary axis.

---Setting range---
-99999.999 to 99999.999 (mm)

#12004 ManualB RotCent erV — Manual feed rate B constant surface control rotation center machine position (vertical)

Set the machine coordinate position (vertical axis) at the center of the rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

(PR) #12005 Mfig — Number of M

Set the number of M that can be specified within the same block.

---Setting range---

1 to 4

(PR) #12006 Mbin — M binary

Data type 0 BCD
Data type 1 Unsigned binary
Data type -1 Singed binary

<For unsigned binary>
The absolute value "1" is output for "-1".
<For singed binary>
"-1" is output as "0xFFFFFFFF".

---Setting range---

Data type
(-1,0,1)

(PR) #12007 Sfig — Number of S

Set the number of spindles.
(Note 1) The setting range differs according to the model.
(Note 2) Sfig is set in the range of 1 to 8. However, the number of outputs by Sfig cannot be controlled. Thus, only one S command is output regardless of the Sfig setting value.

---Setting range---

1 to 8

(PR) #12008 Sbin — S binary

Data type 0 BCD
Data type 1 Unsigned binary
Data type -1 Singed binary

<For unsigned binary>
The absolute value "1" is output for "-1".
<For singed binary>
"-1" is output as "0xFFFFFFFF".
(Note 1) Sbin can be set with "-1", "0" and "1", but the S command cannot be BCD output. If BCD (0) is selected for Sbin, it will be handled as a singed binary (-1).

---Setting range---

Data type
(-1,0,1)

(PR) #12009 Tfig — Number of T

Set the number of T that can be specified within the same block.

---Setting range---

1 to 4

(PR) #12010 Tbin — T binary

Data type 0 BCD
Data type 1 Unsigned binary
Data type -1 Singed binary

<For unsigned binary>
The absolute value "1" is output for "-1".
<For singed binary>
"-1" is output as "0xFFFFFFFF".

---Setting range---

Data type
(-1,0,1)

(PR) #12011 Bfig — Number of B

Set the number of T that can be specified within the same block.

---Setting range---

1 to 4

(PR) #12012 Bbin — B binary

Data type 0 BCD
Data type 1 Unsigned binary
Data type-1 Singed binary

<For unsigned binary>
The absolute value "1" is output for "-1".

<For singed binary>
"-1" is output as "0xFFFFFFFF".

---Setting range---

Data type
(-1,0,1)

#12013 G33.n rot — G33.n rotary axis name

Select the axis to use as C axis with its axis name.

---Setting range---

A to Z

#12014 G33.n ovr — G33.n override

Not used.

#12022 skipF_spec

bit0: Skip speed spec: Cutting feed override ON

Select whether to enable cutting feed override for a skip command.

0: Disable

1: Enable

bit1: Skip speed spec: Dry run ON

Select whether to enable dry run for a skip command.

0: Disable

1: Enable

bit2: Skip speed spec: Feed rate selection

Select the feed rate for a skip command.

0: A feed rate given to address F of the G31 block. If the G31 block has no address F, the value specified by "#1174 skip_F" is applied. In either case the F modal status is unchanged.

1: A feed rate programmed as an F modal value. F modal status is updated by the address F given to the G31 block.

(PR) #12023 Mblkstp1 Pre-read prohibited M code 1

Set M codes to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12024 Mblkstp2 Pre-read prohibited M code 2

Set M codes to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12025 Mblkstp3 Pre-read prohibited M code 3

Set M codes to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12026 Mblkstp4 Pre-read prohibited M code 4

Set M codes to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12027 Mblkstp5 Pre-read prohibited M code 5

Set M codes to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12028 Mblkstp6 Pre-read prohibited M code 6

Set M codes to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12029 Mblkstp7 Pre-read prohibited M code 7

Set M codes to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12030 Mblkstp8 Pre-read prohibited M code 8

Set M codes to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12031 Mblkstp9 Pre-read prohibited M code 9

Set M codes to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12032 Mblkstp10 Pre-read prohibited M code 10

Set M codes to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12033 MblkstpMin1 Minimum value of the pre-read prohibited M code range setting 1

Set the minimum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12034 MblkstpMax1 Maximum value of the pre-read prohibited M code range setting 1

Set the maximum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12035 MblkstpMin2 Minimum value of the pre-read prohibited M code range setting 2

Set the minimum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12036 MblkstpMax2 Maximum value of the pre-read prohibited M code range setting 2

Set the maximum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12037 MblkstpMin3 Minimum value of the pre-read prohibited M code range setting 3

Set the minimum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12038 MblkstpMax3 Maximum value of the pre-read prohibited M code range setting 3

Set the maximum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12039 MblkstpMin4 Minimum value of the pre-read prohibited M code range setting 4

Set the minimum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12040 MblkstpMax4 Maximum value of the pre-read prohibited M code range setting 4

Set the maximum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12041 MblkstpMin5 Minimum value of the pre-read prohibited M code range setting 5

Set the minimum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12042 MblkstpMax5 Maximum value of the pre-read prohibited M code range setting 5

Set the maximum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12043 MblkstpMin6 Minimum value of the pre-read prohibited M code range setting 6

Set the minimum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

(PR) #12044 MblkstpMax6 Maximum value of the pre-read prohibited M code range setting 6

Set the maximum value of the M code to which pre-read will not be applied.

---Setting range---

0 to 99999999

#12049 SBS_no Sub part system I identification No.

Specify the ID number (address B value) to be used when activating this part system as a sub part system during G122 command.
Set to 0 when this part system is not used as a sub part system.

---Setting range---

0 to 7

#12050 SBS_pro Sub part system I standard program No.

Specify the No. of program to be called when activating this part system as a sub part system during G122 command. This parameter setting is used when a program designation (address A value/<file name>) is omitted.

---Setting range---

0 to 99999999

#12051 Jerk_filtG1 G01 jerk filter

Specify the time constant of filter that is used for smoothing the change of jerk when pre-interpolation acceleration/deceleration is performed in cutting feed.
This filter causes no path error, as the filter is applied to the total speed calculated before interpolation.
If you specify the jerk filter time constant, the time constants of each filter will be as follows:
* S-shape filter time constant
"#1568 SfiltG1" - "Jerk_filtG1"
* Jerk filter time constant
"Jerk_filtG1"

---Setting range---

0 to 50 (ms)

#12052 Jerk_filtG0 G00 jerk filter

Specify the time constant of filter that is used for smoothing the change of jerk when pre-interpolation acceleration/deceleration is performed in cutting feed.
This filter causes no path error, as the filter is applied to the total speed calculated before interpolation.
If you specify the jerk filter time constant, the time constants of each filter will be as follows:
* S-shape filter time constant
"#1569 SfiltG0" - "Jerk_filtG0"
* Jerk filter time constant
"Jerk_filtG0"

---Setting range---

0 to 50 (ms)

#12053 EachAxAccCntrl Enable per-axis acceleration tolerance control

Select how to calculate the deceleration speed for a corner between the blocks where the high-accuracy control is enabled.

0: Optimal corner deceleration
(calculate the deceleration speed using the acceleration tolerance common for all the axes determined by G1bF and G1btL)

1: Per-axis acceleration tolerance control
(calculate the deceleration speed using acceleration tolerances of each axis determined by G1bFx and G1btLx)

(PR) #12054 Tol-Ofsnum Number of tool offset sets for allocation

Specify the number of offset sets to be allocated when the arbitrary allocation method is selected for offset sets.

---Setting range---

0 to 999

(PR) #12055 Tol-lifenum Number of life management tools for allocation

Specify the number of life management tools to be allocated when the arbitrary allocation method is selected for life management tools.

---Setting range---

0 to 1000

#12056 I_G0ol Enable G00 initial rapid traverse overlap

Select the state (enabled or disabled) of the rapid traverse overlap function after reset.

0: Disabled
1: Enabled

---Setting range---

0/1

#12057 OT_prechkON Enabling stroke check before travel for stored stroke limit

[M8]
Select the entry inhibition area for stroke check before travel.

0: Perform stroke check before travel for the area specified by G22.
1: Perform stroke check before travel for the area set by the stored stroke limit function, with or without G22.

[C80]
Not used.

#12058 OT_prechkTYPE Stroke check before travel for skip and automatic tool length measurement

[M8]
Select whether to enable or disable the stroke check before travel for skip (G31 or G31.n) and automatic tool length measurement (G37).

0: Disable
1: Enable

(Note) This parameter is enabled when #12057=1 and the option "Stroke check before travel" is ON.

[C80]
Not used.

#12059 SBS_name Sub part system name

Specify each sub part system name.
This name is displayed when the part system acts as a sub part system.

---Setting range---

A combination of a maximum of four alpha-numeric characters

#12060 VblAccPreInt Variable-acceleration pre-interpolation acceleration/deceleration ON

Select whether to enable variable-acceleration pre-interpolation acceleration/deceleration control while high-accuracy control is ON.

0: Pre-interpolation acceleration/deceleration
(Apply the acceleration rate that is determined by G1bF and G1btL and is common for all the axes)
1: Variable-acceleration pre-interpolation acceleration/deceleration
(Apply the acceleration rate that is determined by G1bFx and G1btLx for each axis)

(Note) Variable-acceleration pre-interpolation acceleration/deceleration is a function available under SSS control. To enable this function, set "#8090 SSS ON" to 1.

#12070 Sfilt2_tol Tolerance control: Soft acceleration/deceleration filter 2

Specify the time constant of the filter that smoothes out fluctuations in acceleration under the tolerance control.
Basically set to 0.

---Setting range---

0 to 200 (ms)

(PR) #12071-12078 adr_abs[1]-[8]

Specify the axis address to be given in an arbitrary axis exchange command for the part system.

(Note 1) This parameter is disabled when the arbitrary axis exchange function is unused.
(Note 2) Do not give an identical name to two or more of the parameters adr_abs[1] to adr_abs[8].
(Note 3) Do not leave any unspecified parameter in the middle between adr_abs[1] and [8].
(Note 4) Set the addresses of adr_abs[ ] in the same order as of the axis names (#1013 axname). Note that you can set a nonexistent axis name in the middle.
(Note 5) If there are 9 or more control axes per part system, specify the axis address that is programmed based on the basic axis configuration.

---Setting range---

Axis address such as X, Y, Z, U, V, W, A, B and C

(PR) #12079-12086 adr_inc[1]-[8] Incremental command address for arbitrary axis exchange

Specify the incremental command address for each of the axes to be used in an arbitrary axis exchange command.

(Note 1) This parameter is disabled when the arbitrary axis exchange function is unused.
(Note 2) There is no need to set this parameter when command type (absolute or incremental) is not distinguished by the axis address (when #1076 ABS/INC address=0).
(Note 3) Do not give an identical name to two or more of the parameters adr_inc[1] to adr_inc[8]. If there is any overlap, priority is given in the ascending order (adr_inc[1] to adr_inc[8]).

---Setting range---

Axis address such as X, Y, Z, U, V, W, A, B and C

#12088 Drn_F Dry run speed

Specify a dry run speed for each part system.
When 0 is set, the manual feed rate selected by Manual feedrate method selection (JVS) signal is applied.

---Setting range---

0 to 1000000(mm/min)

#12089 M2adr — **2nd miscellaneous function address type**

Select the address type of the 2nd miscellaneous function.
0: One-letter command for the 2nd miscellaneous function
1: Two-letter command for the 2nd miscellaneous function

(PR) #12090 SnG43.1 — **Spindle designation for G43.1**

Specify which spindle to be selected when G43.1 is commanded.
<Spindle No. type>
Specify by the spindle No. 1 to 8.
The 1st spindle is selected if you specify a nonexistent spindle No.
<Spindle name type>
Specify by the spindle name 1 to 9.
The 1st spindle is selected if you specify a nonexistent spindle name.

(Note) If names (1 to 9) have been set in the spindle name parameter "#3077 Sname" for all spindles, <Spindle name type> is used.

---Setting range---
0 to 9

(PR) #12103 2nd add T-ofs ON — **2nd additional axis tool offset ON (for L system only)**

Select whether to enable tool offset on the 2nd additional axis.
0: Disable
1: Enable

(PR) #12104 2nd add T-ofs set — **2nd additional axis tool offset setting (for L system only)**

Select on which axis to perform the 2nd additional axis tool offset.
Specify the axis address set in "#1013 axname".

---Setting range---
X,Y,Z,U,V,W,A,B,C

#12105 C_minTyp — **Operation selection of minimum turning angle or less**

Specify the operation when the turning angle is set the minimum turning angle (#1521 C_min) or less and the turning operation is not inserted, in the seams of the arc blocks during normal line control.
0: Interpolate before reaching arc end point.
1: Do not interpolate.

#12110 Ret3 — **Return type 3**

[M8]
Specify the axis to be moved later after tool return.
This is referred to with the movement path (transit point #2 to transit point #1).
One bit represents one axis. Up to eight axes can be specified.

---Setting range---
00000000 to 11111111 (Binary)

(PR) #12111 Var protect Top1 — **Common variable setting protection - Top variable No. (1st group)**

Specify the head of the common variables which are protected from setting operation.
(Note 1) If #12111 or #12112 is 0 or is greater than the bottom No. (#12112), this setting is disabled.
(Note 2) For the common variables shared by part systems, the protection takes effect in a part system set by this parameter.
(Note 3) It is possible to set an unspecified variable, but the protection covers the specified variables only.

---Setting range---
0: Disabled
100 to 199, 400 to 999

(PR) #12112 Var protect Btm1 — **Common variable setting protection - Bottom variable No. (1st group)**

Specify the end of the common variables which are protected from setting operation.
(Note 1) If #12111 or #12112 is 0 or is smaller than the top No. (#12111), this setting is disabled.
(Note 2) For the common variables shared by part systems, the protection takes effect in a part system set by this parameter.
(Note 3) It is possible to set an unspecified variable, but the protection covers the specified variables only.

---Setting range---
0: Disabled
100 to 199, 400 to 999

(PR) #12113 Var protect Top2 — **Common variable setting protection - Top variable No. (2nd group)**

Specify the head of the common variables which are protected from setting operation.
(Note 1) If #12113 or #12114 is 0 or is greater than the bottom No. (#12114), this setting is disabled.
(Note 2) For the common variables shared by part systems, the protection takes effect in a part system set by this parameter.
(Note 3) It is possible to set an unspecified variable, but the protection covers the specified variables only.

---Setting range---
0: Disabled
100 to 199, 400 to 999

(PR) #12114 Var protect Btm2 — **Common variable setting protection - Bottom variable No. (2nd group)**

Specify the end of the common variables which are protected from setting operation.
(Note 1) If #12113 or #12114 is 0 or is smaller than the top No. (#12113), this setting is disabled.
(Note 2) For the common variables shared by part systems, the protection takes effect in a part system set by this parameter.
(Note 3) It is possible to set an unspecified variable, but the protection covers the specified variables only.

---Setting range---

0: Disabled
100 to 199, 400 to 999

#12121 REM Mcr No — **Macro No. for rotation center error measurement**

[M8]
Specify the name of macro program for the rotation center error measurement.
The macro program name is input at initialization of rotation center error measurement macro.
If 0 is set, the macro program for the measurement is not input to the part system.
The macro program is used for execution of the measurement.

---Setting range---

0, 9000 to 9099, 9300 to 9999, 100010000 to 100018999, 100030000 to 199999998

#12122 REM PrimAx Rot Dir — **Primary axis rotation direction for rotation center error measurement**

[M8]
Rotation direction of primary axis for rotation center error measurement.
Select the direction, allowing for the rotary axis stroke limit, etc.

0: Positive direction
1: Negative direction

2.2 Base Axis Specification Parameters

(PR) #1010 srvunit Output unit (servo)

Specify the unit for data communicated with the servo drive unit.
The data communicated between the NC and servo drive unit, and the servo movement data unit follow this specification.
Although the standard value is "D", set the optimum value according to the series and specification.
B : 1 µm
C : 0.1 µm
D : 0.01 µm (10nm)
E : 0.001 µm (1nm)

(PR) #1013 axname Axis name

Set each axis' name with an alphabetic character.
Use the characters X, Y, Z, U, V, W, A, B or C.
(Note 1) Do not set the same name twice in one part system.
The same name which is used in another part system can be set.
(Note 2) The PLC name does not need to be set. (Numbers 1 to 6 are shown as the axis names.)

---Setting range---

X,Y,Z,U,V,W,A,B,C

(PR) #1014 incax Increment command axis name

Set the axis name when commanding an incremental value for the axis travel amount.
(Note 1) Set an alphabet that is different from that of "#1013 axname".
(Note 2) Setting is not required if absolute/incremental specification with axis names is not performed ("#1076 Abslnc" = "0").

---Setting range---

X, Y, Z, U, V, W, A, B, C, H

(PR) #1015 cunit Program command unit

Set the minimum increment of program travel command.
cunit Travel amount for travel command 1
0: Follow "#1003 iunit"
1: 0.0001 mm (0.1µm)
10: 0.001 mm (1µm)
100: 0.01 mm (10µm)
1000: 0.1 mm (100µm)
10000: 1.0 mm

If there is a decimal point in travel command, the decimal point position will be handled as 1mm regardless of this setting.

(PR) #1017 rot Rotational axis

Select whether the axis is a rotary axis or linear axis.
When rotary axis is set, the axis will be controlled with the rotary axis's coordinate system. Set the rotary axis type with "#8213 Rotation axis type".
0: Linear axis
1: Rotary axis

(PR) #1018 ccw Motor CCW

Select the direction of the motor rotation to the command direction.
0: Clockwise (looking from motor shaft) with the forward rotation command
1: Counterclockwise (looking from motor shaft) with the forward rotation command

(PR) #1019 dia Diameter specification axis

Select the command method of program travel amount.
When the travel amount is commanded with the diameter dimensions, the travel distance will be 5mm when the command is 10mm of travel distance.
The travel amount per pulse will also be halved during manual pulse feed.
If diameter is selected, tool length, the wear compensation amount, and the workpiece coordinate offset will be displayed in diameter value. Other parameters concerning length will always be displayed in radius value.
0: Command with travel amount
1: Command with diameter dimension

(PR) #1020 sp_ax Spindle interpolation

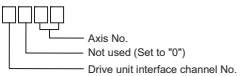
Select "1" when using the spindle for contour control of NC axis (C-axis).
Select "2" to implement the spindle-mode rotary axis control.

---Setting range---

0: Servo axis is used for contour control.
1: Spindle is used for contour control.
2: Spindle-mode rotary axis control.

(PR) #1021 mcp_no Drive unit I/F channel No. (servo)

Using a 4-digit number, set the drive unit interface channel No. and which axis in that channel is to be used when connecting a servo drive unit.



(PR) #1022 axname2 2nd axis name

Set the name of the axis displayed on the screen with two characters. (X1, Z2, etc.)
Always use an alphabetic character (A to Z) for the first character.

---Setting range---

A to Z and 1 to 9 (Two digits)
(Setting will be cleared when "0" is set)

(PR) #1023 crsadr — Command address during mixed control (cross axis control)

Set the axis name for issuing a command to this axis during mixed control (cross axis control).

---Setting range---

A to Z

(Setting will be cleared when "0" is set)

(PR) #1024 crsinc — Incremental command address during mixed control (cross axis control)

Set the axis name for issuing an incremental command to this axis during mixed control (cross axis control).

---Setting range---

A to Z

(Setting will be cleared when "0" is set)

(PR) #1061 intabs — Manual ABS updating

Select whether to update the absolute position data during automatic handle interrupt.
This parameter is enabled only when "#1145 I_abs" is set to "1".

0: Do not update (coordinate system shifted the amount of the interruption)
1: Update (same coordinates as when interrupt did not occur will be applied)

#1062 T_cmp — Tool compensation function

Select whether the tool length compensation and wear compensation are enabled during T command execution.

0 :	Tool length compensation enable	Wear compensation enable
1 :	Tool length compensation enable	Wear compensation disable
2 :	Tool length compensation disable	Wear compensation enable
3 :	Tool length compensation disable	Wear compensation disable

#1063 mandog — Manual dog-type

Select the manual reference position return method for the second return (after the coordinate system is established) and later.
The initial reference position return after the power ON is performed with dog-type return, and the coordinate system will be established.
(This setting is not required when the absolute position detection is used.)

0: High speed return
1: Dog-type

(PR) #1064 svof — Error correction

Select whether to correct the error when the servo is OFF.

0: Not correct the error
The command value will not change during servo OFF, and the movement amount during servo OFF will be handled as droop. When the servo is turned ON the next time, the axis will move to the command position where it used to be when the servo was turned OFF.
1: Correct the error
The command value and the current position will follow the feedback position. When the servo is turned ON the next time, the axis will not move.

During servo READY OFF, the operation will be always the same as of "Correct the error". (The current position will follow the position of the axis.)

(PR) #1068 slavno — Slave axis number

Set the axis number of the slave axis in synchronous control.
The axis number is an NC number excluding the spindle and PLC axis.
Two or more slave axis cannot be set for one master axis.
This parameter cannot be set for a slave axis.
When using the multi-part system, the relation of the master axis and slave axis cannot extend over part systems.

0: No slave axis
1 to 32: 1st axis to 32nd axis

#1069 no_dsp — Axis with no counter display

Select whether to display the axis counter or not.
This setting is enabled on the counter display screen (relative position counter, etc.).

0: Display
1: Not display

#1070 axoff — Axis removal

Select whether to enable or disable axis removal control.

0: Disable
1: Enable

#1072 chop_ax — Chopping axis

Select the chopping axis.

0: Non-chopping axis
1: Chopping axis

(PR) #1493 ref_syn — Synchronization at zero point initialization

0: Master axis and slave axis determine their zero points individually.
1: The zero points of both master and slave axes are determined by initializing the master axis' zero point.

The slave axis moves in perfect synchronization with the master axis.
Set this to "1" for speed/current command synchronization control.

(PR) #1494 dsp_ax_change Axis order of counter display

Set this in order to change the axis order of counter display.
If this is set, the axes will be displayed in ascending order.
However, axis whose setting is "0" will be displayed after axes whose settings are between "1" and "16" are displayed.

(Note 1) When the same value is set for more than one axis, axis that is displayed on the left side on the parameter screen will be first displayed.
(Note 2) When both of the mixed control (cross axis control) and interchange coordinate position display ("1280 ext16/bit2" OFF) are valid, and when there are two or more valid part systems, this parameter will be ignored.
(Note 3) When the arbitrary axis exchange control (option) is ON, and when there are two or more valid part systems, this parameter will be ignored.

---Setting range---

0: The axis is displayed after the axes whose settings are between "1" and "16" are displayed.
1 to 16: Axes are displayed in ascending order.
If the number other than "1" to "16" is set, it is dealt as "0" setting.

(PR) #1495 grf_ax_direction Axis travel direction in 2D graphic

[M8]
Select the axis travel direction in the 2D graphic drawing (trace, check).
If set to 1, the positive/negative directions are reversed.

---Setting range---

0/1

[C80]
Not used.

(PR) #1496 push_typ Stopper method in zero point establishing operation

[C80]
0: Zero point establishing operation is determined by #1493.
1: When both the master and slave axes reach the current limit during stopper-method zero point establishment with #1493 set to 1, droop is cancelled, and the operation goes into the next step.

(PR) #1601 axnameEx Axis name extension letter

[M8]
Specify the second letter of command axis name when the axis name extension parameter is valid "#1266 ext02/bit0 = 1".
The command axis name is not extended if this parameter is unspecified, and the only one letter set in "#1013 axname" or "#1014 incax" respectively is the absolute command axis name or incremental command axis name.
Axis configuration should not be as the non-name extension axis (1-letter axis) after the name extension axis (2-letter axis) in the part system.
(Configure the 2-letter axis after the 1-letter axis)

---Setting range---

A to Z (Setting is cleared when "0" is set)

[C80]
Not used.

(PR) #1603 PLCdev_no Axis device assignment No.

Specify the PLC I/F device assignment No. for the axis.

---Setting range---

0 : No designation for assignment
1 to 32: Axis device assignment No.

(PR) #1605 mgrnum Machine group No.

Specify the machine group No. to which each axis belongs.

---Setting range---

0 to 32

2.3 Base Common Parameters

#1038 plcsel — Ladder selection

Not used. Set to "0".

(PR) #1039 spinno — Number of spindles

Select the number of spindles.
0: No spindle
1 to 8: One to eight spindles

(Note) The setting range differs according to the model.

(PR) #1040 M_inch — Constant input (inch)

Select the unit system for setting and display regarding machine parameter and PLC interface's position, length and speed.
0: Metric system
1: Inch system

(PR) #1041 I_inch — Initial state (inch)

Select the unit system for the program travel amount when the power is turned ON or reset and for position display.
0: Metric system
1: Inch system

(Note) The units of the following data are converted by "#1041 I_inch".
- Command unit at power ON and reset (Inch/metric command mode)
  But under the following conditions, the unit will follow G20/G21 command modal even at reset.
  When reset modal is retained ("#1151 rstint"="0")
  When G code group 06 reset modal is retained ("#1210 RstGmd/bit5" ON)
- Unit system for position display (counter, user parameter, tool, work offset)
- User parameter I/O unit
- Parameter unit of user parameters concerning length and speed
- Arc error parameter (#1084 RadErr)

(PR) #1042 pcinch — PLC axis command (inch)

Select the unit system for the commands to the PLC axis.
0: Metric system
1: Inch system

#1043 lang — Select language displayed

Select the display language.
0: English (Standard)
1: Japanese (Standard)
11: German (Option)
12: French (Option)
13: Italian (Option)
14: Spanish (Option)
15: Traditional Chinese (Option)
16: Korean (Option)
17: Portuguese (Option)
18: Dutch (Option)
19: Swedish (Option)
20: Hungarian (Option)
21: Polish (Option)
22: Simplified Chinese (Option)
23: Russian (Option)
24: Turkish (Option)
25: Czech (Option)

(Note) A language which can be displayed is different according to each series.

(PR) #1044 auxno — MR-J2-CT Connections

Set the number of MR-J2-CTs connected.

(Note) The number of MR-J2-CTs possible to connect and setting range are different according to the model.
Check the specifications of each series.

(PR) #1045 nskno — Megatorgue motor connections

Specify the number of NSK megatorque motors connected. When a value other than 0 is specified, 2nd miscellaneous function data is output as signed binary data.

---Setting range---
0 to 16

(PR) #1046 T-ofs disp type — Tool compensation display type switch (for M system only)

Set this parameter to 1 when you use the L system's tool compensation type (e.g. when using a turning tool) in the M system.
0: Use the compensation type specified by "#1037 cmdtyp"
1: Use the tool compensation type III, irrespective of "#1037 cmdtyp"
(Note that the type is not switched to III on the tool measurement screen.)

(PR) #1047 G_Chg_En_Sno — Select program format switch-enabled part system

[M8]
Select the part system for which you enable the program format switch.
0: Part system 1 (default)
1: Part system 1
2: Part system 2
If G188 is given to any other part system, a program error (P29) occurs. If PFCHR is turned ON in any other part system, it is ignored.
[C80]
Not used.

(PR) #1051 MemTol — Tool compensation memory common for part systems

0: Tool compensation memory separate for part systems
1: Tool compensation memory common for part systems

(PR) #1052 MemVal — No. of common variables shared in part system designation

0: Common variables common for part systems (number fixed)
#100 - : Per part system
#500 - : Common for part systems
1: Common variables common for part systems (number designation)
#100 - : Designate with V1comN
#500 - : Designate with V0comN

(Note 1) When this parameter is changed, the file system will be changed after the power is turned ON. So always execute format.
The new format will be enabled after turning the power ON again.
Setting order
(1) MemVal changeover -> (2) Turn power ON again -> (3) Format -> (4) Turn power ON again
(Note 2) When this parameter is set to "1", #900000 to #907399 are not available even if the number of common variables is 8000.

#1077 radius — Incremental command for diameter specification axis

Select whether the incremental command of the diameter specification axis ("#1019 dia" is set to "1") uses the diameter value or radius value.
0: Diameter value
1: Radius value

#1078 Decpt2 — Decimal point type 2

Select the increment of position commands that do not have a decimal point.
0: Minimum input command unit (follows "#1015 cunit")
1: 1mm (or 1inch) unit (For the dwell time, 1s unit is used.)

#1079 F1digt — Validate F1 digit

Select the F command method.
0: Direct numerical command (command feedrate during feed per minute or rotation)
1: 1-digit code command (feedrate set with "#1185 spd_F1" to "#1189 spd_F5")

#1080 Dril_Z — Drilling Z fixed

Select a fixed cycle hole drilling axis.
0: Use an axis vertical to the selected plane as hole drilling axis.
1: Use the Z axis as the hole drilling axis regardless of the selected plane.

#1081 Gmac_P — Give priority to G code parameter

Select the G code priority relationship during the macro call with G command.
0: Priority is on G code used in the system
1: Priority is on registered G code for call

#1082 Geomet — Geometric

Select the type of geometric to use.
0: Not use
1: Use only geometric I
2: Use geometric I and IB

With geometric, specific address codes are used for exclusive meanings. Thus, if A or C is used for the axis name or 2nd miscellaneous command code, the A used for the axis name may function as the geometric's angle designation. Pay special attention to axis names, etc., when using this function.

#1084 RadErr — Arc error

Set the tolerable error range when the end point deviates from the center coordinate in the circular command.
---Setting range---
0 to 1.000 (mm)

#1087 G96_G0 — Constant surface speed control by rapid traverse feed command

Select how to handle the surface speed for the G00 command when using the constant surface speed control function.
0: Calculate the surface speed constantly even during G00 movement
1: Calculate the surface speed at the block end point in the G00 command

#1088 G30SL — Disable G30 soft limit

Select how to handle the soft limit during G30 (2nd reference position return).
0: Enable
1: Disable

#1091 Mpoint — Ignore middle point

Select how to handle the middle point during G28 and G30 reference position return.
0: Pass the middle point designated in the program and move to the reference position.
1: Ignore the middle point designated in the program and move straight to the reference position.

#1092 Tchg _A — Replace tools for additional axis

Select the movement of the additional axis at the tool change position return command.
0: The additional axis will not move
1: After the standard axis returns, the additional axis will also return to the tool change position

#1093 Wmvfin — Synchronization between part systems method

Select the timing of synchronization between part systems when using the multi-part system.
When the travel command is found in the synchronization command (!, M) block:
0: Synchronize before executing travel command
1: Synchronize after executing travel command

#1094 TI_SBK — Select life count for single block (for L system only)

Select whether to count the data units to be used for single block operation when using the tool life management II function (L system).
0: Not count
1: Count

#1095 T0tfof — TF output (for L system only)

Select how to handle TF for T00 command.
0: TF will be output
1: TF wont be output

(PR) #1096 T_Ltyp — Tool life management type

Select the tool life management type.
1: Life management I
In this type, how long and how many times the program commanded tool is used are accumulated to monitor the usage state.
2: Life management II
This method is the same as tool life management I, but with the spare tool selection function. A spare tool is selected from a group of tool commands commanded in the program. Tool compensation (tool length compensation and tool radius compensation) is carried out for the selected tool.
3: Life management III (for M system only)
The usage time or frequency of use which is designated by the program is accumulated, and the tool usage state is monitored.
It is not managed by the group number.
(Note) When "3" is set for the L system, the Life management I is selected.

#1097 Tldigt — Tool offset No. digits selection

Select the number of digits for an offset No. in command T.
0: Lower two digits of command T serve as an offset No.; the remaining upper digits as a tool No.
1: Lower one digit of command T serves as an offset No.; the remaining upper digits as a tool No.
2: Lower two digits of command T serve as an offset No., the remaining upper digits as a tool No.
3: Lower three digits of command T serve as an offset No.; the remaining upper digits as a tool No.

#1098 Tlno. — Tool length offset number

Select the number of digits of the tool length compensation No. in the T command.
0: Lower 3 digits in T code serve as a tool length and wear offset Nos.; the remaining upper digits as a tool No.
1: Lower 3 digits in T code serve as a tool wear offset No.; the remaining upper digits as a tool No. and tool length offset No.

#1099 Treset — Cancel tool compensation amount

Select how to handle the tool compensation vector when resetting the system.
0: Clear the tool length and wear compensation vectors when resetting
1: Hold the tool length and wear compensation vectors when resetting

When the values are cleared, the compensation will not be applied. So the axis will be shifted by the compensation amount in the next compensation operation.
When the values are kept, the compensation will be applied, so the axis will shift the differential amount of the compensation amount in the next compensation operation.

#1100 Tmove — Tool compensation

Select when to perform tool length compensation and wear compensation.
0: Compensate when T command is executed.
1: Superimpose and compensate with the travel command in the block where the T command is located. If there is no travel command in the same block, compensation will be executed after the travel command is superimposed in the next travel command block.
2: Compensate the wear amount when the T command is executed. Superimpose and compensate the tool length compensation amount with the travel command in the same block. If there is no travel command in the same block, compensation will be executed after the travel command is superimposed in the next travel command block.

#1101 Tabsmv — Tool compensation method

Select the type of travel command when "#1100 Tmove" is set to "1" or "2".
0: Compensate regardless of the travel command type
1: Compensate only at the travel command in the absolute command

#1103 T_Life — Validate life management

Select whether to use the tool life management.
0: Not use
1: Use

#1104 T_Com2 — Tool command method 2

Select how to handle the tool command in the program when "#1103 T_Life" is set to "1".
0: Handle the command as group No.
1: Handle the command as tool No.
(Note) In the case of the tool life management III, the program tool command will be handled as the tool No. regardless of the setting.

#1105 T_Sel2 — Tool selection method 2

Select the tool selection method when "#1103 T_Life" is set to "1".
0: Select in order of registered No. from the tools used in the same group.
1: Select the tool with the longest remaining life from the tools used or unused in the same group.

#1106 Tcount **Life management (for L system only)**

Select the input method when address N is omitted in inputting the data (G10 L3 command) for tool life management function II.
0: Time specified input
1: Number of times specified input

#1107 TIlfsc **Split life management display screen (for L system only)**

Set the number of groups to be displayed on the tool life management II (L system) screen.
0: Displayed group count 1, maximum number of registered tools: 16
1: Displayed group count 2, maximum number of registered tools: 8
2: Displayed group count 4, maximum number of registered tools: 4

#1108 TIrectM **Life management re-count M code (for L system only)**

Set the M code for tool life management II (L system) re-count.
---Setting range---
0 to 99

(PR) #1112 S_TRG **Validate status trigger method**

Select the enable conditions for the user macro interrupt signal (UIT).
0: Enable when interrupt signal (UIT) turns ON
1: Enable when interrupt signal (UIT) is ON

(PR) #1113 INT_2 **Validate interrupt method type 2**

Select the performance after user macro interrupt signal (UIT) input.
0: Execute interrupt program without waiting for block being executed to end
1: Execute interrupt program after completing block being executed

#1114 mcrint **Macro argument initialization**

Select whether to clear statements other than specified arguments by macro call.
Also select whether to clear local variables by power-ON and resetting.
0: Clear the non-specified arguments by macro call.
1: Hold non-specified arguments by macro call
2: Hold non-specified arguments by macro call, and clear local variables by power-ON and resetting

#1115 thwait **Waiting for retract**

Set the number of waits for retract when chamfering is OFF in thread cutting.
---Setting range---
0 to 99 (Approx. 4 ms)
Standard setting value: 4

#1116 G30SLM **Invalidate soft limit (manual operation)**

Enable this function when disabling the soft limit check function at the second to fourth reference position return.
0: Enable soft limit function
1: Disable soft limit function

(PR) #1117 H_sens

Not used.

#1118 mirr_A **Select how to set up the length of tools on cutter tables (opposed tables) (for L system only)**

Select one of the following two methods:
- Set the current length of tools on each facing turret.
- Set a value, assuming that the tools on each facing turret are in the same direction as that of those on the base turret.
0: Current length of the tools on each facing turret
1: Value, assuming that the tools on each facing turret are in the same direction as that of those on the base turret

#1119 Tmiron **Select the mirror image of each facing turret with T command (for L system only)**

Select whether to enable the mirror image of each facing turret with the T command.
0: Disable
1: Enable

(PR) #1120 TofVal **Change macro variable**

Select whether to change the macro variable (tool offset) numbers for shape compensation and wear compensation.
0: Not change (Conventional specification)
1: Change the shape and wear compensation variable numbers each for X, Z, and R

#1121 edlk_c **Edit lock C**

Select the edit lock for program Nos. 9000 to 9999 in memory.
0: Editing possible
1: Editing prohibited. The file cannot be opened.

(Note) If "#1122" is set to "1" or "2", "1" will be set in "#1121" when the power is turned ON.

(PR) #1122 pglk_c **Program display lock C**

Select whether to prohibit the program display and search for program Nos. 9000 to 9999 in memory.
0: Program display and search is possible
1: Program display is impossible. Search is possible.
2: Program display and search is impossible
The program details will not be displayed, but the program No. and sequence No. will display in the prohibited state.
(Note) If "#1122" is set to "1" or "2", "1" will be set in "#1121" when the power is turned ON.

#1123 origin **Origin set prohibit**

Select whether to use the origin set function.
0: Use
1: Not use

#1124 ofsfix Fix tool compensation No.

Select how to handle the compensation No. when the input key is pressed on the tool compensation screen.

0: Increment the compensation No. by 1 (Same as general parameters)
1: # compensation No. does not change

When setting in sequence, "0" is handier. When changing and setting repeatedly while adjusting one compensation value, "1" is handier

#1125 real_f Actual feedrate display

Select the feedrate display on the monitor screen.

0: Command speed
1: Actual travel feedrate

#1126 PB_G90 Playback G90

Select the method to command the playback travel amount in the playback editing.

0: Incremental value
1: Absolute value

#1127 DPRINT DPRINT alignment

Select the alignment for printing out with the DPRINT function.

0: No alignment, output s printed with left justification
1: Align the minimum digit and output

#1128 RstVCl Clear variables by resetting

Select how to handle the common variables when resetting.

0: Common variables won't change after resetting.
1: Common variables will be cleared #100 to #199 by resetting.

#1129 PwrVCl Clear variables by power-ON

Select how to handle the common variables when the power is turned ON.

0: The common variables are in the same state as before turning the power OFF.
1: Common variables will be cleared #100 to #199 when the power is turned ON.

#1130 set_t Display selected tool number

Select the tool command value display on the monitor screen.

0: Display T-modal value of program command
1: Display Tool No. sent from PLC

#1132 brightness

Select the brightness of display unit.

1: High brightness (in bright state)
0: Medium brightness
-1: Low brightness (in dim state)

#1133 ofsmem

Not used. Set to "0".

#1134 LCDneg

Not used. Set to "0".

#1135 unt_nm Unit name

Set the unit name.

Set with 4 or less characters consisting of both alphabets and numbers.

If "0" is set, the unit name won't be displayed.

---Setting range---

4 or less characters consisting of both alphabets and numbers

#1136 optype

Not used. Set to "0".

#1137 Cntsel

Not used. Set to "0".

#1138 Pnosel

Not used. Set to "0".

#1139 edtype

Not used. Set to "0".

#1140 Mn100 M code number

Set the first number of M code that corresponds to the setup Nos. from 100 to 199.

---Setting range-

0 to 99999999

#1141 Mn200 M code number

Set the first number of M code that corresponds to the setup Nos. from 200 to 299.

---Setting range---

0 to 99999999

#1142 Mn300 M code number

Set the first number of M code that corresponds to the setup Nos. from 300 to 399.

---Setting range---

0 to 99999999

#1143 Mn400 M code number

Set the first number of M code that corresponds to the setup Nos. from 400 to 499.

---Setting range---

0 to 99999999

#1144 mdlkof MDI setup lock

Select whether to enable MDI setting in non-MDI mode.

0: Disable MDI setting
1: Enable MDI setting

#1145 l_abs **Manual ABS parameter**

Select how to handle the absolute position data during automatic handle interrupt.
0: Absolute position data will be renewed if manual ABS switch is ON. If it is OFF, data won't be renewed.
1: Follow the "intabs" state when "#1061 intabs" is enabled

#1146 Sclamp **Spindle rotation speed clamp function**

Select how to handle the spindle rotation speed clamp function with the G92/G50S command.
0: G92/G50S command is handled as a clamp command only in the G96 state (during constant surface speed control).
G92S will be handled as normal S command in G97 state (constant surface speed OFF).
1: The S command in the same block as G92/G50 is constantly handled as a clamp command

#1147 smin_V **Minimum spindle rotation speed clamp type**

Specify the type of spindle min. rotation speed clamp value.
0: Rotation speed setting
1: Output voltage coefficient setting

Set "#3023 smini" according to this type setting.

#1149 cireft **Arc deceleration speed change**

Select whether to decelerate at the arc entrance or exit.
0: Not decelerate
1: Decelerate

#1153 FixbDc **Hole bottom deceleration check**

Select whether to perform a deceleration check or in-position check at the hole bottom in a hole drilling cycle. This parameter is enabled only for a hole drilling cycle in which no dwell command can be issued at the hole bottom.
0: Perform no deceleration check and in-position check
1: Perform deceleration check
2: Perform in-position check

(PR) #1154 pdoor

Not used. Set to "0".

#1155 DOOR_m

Not used. Set to "100".

#1156 DOOR_s

Not used. Set to "100".

#1157 F0atrn

Not used. Set to "0".

#1158 F0atno

Not used. Set to "0".

(PR) #1163 No rio **RIO connection detection invalid**

Select whether to enable or disable RIO connection detection.
0: Enable
1: Disable
If your I/O consists of only cards such as CC-LINK, setting this parameter to "1" will avoid the RIO communication cutoff alarm.

(PR) #1164 ATS **Automatic tuning function**

Select whether to enable or disable the automatic tuning function.
0: Disable
1: Enable
(Note) Enable this parameter when using MS Configurator.

#1166 fixpro **Fixed cycle editing**

Select a type of program dealt on the edit/program list/data in/out screen, general program, fixed cycle, or machine tool builder macro program.
0: General programs can be edited, etc.
1: Fixed cycles can be edited, etc.
Password No.: The machine tool builder macro programs can be edited, etc.
---Setting range---
0 to 99999999

#1167 e2rom

Not used. Set to "0".

#1168 test **Simulation test**

Select the test mode for the control unit.
In the test mode, test is performed with a hypothetical reference position return complete even though the real reference position return hasn't been completed. This is limited to test operation of the control unit itself, and must not be used when the machine is connected.
0: Normal operation mode
1: Test mode

#1217 aux01

Not used. Set to "0".

#1218 aux02

bit3: Parameter input/output format

Select the parameter input/output format.

0: Type I

Displayed on one line per parameter.

(Example)

N1001T1P1

N1001T2P1

N1001T3P0

1: Type II

Data with the same parameter number is displayed on the same line.

(Example)

N1001 T1 P1 T2 P1 T3 P0

bit4: External workpiece coordinate offset tool number selection

Select the R register that contains the tool number used for automatic calculation when measuring the coordinate offset of an external workpiece.

0: Follow the setting of "#1130 set_t".

1: Use the tool number indicated by user PLC.

bit5: Parameter I/O II spindle specification address

Select the spindle specification address of parameter I/O type II.

0: C

1: T

This parameter is also applied to the spindle specification address for input and verification.

(Note) This parameter is valid only for parameter I/O type II (when "#1218 aux02/bit3" is set to "1").

bit6: Set No. valid when program input

Select which program No. is applied when inputting programs in "#1 MAIN PROGRAM" on Data I/O screen.

0: The No. in the input data

1: The No. set in the data setting area

bit7: Input by program overwrite

(1) Select the operation when the program to be input in "#1 MAIN PROGRAM" on Data I/O screen, has already been registered.

0: An operation error (E65) occurs.

1: Input by overwrite.

(2) Select the operation in the high-speed program server mode, when the name of the file to be transmitted with (IC -> host) transmission already exists in the host.

0: Prohibit overwrite

1: Enable overwrite

#1219 aux03

bit1: Stop high-speed PC monitoring function

Set "1" to disable the function that triggers the emergency stop when the PC high-speed processing time is extended.

Disable the monitoring function only as a temporary measure.

bit5: Dog-type intermediate point

Select whether to move to the intermediate point during automatic dog-type reference position return.

0: Not move.

1: Move.

bit7: Time constant setting changeover for soft acceleration/deceleration

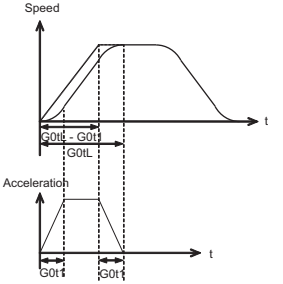
0: Accelerating time is G0tL(G1tL).

When the G00 pre-interpolation acceleration/deceleration and the soft acceleration/deceleration are used together, the inclination of soft acceleration/deceleration will be steeper by setting a time to the soft acceleration/deceleration 2nd step time constant (#2005 G0t1). Consequently, the acceleration for G28/G30 will be larger than that for G00.

(1) Total accelerating time is "G0tL".

(2) The time for curve part is "G0t1".

(3) The time for linear part is obtained by "G0tL-(2 x G0t1)".



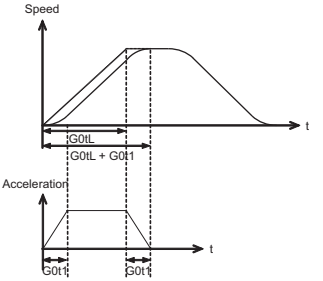
1: Accelerating time is obtained by G0tL+G0t1 (G1tL+G1t1).

When the G00 pre-interpolation acceleration/deceleration and the soft acceleration/deceleration are used together, you can attain the G28/G30 acceleration that is equal to G00, by setting the same value to G00 soft acceleration/deceleration filter (#1569 SfiltG0) as well as to the soft acceleration/deceleration 2nd step time constant (#2005 G0t1).

(1) Total accelerating time is obtained by "G0tL+G0t1".

(2) The time for curve part is "G0t1".

(3) The time for linear part is obtained by "G0tL-G0t1".



#1220 aux04 (for L system only)

bit 0: Tool life check timing selection

Select the criterion to judge the tool life end when the use count is incremented in tool life management II.

0: Determine the tool life end when the incremented use count has exceeded the life count. (Default)
(Use count > life count)

1: Determine the tool life end when the incremented use count has reached the life count.
(Use count >= life count)

#1221 aux05

bit0: Workpiece coordinate/absolute coordinate display switch

Select whether to display the workpiece coordinate or to display the absolute coordinate in the coordinate value screen, command value screen or modal information screen.

0: Workpiece coordinate

1: Absolute coordinate

#1222 aux06

bit3: Enable setup parameter lock

[M8]

Select whether to enable the setup parameter lock.

0: Disable
1: Enable

[C80]

Not used.

bit4: Minimum cut-in amount selection

Select the minimum cut-in amount command value for the compound thread cutting cycle (G76 command).

0: The minimum cut-in amount (Q) will be "0".
1: The minimum cut-in amount (Q) will be set in the last command value (it is retained even after the NC power has been turned off).

bit5: Fixed cycle for compound lathe command format check selection

Select the operation when the 1st block of the fixed cycle for compound lathe is omitted while the conventional format is selected ("#1265 ext01/bit0" is set to "0").

0: Program error (P33) will occur.
1: Parameter setting value will be used.

bit7: Reference position return deceleration check method

Select the deceleration check method to be used during automatic reference position return.

0: In-position check
1: Commanded deceleration check

#1223 aux07

bit1: Deceleration check method 2

Select the deceleration check method in G1+G9.

0: Command deceleration check in G1+G9
1: In-position check in G1+G9

The deceleration check is not performed for the commands except G1+G9.
When "#1306 InpsTyp deceleration check specification type" is set to "1" (Deceleration check specification type 2), this parameter will be invalid.

bit2: Synchronous tap R-point in-position check

Select whether to enable the synchronous tap I-point -> R-point in-position check.

0: Disable
1: Enable

(Note) This parameter is valid only when "1" (Enable in-position check) is set for "#1223 aux07/bit3 Synchronous tap in-position check improvement".

bit3: Synchronous tap in-position check improvement

Select whether to enable the synchronous tap in-position check improvement.

0: Disable
1: Enable

Related parameters:
#1223/bit2 Synchronous tap R-point in-position check
#1223/bit4 Synchronous tap hole bottom in-position check
#1223/bit5 Synchronous tap R-point in-position check 2

bit4: Synchronous tap hole bottom in-position check

Select whether to enable the synchronous tap hole bottom in-position check.

0: Disable
1: Enable

(Note) This parameter is valid only when "1" (Enable in-position check) is set for "#1223 aux07/bit3 Synchronous tap in-position check improvement".

bit5: Synchronous tap R-point in-position check 2

Select whether to enable the synchronous tap R-point in-position check.

0: Disable
1: Enable

(Note) This parameter is valid only when "1" (Enable in-position check) is set for "#1223 aux07/bit3 Synchronous tap in-position check improvement".

bit6: Cancel synchronous tap (, S) return

0: Retain the spindle speed (, S) in synchronous tap return
1: Cancel the spindle speed (, S) in synchronous tap return with G80

bit7: Synchronous tap method

Select the synchronous tapping method.

0: Synchronous tapping with multi-step acceleration and rapid return
1: Conventional type synchronous tapping

#1224 aux08

bit0: Sampling data output

Select whether to enable the sampling data output.

0: Disable
1: Enable

#1225 aux09

bit7: Enable/disable spindle rotation speed clamp

Select whether to enable the spindle rotation speed clamp by the G92 S or Q command for the spindle command rotation speed (R7000) set with the user ladder.

0: Enable
1: Disable

#1226 aux10

bit0: Tool compensation data for external workpiece coordinate offset measurement
Select the tool compensation data to be used for external workpiece coordinate offset measurement.
0: Tool length data and tool nose wear data
1: Tool length data

bit1: Optional block skip type
Select whether to enable the optional block skip in the middle of a block.
0: Enable only at the beginning of a block.
1: Enable in the middle of a block, as well as at the beginning of the block.
Note that a slash "/" in an equation between [ ] is handled as division operator.
(Note) This parameter is enabled when "#1274 ext10/bit4" is "0".

bit2: Single block stop timing
Select the timing at which the single block signal is activated.
0: When the signal goes ON while automatic operation is starting, the block will stop after finished.
1: When the signal is ON at the end of the block, the block will stop.

bit3: C-axis reference position return type
Select the C-axis reference position return type.
0: Basic position return is performed by the G28 reference position return command or by activating the manual reference position return. The basic point dog is used.
1: When the first C-axis command is issued after the C-axis mode is entered in automatic mode, reference position return is performed before the execution of the block. The reference position return is also performed by the G28 reference position return command or by activating the manual reference position return. The Z phase of the encoder is used.

bit4: S command during constant surface speed
Select whether to output a strobe signal when the S command is issued in constant surface speed mode.
0: Not output any strobe signal in constant surface speed mode.
1: Output strobe signals in constant surface speed mode.

bit5: Arbitrary allocation of dog signal
Select whether to enable the arbitrary allocation parameter for the origin dog and H/W OT.
0: Disable (Fixed device is used.)
1: Enable (Device is specified by the parameter.)

bit6:
Not used.

bit7: Shorten JOG stop time
Specify whether to shorten the JOG stop time.
0: Do not shorten the JOG stop time. (Same as before)
1: Shorten the JOG stop time.

#1227 aux11

bit0: Select PLC signal or spindle feedrate attained
Set up this option when disabling the cutting start interlock by spindle feedrate attained.
0: Cutting start interlock by PLC signal
1: Cutting start interlock by spindle feedrate attained

bit1: Select H or D code
Set up this option to validate the data that is set up on the tool life management screen when issuing the H99 or D99 command.
0: The H and D codes validate the data that is set up on the management setup screen.
1: Validates the data that is set up on the management setup screen when issuing the H99 or D99 command.

bit2: Measures against tool setter chattering
Select a condition where a relieving operation completes after measurement with tools.
0: Sensor signals have stopped for 500 ms or longer.
1: 100 µm or longer has passed after sensor signals stopped.

bit3:
Not used.

bit4: Word command check
Select whether to output an error when no numeric value follows a program address during execution of a machining program.
0: Not check
1: Check

bit5: Spindle rotation speed clamp
Specify whether to clamp the rotation speed in constant surface speed mode when the spindle rotation clamp command is issued.
0: Clamps the rotation regardless of the constant surface speed mode.
1: Clamps the rotation only in constant surface speed mode.

bit7: Switch the range of tool life data to be input
Set up the range of tool life data to be input or compared.
0: Inputs or compares all of the data output.
1: Inputs or compares part of the data output

1) Tool life management I data to be input or compared tool number (D), lifetime (E), life count (F), and auxiliary data (B).
2) Tool life management II data to be input or compared Group number (G), method (M), life (E/F), tool number (D), and compensation number (H)

#1228 aux12

bit0:
When not using, set to "0".

bit1: Switch "offset and parameter" screen
Select to switch the "offset and parameter" screen to the parameter screen.
0: Display the "offset and parameter" screen.
1: Display the "parameter" screen.

bit2: Switch data protection in data transmission mode
[M8]
Select the range of data protection in data transmission mode.
0: Enable the protection for both send and receive data.
1: Enable the protection for receive data only.
[C80]
Not used.

bit3: Nose R specification
Select whether to specify the nose R compensation by shape or wear number.
0: Specifies the nose R compensation by shape number.
1: Specifies the nose R compensation by wear number.

bit4: Select operation error or stop code
Select operation error or stop code to provide for both block start and cutting start interlocks.
0: Operation error
1: Stop code

bit5: Select constant surface speed coordinates
Select the constant surface speed coordinate.
0: Workpiece coordinate
1: Absolute value coordinate

bit6: Switch relative values displayed
Select whether to preset the relative coordinates with workpiece coordinate preset (G92.1) or counter preset (G92).
0: Preset the relative coordinates.
1: Not preset the relative coordinates.

bit7: Protection with manual value command
Select whether to protect a manual value command.
0: Not protect. (Conventional specification)
1: Protect.

#1229 set01

bit0: Subprogram interrupt
Select the type of the user macro interrupt.
0: Macro type user macro interrupt
1: Sub-program type user macro interrupt

bit1: Accurate thread cutting E
Select what the address E specifies in inch screw cutting.
0: Number of threads per inch
1: Precision lead

bit2: Radius compensation type B (for M system only)
Select the method of the arithmetic processing for the intersection point when the start-up or cancel command is operated during radius compensation.
0: The processing does not handle the start-up or cancel command block: handle the offset vector in the direction vertical to that of the command instead.
1: The processing is executed for the intersection point between the command block and the next block.

bit2: Nose R compensation type B (for L system only)
Select the method of the arithmetic processing for the intersection point when the start-up or cancel commands are operated during nose R or radius compensation.
0: The processing does not handle the start-up or cancel command block: handle the offset vector in the direction vertical to that of the command instead.
1: The processing is executed for the intersection point between the command block and the next block.

bit3: Initial constant surface speed
Select the initial state after the power-ON.
0: Constant surface speed control cancel mode
1: Constant surface speed control mode

bit4: Synchronous tap
Select the operation when ",R" is omitted in G74/G84 tapping cycle.
0: Asynchronous tap
1: Synchronous tap

bit5: Start point alarm
Select the operation when the operation start point cannot be found while executing the next block of G115, G116 or G117.
0: (G115/G116)Starts after the block has been moved.
(G117)Enables an auxiliary function after the block has been moved.
1: (G115)Waits until reaching start point at the movement after next block when the operation start point is not found.
(G116/G117)Outputs an program error (P33) when the operation start point is not found.

bit6: Grid display selection
Select the grid display type on the servo monitor screen during the dog type reference position return.
0: Distance between dog OFF and basic point (including a grid mask amount)
1: A value given by reducing a grid mask amount from the distance between dog OFF and basic point

#1230 set02

bit2: Proximity switch spindle orientation: Z phase re-detection request type

Select when to request Z phase re-detection for proximity switch type spindle orientation.

0: After confirming the spindle has reached the Z phase detection speed.

1: Right after Servo ON of the spindle.

bit7: Macro interface input/output for each part system

Select the specification of the macro interface input/output.

0: Shared by all part systems.

1: Used independently by the part systems.

#1231 set03

bit0: Graphic check compatibility parameter

[M8]

Select whether to return the data to the pre-starting data after having checked a machining program that rewrites the common variables, workpiece offsets and tool offsets.

0: Return the data.

1: Not return the data.

[C80]

Not used.

bit1: Switch graphic trace coordinates

[M8]

Select whether to use machine coordinate value or tool position coordinate value (position being machined, obtained by subtracting the tool compensation amount from machine coordinate values) for drawing with trace display.

0: Machine coordinate value (conventional method)

1: Tool position coordinate value

[C80]

Not used.

bit2: Switch graphic check trace

[M8]

Select the coordinates to draw at program check: both machine coordinate value (tool center path) and tool position coordinate value (program path) simultaneously, or only the coordinates selected with "#1231 set03/bit1 (Switch graphic trace coordinates)".

0: Both machine coordinates and tool position coordinates (conventional method)

1: Only coordinates designated with switch graphic coordinates

[C80]

Not used.

bit4: Switch zero point mark display position

[M8]

Select the position for displaying the zero point mark in the graphic display.

0: Machine coordinate basic point (same as conventional method)

1: Workpiece coordinate basic point

[C80]

Not used.

bit5: Switch graphic check counter display

[M8]

Select the type of counter displayed on the Graphic Check screen with the combination of "#1231 set03/bit1".

If the drawing coordinate system is other than "all workpiece coordinates", the counter displayed is workpiece coordinate position counter or tool position (workpiece coordinate) regardless of this setting.

0: (When "#1231 set03/bit1" is set to "0") Machine position counter
(When "#1231 set03/bit1" is set to "1") Tool position (workpiece coordinate) counter

1: (When "#1231 set03/bit1" is set to "0") Workpiece coordinate counter
(When "#1231 set03/bit1" is set to "1") Tool position (workpiece coordinate) counter

[C80]

Not used.

bit6: Initialization of drawing in graphic check

[M8]

Select whether to initialize the workpiece drawing automatically when you change any data in the 3D check workpiece setup screen.

0: Initialize the workpiece drawing (conventional specifications)

1: Not initialize the workpiece drawing

Note that if you change the workpiece shape or dimensions, the workpiece drawing is automatically reset, irrespective of this parameter.

[C80]

Not used.

bit7: Disable switching of graphic check method

[M8]

Select whether to enable or disable switching of the 3D check method.

0: Enable

1: Disable

If you choose Disable, the last selected check method remains selected.

[C80]

Not used.

#1232 set04

bit0: Exclude acceleration/deceleration in load monitor

Select whether or not to exclude acceleration/deceleration when detecting the load in load monitoring.

0: Acceleration/Deceleration is included

1: Acceleration/Deceleration is excluded

(Note) When "Exclude acceleration/deceleration in load monitor" ("#1232 set04/bit0") is enabled, "Spindle function 8" ("#13228 SP228/bit2") needs to be set to "1" (load display, high-cycle motor output effective value).

bit5: Actual load selection

Load fluctuation due to speed change is excluded from the actual load.

0: Disable

1: Enable

(Note) When "Actual load selection" ("#1232 set04/bit5") is enabled, "Spindle function 8" ("#13228 SP228/bit2") needs to be set to "1" (load display, high-cycle motor output effective value).

#1233 set05

When not using, set to "0".

#1234 set06

bit3: Interlock when tap retract enabled

Select whether to enable automatic/manual interlock for the part system with "Tap retract enable" signal ON.

0: Interlock all the axes

1: Disable the interlock

#1235 set07

bit0: Helical interpolation speed 2

0: Select normal speed designation also for 3rd axis

1: Select arc plane element speed designation

bit2: Fixed type chopping compensation valid only at start

When the fixed type compensation value is selected, the method can be changed to the compensation value sequential update type after the first four cycles.

0: Disable the method changeover

1: Enable the method changeover

bit4: Selection condition of synchronous tapping gear step

Select the parameters that determine the gear step for synchronous tapping.

0: #3005 through #3008 (smax1 to 4) when "#1223 aux07/bit7" is "0".
Or #3013 through #3016 (stap1 to 4) when "#1223 aux07/bit7" is "1".

1: Always #3013 through #3016 (stap1 to 4)

#1236 set08

bit0: Manual rotary axis feedrate unit

Select the unit of manual rotary axis feedrate.

0: Fixed to [°/min]

1: Same speed as before (When inch command, the speed is the command speed divided by 25.4.)

bit1: Spindle speed detection

Select the pulse input source of actual spindle rotation speed (R6506/R6507) when the spindle encoder serial connection is selected ("#3025 enc-on" is set to "2").

0: Serial input

1: Encoder input connector

bit2: Current limit droop cancel invalid

Select whether to cancel the position droop when the current limit changeover signal is canceled.

0: Cancel the droop.

1: Not cancel the droop.

bit3: Rotary axis command speed scale

Select to multiply the rotary axis command speed by 10 times.

0: Invalid

1: During initial inching, the rotary axis command speed is multiplied by 10. In other words, if "F100" is commanded, the speed will be the same as when 1000°/min is commanded.
The rotary axis speed display unit will be 10°/min.

(PR) #1237 set09

Not used. Set to "0".

(PR) #1238 set10

bit0: Switch G36 function
Select the function, the automatic tool length measurement or arc thread cutting (CCW), to be applied to G36 when the G code system 6 or 7 is selected.
0: Automatic tool length measurement
1: Arc thread cutting (CCW)

bit3: Ignoring input from RIO
Select whether to ignore the input from RIO.
0: Output the input from RIO to the device X.
1: Ignore the input from RIO, and not output it to X device.
(X000 to X0FF, X100 to X1FF and X200 to X2BF)
* Normally set this parameter to "0".
* The devices X2C0 to X2FF are used for the handle pulse input and board reset from the operation panel I/O unit card (HN391/HN392), thus are excluded from the target.

bit6: Switch absolute position detection alarm
Select the output destination of the absolute position detection alarm.
0: NC alarm 4 (AL4)
1: NC alarm 5 (AL5)
(Note) The absolute position detection alarm is listed in the alarm history regardless of this parameter setting.

bit7: Switch operation alarm
Select whether to enable the NC alarm 5 (AL5) signal output.
0: Disable NC alarm 5 (AL5)
All operation alarms will be output to NC alarm 4 (AL4).
1: Enable NC alarm 5 (AL5)
The following operation alarms will be output to NC alarm 5 (AL5), not to NC alarm 4 (AL4).
•External interlock axis found (M01 0004)
•Cutting override zero (M01 0102)
•External feedrate zero (M01 0103)
•Block start interlock (M01 0109)
•Cutting block start interlock (M01 0110)
•Interference check disabled (M01 0200)
•Cutting interlock for spindle-spindle polygon (G51.2) (M01 1033)
The above alarms are not recorded in the alarm history regardless of the setting value of this parameter.

(PR) #1239 set11

bit0: Coil switching method
Select the coil switching method.
0: Via PLC (Y189F).
1: NC internal processing. (Y189F is invalid.)

bit1: Handle I/F selection
[M8]
Select the handle connection destination.
0: Use the handle connected to the encoder communication connector.
1: Use the remote I/O unit as a priority.
(Note) When the operation panel I/O unit is mounted, the handle connected to the unit will be used regardless of this parameter setting.
[C80]
Not used.

bit3: Polygon machining mode at reset
Select whether to cancel the polygon machining mode when reset is applied.
0: Not cancel.
1: Cancel.

bit4: Invalidate G51.1 phase command
Select whether to enable the phase control with the spindle-spindle polygon function.
0: Always enable. (When R is not commanded, it will be handled as R0.)
1: Enable only at the R command.

bit5: Door interlock spindle speed clamp valid
Select whether to enable the spindle clamp speed changeover by the PLC signal.
0: Disable
1: Enable

bit6: External deceleration axis compliance valid
Designate the method for setting the external deceleration speed.
0: Set speed common for all axes (#1216 extdcc external deceleration speed)
1: Set speed for each axis (#2086 exdcax external deceleration speed)

(PR) #1240 set12

bit0: Handle input pulse
Select the handle input pulse.
0: MITSUBISHI CNC standard handle pulse (25 pulse/rev)
1: Handle 400 pulse (100 pulse/rev)

bit2: Zero point shift amount magnification
If "1" is set, the following magnification will be applied on the #2027 G28sft reference point shift amount, #2057 zero point proximity + and #2058 zero point proximity - settings.
For 0.1μm: 10-fold
For 0.01μm: 100-fold

bit4: Optical communication automatic channel detection invalid
Select whether to enable the optical communication automatic channel detection.
0: Enable
1: Disable

#1241 set13

bit0 : Prevention of program error due to incorrect G code combination
When a G code from some modal groups is commanded in the same block as an unmodal G code, a program error due to incorrect G code combination occurs.
This parameter is used to avoid this program error.
0: The program error(P45) will occur.
1: The program error is avoided, however, a G code from an uncombinable modal group is ignored.

bit1: Interference check at starting up radius compensation (for M system only)
Interference check at starting up nose R compensation (for L system only)
0: In a start-up block, an interference check is not carried out.
1: An error occurs even at a start-up block if an interference occurs.
The error occurs even when the interference avoidance is set to ON (#8102="1"). However, an interference check is not carried out when it is set to OFF (#8103="1").

bit4: Plane axis check invalid in fixed cycle for turning machining
Select whether to raise a program error when a fixed cycle for turning machining is commanded in either of the following conditions:
* The commanded axis does not coincide with the selected plane
* One or both of the selected plane axes have no movement
0: Raise a program error
1: Not raise a program error

bit5: Macro argument L/P valid
Select whether to enable L and P to be used as argument of G(MSTB) macro command or ASCII code macro command.
0: L and P commands cannot be used.
1: L and P commands can be used as argument.

bit7: Spindle rotation speed during synchronous tap return
Specify how to operate in a sync tap command block if the tap return spindle rotation speed (,S) is lower than the tap spindle rotation speed (S).
0: Operate at the tap return spindle rotation speed (,S)
1: Operate at the tap spindle rotation speed (S)

#1242 set14

bit0: Ignoring timing sync in multi-system simultaneous thread cut cycle I (G76.1)
Select whether to execute timing synchronization during multi-part system simultaneous thread cut cycle I (G76.1).
0: Execute timing synchronization at the start and end of thread cutting.
1: Ignore the timing synchronization given during the cycle.

bit1: G92.1 single command error check ON
Select whether to enable the error check when G92.1(G50.3) is given alone in a block.
0: Disable the error check
1: Enable the error check

bit2:
[M8]
Select whether to output an operation error upon detection of spindle speed fluctuation (G162).
0: Output an operation error
1: Not output an operation error
[C80]
Not used.

bit6: G113 command type when multiple spindle synchronization set valid
Specify the G113 command type of when multiple spindle synchronization set is valid.
0: Cancels all the spindle synchronization by issuing G113H0 or G113D0.
1: Cancels all the spindle synchronization by issuing G113.

#1243 set15

Not used. Set to "0".

#1244 set16

bit0: No superimposition of timing synchronization block onto subsequent block

0: Superimpose a block, where timing synchronization command is given as a single command, onto the subsequent block, and treat the blocks as one block

1: Treat a block, where timing synchronization command is given as a single command, as one block.

bit1: Enable automatic re-calculation after timing synchronization

0: Look-ahead a block next to the timing synchronization command block

1: Automatically re-calculate a block next to the timing synchronization command block after the synchronization has been completed.

bit2: Balance cut in all the blocks

Select in which block(s) to execute synchronization between part systems when a balance cut command is given.

0: Execute synchronization in cutting feed command block(s)

1: Execute synchronization in all the blocks

bit3: Enable tool offset at start/stop of arbitrary axis superimposition

Select whether or not to apply tool offset to a travel at workpiece coordinate system switch or a travel toward the superimposition start/end position when the arbitrary axis superimposition control start/stop command is issued.

0: Not apply

1: Apply

bit4: Speed clamp method under superimposition control

0: Apply a fixed superimposition clamp speed to the superimposition-related axes. This clamp speed takes effect irrespective of the feed status (feed direction and mode) of the superimposition-related axes. When this method is chosen, the clamp speed is unchanged during block execution.

1: Apply the optimal clamp speed according to the real-time monitored feed status of the superimposition-related axes (feed direction and mode). When this method is chosen, the clamp speed is changed even during block execution. This method helps reduce the cycle time.

bit5: Read of position info with superimposing travel distance taken into account

Select whether to take into account the superimposing travel distance (travel distance of the basic axis) when reading position info (machine coordinates/skip coordinates) using a variable under control axis superimposition or arbitrary axis superimposition control.

0: Not take the distance into account

1: Take the distance into account

bit6: Axis address check ON

Select whether to output a program error (P32) when any address other than those specified by "#1013 axname" and "#1014 incax" is given as an axis address.

If the arbitrary axis exchange function is ON, select whether to output a program error (P32) when any address other than those specified by "#12071-12078 adr_abs[1]-[8]" and "#12079-12086 adr_inc[1]-[8]" is given as an axis address.

0: Not output a program error (P32) (Ignore the axis address)

1: Output a program error (P32)

#1245 set17

bit7: Synchronous tap spindle rotation direction type

Select whether the spindle's rotation direction is determined by the synchronous tapping axis' travel direction.

0: The spindle's rotation direction is determined by the synchronous tapping axis' travel direction.
When the travel direction is negative, the spindle rotates forward.
When the travel direction is positive, the spindle rotates in reverse.

1: The spindle always rotates forward regardless of the synchronous tapping axis' travel direction.

(Note) When a reverse tap is commanded, the spindle rotates in an opposite direction to that mentioned above.

(PR) #1246 set18

bit0: Thread cut override ON
Select whether to enable spindle override during thread cutting.
0: Disable
1: Enable

bit1: Thread cut override feed hold
Select whether to perform feed hold when spindle override is changed during thread cutting.
0: Not perform feed hold
1: Perform feed hold

bit2: Switch coordinate systems for radius compensation
Select the coordinate system for radius compensation.
0: Type 1 (Conventional specification)
Perform radius compensation with reference to a position on the workpiece coordinate system.
1: Type 2
Perform radius compensation with reference to a position on the program coordinate system.

bit3: Change repetition final return position at M2L
Select the final return position after repetition, when in G99 modal and in M2 format with the label L.
0: Initial point
1: R point

bit4: T-lifeover signal output
Select the timing at which tool life over signal is output when using the M system tool life management I/III.
0: Turn the signal ON when a selected tool has reached the lifetime.
1: Turn the signal ON when any of tools (in the case of the tool life management III, all the registered tools) in a selected group has reached the lifetime.

bit5: Tool status update type
Select whether to update tool status automatically when lifetime/usage data is changed on the screen in the M system tool life management I/II/III.
0: Not update.
1: Update.
(Note) When "1" is selected, tool status will be updated as follows.
- When usage data is "0", tool status will be "0".
- When usage data is smaller than lifetime data, tool status will be "1".
- When usage data is the same as or larger than lifetime data, tool status will be "2".

bit6 : Switch F 1-digit feedrate change method
Set whether to enable feedrate change with handle until power OFF, or change the parameters #1185 to #1189 with change of speed.
0: Enabled until power OFF
1: Change #1185 spd_F1 to #1189 spd_F5

bit7: PLC axis random device assignment
Select whether to enable the origin dog and H/W OT random assignment for a PLC axis.
0: Disable (assigned to a fixed device)
1: Enable (assigned to the parameter set device)

#1247 set19

bit0: Movement by tool length compensation command (for M system only)
Select whether or not to move the axis by the compensation amount when tool length compensation/cancel is independently commanded.
0: Move
1: Not move

bit1: Thread cutting operation when manual speed command enabled
Select the thread cutting operation in manual speed command.
0: The axis travels at the handle feed rate, jog feed rate, or manual rapid traverse rate
1: The axis travels following the program command

bit2: Inclined surface machining mode hold
Select whether to hold or cancel the inclined surface machining mode at an emergency stop or power OFF.
0: Cancel the inclined surface machining mode.
1: Hold the inclined surface machining mode.

#1248 set20

Not used. Set to "0".

#1249 set21

bit5: Warning on 24Hr continuous ON display
Select whether to show or hide the alarm (V53 0001).
0: Not display
1: Display

#1250 set22

bit0: Enable cycle operation after turning OFF manual arbitrary reverse run mode
[M8]
Select whether to enable automatic cycle operation after turning OFF the manual arbitrary reverse run mode.
0: Disable
1: Enable
[C80]
Not used.

bit3 : Switch acceleration for rapid traverse
[M8]
Select how to determine the acceleration for rapid traverse (G0) in high-accuracy control.
This parameter is enabled during tool center point control, workpiece installation error compensation or inclined surface machining command.
0: The acceleration is determined by "#1206 G1bF (Maximum speed)" and "#1207 G1btL (Time constant)" and is common to all axes.
1: The acceleration is determined by "#2001 rapid (Rapid traverse rate)" and "#2004 G0tL (G0 time constant (linear))" and is individual for each axis.
[C80]
Not used.

#1251 set23

bit0: Load inertia ratio display

Select whether to show the load inertia ratio of servo and spindle units on the drive monitor screen.

0: Display according to "#2235 SV035/bitF" and "#13226 SP226/bitF"

1: Not display (Show zero)

bit1: Spindle temperature display

Select whether or not to display the spindle unit temperature on the drive monitor screen.

0: Display according to "#13225 SP225/bit2"

1: Not display (Show zero)

bit2 : Warning for unreflected workpiece offset

[M8]

Select whether to enable the warning that appears when workpiece offset, extended workpiece offset, external workpiece offset or workpiece shift has not been reflected in the workpiece position counter.

0: Disable the warning

1: Enable the warning

[C80]

Not used.

#1252 set24

bit3: Number of file input/output points for PLC constant (extension)

[M8]

Specify the number of file I/O points for the PLC constant (extension) at the time of parameter input/output (ALL.PRM).

0: All the points of file input/output (ALL.PRM) for the PLC constant (extension)

1: The number of points specified by #1326 (PLC Const Ext. Num) for the PLC constant (extension)

(PR) #1253 set25

bit0: Number of machine tool builder macro definition files

Select the number of definition files for machine tool builder macro.

0: One (O199999999)

1: Ten (O199999990 to O199999999)

bit2: Acceleration/Deceleration mode change in hole drilling cycle

Change the acceleration/deceleration mode of hole drilling cycle.

0: The operation follows the parameter setting. The setting of #1153 is enabled.

1: A constant inclination acceleration/deceleration and an acceleration/deceleration after interpolation are applied to the hole drilling cycle. The setting of #19417 is enabled.

bit4: Clearing data at fixed cycle mode switch

Select whether to zero clear the argument data at the time of fixed cycle mode switch.

0: Do not zero clear the argument data

1: Zero clear the argument data

bit5: G53 motion type

Change the motion type for G53 command.

0: Cutting feed or rapid traverse is determined by the active modal status.

1: Fixed to rapid traverse.

bit6: Switch G68/G69 function

Select whether to use G68/G69 as tool post mirror image function or balance cut function when the selected G code system is 6 or 7.

0: Facing turret mirror image

1: Balance cut

(PR) #1254 set26

bit0: Reducing processing time of zero-travel-distance block (for L system only)

Select whether to reduce the processing time of a zero-travel-distance block.

0: Disable the reduction of non-travel block processing time.

1: Enable the reduction of non-travel block processing time.

bit1: Program format switch

[M8]

Enable the program format switch function.

0: Disable the function

1: Enable the function

[C80]

Not used.

bit3: Select timing for updating axis parameter

Select the timing for when to update axis parameter.

0: Update after All axes smoothing zero turns ON for all the part systems.

1: Update after All axes smoothing zero turns ON for each part system.

bit4: Reference of zero point shift distance for spindle C axis

[M8]

Select the reference method for zero point shift distance when C axis returns to zero under spindle C axis control.

0: Use "#2027 G28sft" as the zero point shift distance.

1: Use "#3113 cax_sft" as the zero point shift distance.

[C80]

Not used.

(PR) #1255 set27

bit0: High-accuracy calculation during constant surface speed control

[M8]

Enable the high-accuracy spindle speed calculation under constant surface speed control.

0: Calculate the speed with the tolerance of plus or minus 10r/min (same as conventional specifications).

1: Calculate the speed with the tolerance of plus or minus 1r/min.

[C80]

Not used.

bit1: MTB macro M99 command single block stop

[M8]

For M99 command during MTB macro, select whether to execute single block stop or not.

0: Not execute single block stop in the M99 command

1: Execute single block stop in M99 command

(Note 1) During Suppression of single block stop (#3003/BIT0 = 1) of system variable, single block stop is not applied in the M99 command even if this parameter is valid.

(Note 2) While single block is suppressed by the A1 command of macro definition program (O199999999), single block stop is applied if this parameter is valid.

[C80]

Not used.

bit3: Holding diameter/radius designation after NC reset

[M8]

Select whether to hold the diameter/radius designation of each axis selected in G10.9 after NC reset.

0: Diameter/radius designation is initialized by NC reset.

1: Diameter/radius designation is held after NC reset.

[C80]

Not used.

bit4:Tool retraction from hole bottom in boring cycle

[M8]

0: Move at the rapid traverse rate (G0 interpolation feed).

1: Move with linear interpolation (at the feedrate commanded with F).

[C80]

Not used.

bit5: Tool length offset for multiple axis synchronization control

[M8]

Select whether to enable the tool length offset dedicated to the multiple axis synchronization control.

0: Disable

1: Enable

(PR) #1256 set28

bit0: Switch to C axis mode at cancel of EMG stop/door open under spindle C axis

Select whether to switch the control to C axis mode when you execute and cancel emergency stop, or turn ON and OFF the door open signal under spindle C axis control mode.
(This takes effect when spindle/C axis switch method is PLC signal type.)

0: Not switch to C axis mode.
Control is switched to C axis mode when C axis' Servo OFF signal is turned OFF and ON after cancel of emergency stop or door open.

1: Switch to C axis mode when emergency stop or door open is cancelled.

bit1: Position loop gain in C axis zero return/orientation/synch tap zero return

[M8]

Select the position loop gain to be applied when the interpolation mode is selected for the spindle C axis, spindle orientation or synchronous tap zero return that is executed when the spindle stops (when "#3106 zrn_typ/bitE"="0").

0: SP003 PGS

1: SP002 PGN

[C80]

Not used.

bit2: Change current FB (load) output unit

[M8]

Select the units in which the current FB (load) is output to a register.
When output in units of 0.01%, the output range is from 0 to 327.67%.

0: Default (Output in units of 1%).

1: Output in units of 0.01%.

[C80]

Not used.

bit3: Tool shape compensation in 3D coordinate conversion mode (For L system only)

[M8]

Select whether to apply tool shape compensation before or after executing 3D coordinate conversion.

0: Apply tool shape compensation before 3D coordinate conversion

1: Apply tool shape compensation after 3D coordinate conversion

[C80]

Not used.

#1257 set29

Not used. Set to "0".

(PR) #1258 set30

bit0: Skip I/F switch

Select A or B contact for the skip interface.

0: A contact (Skip operation starts at rising edge of a signal)

1: B contact (Skip operation starts at falling edge of a signal)

(Note) This parameter is not applied to PLC skip.

bit4: Thread recut command

Specify through which interface to give a thread recut command.

0: Through HMI screen

1: Through PLC I/F

bit5: Addition of command Q to thread recut

Select whether to add the command Q's data to the spindle angle to be compensated during thread recut of a stored thread section.

0: Not add the command Q's data

1: Add the command Q's data

bit6: Spindle compensation angle in thread recut mode

Select whether to calculate the spindle compensation angle when a thread cut command is given during the thread recut mode.

0: Calculate the angle for the initial thread cut command in automatic operation.
(The initially calculated angle is used for the 2nd and subsequent thread cut commands.)

1: Calculate the angle every time a thread cut command is given.

(PR) #1259 set31

bit0: Enable normal life tool's data count (for M system only)

Select whether to enable or disable too use data counting when the tool status is 2 (normal life tool).

0: Not count the use data of normal life tool.

1: Count the use data of normal life tool.

bit2: Disabling decimal point for PLC window

Select the input/output specifications of fraction data for PLC window.

0: Enable decimal point
Fraction data is output as the fixed fraction information.
(The numbers of digits in the integer and fraction parts are the same as of the on-screen specifications.)

1: Disable decimal point (cut off all digits after decimal point)
Only the integer part is input/output.

(PR) #1260 set32

bit0: Switching to actual cutting mode during automatic operation

[M8]

0: Unable to switch to actual cutting mode or no-load operation mode during automatic operation.
Block stop is executed before a speed change-disabled command (thread cut or tap).

1: Able to switch to actual cutting mode or no-load operation mode during automatic operation.
Block stop is not executed before a speed change-disabled command (thread cut or tap).

[C80]

Not used.

bit1: Speed selection for other part systems during actual cutting mode

[M8]

0: Other part systems operate at the programmed speed in the same manner as the part system where a speed change-disabled command (thread cut or tap) is given.

1: Other part systems operate at the program check speed.

[C80]

Not used.

bit2: Prohibit reverse run of fixed cycle

[M8]

Select whether to prohibit reverse run of a fixed cycle during manual arbitrary reverse run.

0: Permit reverse run

1: Prohibit reverse run

(Note) Even when the parameter is "1", reverse run is enabled during fixed cycle operation.

[C80]

Not used.

bit3: Prohibit MSTB reverse run

[M8]

Select whether to prohibit reverse run of MSTB during the manual arbitrary reverse run.

0: Enable MSTB reverse run

1: Disable MSTB reverse run

(Note) Even when the parameter is "0", MSTB reverse run is disabled while the MSTB reverse run prohibit signal (MRPSG) is ON.

[C80]

Not used.

bit4: Thread cut start shift angle operation

Select the operation to be performed at the start of thread cutting when a thread cut start shift angle command is issued.

0: Start thread cut from the thread cut start shift angle after phase Z has been detected once.

1: Start thread cut from the thread cut start shift angle, independently of phase Z detection.

bit7: Storage of spindle C axis coordinate system

Select whether to automatically insert zero return to spindle/C axis control at the initial servo ON or at every servo ON. This parameter is enabled when spindle/C axis deceleration stop type (#3106 zrn_typ/BIT8=1) and zero point return automatic insertion (#1226 aux10/BIT3=1) are selected.

0: Execute automatic zero return before C axis rotation for the first C axis command given after every servo ON.

1: Execute automatic zero return before C axis rotation for the first C axis command given after the initial servo ON. For the 2nd and subsequent servo ON, the coordinate system is retained after servo OFF, and zero return is not automatically inserted.

(PR) #1261 set33

bit1: Operation panel I/O emergency stop function OFF

Select whether to disable the emergency stop function when an operation panel I/O unit is disconnected. (This setting is enabled for separated-type NC only)

0: Enable the emergency stop function
1: Disable the emergency stop function

* While the operation panel I/O unit is connected to the NC unit, the emergency stop function is enabled irrespective of this parameter.

bit2: Synchronized turning ON/OFF of NC and display

Select whether to synchronize the turning ON/OFF of the M800W Series NC controller and display.

0: NC and display turn ON/OFF independently.
1: NC and display turn ON/OFF in synchronization with each other.

* If no operation panel I/O unit is connected, the NC and display turn ON/OFF independently, irrespective of this parameter.

bit3: PLC high-speed process start timing selection

Select the type of PLC high-speed process start timing.

0: Type 1 (default)
1: Type 2

bit4: High-speed ladder execution cycle

Specify the high-speed ladder execution cycle. (Standard value: 0)

0: Default
1: Twice the default (equivalent to Mitsubishi M700V Series)

(Note) When the parameter (#1261 set33/bit4) is set to its default value, the high-speed ladder execution cycle differs according to the model and the number of part systems.

bit5: Operation switch at OT and soft limit in synchronous operation method

This parameter switches the axis operation at OT and soft limit for slave axis in the synchronous operation method.
When independent operation method or correction mode is set, the operation will be the same as #1261=0 (disable).

0: When OT signal is turned ON for only slave axis according to OT and soft limit, the slave axis stops but master axis does not stop.
1: When one of master axis or slave axis is in the OT and soft limit, both master and slave axes stop.

(PR) #1262 set34

bit2: Disable warning for coordinate system selection without 3D manual feed spec.

[M8]

Select whether to display a warning when hypothetical coordinate system has been selected although 3D manual feed is not included in the specifications.

0: Display
1: Not display

[C80]

Not used.

bit3: Condition of turning OFF Tool life end signal (for L system only)

[M8]

Select when to turn OFF the tool life end signal in the tool life management 1 for L system.

0: When M function finish signal (FIN) is turned ON
1: When a tool that has not reached the end of life is selected

(PR) #1263 set35

bit1: Show/Hide history clear menus

Show/Hide operation menus for data clear of collection setting screen, history clear of alarm history screen, history start, and history stop.

0: Show history clearing operation menus
1: Hide history clearing operation menus

bit2: Hide the alarm category of PLC message

Select whether to hide the alarm category of PLC message (alarm or operator message).

0: Display the alarm category
1: Hide the alarm category

bit3: Overvoltage alarm switch

Select the alarm for overvoltage.

0: Display the warning upon occurrence of overvoltage alarm.
1: Execute emergency stop upon occurrence of overvoltage alarm.

#1264 set36

Not used. Set to "0".

(PR) #1265 ext01

bit0: Command format 1

Select the command format for the fixed cycle for compound lathe.

0: Conventional format
1: MITSUBISHI CNC special format (1 block command method)

bit1: Command format 2

Select the command format for the lathe fixed cycle.

0: Conventional format
1: MITSUBISHI CNC special format

bit2: Command format 3

Select the command format for the hole drilling fixed cycle.

0: Conventional format
1: MITSUBISHI CNC special format

bit3: F-command unit 2 (for L system only)

Specify the unit to be used if a synchronous feed or thread cutting lead command contains no decimal point.

0: Type 1 (conventional specifications) or Type 2
Type 1 or Type 2 is selected by the parameter "#1271 ext07/bit2".
1: Type 3
F command 0.01 mm/rev, 0.0001 inch/rev
E command
Sync feed (corner chamfer/corner R feedrate) 0.01 mm/rev, 0.0001 inch/rev
Thread cut (fine thread cut lead) 0.0001 mm/rev, 0.000001 inch/rev

(Note) Type 3 is independent of the input unit.

(PR) #1266 ext02

bit0: Axis name extension valid

[M8]

0: "Axis name extension" invalid

1: "Axis name extension" valid

[C80]

Not used.

(PR) #1267 ext03

bit0: G code type

Select the high-speed high-accuracy G code type.

0: Conventional format (G61.1)

1: MITSUBISHI CNC special format (G08P1)

(PR) #1268 ext04

bit2: Enable synchronous tapping per minute

Select whether to enable feed per minute with the F command of synchronous tapping cycle.

0: Disable (Command in pitch regardless of "G group 5" modal)

1: Enable (Follow "G group 5" modal)

bit4:

Select whether to enable address K to be used for specifying the repetition count in G76/G87 command.

0: Disable

1: Enable

When 1 is set in this parameter with #1271ext07/bit1 (Specifying repetition count with address K) set to 1, the address K given to G76/G87 is treated as the number of repetitions.

(PR) #1269 ext05

bit0: Inverse tangent (ATAN) command format

Select the command format of ATAN operation.

0: Format 1: Either the ratio of two sides or the whole expression is enclosed in square brackets "[ ]".
ATAN[#k] or ATAN[#j/#k]

1: Format 2: Two sides are enclosed in "[ ]" respectively and also divided by a slash "/".
ATAN[#j]/[#k]

bit1: Range of inverse tangent (ATAN) calculation result

Select the range of calculation result for inverse tangent (ATAN) to be applied when Format 2 is selected for inverse tangent (ATAN) command (when #1269/bit0=1).

0: -180 to 180 deg

1: 0 to 360 deg

(PR) #1270 ext06

bit2: Select finished shape program search method

[M8]

Select how to search a finished shape program to be called by G70, G71, G72 or G73 command.

0: Search from the top of the currently executed program or from the top of the program specified with the address A.

1: <G71, G72, G73>
Search from a block following G71, G72 or G73.
<G70>
Search from the same start sequence No., if it exists, as that of the finished shape program where G71, G72 or G73 has been executed.
In the other cases, search from the top of the currently executed program or from the top of the program specified with the address A.

[C80]

Not used.

bit4: Switch chamfering operation

Select the operation to be performed when the cycle start point is exceeded as a result of chamfering in a thread cutting cycle.

0: Output a program error (P192).

1: Stop chamfering upon arrival at the cycle start point, and then move to the end point of the thread cutting block at a rapid traverse rate.

bit5: Coordinate rotation angle without command (for L system only)

Select the operation when there is no rotation angle command R for the coordinate rotation.

0: Use the previously commanded value (modal value). If the command is the first issued command, the rotation angle will be 0°.

1: Use the set value in "#8081 Gcode Rotat".

bit6: Switch continuous thread cutting Z phase wait operation

Select when to start the 2nd block thread cutting when there is a command with no movement (MST command, etc.) between the thread cutting blocks.

0: Wait for the spindle's single rotation synchronization signal before starting the movement.

1: Start movement without waiting for the spindle's single rotation synchronization signal.

bit7: Handle C axis coordinate during cylindrical interpolation

Specify whether to keep the rotary axis coordinate as before the cylindrical interpolation start command is issued during the cylindrical interpolation.

0: Not keep

1: Keep

(PR) #1271 ext07

bit0: Mirror image operation
Select the type of mirror image operation.
0: Type 1
- The program mirror image, external mirror image, and parameter mirror image are exclusive to each other.
- An increment command moves the image to the position indicated by the travel amount with the sign inverted.

1: Type 2
- Mirror image operation is enabled when the program mirror image (G51.1) command is issued or when the external signal or parameter is ON.
- An increment command moves the image to the position determined by applying the mirror image to the absolute program coordinates.

bit1: Address specifying fixed cycle repetition count (for M system only)
Select the address that specifies the fixed cycle repetition count.
0: Address L only (Default)
1: Addresses K and L
If addresses K and L are specified simultaneously, the data at address K will be used for operation.

bit2: F-command unit
(M system)
Specify the unit to be used if a thread cutting lead command contains no decimal point.
* This setting is independent of the input unit.
0: Type 1 (conventional specifications)
F1 : 1 mm/rev, 1 inch/rev
1: Type 2
F1 : 0.01 mm/rev, 0.0001 inch/rev
(L system)
Specify the unit to be used if a synchronous feed or thread cutting lead command contains no decimal point.
0: Type 1 (conventional specifications)
[Input unit B] F1 : 0.0001 mm/rev, 0.000001 inch/rev
[Input unit C] F1 : 0.00001 mm/rev, 0.0000001 inch/rev
1: Type 2
F1 : 0.0001 mm/rev, 0.000001 inch/rev
* Type 2 is independent of the input unit.

bit3: G-code group for unidirectional positioning (for M system only)
Select the G-code group for unidirectional positioning.
0: Unmodal G code (group 00)
1: Modal G code (group 01)
Related parameter: "#8209 G60 Shift" (Set the last positioning direction and distance for each axis applicable when the unidirectional positioning command is issued.)

bit4: Operation by independent G40 command
Select whether the radius compensation vector is canceled by the independent G40 command.
0: Type 1 (conventional specification) (Default)
The radius compensation vector will be canceled by the independent G40 command.
1: Type 2
The radius compensation vector won't be canceled by the independent G40 command: it will be canceled by the next travel command for the radius compensation plane.

bit5: Cut start position (for L system only)
Select the position from where cutting begins in a fixed cycle for compound lathe.
0: Conventional specification (Default)
The cut start position will be determined by the final shaping program.
1: Extended specification
The cut start position will be determined from the cycle start point.

bit6: Nose R compensation (for L system only)
Select whether to apply nose R compensation for shapes in a rough cutting cycle.
0: Conventional specification (Default)
The shape after nose R compensation in the final shaping program will be used as rough cutting shape (when the nose R compensation for the final shaping program).
1: Extended specifications
The shape without nose R compensation in the final shaping program will be used as rough cutting shape.

bit7: Cut amount (for L system only)
Select the operation to be performed when the program-specified cut amount exceeds the cut amount of the final shaping program.
0: Conventional specification (Default)
A program error will occur when the program-specified cut amount exceeds the cut amount of the final shaping program.
1: Extended specification
Rough cutting will be performed by one cut when the program-specified cut amount exceeds the cut amount of the final shaping program.

(PR) #1272 ext08

bit0: Switch pocket machining operation
Select the pocket machining specification.
0: Conventional specification
Pocket machining will be selected with the H designation.
The pull direction when pocket machining is ON will be the Z direction.
1: Extended specification
Pocket machining will start only when both X and Z axes are specified in the first travel block after the finished shape start block.
The pull direction when pocket machining is ON will be the X direction.

bit1: M function synchronous tap cycle
Specify whether to enable the M function synchronous tapping cycle.
0: Disable
1: Enable

bit2: Spiral/conical interpolation command format 2
Select the command format for spiral and conical interpolation.
0: Type 1 (conventional specification)
1: Type 2 (with the number of spiral rotation L designation and the increment designation)

bit3: Switch macro call function
Select whether to shift the argument to the subprogram if nests are overlapped when per block call (G66.1) is commanded.
0: Shift
1: Not shift (Conventional specification)

bit4: Tap cycle selection
Select the tapping cycle.
0: Pecking tapping cycle
1: Deep hole tapping cycle

bit5: Deep hole tap cycle override selection
Select whether to enable override on the pulling operation during synchronized tapping with the deep hole tapping cycle.
0: Disable
1: Enable

bit6: Switch corner chamfering/ corner R command format
Select the command format of the corner chamfering/corner R.
0: Command format I (conventional format)
Issue a command with comma (,C and ,R).
1: Command format II
In addition to command format I, addresses without comma can be used to command.
I/K or C can be used for corner chamfering, while R can be used for corner R.

bit7: Return position after macro interrupt in fixed cycle selection
Select the destination to return to after a macro interrupt in the fixed cycle.
0: Return to the block in the fixed cycle.
1: Return to the block next to the fixed cycle.

(PR) #1273 ext09

bit0: Switch ASIN calculation results range
Select the notation system for operation result of ASIN.
0: Do not switch minus figures to positive figures. (-90° to 90°)
1: Switch minus figures to positive figures. (270° to 90°)

bit1: Switch system variable unit
Select the unit for the system variable #3002 (cycle start operation time).
0: 1 ms unit
1: 1 hour unit

bit2: Switch G71, G72, G73 cutting direction judgment
Select the cutting direction when the longitudinal rough cutting cycle (G71), face rough cutting cycle (G72) or closed loop cutting cycle (G73) is commanded.
0: Conventional specification
Determined according to the finished shape program.
1: Extended specification
Determined according to the finishing allowance and cutting allowance commanded in the program.

bit3: Facing turret mirror image coordinate value type
Select how to show the workpiece coordinate values of the axis for which the facing turret mirror image is valid.
0: Movements in the workpiece coordinate system are in the same direction as those in the workpiece machine coordinate system.
1: Movements in the workpiece coordinate system are in the opposite direction to those in the workpiece machine coordinate system.

bit4: Facing turret mirror image valid axis selection
Select the axis for which the facing turret mirror image is valid.
0: Fixed to 1st axis.
1: Determined according to the plane selected when the facing turret mirror image is commanded.

(PR) #1274 ext10

bit2: M98 sequence No. address selection

Select which address to use for calling a sequence No. in a sub program under sub program control (M98/M198).

0: Address H is used for specifying the sequence No.

1: Address Q is used for specifying the sequence No.

bit4: Optional block skip operation changeover

Select the optional block skip operation.

0: Enable or disable optional block skipping in the middle of a block according to the setting of "#1226 aux10/bit1".

1: Enable optional block skipping at the top and in the middle of a block. Note that a slash "/" on the right-hand side of equation or that in an equation between [ ] is handled as division operator.

bit5: Use of G54Pn for selecting extended workpiece coordinate system

Select whether to use G54Pn as a command for selecting an extended workpiece coordinate system.

0: Not use G54Pn as a command for selecting an extended workpiece coordinate system

1: Use G54Pn as a command for selecting an extended workpiece coordinate system

When 1 is set in this parameter, G54Pn is treated in the same manner as G54.1Pn.

bit7: Word range check

Select whether to check that the operation expression of the word data in the program is enclosed in brackets [ ] when the machine program is executed.

This check is also applied to the 08000 to 09999 and the machine tool builder macro program.

0: Not check

1: Check

(PR) #1275 ext11

Not used. Set to "0".

(PR) #1276 ext12

Not used. Set to "0".

(PR) #1277 ext13

bit0: Tool life management II count type 2

Select how and when the mount or use count will be incremented in tool life management II. The condition to output "tool group life over (TGLO)" signal will be changed accordingly.

0: Type 1 (Default)
Counts up when the spindle tool is used for cutting.
TGLO signal will be output when the last tool in selected group is judged as expired.

1: Type 2
Counts up by one for a tool used or mounted in a program at the time of resetting.
TGLO signal will be output when any of tool groups has reached its lifetime limit.

bit1: Tool life management II life prediction

Select whether to enable tool life prediction function in tool life management II.

0: Disable

1: Enable

bit2: Tool life management II life end signal timing

Select the timing at which tool life prediction signal is output in tool life management II.

0: Output only when the ["life value" - "used value"] matches the remaining life.
("life value" - "used value" = "remaining life")

1: Output when the ["life value" - "used value"] is less than the remaining life.
("life value" - "used value" <= "remaining life")

bit3: Tool life management II life end signal tool

Select the tool for which the tool life prediction signal is output in tool life management II.

0: Output the signal tool by tool.

1: Output the signal at the last tool in the group.

bit4: Tool life management II count changeover (For M system only)

Select the tool life count method and its timing.

0: Conforms to "ext13/bit0" setting.

1: When "ext13/bit0" is set to "0":
Counts up by one for a tool used or mounted in a program at the time of resetting.
When "ext13/bit0" is set to "1":
Follow the setting of "Method (Mthd)" on Tool life screen.

The output condition of "tool group life over" signal conforms to "ext13/bit0".

(PR) #1278 ext14

bit0: Program restart method selection
Select the program restart type.
0: Restart type A
1: Restart type B

bit1: Change miscellaneous command completion method
Select the complete signal and completion condition.
0: Normal method
Complete at the falling edge of M function finish 1 signal (FIN1) or rising edge of M function finish 2 (FIN2).
1: High-speed method
Complete when High-speed M finish signal (MFIN1 to 4, SFIN1 to 6, TFIN1 to 4 or BFIN1 to 4) reaches the same logical level as the strobe signal.

bit2: Change areas for stored stroke limit I
Enable/Disable change of the areas for stored stroke limit I.
0: Disable
1: Enable

bit3: Select M30 rewinding operation
Select the operation when the miscellaneous function completed signal (FIN) is returned to M30.
0: Not carry out automatic rewinding
1: Carry out automatic rewinding

bit4: Select M02 rewinding operation
Select the operation when the miscellaneous function completed signal (FIN) is returned to M02.
0: Not carry out automatic rewinding
1: Carry out automatic rewinding

bit5: M code output during high-speed simple program check
Select whether to enable M code output during high-speed simple program check.
The M codes to be output are those specified by "#1451 M[M031-000](SMLK)" to "#1466 M[M511-480](SMLK)".
0: Disable
1: Enable

bit7: Operation for circular radius error at perfect circle command
Select the operation to be performed when a perfect circle command is given and there is a difference between the start point and end point radii, but no difference between the start point and end point angles.
0: Linear interpolation from the start to the end point
1: Spiral interpolation from the start to the end point

(PR) #1279 ext15

bit0: Part system synchronization method
Select the part system synchronization method.
0: If one part system is not in the automatic operation, the synchronization command will be ignored and the next block will be executed.
1: Operate according to the "waiting ignore" signal.
If the "waiting ignore" signal is set to "1", the synchronization command will be ignored. When set to "0", synchronization will be applied.

bit1: Interrupt amount during machine lock
Select when to cancel the interruption amount during machine lock.
0: When resetting
1: During manual reference position return (not when resetting)

bit2: Selection of cutting start interlock target block
Select whether to enable the cutting start interlock for successive cutting blocks.
0: Enable
1: Disable

bit4: Dry run OFF during thread cutting
Select whether to enable or disable dry run during thread cutting.
0: Enable dry run
1: Disable dry run

bit5: Cancel G92 shift distance
Select whether to clear the G92 (coordinate system setting) shift distance when the manual reference position is reached.
0: Not clear
1: Clear

bit6: Enable single block stop at middle point
Set whether to enable/disable single block stop at the middle point of G28/G29/G30.
0: Disable single block stop
1: Enable single block stop

bit7: Retain G52 at manual reference position return
Select whether to retain the local coordinate system setting (G52) at the time of manual reference position arrival. This parameter is enabled when #1279 ext15/bit5 is 1.
0: Not retain (Cancel)
1: Retain

(PR) #1280 ext16

bit0: I/F per axis during mixed control (cross axis control)
Select how to handle the following PLC interface for axes interchanged with the mixed control (cross axis control).
- Mirror image
- Manual/automatic interlock
- Manual/automatic machine lock

0: Follows axis configuration before the mixed control (cross axis control).
1: Follows axis configuration after the mixed control (cross axis control).

(Example)
The device No. of automatic interlock (+) for X1 will be as follows when the mixed control (cross axis control) is executed with the 1st axis (X1) in the 1st part system and 1st axis (X2) in the 2nd part system.
When "0" is set: YA60 (interface for 1st axis in 1st part system)
When "1" is set: YA68 (interface for 1st axis in 2nd part system)
(Note) If the number of axes in the part system changes with the mixed control (cross axis control), the interface of the target axis may change when this parameter is set to "1".

bit1: Mixed control (cross axis control) cancel with reset
Select whether to cancel the mixed control (cross axis control) when reset is applied.
0: Cancel.
1: Not cancel.

bit2: Interchange coordinate position display
Select whether to display interchanged (or moved) coordinate positions in the mixed control (cross axis control).
This setting will be applied when the axes are moved, as well as when the axes are interchanged.
0: Display interchanged (or moved) coordinate positions.
1: Display coordinate positions without being interchanged (nor moved).

(Example)
When 1st part system's C axis is moved to 2nd part system with a 1st part system (X, Z, C, Y) and 2nd part system (X, Z) configuration:
1st part system: X, Z and Y coordinate positions are displayed.
2nd part system: X, Z and C coordinate positions are displayed.

bit3: Reset operation for synchronization/super-imposition control
Select whether to cancel synchronization/superimposition control when reset is applied.
0: Cancel.
1: Not cancel.

bit4: Mixed control (cross axis control) command method
Select how to command mixed control (cross axis control).
0: Use PLC interface signal for mixed control
1: Use G command for mixed control

bit5: Command method of control axis synchronization across part systems
Select how to command the control axis synchronization across part systems.
0: Use PLC I/F.
1: Use G command.

bit6: Interchange machine position display
Select whether to display interchanged (or moved) machine positions in the mixed control (cross axis control).
This setting will be followed not only when the axes are interchanged but also when the axes are moved.
(Note 1) This parameter is enabled when "#1280 ext16/bit2 (Interchange coordinate position display)" is "0".
0: Display interchanged (or moved) machine positions.
1: Display machine positions without being interchanged (nor moved).

bit7: Control axis superimposition command method
Select how to command control axis superimposition.
0: Use PLC interface signal for control axis superimposition
1: Use G command for control axis superimposition

(PR) #1281 ext17

bit0: Switch manual high-speed reference position return in synchronous control

Select the movement of synchronized axes in manual high-speed reference position return.

0: Master and slave axes start the return synchronizing. Even when one axis stops at its reference position, the other axis continues moving until it reaches its reference position.

1: Master and slave axes start the return synchronizing, and when the master axis stops at the reference position, the slave axis also stops. Thus, the relative position of the master and slave is kept.

bit1: Selection of additional tool offset axis (for L system only)

Select on which axis to perform the additional axis' tool compensation.

0: Follow the setting of #1520 Tchg34.

1: The axis specified by #1027 Base_J is used as the 3rd compensation axis.

bit3: Synchronous control operation setting

Select whether or not the positioning of slave axis automatically aligns with that of master axis when the axis subject to synchronous control is changed from servo OFF to servo ON.

0: The positioning does not automatically align.

1: The positioning automatically aligns.

bit4:

Not used.

bit5: High-speed synchronous tapping valid

Select whether to enable the high-speed synchronous tapping.

0: Disable

1: Enable

bit6: Compensation method for external machine coordinate system/ball screw thermal expansion during synchronization

Select the method of how to compensate the slave axis when compensating external machine coordinate system or ball screw thermal expansion during synchronization control.
The setting of this parameter will be validated when you select synchronous operation method by the synchronization control operation method signal.

0: Master axis and slave axis are independently compensated.

1: Master axis' compensation amount is applied to slave axis.

bit7: Switch automatic high-speed reference position return in synchronous control

Select the movement of synchronized axes in automatic high-speed reference position return.

0: Master and slave axes start the return synchronizing, and when the master axis stops at the reference position, the slave also stops. Thus, the relative position of the master and slave is kept.

1: Master and slave axes start the return synchronizing. Even when one axis stops at its reference position, the other axis continues moving until it reaches its reference position.

(PR) #1282 ext18

bit1: Condition of the reference position reached signal in synchronous control

This parameter switches only conditions of a master axis's reference position return reached signal in synchronous operation. A slave axis's signal is output when the slave axis reaches the reference position coordinate.

0: A master axis's reference position reached signal is output only when both of the master and slave axes reach the reference position coordinate by a reference position return.

1: A master axis's reference position reached signal is output when the master axis reaches the reference position coordinate.

bit3: Index table clamp type

Set the clamp type of the index table.

0: Type A: Clamped when an unclamp command turns OFF.

1: Type B: Clamped when a clamp command turns ON.

bit5: Automatic correction of synchronization offset at power ON

The slave axis position is automatically corrected so that the synchronization offset before having turned the power OFF the last time can be restored at power ON.
(Note1) This parameter is enabled when the parameter "#1281 ext17/bit3 (Synchronous control operation setting)" is set to "1".

0: Disable

1: Enable

bit6: Reset type at emergency stop cancel

Select the type of reset to be applied when emergency stop is cancelled.

0: Reset 1

1: Reset 2

bit7: Functional operation inhibition during write of servo parameters

Select whether to inhibit functional operation during write of servo parameters.

0: Inhibit functional operation with an alarm displayed

1: Give priority to functional operation with write of servo parameters suspended

(Note) This parameter can inhibit a start of the following four functions.

- Spindle/C axis changeover
- Speed observation mode signal ON
- High-speed synchronous tapping
- Start of PLC indexing axis

(PR) #1283 ext19

Not used. Set to "0".

(PR) #1284 ext20

bit0: Spindle speed clamp check

Select whether to check the spindle speed clamp under the constant surface speed control.

0: Check the spindle speed clamp.

1: Not check the spindle speed clamp.

(Note) This parameter is enabled when the parameter "#1146 Sclamp" is set to "1".

bit1: Spindle control selected in response to Z83 (NC started during SP rotation)

Select whether to force-stop the spindle when the alarm (Z83 0001) occurs.

0: Not force-stop the spindle

1: Force-stop the spindle

bit3: M code output during multi-system simultaneous simulation (Check type II)

[M8]

Select whether to enable a miscellaneous function code output during execution of multi-part system simultaneous simulation (Check type II).

0: Not output a miscellaneous function

1: Output a miscellaneous function

(Note) When the output is enabled, the miscellaneous codes specified in #1406 S_mode(SMLK), #1407 T_mode(SMLK), #1408 M2_mode(SMLK) and #1451 M[M031-000](SMLK) to #1466 M[M511-480](SMLK) can be output.

M code output specification is determined by #1405 M_mode(SMLK).

[C80]

Not used.

bit6: Automatic operation handle interruption during inclined surface machining

Select whether to enable the automatic operation handle interruption function during inclined surface machining.

0: Disable

1: Enable

(PR) #1285 ext21

bit0: Multi-part system program management

Select whether to use multi-part system program management.

0: Not use

1: Use

(Note) When this parameter's value is changed, the power must be turned OFF and ON, and the system formatted. Two or more part systems from [1] to [4] need to be set to "1" in "#1001 SYS_ON". Otherwise this parameter will be disabled even though set to "1".

bit1: Program search type switch

Select how to search a program to operate.

0: Operation search is performed in the selected part system.

1: Operation search is performed for all part systems. (The program No. will be common to all part systems.)

bit2: Multi-part system program generation and operation

Select whether to perform the following processes for all the part systems or for each part system separately in multi-part system program management: newly create, delete or rename the machining programs in NC memory (including MDI program and machine tool builder macro program) or transfer, compare, merge the programs between NC memory and other device.

0: Perform these processes for the programs in all the part systems. If no subprogram contents are found by the subprogram call during automatic operation, the program will be searched for and executed from $1.

1: Perform these processes for the programs in the selected part system.

(PR) #1286 ext22

bit2: O No. for program input No.

Select the operation when the same program No. is input during data input.

0: The O No. is handled as a character string data.

1: The O No. is handled as a program No. Whether to overwrite the program or cause an error is decided by "#1218 bit7 Input by program overwrite".

bit3: No O No. at machining program input

Select whether to enable the machining program input even if there is no program No. (O No.). The program No. is fixed to 01 in this case.

0: Disable

1: Enable

bit5: Selection of multi-part system program input/output method

Select whether to perform the transfer from NC memory to other device for all the part systems or for each part system separately in multi-part system program management.

0: Output the designated programs for all the part systems.
(The programs output from NC memory contain the system delimiter $ marks.)

1: Output the programs of only the selected part system.

(PR) #1287 ext23

bit1: Inclined surface coordinate display
0: Display the position which includes tool length offset.
1: Display the position on the program which excludes tool length offset.

bit2: Inclined surface coordinate display (for M system only)
0: Display the position which includes tool radius compensation.
1: Display the position on the program which excludes tool radius compensation.

bit4: Relative coordinate display
(M system)
0: Display the position which includes tool length offset.
1: Display the position on the program which excludes tool length offset.
(L system)
0: Display the position which includes tool shape compensation.
1: Display the position on the program which excludes tool shape compensation.

bit5: Relative coordinate display
(M system)
0: Display the position which includes tool radius compensation.
1: Display the position on the program which excludes tool radius compensation.
(L system)
0: Display the position which includes nose R compensation.
1: Display the position on the program which excludes nose R compensation.

bit6: Absolute coordinate display
Select how coordinate values are displayed when absolute coordinate display is selected ("#1221 aux05/bit0"="1").
(M system)
0: Display the position which includes tool length offset.
1: Display the position on the program which excludes tool length offset.
(L system)
0: Display the position which includes tool shape compensation.
1: Display the position on the program which excludes tool shape compensation.

bit7: Absolute coordinate display
Select how coordinate values are displayed when absolute coordinate display is selected ("#1221 aux05/bit0"="1").
(M system)
0: Display the position which includes tool radius compensation.
1: Display the position on the program which excludes tool radius compensation.
(L system)
0: Display the position which includes nose R compensation.
1: Display the position on the program which excludes nose R compensation.

(PR) #1288 ext24

bit0: MDI program clear
Select whether to clear the MDI programs when MDI operation ends, the power is turned ON again, reset is input, or emergency stop is canceled.
0: Not clear.
1: Clear (save only % programs).

bit2: Restore previous program before external search by NC reset
Select whether to restore the previous program before external search when operation is finished, power is turned OFF and ON, NC reset is input or Emergency stop is cancelled.
0: Not restore the previous program before external search
1: Restore the previous program before external search

bit3: Restore previous program before external search by Program restore signal
Select whether to restore the previous program before external search when Program restore signal is input.
0: Not restore the previous program before external search
1: Restore the previous program before external search

(PR) #1289 ext25

bit0: Tool radius compensation switch corner judgment method (Nose R comp.)
Select the criterion to execute the outer rounding at the small corner in tool radius compensation.
(L system)
0: The corner angle is 0°; linear-linear; G02-G03/G03-G02; the radius is the same. (Conventional method)
1: The corner angle is 1° or smaller; linear-linear; G02-G03/G03-G02; the radius is almost the same. (Method for rounding minute corner angle)
(M system)
0: The corner angle is 1° or smaller; linear-linear; G02-G03/G03-G02. (Conventional method)
1: The corner angle is 1° or smaller; linear-linear; G02-G03/G03-G02; the radius is almost the same. (Method for rounding minute corner angle)

(PR) #1290 ext26

Not used. Set to "0".

(PR) #1291 ext27

bit2: Variable command: Reset operation for tool function T code (#4120/#4320)
Select how reset operation affects the address T's modal information (#4120/#4320).
0: Clear the information
1: Retain the information

(PR) #1292 ext28

bit1: Address F given in sync tap cycle

Select the specification of address F given in synchronous tapping cycle.

0: The value given to address F in synchronous tapping cycle is treated as the feed rate. Feed command follows the setting of "#1268 ext04/bit2 Enable synchronous tapping per minute". F modal status is unchanged.

1: Follow the G code group 5 modal status, irrespective of the setting of "#1268 ext04/bit2 Enable synchronous tapping per minute". The F modal value given in the program is treated as the feed rate.

bit5: Selection of sub program call operation in fixed cycle mode

Select the operation to be carried out when sub program call (M98/M198) and either an axis address or ad dress R (for hole drilling cycle) are given in one block during fixed cycle for drilling or turning machining.

0: Not execute fixed cycle operation in the sub program call block.Sub program call is executed after travelling to the position specified by the axis address in modal status of G code group 01. Neither the axis address nor address R affects the subsequent fixed cycle operation.

1: Execute fixed cycle operation in the sub program call block before executing the sub program call. The axis address or address R is treated as the fixed cycle argument.

(PR) #1293 ext29

bit0: Synchronous feed in milling

Select whether to enable synchronous feed in milling interpolation, cylindrical interpolation or polar coordinate interpolation mode.

0: Disable

1: Enable

bit1: Enabling N0 command

Select how to handle a command of sequence number zero (N0).

0: N0 causes an error.

1: N0 is ignored (causes no error).

(PR) #1294 ext30

Not used. Set to "0".

(PR) #1295 ext31

bit6: Analog spindle synchronous tapping ON

[M8]

Select whether to enable analog spindle synchronous tapping.

0: Disable

1: Enable

(PR) #1296 ext32

Not used. Set to "0".

(PR) #1297 ext33

Not used. Set to "0".

(PR) #1298 ext34

Not used. Set to "0".

(PR) #1299 ext35

Not used. Set to "0".

(PR) #1300 ext36

bit0: Multiple spindle control II

Select multiple spindle control I or II.

0: Multiple spindle control I (L system only)

1: Multiple spindle control II (select from ladder)

bit1: Spindle control for each part system

[M8]

Select whether to set spindle control command (S code/G96/G92) to be common in the part systems or to be separated by each part system when multiple spindle control II is enabled (#1300 ext36/bit0 = 1).

0: Common in the part systems

1: Separated by each part system

[C80]

Not used.

bit2: Part system-based spindle clamp speed management

Select how to manage the spindle clamp speed data.

0: Manage the data of all part systems collectively

1: Manage the data of each part system individually

bit3: Spindle command rotation speed input timing selection

[M8]

When multiple-spindle control II is enabled (#1300 ext36/bit0 = 1), switch the timing to update the spindle command rotation speed input when performing the spindle selection(SWS) or spindle command selection(SLSP) with M command given in the same block as S command.

0: S command updates the spindle command rotation speed input for the spindle which is before the selection by the spindle selection(SWS) or spindle command selection(SLSP).

1: S command updates the spindle command rotation speed input for the spindle which is after the selection by the spindle selection(SWS) or spindle command selection(SLSP).

[C80]

Not used.

bit7: Spindle synchronization command method

Select the spindle synchronization command method.

0: Spindle synchronization with PLC I/F

1: Spindle synchronization with machining program

#1301 nrfchk Near reference position check method

Select the high-speed check method of the origin neighboring signal.

0: Do not check positions near the origin at high speeds.
(Conventional specifications)

1: Check positions near the origin at high speeds using command machine positions.

2: Check positions near the origin at high speeds using detector feedback positions.

#1302 AutoRP **Automatic return by program restart**

Select the method to move to the restart position when restarting the program.
0: Move the system manually to the restart position and then restart the program.
1: The system automatically moves to the restart position at the first activation after the program restarts.

(PR) #1303 V1comN **No. of #100 address part system common variables**

Set the number of common variables, common for part systems, starting from address #100.
This is valid only when "#1052 MemVal" is set to "1".
---Setting range---
0 to 100

(PR) #1304 V0comN **No. of #500 address part system common variables**

Set the number of common variables, common for part systems, starting from address #500.
This is valid only when "#1052 MemVal" is set to "1".
---Setting range---
0 to 500

#1306 InpsTyp **Deceleration check specification type**

Select the parameter specification type for the G0 or G1 deceleration check.
0: Deceleration check specification type 1
G0 is specified with "#1193 inpos", and G1+G9 with "#1223 aux07/bit1".
1: Deceleration check specification type 2
G0 or G1+G9 is specified with "#1193 inpos".

(PR) #1307 G0acc_plc **PLC axis G00 constant inclination valid**

[C80]
Set a type of acceleration/deceleration for the rapid traverse command.
0: Time constant acceleration/deceleration (conventional method)
1: Constant inclination acceleration/deceleration

(PR) #1308 G1acc_plc **PLC axis G01 constant inclination valid**

[C80]
Select the type of acceleration/deceleration for the cutting feed command.
0: Time constant acceleration/deceleration (conventional method)
1: Constant inclination acceleration/deceleration

(PR) #1309 GType **Switch command format**

Select which is used to command the reverse tap.
0: G84.1/G88.1
1: D command with the value changed to negative

#1310 WtMmin **Minimum value for synchronization M code**

Set the minimum value for the M code. When "0" is set, the synchronization M code will be invalid.
---Setting range---
0, 100 to 99999999

#1311 WtMmax **Maximum value for synchronization M code**

Set the maximum value for the M code. When "0" is set, the synchronization M code will be invalid.
---Setting range---
0, 100 to 99999999

#1312 T_base **Tool life management standard number**

Set the standard No. for the tool life management.
When the value specified by the T code command exceeds the set value in this parameter, the set value will be subtracted from the command value, which will be used as tool group No. for tool life management.
When the value specified by the T code command is equal to or less than the set value, the T code will be handled as a normal T code and not subjected to tool life management.
When "0" is set in this parameter, the T code command will always specify a group No. (Valid for M-system tool life management II.)
---Setting range---
0 to 9999

#1313 TapDw1 **Synchronous tap hole bottom wait time**

Set the hole bottom wait time for synchronous tapping.
When P address is specified, the greater value will be used as the hole bottom wait time. When an in-position check is performed at the hole bottom, the wait time will be provided after the completion of the in-position check.
(Note) This parameter is valid only when "1" is set in "#1223 aux07/bit3" (synchronous tap in-position check improvement) and "#1223 aux07/bit4" (synchronous tap hole bottom in-position check).
---Setting range---
0 to 999 (ms)

#1314 TapInp **Synchronous tap in-position check width (tap axis)**

Set the hole bottom in-position check width for synchronous tapping.
(Note) This parameter is valid only when "1" is set in "#1223 aux07/bit3" (synchronous tap in-position check improvement) and "#1223 aux07/bit4" (synchronous tap hole bottom in-position check).
---Setting range---
0.000 to 99.999

(PR) #1316 CrossCom **Reference of common variables common for part systems**

Select whether to use the common variables from #100100 to #800199.
0: Not use
1: Use
This parameter is valid only when the number of variable sets is set to 600 or more.
When this parameter is set to "1", variables from #100100 to #100110 will not be available as the system variables for PLC data read function, and the setting of "#1052 MemVal" will be invalid.

(PR) #1318 MacVcom Machine tool builder macro variables for each part system

In a multi-part system configuration, select whether to use the machine tool builder macro variables (#450 to #499, #80000 to #80049 and #80500 to #80649) in common to all part systems or individually for each part system.

0 : #450 to #499, #80000 to #80049 and #80500 to #80649 are used in common.
1 : #450 to #499 are used in common to part systems.
#80000 to #80049 and #80500 to #80649 are individual for each part system.
2 : #450 to #499 are individual for each part system.
#80000 to #80049 and #80500 to #80649 are common to part systems.
3 : #450 to #499, #80000 to #80049 and #80500 to #80649 are used individually for each part system.

#1319 Grp24_mdrst_off G group 24 modal retention reset OFF

[M8]
Select whether or not to retain the G group 24 modal state (G188/G189) after modal retention reset.
0: Not initialize the G group 24 modal state even when you turn OFF the program format change request signal (PFCHR) and press Cycle Start.
1: Determine the G group 24 modal state according to the program format change request signal (PFCHR) when Cycle Start is pressed.
[C80]
Not used.

(PR) #1324 Chop_R Chopping compensation value fixing method

Set the head No. of the R register used as the compensation amount save area during fixed compensation amount method.
When the first number is an odd number, the operation message "Setting error" appears.
When the value overlaps with the chopping control data area, the operation message "Setting error" appears.

---Setting range---
8300 to 9782
(Only the even number)
(Within backup area)

(PR) #1326 PLC Const Ext. Num PLC constant extension number

Set the number of PLC constant extension points.

---Setting range---
0 to 750

#1327 3D ATC type Tool change method specification

Select the tool change method for determining the tool to draw solids.
With 3D drawing, the tool will be changed by the method designated with this parameter, and then the image will be drawn.
0: With one standby tool
1: With two standby tools
2: With no standby tool

#1328 TLM type Tool measurement standard positions election

Select the tool measurement method.
0: Use the machine position at TLM switch ON as 0.
1: Use the machine zero point as standard.

#1329 Emgcnt Emergency stop contactor shut-off time

Set the time taken for the drive section's main power to be shut-off when the confirmation of all the axes' stop failed after the emergency stop state.
The contactor shut-off signal is output as soon as all the axes are confirmed stopped if the confirmation is done prior to the set time.
When there is no safety observation option or "0" is set, the shut-off time will be 30(s).

---Setting range---
0 to 60 (s)

(PR) #1330 MC_dp1 Contactor weld detection device 1

When safety observation is executed, set the remote I/O device to input the contactor's auxiliary b contact signal used for the contactor weld detection.
If "0" is set, weld detection will not be executed.
Thus, "X0" cannot be used as contactor weld detection device.

---Setting range---
[M8]
0000 to 02FF (HEX)
[C80]
0000 to 01FF (HEX)

(PR) #1331 MC_dp2 Contactor weld detection device 2

When safety observation is executed, set the remote I/O device to input the contactor's auxiliary b contact signal used for the contactor weld detection.
If "0" is set, weld detection will not be executed.
Thus, "X0" cannot be used as contactor weld detection device.

---Setting range---
[M8]
0000 to 02FF (HEX)
[C80]
0000 to 01FF (HEX)

(PR) #1332 F-bus init delay **Fieldbus communication error invalid time**

[M8]

Specify a period of time during which the control does not detect a Fieldbus communication error of the Fieldbus expansion card mounted in the slot EXT3 (or EXT1 for M80/M800S/E80), after startup of the NC is completed.

Set this in 0.1-second increments.

(Note 1) This parameter is enabled for all the communication expansion cards except CC-Link expansion card.

(Note 2) PROFIBUS-DP communication expansion card refers to this parameter, whichever slot (EXT3 or EXT4 (or EXT1 or EXT2 for M80/M800S/E80)) the card is mounted in. It does not refer to the parameter #1490.

---Setting range---

0 to 60000 (0.1s)

#1333 LMC restrain **Lost motion compensation restraint in handle mode**

Select whether to restrain the lost motion compensation in handle mode.

0: Restrain

1: Not restrain

(PR) #1334 DI/DO refresh cycl **DI/DO refresh cycle**

Select the start cycle of PLC main processing program.

When wait time until the next start cycle from 1 scan end is long, the wait time can be shortened by adjusting the start cycle.

-1: Low-speed mode (2 fold)

0: Standard mode

1: High-speed mode 1 (1/2 fold)

2: High-speed mode 2 (1/4 fold)

(Note 1) When the high-speed mode is selected, the fine segment processing performance may degrade due to the increased processing load of the system.

(Note 2) When the high-speed mode 2 is selected, the scan time should be 1/4 or less of the base interruption cycle as a standard. If the standard is exceeded, the update of all the DI/DOs in refresh cycle may not be able to be performed.

(Note 3) If the number of RIO stations connected is large, the update of all the RIO in refresh cycle may not be able to be performed. Make the setting according to the number of stations per RIO channel.

#1335 man_smg **Manual feed acceleration/deceleration selection**

Select the acceleration/deceleration mode in jog feed, incremental feed and manual reference position return (when rapid traverse signal OFF).

0: Acceleration/Deceleration for rapid traverse

1: Acceleration/Deceleration for cutting feed

(PR) #1336 #400_Valtype **#400 address variable type**

Select whether the #400-level variables are used as machine tool builder macro variables or as common variables.

0: #400 to #449 are not available; #450 to #499 are used as machine tool builder macro variables.

1: #400 to #499 are used as common variables

(Note) 700 sets or more of common variables are required for using #400 to #499 as common variables. If this parameter is set to "1" while the number of common variables is set to less than 700, this parameter setting will be regarded as "0".

(PR) #1338 rev data save trg **Trigger switching to save arbitrary reverse run data**

Select the condition to start/stop saving reverse run data.

0: Start when the reverse run control mode signal is turned ON. Stop when turned OFF.

1: Start when the reverse run control mode signal is ON and macro interrupt is valid (M96/ION). Stop when the reverse run control mode signal is OFF or macro interruption is finished (M97/IOF) (compatible with M500M).

(PR) #1339 MC_dp3 **Contactor weld detection device 3**

When safety observation is executed, set the remote I/O device to input the contactor's auxiliary b contact signal used for the contactor weld detection.

If "0" is set, weld detection will not be executed.

Thus, "X0" cannot be used as contactor weld detection device.

---Setting range---

[M8]

000 to 02FF (HEX)

[C80]

0000 to 01FF (HEX)

(PR) #1340 MC_dp4 **Contactor weld detection device 4**

When safety observation is executed, set the remote I/O device to input the contactor's auxiliary b contact signal used for the contactor weld detection.

If "0" is set, weld detection will not be executed.

Thus, "X0" cannot be used as contactor weld detection device.

---Setting range---

[M8]

000 to 02FF (HEX)

[C80]

0000 to 01FF (HEX)

#1342 AlmDly Alarm display delay time

Set a period of time by which alarm display is delayed.
Set a time between when an operation alarm occurs and when the alarm display and signal turn ON.
When set to "0", the alarm display and signal will turn ON immediately after the alarm occurrence.
When set to "-1", the alarm display and signal will not turn ON after the alarm occurrence.
Target alarms:
M01 External interlock axis found 0004
M01 Internal interlock axis found 0005
M01 Sensor signal illegal ON 0019
M01 No operation mode 0101
This parameter is disabled if "#1343 DlyReg" is set.

---Setting range---

-1 to 30000 (ms)

(PR) #1343 DlyReg R register for delayed alarm display setting

Set the head No. of the R register to be used for delayed display of an operation alarm.
If any R register outside the user area is specified, delayed alarm display is disabled.
If this parameter is set, the setting of #1342 AlmDly is disabled. When not using, set to "0".

---Setting range---

0 to 29899

(PR) #1349 DOOR_1 Door 1 switch input device

Set a remote I/O device to input the door sensor signal to detect Door 1's status in safety observation.
When "0" is set, the door is always detected to be open.
Thus, "X0" cannot be used as Door 1 switch input device.

---Setting range---

0000 to 02FF (HEX)

(PR) #1350 DOOR_2 Door 2 switch input device

Set a remote I/O device to input the door sensor signal to detect Door 2's status in safety observation.
When "0" is set, the door is always detected to be open.
Thus, "X0" cannot be used as Door 2 switch input device.

---Setting range---

0000 to 02FF (HEX)

(PR) #1353 MC_ct1 Contactor shutoff output 1 device

Set a device of an output remote I/O device to control contactor in safety observation.
When set to "0", contactor shutoff output is disabled.
Thus, "Y0" cannot be used as contactor shutoff output device.

---Setting range---

[M8]
0000 to 02FF (HEX)
[C80]
0000 to 01FF (HEX)

(PR) #1357 mchkt1 Contactor operation check allowed time 1

Set a period of time until emergency stop is issued when a contactor does not operate even though contactor shutoff output 1 is output.
If the vertical axis drop prevention function is used, set a value bigger than the vertical axis drop prevention time (SV048 EMGrt).
When "0" is set, the contactor operation check will be disabled.

---Setting range---

0 to 30000 (ms)

(PR) #1361 aux_acc Auxiliary axis acceleration/deceleration type

Select the acceleration/deceleration type of auxiliary axis in PLC axis indexing.
0: Acceleration/deceleration with constant time
1: Acceleration/deceleration with a constant angle of inclination

#1365 manualFtype Manual speed command type

Select the manual speed command type.
0: Manual speed command
The axis travels at the handle/jog feed rate.
Reverse run is performed for each part system independently of the other ones.
1: Manual speed command 2
In a multi-part system configuration, the axis travels at the handle/jog feed rate multiplied by the ratio of each part system's program command speeds.
When the block start point is reached in reverse run in any of the part systems, the axes in the other part systems stop simultaneously.

#1366 skipExTyp Multi-system simultaneous skip command

Select the operation when G31 is commanded in more than one part system.
(Note) When set to "1", the skip coordinate position will always be "0" whether G31 is commanded in a single part system or in one part system of a multi-part system.
Set to "0" when using G31 command for measurement etc.
0: Carry out G31 command in one part system, while the G31 is kept in an interlocked state in the other systems.
1: Carry out G31 command simultaneously in more than one part system.
Note that the skip coordinate is not read and so the skip coordinate value will be 0.

#1367 G1AccOVRMax Max. override value for cutting feed constant inclination acc./dec.

Set the maximum override value to be applied to the cutting feed that is in constant inclination acceleration/deceleration.
When the setting of this parameter is between 0 and 99, the override value is handled as 100% even though the specified cutting feed override is over 100%.

---Setting range---

0 to 300(%)

(PR) #1369 S_Sig1 Safety observation signal device 1

Set the remote I/O device to input the observation speed change signal 1 during executing the safety observation function.
When set to "0", there is no observation speed change signal input.
Therefore "X0" cannot be used as safety observation signal device.

---Setting range---

0000 to 02FF (HEX)

(PR) #1370 S_Sig2 Safety observation signal device 2

Set the remote I/O device to input the observation speed change signal 2 during executing the safety observation function.
When set to "0", there is no observation speed change signal input.
Therefore "X0" cannot be used as safety observation signal device.

---Setting range---

0000 to 02FF (HEX)

(PR) #1371 PwrIntegIntvl Power consumption accumulation interval

Specify the intervals of accumulating power consumption to create the history.
The accumulated power consumption history can be obtained according to this parameter along with "#1392 StartTimeIPC" (Power consumption accumulation start time).
When 0 is set, power consumption is not accumulated.

---Setting range---

0 to 999(hr)

#1372 DrvBasePwr Fixed drive system power consumption

Specify the fixed power consumption of the drive system.
This value is used for calculating the power consumption.

---Setting range---

0 to 99999999(W)

(PR) #1373 mstpssc Multi-step speed monitor enabled

Enable the multi-step speed monitor.

0: Disable the multi-step speed monitor
1: Enable the multi-step speed monitor

* When enabling the multi-step speed monitor, setting values for SV238, SV239, SP238 and SP239 will be ignored.

(PR) #1379 S_Sig3 Safety observation signal device 3

Set the remote I/O device to input the observation speed change signal 3 during executing the safety observation function.
When set to "0", there is no observation speed change signal input.
Therefore "X0" cannot be used as safety observation signal device.

---Setting range---

0000 to 02FF (HEX)

#1389 G1SmthChk Smoothing check method in cutting block

Select whether to apply smoothing check method to a cutting block for deceleration check, when deceleration check method is selected individually for G0 and G1 (when "#1306 InpsTyp" = 1).

0 : Follow the setting of Aux07/BIT1
1 : Apply smoothing check method

(PR) #1390 BackUSBUseNum Number of backside USB ports occupied

Specify the number of the display's rear USB ports occupied by a machine tool builder. Using this setting the control determines the drive to be used for the front SD and USB memory.
(Note) This parameter is enabled for a Windows-based display of M800W/M80W.

---Setting range---

0 to 6

(PR) #1391 User level protect Enable Data protection by user's level

Enable the function of Data protection by user's level.

0: Use a machine user password to switch the protection of each operation (same as the conventional models)
1: Switch the protection according to the protective levels (0 to 7) specified for each operation through the protection setting screen

(Note) You are authorized to change this parameter from 1 to 0 only if your operation level is the same or higher than that of "Available level" on the protection setting screen.

(PR) #1392 StartTimeIPC Power consumption accumulation start time

Specify when to start accumulating power consumption to create the history.
The accumulated power consumption history can be obtained according to this parameter along with "#1371 PwrIntegIntvl" (Power consumption accumulation interval).

---Setting range---

0 to 23 (o'clock)

#1393 Efficiency(PwrCal) Efficiency for power consumption computation

Specify the efficiency for calculating power consumption.
This value is used for calculating the drive system power consumption.
When 0 is set, the efficiency is treated as 70(%).
If the drive system power consumption computed by the NC is different from that measured by a measuring device, this parameter is used to adjust the drive system power consumption of the NC.

---Setting range---

0 to 100 (%)

(PR) #1395 H1_pno 1st handle selection

Specify the connection destination of the 1st handle.
bit F to 8: Remote I/O unit station 1 to 40(HEX)
bit 7 to 4: Handle connection destination
0: CNC unit
1 to 2: Remote I/O unit
5: Expansion unit
F: Operation panel I/O unit
bit 3 to 0: Handle connection channel 1 to 3 (3 is only valid for operation panel)
(Ex)
0001: Handle 1 connected to the CNC unit
2421: Handle 1 of 36th station for remote I/O unit connected to RIO2
00F3: Handle 3 of operation panel I/O unit connected to RIO3
(Note 1) When the specified destination is not implemented, handle movement is not performed.
(Note 2) When all the H1_pno to H3_pno are set to 0000, handles are automatically allocated.
Other than above, 0000 setting is the same connection as 0001 setting.

---Setting range---

0x0000 to 0xFFFF

(PR) #1396 H2_pno 2nd handle selection

Specify the connection destination of the 2nd handle.
bit F to 8: Remote I/O unit station 1 to 40(HEX)
bit 7 to 4: Handle connection destination
0: CNC unit
1 to 2: Remote I/O unit
5: Expansion unit
F: Operation panel I/O unit
bit 3 to 0: Handle connection channel 1 to 3 (3 is only valid for operation panel)
(Ex)
0001: Handle 1 connected to the CNC unit
2421: Handle 1 of 36th station for remote I/O unit connected to RIO2
00F3: Handle 3 of operation panel I/O unit connected to RIO3
(Note 1) When the specified destination is not implemented, handle movement is not performed.
(Note 2) When all the H1_pno to H3_pno are set to 0000, handles are automatically allocated.
Other than above, 0000 setting is the same connection as 0001 setting.

---Setting range---

0x0000 to 0xFFFF

(PR) #1397 H3_pno 3rd handle selection

Specify the connection destination of the 3rd handle.
bit F to 8: Remote I/O unit station 1 to 40(HEX)
bit 7 to 4: Handle connection destination
0: CNC unit
1 to 2: Remote I/O unit
5: Expansion unit
F: Operation panel I/O unit
bit 3 to 0: Handle connection channel 1 to 3 (3 is only valid for operation panel)
(Ex)
0001: Handle 1 connected to the CNC unit
2421: Handle 1 of 36th station for remote I/O unit connected to RIO2
00F3: Handle 3 of operation panel I/O unit connected to RIO3
(Note 1) When the specified destination is not implemented, handle movement is not performed.
(Note 2) When all the H1_pno to H3_pno are set to 0000, handles are automatically allocated.
Other than above, 0000 setting is the same connection as 0001 setting.

---Setting range---

0x0000 to 0xFFFF

#1399 sp_filt Spindle's actual rotation speed filter

Specify the average filter scale factor for the spindle's actual rotation speed data.
If the scale factor increases, fluctuations in speed display are mitigated.
0: Standard setting
1: 0.5-fold
2: 1-fold
3: 2-fold
4: 4-fold
5: 8-fold

#1401 M_mode M command operation selection

Select the M command operation.
(Note) Register M codes in the special operation registration M codes (#1411 to #1418).
0: Not wait for the completion of registered M codes,
but wait for the completion of the other M codes
1: Wait for the completion of registered M codes,
but not wait for the completion of the other M code

#1402 S_mode S command completion method selection

Select the S command completion method.
0: Wait for the complete signal from PLC
1: Not wait for the complete signal from PLC

#1403 T_mode T command completion method selection

Select the T command completion method.
0: Wait for the complete signal from PLC
1: Not wait for the complete signal from PLC

#1404 M2_mode 2nd miscellaneous command completion method selection

Select the 2nd miscellaneous command completion method.
0: Wait for the complete signal from PLC
1: Not wait for the complete signal from PLC

#1405 M_mode(SMLK) M code output (during high-speed simple program check)

M code output (during high-speed simple program check)
Select the M code output method to be applied during high-speed simple program check.
0: Output the M codes registered in #1449 to #1464 M[M511-000](SMLK), but not output unregistered M codes.
M512 or subsequent M codes are not output.
1: Output the M codes unregistered in #1449 to #1464 M[M511-000](SMLK), but not output those registered.
M512 and subsequent M codes are all output.

#1406 S_mode(SMLK) S code output (during high-speed simple program check)

S code output (during high-speed simple program check)
Select the S code output method to be applied during high-speed simple program check.
0: Not output S code
1: Output S code

#1407 T_mode(SMLK) T code output (during high-speed simple program check)

T code output (during high-speed simple program check)
Select the T code output method to be applied during high-speed simple program check.
0: Not output T code
1: Output T code

#1408 M2_mode(SMLK) 2nd miscellaneous code output (during high-speed simple program check)

2nd miscellaneous code output (during high-speed simple program check)
Select the 2nd M code output method to be applied during high-speed simple program check.
0: Not output 2nd M code
1: Output 2nd M code

#1411 M_wait[M031-000] Special operation registration M code

Register an M code that needs special operation.
Each bit of the setting value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
(Note) Note that the registered M code operation varies according to M_mode (#1401).
---Setting range---
0 to FFFFFFFF
Set this in hexadecimal format.

#1412 M_wait[M063-032] Special operation registration M code

Register an M code (32 to 63) that needs special operation.
Each bit of the setting value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
(Note) Note that the registered M code operation varies according to M_mode (#1401).
---Setting range---
0 to FFFFFFFF
Set this in hexadecimal format.

#1413 M_wait[M095-064] Special operation registration M code

Register an M code (64 to 95) that needs special operation.
Each bit of the setting value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
(Note) Note that the registered M code operation varies according to M_mode (#1401).
---Setting range---
0 to FFFFFFFF
Set this in hexadecimal format.

#1414 M_wait[M127-096] Special operation registration M code

Register an M code (96 to 127) that needs special operation.
Each bit of the setting value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
(Note) Note that the registered M code operation varies according to M_mode (#1401).
---Setting range---
0 to FFFFFFFF
Set this in hexadecimal format.

#1415 M_wait[M159-128] Special operation registration M code

Register an M code (128 to 159) that needs special operation.
Each bit of the setting value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
(Note) Note that the registered M code operation varies according to M_mode (#1401).
---Setting range---
0 to FFFFFFFF
Set this in hexadecimal format.

#1416 M_wait[M191-160] Special operation registration M code

Register an M code (160 to 191) that needs special operation.
Each bit of the setting value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
(Note) Note that the registered M code operation varies according to M_mode (#1401).
---Setting range---
0 to FFFFFFFF
Set this in hexadecimal format.

#1417 M_wait[M223-192] Special operation registration M code

Register an M code (192 to 223) that needs special operation.
Each bit of the setting value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
(Note) Note that the registered M code operation varies according to M_mode (#1401).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1418 M_wait[M255-224] Special operation registration M code

Register an M code (224 to 255) that needs special operation.
Each bit of the setting value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
(Note) Note that the registered M code operation varies according to M_mode (#1401).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1419 M_wait[M287-256] Special operation registration M code

Register an M code that needs special operation.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
Note that operation of the registered M code varies according to #1401 M_mode.

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1420 M_wait[M319-288] Special operation registration M code

Register an M code that needs special operation.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
Note that operation of the registered M code varies according to #1401 M_mode.

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1421 M_wait[M351-320] Special operation registration M code

Register an M code that needs special operation.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
Note that operation of the registered M code varies according to #1401 M_mode.

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1422 M_wait[M383-352] Special operation registration M code

Register an M code that needs special operation.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
Note that operation of the registered M code varies according to #1401 M_mode.

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1423 M_wait[M415-384] Special operation registration M code

Register an M code that needs special operation.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
Note that operation of the registered M code varies according to #1401 M_mode.

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1424 M_wait[M447-416] Special operation registration M code

Register an M code that needs special operation.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
Note that operation of the registered M code varies according to #1401 M_mode.

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1425 M_wait[M479-448] Special operation registration M code

Register an M code that needs special operation.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
Note that operation of the registered M code varies according to #1401 M_mode.

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1426 M_wait[M511-480] Special operation registration M code

Register an M code that needs special operation.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1411.
Note that operation of the registered M code varies according to #1401 M_mode.

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

(PR) #1427 RT2AftG1 RT2: Enable switching of acce/dece time constant after G1 interpolation

Select whether to enable switching of acceleration/deceleration time constant after G1 interpolation.
0: Disable switching of acceleration/deceleration time constant after G1 interpolation.
1: Enable switching of acceleration/deceleration time constant after G1 interpolation.

(PR) #1428 RT2rst RT2: Enable changing acce/dece time constant back when NC is reset

Select whether to change acceleration/deceleration time constant back to parameter value when NC is reset.
0: Disable changing acceleration/deceleration time constant back when NC is reset.
1: Enable changing acceleration/deceleration time constant back when NC is reset.

(PR) #1431 Ax_Chg Selection of mixed control or arbitrary axis exchange control

Choose which of the following controls to enable:
Mixed control I or II or Arbitrary axis exchange control.
0: Mixed control I or II
1: Arbitrary axis exchange control

#1432 Ax_Chg_Spec

bit0: Selection of alarm when axis exchange is disabled
Select whether to issue an alarm or wait until the axis becomes exchangeable when axis exchange is disabled.
0: Wait until the axis becomes exchangeable when the axis declared in an axis exchange command is incapable of being exchanged.
* The parameter #1433 (G140TimeOut) determines the operation to be carried out during the waiting time.
1: Output the alarm (M01 1101) when the axis declared in an axis exchange command is incapable of being exchanged.

bit1: Compensation cancel after arbitrary axis exchange
Select whether to enable canceling of compensation after an arbitrary axis exchange.
0: Not cancel compensation after arbitrary axis exchange
1: Cancel compensation after arbitrary axis exchange

#1433 G140TimeOut G140 timeout period

Specify a period of time to wait before outputting the alarm (M01 1101) when an axis declared in the axis exchange command is unexchangeable.
If the specified time elapses with the axis remaining unexchangeable, the alarm (M01 1101) is output. However this alarm is cancelled and axis exchange is carried out once the axis becomes capable of being exchanged.
0 to 254: Period of time to wait before timeout (sec)
255 : Wait until the axis becomes exchangeable without executing timeout check
(Note) This parameter is enabled when the alarm is not caused by an axis' unexchangeable state (when #1432 Ax_Chg_Spec(bit0) = 0).

---Setting range---
0 to 254 (s)
255: No timeout

#1434 G140Type2 G140 command type 2

Select which axis address(es) can be commanded under G140 (Arbitrary axis exchange) control.
0: The axis (or axes) specified in the G140 block can be commanded.
1: Not only the axis (or axes) specified in the G140 block but those unspecified in the block can also be commanded.

#1435 crsman Manual interruption during cross machining

Select whether to enable manual interruption for an axis being under cross machining control.
0: Disable
1: Enable

#1436 mstsyn Enable override for dwell and miscellaneous function time

Select whether to enable override for the dwell time and miscellaneous function time.
0: Disable (Override takes no effect.)
1: Enable (Override takes effect.)

#1437 SBS2_Spec Selection of alarm when sub part system II start is disabled

bit0: Selection of alarm when sub part system II start is disabled
Select the type of operation to be carried out when the sub part system specified by G144 is incapable of being activated.
0: Wait until the system becomes capable of being activated
1: Output an alarm

bit1: Sub part system control II: Reset type selection
Select how to reset the sub part system control II.
0: Reset sub part system at the same time as main part system reset.
1: Not reset sub part system at the time of main part system reset.

(PR) #1438 Ofs-SysAssign Enable part system allocation of tool offset sets

Select the allocation method of tool offset sets.
0: Automatic equal allocation
1: Arbitrary allocation
The setting of "1" is enabled for a system configured with two or more part systems. When "1" is selected for a system configured with a single part system, all the life management tools of the system are allocated to the 1st part system.

(PR) #1439 Tlife-SysAssign — Part system allocation of life management tools

Select the allocation method of the life management tools.
0: Automatic equal allocation
1: Arbitrary allocation
The setting of "1" is enabled for a system configured with two or more part systems. When "1" is selected for a system configured with a single part system, all the life management tools of the system are allocated to the 1st part system.

(PR) #1440 multi_sp_syn — Multiple spindle synchronization valid

Select whether to enable multiple spindle synchronization.
0: Disable
1: Enable

(PR) #1441 Tcode_Method_Chg — T command method selection

Select the tool command method.
0: Tool life management II format
1: Tool function

#1442 G0ol — Enable G00 rapid traverse overlap

Select whether to enable the G00 rapid traverse overlap function.
0: Disable
1: Enable

#1443 G28ol — Enable G28 rapid traverse overlap

Select whether to enable the G28 rapid traverse overlap function.
0: Disable
1: Enable

#1444 otsys — Stop all part systems at OT

Select whether to stop all the part systems or only the part system whereH/W-OT, soft limit or interference check alarm has occurred.
(Note) If H/W-OT, soft limit or interference check alarm has occurred on an axis related to superimposition, synchronization, arbitrary axis superimposition, or synchronization during axis traveling, the part system to which the superimposition (synchronous) and basic axes belong is treated as the one where the alarm has occurred.
0: Stop each part system
1: Stop all the part systems

(PR) #1445 Tol-Custom-nondisp — Non-display of additional info on tool management screen

Select whether to display or hide additional information on the tool management screen.
0: Display
1: Not display

#1446 Tlno.hold — Tool length offset No. retention

Select the operation to be performed when command T has no tool length offset No.
0: Tool length offset No. is deemed as 0.
1: Last commanded tool length offset No. is applied.
(Tool length offset No. is unchanged.)

#1447 G96_tmp_cancel — Temporary cancel of constant surface speed control

0: Disable a spindle rotation command given in another part system
1: Enable a spindle rotation command given in another part system

#1448 Sclamp_err_cancel — Cancel of the error for absence of spindle speed clamp

0: Disable cancel of the error
1: Enable cancel of the error

#1449 m_clamp_on — Manual feed rate clamp ON

0: Rapid traverse rate (#2001 rapid) serves as the maximum speed in jog, handle, incremental or manual reference position return (high-speed) mode. However you can use a PLC device to switch the maximum speed to the manual feed clamp speed (#2614 m_clamp).
1: Manual feed clamp speed (#2614 m_clamp) serves as the maximum speed in jog, handle, incremental, or manual reference position return (high-speed) mode.

(PR) #1450 5axis_Spec

bit0: Axis name setting method of rotary axis configuration parameter
Select the axis name setting method for rotary axis configuration parameter (#7900, #7901, #7902, #7922, #7932, #7942, #7952).
0: Set by axis name
1: Set by 2nd axis name

bit1: Using G174 tool axis rotation angle as compensation amount
0: Specify the compensation amount using the address R and R register.
1: Use the tool axis rotation angle of G174 as the compensation amount.

bit2: Application of rotary axis configuration parameters
Select the method of applying the rotary axis configuration parameters.
0: Automatic selection method
1: PLC signal method
(Note) This parameter is enabled when "#1450 5axis_Spec/bit0 (Axis name setting method of rotary axis configuration parameter)" is "1".

bit3: Select specifications of rotation direction parameter
[M8]
Select the specifications of rotation direction parameter (#7923, #7933, #7943, #7953).
0: The parameter specifications vary for each function.
1: The parameter specifications are common to the functions.
"#7923 DIR_T1", "#7933 DIR_T2", "#7943 DIR_W1", "#7953 DIR_W2"
0: When the tool motion viewed from the workpiece is in right-hand screw direction, it is taken as the positive direction.
1: When the tool motion viewed from the workpiece is in left-hand screw direction, it is taken as the positive direction.

#1451 M[M031-000](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1452 M[M063-032](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1453 M[M095-064](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1454 M[M127-096](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1455 M[M159-128](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1456 M[M191-160](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1457 M[M223-192](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1458 M[M255-224](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1459 M[M287-256](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1460 M[M319-288](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1461 M[M351-320](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1462 M[M383-352](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1463 M[M415-384](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1464 M[M447-416](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1465 M[M479-448](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1466 M[M511-480](SMLK) Special operation registration M code (High-speed simple program check)

Register an M code to be output during high-speed simple program check.
Each bit of the set value corresponds to the M code number.
(Example) To register M05, set 00000020 in #1451.
Note that operation of the registered M code varies according to #1405 M_mode(SMLK).

---Setting range---

0 to FFFFFFFF
Set this in hexadecimal format.

#1467 Manual MSTB macro MSTB macro call via manual numerical value command

[M8]
Select whether to enable a miscellaneous command macro call through the manual numerical value command.
0: Disable
1: Enable
When Disable is selected, the commanded MSTB code and strobe are output.
[C80]
Not used.

#1468 ctrl period Control period

[M8]
Set the standard value "0".
[C80]
Not used.

(PR) #1469 P-BUS dev assign PROFIBUS device allocation method

[M8]
Select how to allocate the PLC devices that are used for PROFIBUS-DP(DPV0):
fixed allocation (512 points) or arbitrary allocation (8192 points).
0: Fixed
1: Arbitrary

(PR) #1471 mgralmstp Enable machine groupwise alarm stop

Select whether to enable the machine groupwise alarm stop function.
0: Disable
1: Enable

(PR) #1472 mgralmrestart Allowing automatic operation to start after machine groupwise alarm stop

Select whether to allow automatic operation to be activated after machine groupwise alarm stop.
0: Not allow automatic operation to start after machine groupwise alarm stop
1: Allow automatic operation to start after machine groupwise alarm stop

(PR) #1473 mgralmcont Allowing operation to continue after machine groupwise alarm stop

When any alarm causes an axis that is in the midst of program execution to stop, this parameter allows you to select the behavior of axes that belong to machine groups other than that of the said axis.
0: Feed hold
1: The operation is allowed to continue.

(PR) #1474 SBS2_sys num Number of sub systems to use in sub part system control II

Specify the number of sub part systems to use in sub part system control II.
The specified number of part systems counted from the end of the system's effective part systems are treated as sub part systems.
---Setting range---
0 to 7

(PR) #1475 MES-IF_on MES-IF ON

Set whether to enable the MES interface function.
0: Disable
1: Enable

#1476 ComErrDly Delayed display of communication alarm

[C80]
Specify a period of time by which to delay the alarm display and record to the alarm history, when the communication error (Y02 0051) occurs.
Set this time when a communication error is caused at power OFF.
If it does not occur (if unused), set to 0.
---Setting range---
0 to 5000 (ms)

#1477 SrvAlmDly Delayed display of servo alarm

[C80]
Specify a period of time by which to delay the alarm display and record to the alarm history, when a servo/spindle alarm occurs.
Set this time when a servo/spindle alarm is caused at power OFF.
If it does not occur (if unused), set to 0.
---Setting range---
0 to 5000 (ms)

(PR) #1478 F-bus Card 1 OFF Fieldbus communication extension card 1 OFF

[M8]
Select whether to enable or disable the Fieldbus communication expansion card mounted in the slot EXT3 (or EXT1 for M80/M800S/E80).
0: Enable (default)
1: Disable
(Note) This parameter is enabled for all the communication expansion cards, except CC-Link expansion card.

(PR) #1479 F-bus Card 2 OFF Fieldbus communication extension card 2 OFF

[M8]
Select whether to enable or disable the Fieldbus communication expansion card mounted in the slot EXT4 (or EXT2 for M80/M800S/E80).
0: Enable (default)
1: Disable
(Note) This parameter is enabled for all the communication expansion cards, except CC-Link expansion card.

(PR) #1480 tp_invalid Disable touch panel operation

Select whether to disable input via touch panel.
0: Enable touch panel operation
1: Disable touch panel operation

(PR) #1481 Enable S-Safety Enable smart safety observation

Select whether to enable smart safety observation.
0: Disable
1: Enable

(PR) #1483 SBS1_sys num Number of sub systems to use in sub part system control I

Specify the number of sub part systems to be used for Sub part system control I in M80/M80W.
The specified number of part systems counted from the end of the system's effective part systems are treated as sub part systems.
(Note) For M800, this setting is ignored. (All the effective part systems can be used as main or sub part system.)
---Setting range---
0 to 7

#1487 ITF3_Spec Interference check III specification

bit0: Speed clamp specifications at entering the interference warning area

In interference check III, select whether to perform speed clamp and torque limit in only the part systems relating to the interference warning or in all the part systems at entering the interference warning area.

0: Perform in only the part systems relating to the interference warning
1: Perform in all the part systems and axes

(PR) #1488 ITF3 valid Interference check III valid

Interference check III is validated.
When interference check III is invalid, interference check between part systems is valid.
0: Interference check III invalid
1: Interference check III valid

(PR) #1489 SLMP_on SLMP_on

[M8]
Select whether to enable or disable the SLMP server function.
0: Disable
1: Enable
[C80]
Not used.

(PR) #1490 F-bus init delay 2 Field bus communication error invalid time 2

[M8]
Specify a period of time during which the control does not detect a Fieldbus communication error of the Fieldbus expansion card mounted in the slot EXT4 (or EXT2 for M80/M800S/E80), after startup of the NC is completed.
Set this in 0.1-second increments.
(Note1) This parameter is enabled for all the communication expansion cards except PROFIBUS-DP communication expansion card and CC-Link expansion card.

---Setting range---

0 to 60000 (0.1s)

#1925 EtherNet Start of service

Start or stop the Ethernet communication function.
0: Stop
1: Start

(PR) #1926 Global IP address IP address

Set the main CPU's IP address.
Set the NC IP address seen from an external source.

---Setting range---

Set these parameters in accordance with the network rules in the connection environment.

(PR) #1927 Global Subnet mask Subnet mask

Set the subnet mask for the IP address.

---Setting range---

Set these parameters in accordance with the network rules in the connection environment.

(PR) #1928 Global Gateway Gateway

Set the IP address for the gateway.

---Setting range---

Set these parameters in accordance with the network rules in the connection environment.

#1929

Not used. Set to "0".

#1930

Not used. Set to "0".

(PR) #1931 Host number Host No.

[M8]
Set the host's port No.

---Setting range---

1 to 9999
[C80]
Not used.

(PR) #1934 Local IP address

[M8]
Set the HMI side CPU's IP address.

---Setting range---

Set these parameters in accordance with the network rules in the connection environment.
[C80]
Not used.

(PR) #1935 Local Subnet mask

[M8]
Set the HMI side CPU's subnet mask.

---Setting range---

0.0.0.0 to 255.255.255.255
[C80]
Not used.

(PR) #1953 Intra IP address IP address on windows-less display unit (LAN1) side

[M8]
Specify the IP address on the windows-less display unit (LAN1) side.

---Setting range---

Set these parameters in accordance with the network rules in the connection environment.
[C80]
Not used.

(PR) #1954 Intra Subnet mask — Subnet mask on windows-less display unit (LAN1) side

[M8]
Specify the IP address of subnet mask on the windows-less display unit (LAN1) side.
---Setting range---
Set these parameters in accordance with the network rules in the connection environment.
[C80]
Not used.

(PR) #1955 Intra Gateway — Gateway on windows-less display unit (LAN1) side

[M8]
Specify the gateway IP address on the windows-less display unit (LAN1) side.
---Setting range---
Set these parameters in accordance with the network rules in the connection environment.
[C80]
Not used.

(PR) #1958 Ext Unit1 IP Addr — Field network communication expansion unit: IP address 1

[M8]
Specify the IP address of the field network communication expansion unit installed in the slot EXT3 (or EXT1 for M80/M800S/E80).
---Setting range---
0.0.0.0 to 255.255.255.255

(PR) #1959 Ext Unit1 Sub mask — Field network communication expansion unit: subnet mask 1

[M8]
Specify the subnet mask of the field network communication expansion unit installed in the slot EXT3 (or EXT1 for M80/M800S/E80).
---Setting range---
0.0.0.0 to 255.255.255.255

(PR) #1960 Ext Unit1 Gateway — Field network communication expansion unit: gateway 1

[M8]
Specify the gateway of the field network communication expansion unit installed in the slot EXT3 (or EXT1 for M80/M800S/E80).
---Setting range---
0.0.0.0 to 255.255.255.255

(PR) #1961 Ext Unit2 IP Addr — Field network communication expansion unit: IP address 2

[M8]
Specify the IP address of the field network communication expansion unit installed in the slot EXT4 (or EXT2 for M80/M800S/E80).
---Setting range---
0.0.0.0 to 255.255.255.255

(PR) #1962 Ext Unit2 Sub mask — Field network communication expansion unit: subnet mask 2

[M8]
Specify the subnet mask of the field network communication expansion unit installed in the slot EXT4 (or EXT2 for M80/M800S/E80).
---Setting range---
0.0.0.0 to 255.255.255.255

(PR) #1963 Ext Unit2 Gateway — Field network communication expansion unit: gateway 2

[M8]
Specify the gateway of the field network communication expansion unit installed in the slot EXT4 (or EXT2 for M80/M800S/E80).
---Setting range---
0.0.0.0 to 255.255.255.255

(PR) #11001 APC type — APC screen display type selection

Set the type of screen displayed with the pallet program registration screen.
0: Standard pallet registration screen
1: Pallet 4-page registration screen

(PR) #11002 Valid pallet num — Number of pallets setting

Set the number of pallets validated on the pallet program registration screen.
---Setting range---
2 to 12 (Interpreted as 2 when 0 is set.)

(PR) #11003 APLC valid — APLC valid

Temporarily disable APLC.
Normally set "1".
0: Disable
1: Enable

(PR) #11004 PLCauto-run enable — PLC automatic startup valid

[M8]
Select starting condition of the built-in PLC.
0: Start PLC after NC screen startup
1: Start PLC at NC startup
(Note) When standard NC screen is not used, set "1".
[C80]
Not used.

(PR) #11005 PC IP address IP address setting

[M8]
Set the IP address for the display unit or PC in which machining programs are stored.
Set the IP address for the display unit of which power is turned OFF with automatic power OFF.
When the 3D machine interference check function is enabled, set the IP address of the display unit that is used for the 3D machine interference check (for M800W only).
(Note) When "0.0.0.0" is input, "192.168.100.2" is automatically set.
* This parameter is dedicated to M800W/M80W with Windows-based display.

PC Subnet
Set the subnet mask for the display unit or PC in which machining programs are stored.
PC Gateway
Set the gateway for the display unit or PC in which machining programs are stored.
---Setting range---
0.0.0.0 to 255.255.255.255
[C80]
Not used.

#11006 PC Port number Port No. setting

[M8]
Set the port No. for the display unit or PC in which machining programs are stored.
(Note 1) When "0" is input, "55555" is automatically set.
(Note 2) When changing the parameter, set the same value in "PD_Control_Port" in the PC side environment setting file.
---Setting range---
0 to 65535
[C80]
Not used.

(PR) #11007 PC Timeout Communication timeout time setting

[M8]
Set the NC side communication timeout time.
Set the timeout time for the display unit to be shut down upon automatic power OFF request.
(Note 1) When "0" is input, "120" is automatically set.
(Note 2) When the value greater than "300" is set, a setting error occurs.
(Note 3) When changing the parameter, set the same value in "PD_Time_out" in the PC side environment setting file.
---Setting range---
0 to 300 (s)
[C80]
Not used.

(PR) #11009 M2 label O M2 label O

Select the program number label when using the M2 format.
0: Label L
1: Label O

(PR) #11010 Software keyboard Software keyboard

[M8]
Select with touch panel whether to use software keyboard.
0: Do not use
1: Use
2: Use (Note1)

(Note1) Software keyboard automatically appears on a specific screen.

#11011 Handy TERM. PW. Handy terminal password

[M8]
Set the password used for the handy terminal customized downloading.
Blank (when "0" is set) and "0000" are regarded as no password.
Not the password of a new customizing file but the password of the customizing file downloaded to the last handy terminal is set.
Set blank or "0000" when initially downloading.
---Setting range---
0000 to 9999
[C80]
Not used.

(PR) #11012 16 axes for 1ch Connecting 16 axes for 1ch

Select the maximum number of axes (sum of the NC axis, spindle, and PLC axis) connected to the drive unit interface (channel 1).
0: Up to 8 axes can be connected to channel 1.
1: Up to 16 axes can be connected to channel 1. This parameter is disabled when the extension unit is connected. It is possible to connect only up to eight axes or less per channel.

#11013 3D_MChk Invalidate 3D machine interference check

Select whether to enable the 3D machine interference check function.
0: Enable
1: Disable

#11014 Chk_len1 1st-step interference check distance

Set the 1st-step check distance when in 3D machine interference check mode.
The standard value is "30.000".
---Setting range---
0.000 to 99999.999(mm)

#11015 Chk_len2 2nd-step interference check distance

Set the 2nd-step check distance when in 3D machine interference check mode.
The standard value is "5.000".
---Setting range---
0.000 to 99999.999(mm)

#11016 Expand_Rate **Shape expansion rate**

Set the model shape expansion rate to be used for 3D machine interference check. This parameter is used for expanding a model shape to be used for 3D machine interference check. The interference check is performed using a shape expanded by the amount of [Check length (mm) x Shape expansion rate (%)].

---Setting range---

0 to 300(%)

#11017 T-ofs set at run **Tool compensation amount setting during automatic operation enabled**

Select whether to enable the tool compensation amount setting and life value setting during automatic operation and operation pause.

0: Disable
1: Enable

#11018 M password hold **Machine user password is held**

When set to "1", the "Machine user" (operation level 6) password will be held even if the NC is restarted.

0: Do not hold
1: Machine user password is held

(PR) #11019 2-system display **2-part system simultaneous display**

Select whether to enable simultaneous display of multiple part systems on the monitor screen.

0: Display one part system on the monitor screen.
1, 2: Display two part systems simultaneously on the monitor screen.
3: Display three part systems simultaneously on the monitor screen.
Note that this is enabled for a 15- or 19-type display unit only. [M8]
4: Display four part systems simultaneously on the monitor screen.
Note that this is enabled for a 15- or 19-type display unit only. [M8]

(Note 1) If the number of part systems to display is smaller than that of the simultaneous display, a single part system display is selected.
(Note 2) If you select "3" or "4" for any display unit other than 15- or 19-type, a single part system display is selected.

#11021 PLC mesg disp type **Format of PLC alarm and operator message**

Select the format of PLC alarms and operator messages to be displayed on the bottom right of the screen.

0: Display up to the first 40 characters.
1: If text is longer than 40 characters, divide it into two and display separately. (Supplementary information is displayed together)

#11022 SRAM Output Type

Not used. Set to "0".

#11023 G33.n Drn

Not used. Set to "0".

#11024 G33.n fhd

Not used. Set to "0".

#11028 Tolerance Arc Cent **Tolerable correction value of arc center error**

Set the tolerable correction value for the calculated coordinate value error of R-specified circular center.
When a difference between "a line between the start and end points" and "commanded radius x 2" is the tolerance or smaller, the error is corrected so that the middle of a line between the start and end points will be the arc center.

When [Setting value < 0] : 0 (Not correct)
When [Setting value = 0] : 2 x minimum setting increment
When [Setting value > 0] : Setting value

---Setting range---

<Metric system> -1 to 0.100 (mm)
<Inch system> -0.0393 to 0.0039 (inch)

#11029 Arc to G1 no Cent **Change command from arc to linear when no arc center designation**

When arc center or radius designation is omitted from arc command, change the arc command into linear without causing program error.

0: Program error
1: Change into linear command

#11030 Man tap sync cancl **Synchronization cancel in manual synchronous tapping**

Select whether handle feed of the tapping axis in manual synchronous tappingsynchronizes with the spindle or not.

0: Synchronize with the spindle
1: Not synchronize with the spindle

(PR) #11031 Cursor pos search **Cursor position search**

Select the cursor position searching method.

0: Disable
1: Pressing the INPUT key in [Monitr] - [Edit] menu starts the operation search for the block with the cursor.
2: Turning ON/OFF the "Edit/Search" signal in [Monitr] - [Edit] menu starts the operation search for the block with the cursor.
3: Turning ON/OFF the "Edit/Search" signal in [Monitr] - [Edit] menu starts the operation search for the block with the cursor. Pressing the reset key shows the top of the program on the [Edit/Search] window.

(PR) #11032 Menu sel para lkof — Validate menu selection parameter setting

Select whether to enable the setting of the "menu selection parameters" (#10501 to #10530, #10551 to #10580, and #10601 to #10630), with which the order of main menus on Monitor, Setup and Edit screens can be rearranged. And also select who is allowed to do this setting.

0: Disable
1: Enable (machine tool builder password is required)
2: Enable (users are allowed to set)

(PR) #11033 skipB_no_sens — Unconnected sensor selection when skip is set to contact B

Select the contact of the sensor which you wish to set as unconnected, when the skip signal is set to contact B.
Set "1" for the contact to be unconnected.
bit0: Skip input 1
bit1: Skip input 2
bit2: Skip input 3
bit3: Skip input 4
bit4: Skip input 5
bit5: Skip input 6
bit6: Skip input 7
bit7: Skip input 8
(Note 1) This parameter is enabled when "#1258 set30/bit0" is set to "1".
(Note 2) This parameter is independent of PLC skip.

---Setting range---

00000000 to 11111111 (Binary)

#11034 G12AddrCheckType — Command address type to check in circular cutting

Select the type of command address to check in circular cutting.

0: Regard command addresses other than D, F, I as illegal.
1: Regard the command address H as illegal. And commands other than D,F,I and M,S,T,B are disabled.

#11035 Sys. change limit — Part system switching restriction

This restricts switching the part systems displayed on screen.

0: Not restrict
1: Disable the part system switching by pressing [$<->$] key on touch panel.
2: Disable the part system switching by display switch signals(Y730 to Y733).

#11036 meas dir judge — Non-sensitive band for manual measurement direction judgment (for M system only)

Set the non-sensitive band to be used for judging the manual measurement direction. If the feedback position fluctuates widely at the axis stop, set the fluctuation width or larger value in this set the parameter.
When set to "0", the band will be 1 (μm).

---Setting range---

0 to 1000 (μm)
0: 1 (μm)

#11037 R-Navi Index Type — R-Navi machining surface indexing type

[M8]
Select the machining surface indexing type in the R-Navi function.

0: Indexing type 1 (Only rotary axes move to perform indexing)
1: Indexing type 2 (Indexing is performed with the tool center point fixed to the position seen from the workpiece)

[C80]
Not used.

#11038 T disp typ — T display (tool command value) type (For L system only)

Select the T display (tool command value) type on the monitor screen between displaying tool No. only or displaying tool No. and compensation No. (L system only)

0: Display tool No. only
1: Display the tool command value (the combined value consisting of the tool No. and compensation No.) last commanded by the program. Even in a manual value command, the program's tool command value is displayed.

#11039 Cusr pos srch type — Cursor position search type

Set the availability of the cursor position search during single block stop when #11031 Cursor pos search=1 to 3.

0: Disable cursor position search during single block stop.
1: Enable cursor position search during single block stop.

Sub-program is displayed when selecting menus [Monitr]-[Edit] while single block stop is carried out during sub-program with this parameter set to 1.

#11051 Direct Socket ON — Direct Socket communication I/F ON

[M8]
Select ON/OFF of the Direct Socket communication I/F.

0: OFF (Default)
1: ON

(Note) When the Direct Socket communication I/F is ON, applications that uses "#1926 Global IP address" such as MS Configurator and GX Developer cannot be used.

[C80]
Not used.

#11052 LOG Sort Order — Log data sorting order

Select in which order to sort the operation log files (all logs) to be output.

0: Sort the data in chronologically ascending order separately for each log type.
1: Sort the data in chronologically ascending order for all the log types.
If the times and dates logged are identical, the log files are output in the order of key, touch-screen, alarm, PLC signal, tool offset change, workpiece offset change and AC power.

#11054 Sp-stby disp type **Spindle-standby display type**

Specify which magazine to display when Sp-stby is selected on the Spindle standby or Tool registration screen.
0: Fixed to the magazine #1
1: The magazine selected by the menu (Magazine 1 to Magazine 5).

#11055 Disp. sysno **Number of part systems to display**

Specify how many part systems to display on a screen.
0 : The same number as that of the enabled part systems
1 or greater: The number specified by this parameter serves as that of the part systems to display.
(Note) The setting range differs according to the NC model.
For the number of part systems displaying in the operating state, follow this parameter setting.

---Setting range---
0 to 8

(PR) #11056 Workshift invalid **Workpiece coordinate system shift OFF (For L system only)**

Set this parameter to 1 if you wish to disable the workpiece coordinate system shift function.
0: Enable the workpiece coordinate shift function
1: Disable the workpiece coordinate shift function

(PR) #11058 plc_opemsg0 **Operator messages display device**

Set the No. of F device to specify the displayed operator message.
Device specified with this parameter is treated as No.1, and displays up to 4 operator messages corresponding to F device that is ON.
This parameter is valid when #6455/bit3 is 0.
(Note 1) Use from F1024 when 0 is set.
(Note 2) Set the device No. to be a multiple of 32. When other value is input, a setting error occurs.

---Setting range---
0 to 2016

(PR) #11059 Remote comm enable **Remote connect enabled**

[M8]
Select whether to enable the remote communication.
0: Disabled
1: Enabled
[C80]
Not used.

(PR) #11060 Screen theme color **Select screen theme colors**

Select the screen theme colors.
This selection affects the colors of the entire screen.
0: Standard colors (gray tone)
1: Blue tone

(PR) #11061 Num of EcoMonitors **The Number of EcoMonitorLight connected to CNC**

[M8]
Specify how many EcoMonitorLight units (an energy meter made by Mitsubishi Electric for measuring the consumption and regeneration) are connected to the CNC.

---Setting range---
0 to 16
Default 0
[C80]
Not used.

(PR) #11062-11066 NoHistDevIn.1-5 **History exclusion PLC input signal 1 to 5**

[C80]
Specify the PLC input signal (X) that is excluded from the PLC signal log.
Efficiency of the history analysis is improved by excluding the machine contact input/output signals or other frequently switched signals from the signal log.
When "0" is set, the history exclusion PLC input signal is disabled.
Thus X0 cannot be excluded from the signal log.

---Setting range---
0000 to 1FFF

(PR) #11067-11071 NoHistDevOut.1-5 **History exclusion PLC output signal 1 to 5**

[C80]
Specify the PLC output signal (Y) that is excluded from the PLC signal log.
Efficiency of the history analysis is improved by excluding the machine contact input/output signals or other frequently switched signals from the signal log.
When "0" is set, the history exclusion PLC output signal is disabled.
Thus Y0 cannot be excluded from the signal log.

---Setting range---
0000 to 1FFF

(PR) #11080 HomeScreen display **HomeScreen display**

[M8]
Select whether to display the home screen.
0: Not display
1: Display (display at power ON)
2: Display (not display at power ON)
[C80]
Not used.

(PR) #11082 Lsys_change_Gtype L system G code system after program format switch (for M system only)

When switching the program format from M system to L system with program format switch command (G188) or when switching G code guidance from M system to L system by the menu [Edit]-[Guide M/L], the G code systems after switching follow the setting of this parameter.

0: L system G code system 2
1: L system G code system 3
2: L system G code system 4
3: L system G code system 5
4: L system G code system 6
5: L system G code system 7

#11086 rot_angle_dsp Counter display during coordinate rotation

Select the type of counter display (workpiece coordinate position, relative position and absolute position) while #8116 is 0 (coordinate rotation by parameter is enabled).

0: Display the position relative to the orthogonal coordinate system.
1: Display the position relative to the coordinate system rotated through the coordinate rotation by parameter.
(with EXT [external workpiece coordinate offset] added during automatic operation)
2: Display the position relative to the coordinate system rotated through the coordinate rotation by parameter.
(with EXT [external workpiece coordinate offset] constantly added)

(PR) #11087 Meas basic point Tool length measurement I reference point (for L system only)

Select how to specify the measurement reference point coordinates for manual tool length measurement I (L system).

0: Use the machine zero as the reference point
1: Use the coordinates of #2015 tlml- as the reference point (the same operation as when #1282 bit2 = 0 for M7)
2: Use the workpiece coordinate system offset (modal) as the reference point (the same operation as when #1282 bit2 = 1 for M7)

#11091 PLC counter valid Enable PLC axis counter

[M8]
Select whether to have the monitor screen show a PLC axis position counter.

0: Monitor screen does not show a PLC axis position counter.
1: Depending on the selected counter type, monitor screen is able to show.

(PR) #11094 GX Restriction Inhibiting GX Developer connection

[M8]
Select whether to block the connection from GX Developer.

0: Allow the connection
1: Block the connection

#11100 3D_MChk_ToolAlm Alarm when tool interference check is disabled

[M8]
Select whether the 3D machine interference check outputs an alarm or not when the tool is not mounted.

0: Not output an alarm when the tool check is disabled or the tool is not mounted.
1: Output an alarm when the tool check is disabled or the tool is not mounted.

(PR) #11101-11130 Monitr menu(MTB)1-30 Monitor main menu (MTB) 1 to 30

Designate the destination menu Nos. to move monitor screen's main menus.

-1 : Menu not displayed
0 : No change
1 to 30: Destination menu Nos.

(PR) #11151-11180 Setup menu(MTB) 1-30 Setup main menu (MTB) 1 to 30

Designate the destination menu Nos. to move setup screen's main menus.

-1 : Menu not displayed
0 : No change
1 to 30: Destination menu Nos.

(PR) #11201-11230 Edit menu(MTB) 1-30 Edit main menu (MTB) 1 to 30

Designate the destination menu Nos. to move edit screen's main menus.

-1 : Menu not displayed
0 : No change
1 to 30: Destination menu Nos.

(PR) #11251-11280 Diagn menu(MTB)1-30 Diagn main menu (MTB) 1 to 30

Designate the destination menu Nos. to move diagn screen's main menus.

-1 : Not display the menu
0 : No change
1 to 30: Destination menu No.

(PR) #11301-11330 Mainte menu(MTB)1-30 Mainte main menu (MTB) 1 to 30

Designate the destination menu Nos. to move mainte screen's main menus.

-1 : Not display the menu
0 : No change
1 to 30: Destination menu No.

(PR) #11351-11366 manasel_00-manasel_15 Multi-analog input data type ch0 to ch15

[M8]
Select the type of data to be input to the multi-analog input unit.
0: Analog voltage
1: Analog current
2: Temperature (resistance thermometer bulb, normal, Pt100, 3-wire)
3: Temperature (resistance thermometer bulb, normal, Pt100, 4-wire)
4: Temperature (resistance thermometer bulb, normal, Pt1000, 3-wire)
5: Temperature (resistance thermometer bulb, normal, Pt1000, 4-wire)
6: Temperature (resistance thermometer bulb, high-accuracy, Pt100, 3-wire)
7: Temperature (resistance thermometer bulb, high-accuracy, Pt100, 4-wire)
8: Temperature (resistance thermometer bulb, high-accuracy, Pt1000, 3-wire)
9: Temperature (resistance thermometer bulb, high-accuracy, Pt1000, 4-wire)
10: Temperature (thermocouple (K))
11: Temperature (thermocouple (J))

#11669 EMG F_disp Filt Actual feedrate detection cycle for displaying F during emergency stop

[M8]
Adjust the axis travel detection cycle for displaying actual feedrate (F) during emergency stop.
Increasing the magnification leads to smaller fluctuations in the actual feedrate readout (F).
0: Standard setting (1-fold)
1: 0.25-fold
2: 0.5-fold
3: 1-fold
4: 2-fold
5: 4-fold
6: 8-fold
(Note) This parameter is enabled when "#1125 real_f (Actual feedrate display)" is "1" .

#11700 EM Cmn No Starting common variable No. for storage of error measurement result

[M8]
Specify the starting number of common variables that store the measurement result.
Eight common variables starting from the specified number are used.
Specify the No. of common variable that is common to part systems.
* Select the number so that eight common variables beginning with the selected number are all common to part systems.
---Setting range---
0, 100 to 142, 400 to 992, 100100 to 800192, 900000 to 907392

#11701 WEM Mcr No Macro No. for workpiece installation error measurement

[M8]
Specify the name of macro program for the workpiece installation error measurement.
The macro program name is output at initialization of workpiece installation error measurement macro.
The macro program is used for execution of the measurement.
---Setting range---
0, 9000 to 9099, 9300 to 9999, 100010000 to 100018999, 100030000 to 199999998

#11702 Ref Sphere Dia Reference sphere diameter

[M8]
Specify the diameter of reference sphere that is used for rotation center error measurement.
If the set value is significantly different from the actual diameter, the sensor may be damaged.
---Setting range---
0.000, 1.000 to 100.000 (mm)

(PR) #11708 F-bus 1 Err Switch Fieldbus communication error switch 1

[M8]
Select whether to activate emergency stop or display a warning if an error occurs on the Fieldbus expansion card mounted in the slot EXT3 (or EXT1 for M80/M800S/E80).
(Note) The parameter does not apply to a CC-Link expansion card.
0: Emergency stop
1: Warning display

(PR) #11709 F-bus 2 Err Switch Fieldbus communication error switch 2

[M8]
Select whether to activate emergency stop or display a warning if an error occurs on the Fieldbus expansion card mounted in the slot EXT4 (or EXT2 for M80/M800S/E80).
(Note) The parameter does not apply to a CC-Link expansion card.
0: Emergency stop
1: Warning display

#11716 CutEdgeAngleType Turning tool shape compensation: setting method of cutting-edge angle

[M8]
Select the method of specifying the cutting-edge angle that is used for turning-tool shape compensation in Compound type fixed cycle for turning machining I.
0: Tool shape method
1: Tool compensation method

(PR) #11717 astap_sysno Analog spindle synch tap: Part system selection

[M8]
Select the part system to which the analog spindle synchronous tapping cycle is applied.
When 0 is set, the part system 1 is considered to be selected.
---Setting range---
0 to 8

#11718	astap_timeadj	Analog spindle synch tap: Timing adjustment

[M8]
This parameter enables you to adjust the motion start timing of the tap axis and the spindle in analog spindle synchronous tapping.
(1) When the setting = 0
Not adjust the timing.
(2) When the setting > 0
Delay the start of tap axis command by the specified length of time.
This is effective when the analog spindle lags behind the tap axis.
(3) When the setting < 0
Delay the start of analog spindle command by the specified length of time.
This is effective when the analog spindle runs ahead of the tap axis.

---Setting range---
-50 to 50 (ms)

(PR) #26750	CPUUnitNum	Number of CPU modules

[C80]
Specify the number of CPU modules that configure a multiple CPU system.
When set to "0", the number of CPU modules is considered as 2.
(Note) Set the identical value for all the CPU modules.

---Setting range---
0 to 4 (units)

(PR) #26751	DevCondenseRef	Compressed device refresh ON

[C80]
Select whether to use the compression setting for the R devices refreshed at END in such a case as when a system is configured with 3 CNC modules.
0: Not use
1: Use

2.4 Axis Specifications Parameters

#2001 rapid Rapid traverse rate

Set the rapid traverse feedrate for each axis.
(Note) The maximum value to be set depends on the machine specifications.

---Setting range---

1 to 1000000 (mm/min)

#2002 clamp Cutting feedrate for clamp function

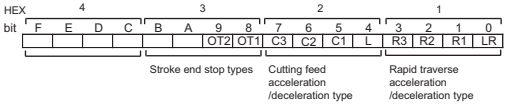
Set the maximum cutting feedrate for each axis.
Even if the feedrate in G01 exceeds this value, the clamp will be applied at this feedrate.

---Setting range---

1 to 1000000 (mm/min)

(PR) #2003 smgst Acceleration and deceleration modes

Set acceleration and deceleration control modes.
Set value is in hexadecimal.



HEX-1 Rapid traverse acceleration/deceleration type

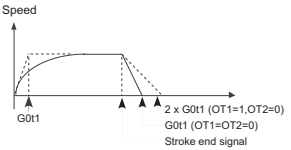
0(bit3,2,1,0 = 0000) : Step
1(bit3,2,1,0 = 0001) : Linear acceleration/deceleration
2(bit3,2,1,0 = 0010) : Prim ary delay
8(bit3,2,1,0 = 1000) : Exponential acceleration and linear deceleration
F(bit3,2,1,0 = 1111) : Soft acceleration/deceleration
(Note) R1 > R3 when both R1 and R3 contain 1.

HEX-2 Cutting feed acceleration/deceleration type

0(bit7,6,5,4 = 0000) : Step
1(bit7,6,5,4 = 0001) : Linear acceleration/deceleration
2(bit7,6,5,4 = 0010) : Prim ary delay
8(bit7,6,5,4 = 1000) : Exponential acceleration and linear deceleration
F(bit7,6,5,4 = 1111) : Soft acceleration/deceleration

HEX-3 Stroke end stop types

0(bit9,8 = 00) : Linear deceleration (Decelerates at G0t1)
1(bit9,8 = 01) : Linear deceleration (Decelerates at 2×G0t1)
2(bit9,8 = 10) : Position loop step stop
3(bit9,8 = 11) : Position loop step stop



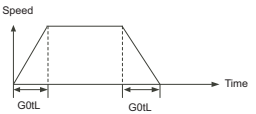
(Note) OT1(bit8) is valid under the following conditions (valid for dog type zero point return):
- Stop type: Linear deceleration
- Acceleration/Deceleration mode: Exponential acceleration and Linear deceleration

HEX-4

Not used. Set to "0".

#2004 G0tL G0 time constant (linear)

Set a linear control time constant for rapid traverse acceleration and deceleration.
The time constant will be enabled when LR (rapid traverse feed with linear acceleration/deceleration) or F (soft acceleration/deceleration) is selected in "#2003 smgst Acceleration and deceleration modes".



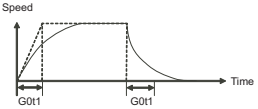
---Setting range---

1 to 4000 (ms)

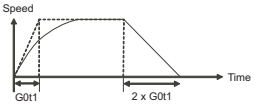
#2005 G0t1 **G0 time constant(primary delay) / Second-step time constant for soft acceleration/deceleration**

Set a primary-delay time constant for rapid traverse acceleration and deceleration.
The time constant will be enabled when R1 (rapid traverse feed with primary delay) or R3 (exponential acceleration and linear deceleration) is selected in "#2003 smgst Acceleration and deceleration modes".
When the soft acceleration/deceleration is selected, the second-step time constant will be used.

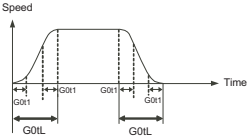
<Rapid traverse feed with primary delay>



<Rapid traverse feed with exponential acceleration and linear deceleration>



<Soft acceleration/deceleration>
•When "#1219 aux03/bit7" is set to "0"



(Note) The time constant setting for the soft acceleration/deceleration can be changed by the setting of "#1219 aux03/bit7"

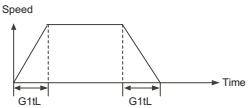
---Setting range---
1 to 5000 (ms)

#2006 G0t2

Not used. Set to "0".

#2007 G1tL **G1 time constant (linear)**

Set a linear control time constant for cutting acceleration and deceleration.
The time constant will be enabled when LC (cutting feed with linear acceleration/deceleration) or F (soft acceleration/deceleration) is selected in "#2003 smgst Acceleration or deceleration modes".

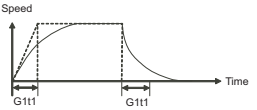


---Setting range---
1 to 4000 (ms)

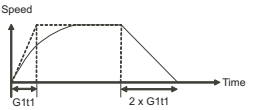
#2008 G1t1 G1 time constant (primary delay)/Second-step time constant for soft acceleration/deceleration

Set the primary delay time constant for cutting acceleration and deceleration.
The time constant will be enabled when C1 (cutting feed with the primary delay) or C3 (cutting feed with exponential acceleration and linear deceleration) is selected in "#2003 smgst acceleration/deceleration modes".
When the soft acceleration or deceleration is selected, the second-step time constant will be used.

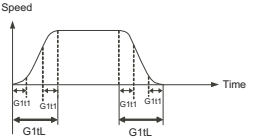
<Cutting feed with primary delay>



<Cutting feed with exponential acceleration and linear deceleration>



<Soft acceleration/deceleration>



---Setting range---
1 to 5000 (ms)

#2009 G1t2

Not used. Set to "0".

#2010 fwd_g Feed forward gain

Set a feed forward gain for pre-interpolation acceleration/deceleration.
The larger the set value, the smaller the theoretical control error will be. However, if a machine vibration occurs, set the smaller value.

---Setting range---
0 to 200 (%)

#2011 G0back G0 backlash

Set up the backlash compensation amount when the direction is reversed with the movement command in rapid traverse feed mode or in manual mode (except for handle feed mode) .

---Setting range---
-9999999 to 9999999

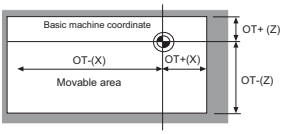
#2012 G1back G1 backlash

Set up the backlash compensation amount when the direction is reversed with the movement command in cutting mode.
G1 backlash is enabled in handle feed mode.

---Setting range---
-9999999 to 9999999

#2013 OT - Soft limit I -

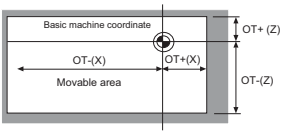
Set a soft limit area with reference to the zero point of the basic machine coordinate. Set the coordinate in the negative direction for the movable area of stored stroke limit 1. The coordinate in the positive direction is set in "#2014 OT+".
To narrow the available range in actual use, use the parameters "#8204 OT-" and "#8205 OT+".
When the same value (other than "0") is set in this parameter and "#2014 OT+", this function will be disabled.



---Setting range---
-99999.999 to 99999.999 (mm)

#2014 OT + Soft limit I +

Set a soft limit area with reference to the zero point of the basic machine coordinate. Set the coordinate in the positive direction for the movable area of stored stroke limit 1. The coordinate in the negative direction is set in "#2013 OT-".
To narrow the available range in actual use, use the parameters "#8204 OT-" and"#8205 OT+".
When the same value (other than "0") is set in this parameter and "#2013 OT-", this function will be disabled.



---Setting range---
-99999.999 to 99999.999 (mm)

#2015 tlml- Negative direction sensor of tool setter

Set a sensor position in the negative direction when using the tool setter.
When the TLM is used, set up the distance of a tool replacement point (reference point) for measuring the tool length from the zero point to the measurement reference point (surface).
(Note) In the case of the basic axis and inclined axis of the inclined axis specifications, set the position on the orthogonal coordinate.

---Setting range---
-99999.999 to 99999.999 (mm)

#2016 tlml+ Positive direction sensor of tool setter or TLM standard length

Set the sensor position in the positive direction when using the tool setter.
When the TLM is used, set the distance from a tool change point (reference position) to the measurement basic point (surface) in order to measure the tool length.
(Note) In the case of the basic axis and inclined axis of the inclined axis specifications, set the position on the orthogonal coordinate.

---Setting range---
-99999.999 to 99999.999 (mm)

#2017 tap_g Axis servo gain

Set the position loop gain for special operations (synchronized tapping, interpolation with spindle C axis, etc.).
Set the value in 0.25 increments.
The standard setting value is "10".

---Setting range---
0.25 to 200.00 (rad/s)

(PR) #2018 no_srv Operation with no servo control

Select when performing test operation without connecting the drive unit and motor.
0: Normal operation
1: Test operation
When "1" is set, the operation will be possible even if drive units and motor are not connected, because the drive system alarm will be ignored.
This parameter is used for test operation during start up: Do not use during normal operation. If "1" is set during normal operation, errors will not be detected even if they occur.

#2019 revnum Return steps

Set the steps required for reference position return for each axis.
0: Not execute reference position return.
1 to max. number of NC axes: Steps required for reference position return

#2020 o_chkp Spindle orientation completion check during second reference position return

Set the distance from the second reference position to the position for checking that the spindle orientation has completed during second reference position return.
When the set value is "0", the above check will be omitted.

---Setting range---
0 to 99999.999 (mm)

#2021 out_f Maximum speed outside soft limit range (For L system only)

Set the maximum speed outside the soft limit range.

---Setting range---
0 to 1000000 (mm/min)

#2022 G30SLX Validate soft limit (automatic and manual)

Select whether to disable a soft limit check during the second to the fourth reference position return in both automatic and manual operation modes.
0: Enable
1: Disable

#2023 ozfmin Set up ATC speed lower limit

Set the minimum speed outside the soft limit range during the second to the fourth reference position return.

---Setting range---
0 to 1000000 (mm/min)

#2024 synerr **Allowable error**

Set the maximum synchronization error, allowable at the synchronization error check, for the master axis.
When "0" is set, the error check will not be carried out.

---Setting range---

0 to 99999.999 (mm)
During simple C-axis synchronous control: 0 to 99999.999(°)

#2061 OT_1B- Soft limit IB-

Set the coordinate of the lower limit of the area where the stored stroke limit IB is inhibited.
Set a value from zero point in the basic machine coordinate system.
If the same value (non-zero) with the same sign as that of "#2062 OT_IB+" is set, the stored stroke limit IB function will be disabled.

---Setting range---

-99999.999 to 99999.999 (mm)

#2062 OT_1B+ Soft limit IB+

Set the coordinate of the upper limit of the area where the stored stroke limit IB is inhibited.
Set a value from zero point in the basic machine coordinate system.

---Setting range---

-99999.999 to 99999.999 (mm)

#2063 OT_1B type Soft limit IB type

Select the type that applies the settings of "#2062 OT_IB+" and "#2061 OT_IB-" in stored stroke limit I.
0: Soft limit IB
1: The settings are invalid
2: Soft limit IC
3: Soft limit is checked for the inclined axis control axis with the program coordinate system.
(Note) This is valid only for inclined axis' base axis and inclined axis.

#2068 G0fwdg **G00 feed forward gain**

Set a feed forward gain for G00 pre-interpolation acceleration/deceleration.
The larger the setting value, the shorter the positioning time during in-position checking.
If a machine vibration occurs, set the smaller value.

---Setting range---

0 to 200 (%)

#2069 Rcoeff **Axis arc radius error correction coefficient**

Set the percentage to increase or decrease the arc radius error correction amount for each axis.

---Setting range---

-100.0 to +100.0 (%)

(PR) #2070 div_RT **Rotational axis division count**

Set the number of divisions of one turn of the rotary axis under control.
(Example)
When "36" is set, one turn is supposed to be 36.000.
(Note 1) When "0" is set, the normal rotary axis (360.000 degrees for one turn) is assumed.
(Note 2) If this parameter is changed when the absolute position detection specification is used, absolute position data will be lost. Initialization must be performed again.

---Setting range---

0 to 999

(PR) #2071 s_axis **Inclined axis selection (for L system only)**

Select whether the axis is to be under the inclined-axis control or to be the base axis corresponding to the inclined axis.
0: Not to be under the inclined-axis control
1: Inclined axis
2: Base axis corresponding to inclined axis

(Note) Each of "1" and "2" values must be set for only one axis. If either value is set for two or more axes, inclined-axis control does not work.

#2072 rslimt **Restart limit**

Set the most minus (-) side position where restart search is possible.
If the machine is positioned on the more minus (-) side than the set value in T-command restart mode, restart search in type 3 will be disabled.

---Setting range---

-99999.999 to 99999.999 (mm)

#2073 zrn_dog **Origin dog Random assignment device**

Under the standard specifications, the origin dog signal is assigned to a fixed device. Set the input device in this parameter when it is desired to assign the origin dog signal to a position other than the fixed device.

(Note1) This parameter is enabled in the following conditions.
NC axis: When "#1226 aux10/bit5" is set to "1".
PLC axis: When "#1246 set18/bit7" is set to "1".
(Note 2) When this parameter is valid, do not set the existing device number. If the existing device number is set, an emergency stop will occur. However, no device number check will be performed for an axis to which the "near-point dog ignored" signal is input.

---Setting range---

0000 to 02FF (HEX)

#2074 H/W_OT+ H/W OT+ Random assignment device

Under the standard specifications, the OT (+) signal is assigned to a fixed device. Set the input device in this parameter when it is desired to assign the OT (+) signal to a position other than the fixed device.

(Note1) This parameter is enabled in the following conditions.
NC axis: When "#1226 aux10/bit5" is set to "1".
PLC axis: When "#1246 set18/bit7" is set to "1".
(Note 2) When this parameter is valid, do not set the existing device number. If the existing device number is set, an emergency stop will occur. However, no device number check will be performed for an axis to which the "OT ignored" signal is input.

---Setting range---
0000 to 02FF (HEX)

#2075 H/W_OT- H/W OT- Random assignment device

Under the standard specifications, the OT (-) signal is assigned to a fixed device. Set the input device in this parameter when it is desired to assign the OT (-) signal to a position other than the fixed device.

(Note1) This parameter is enabled in the following conditions.
NC axis: When "#1226 aux10/bit5" is set to "1".
PLC axis: When "#1246 set18/bit7" is set to "1".
(Note 2) When this parameter is valid, do not set the existing device number. If the existing device number is set, an emergency stop will occur. However, no device number check will be performed for an axis to which the "OT ignored" signal is input.

---Setting range---
0000 to 02FF (HEX)

#2076 index_x Index table indexing axis

Select whether the axis is a normal axis or an index table indexing axis.
0: Normal axis
1: Index table indexing axis

(Note) This parameter is valid only for the NC axis. The parameter is invalid if set for the PLC axis.

#2077 G0inps G0 in-position width

Set the in-position width for G0.
Between SV024 and this parameter, the parameter with a larger value will be applied.
When "0" is set, this parameter will be invalid: only SV024 will be available.
When "#1205 G0dbcc" is "1", SV024 is used as the G0 in-position width.

---Setting range---
0.000 to 99.999 (mm)

#2078 G1inps G1 in-position width

Set the in-position width for G1.
Between SV024 and this parameter, the parameter with a larger value will be applied.
When "0" is set, this parameter will be invalid: only SV024 will be available.

---Setting range---
0.000 to 99.999 (mm)

(PR) #2079 chcomp Chopping compensation coefficient

Set the coefficient to be applied to the compensation amount for the insufficient amount caused by servo delay during chopping.

---Setting range---
0 to 10 (standard value: 8)

#2080 chwid Bottom dead center position width

Set the tolerance between the commanded stroke and actual stroke.
Compensation will be applied during chopping so that the result of [command width - maximum stroke of top or bottom dead point/ 2] will be within this tolerance.

---Setting range---
0 to 10.000 (mm)

#2081 chclsp Maximum chopping speed

Set the clamp speed in chopping operation.
When "0" is set, the clamp speed will be determined by "#2002 clamp".

---Setting range---
0 to 60000 (mm/min)

#2082 a_rstax Restart position return order

Set the No. for each axis in order from the 1st automatically returning axis to the restart position.
When "0" is set, the axis will not return.
Note that when "0" is set for all axes, all of the axes will return simultaneously.
(Note) On the absolute position system, when performing the restart search just after power ON, and when the axis that is the order 0 is moved by the follow-up, an operation error(M01 0128) may occur.

---Setting range---
0 to 16

#2084 G60_ax Unidirectional positioning operation selection

Select how to operate the unidirectional positioning when the positioning command (G00) is issued.
0: Carry out unidirectional positioning according to the command and modal.
1: Carry out unidirectional positioning regardless of the command and modal.
Set "1" for the axis to carry out the unidirectional positioning at every positioning command, regardless of whether the unidirectional positioning command and modal are issued.

<Related parameters>
"#8209 G60 SHIFT" and "#2076 index_x"

#2086 exdcax External deceleration speed

Set the maximum feed rate for each axis when the external deceleration signal is ON.
This parameter is enabled when "#1239 set11/bit6 (External deceleration axis compliance valid)" is set to "1".

---Setting range---
0 to 1000000 (mm/min)

#2087	syncnt	Synchronization/super-imposition control setting for each axis

Set the polarity of synchronous axis with respect to basic axis to the bit corresponding to each axis.
0: Polarity with respect to basic axis is positive
1: Polarity with respect to basic axis is negative

---Setting range---

0 to FF (hexadecimal)

#2088	bsax_sy	Reference axis for synchronous control

Set the basic axis for synchronous control with the 2nd axis name (axname2).A numerical character cannot be set as the 1st character.

---Setting range---

1st character:A to Z
2nd character:A to Z, 1 to 9

#2089	bsax_pl	Superimposition control base axis

Set the base axis of superimposition control using the 2nd axis name (axname2).
A numerical character cannot be set as the 1st character.
(Note) This parameter is enabled only when "#1280 ext16/bit7 Control axis superimposition command method" is set to "1".

---Setting range---

A to Z and 1 to 9 (Two digits)
(Setting will be cleared when "0" is set)

#2090	plrapid	Rapid traverse rate for super-imposition control

Set the rapid traverse rate for superimposition control.
(Equivalent to "#2001 rapid Rapid traverse rate".)

---Setting range---

0 to 1000000(mm/min)

#2091	plclamp	Cutting feed clamp speed for super-imposition control

Set the cutting feed clamp speed for superimposition control.
(Equivalent to "#2002 clamp Cutting feed clamp speed".)

---Setting range---

0 to 1000000(mm/min)

#2092	plG0tL	G0 time constant for superimposition control (linear)

Set the G0 time constant (linear) for superimposition control.
(Equivalent to "#2004 G0tL G0 time constant (linear)".)

---Setting range---

0 to 4000(ms)

#2093	plG0t1	G0 time constant for superimposition control (primary delay)

Set the G0 time constant (primary delay) for superimposition control.
(Equivalent to "#2005 G0t1 G0 time constant (primary delay".)

---Setting range---

0 to 5000(ms)

#2094	plG1tL	G1 time constant for superimposition control (linear)

Set the G1 time constant (linear) for superimposition control.
(Equivalent to "#2007 G1tL G1 time constant (linear)".)

---Setting range---

0 to 4000(ms)

#2095	plG1t1	G1 time constant for superimposition control (primary delay)

Set the G1 time constant (primary delay) for superimposition control.
(Equivalent to "#2008 G1t1 G1 time constant (primary delay)".)

---Setting range---

0 to 5000(ms)

#2096	crncsp	Minimum corner deceleration speed

Set the minimum clamp speed for corner deceleration in the high-accuracy control mode. Normally set "0".

(Note) This parameter is invalid during SSS control.

---Setting range---

0 to 1000000 (mm/min)

#2097	tlml2-	Sub side tool setter - direction sensor

Set the sensor position (on sub side) in the (-) direction when using the tool setter on the sub spindle side.
(Note) In the case of the basic axis and inclined axis of the inclined axis specifications, set the position on the orthogonal coordinate.

---Setting range---

-99999.999 to 99999.999 (mm)

#2098	tlml2+	Sub side tool setter + direction sensor

Set the sensor position (on sub side) in (+) direction when using the tool setter on the sub spindle side.
(Note) In the case of the basic axis and inclined axis of the inclined axis specifications, set the position on the orthogonal coordinate.

---Setting range---

-99999.999 to 99999.999 (mm)

#2102 skip_tL — Skip time constant linear

Set a linear control time constant for variable speed skip acceleration and deceleration, or for an occasion where a skip command issues acceleration/deceleration time constant enabled (R1).
The time constant will be enabled when LC (cutting feed with linear acceleration and deceleration) or "F" (soft acceleration/deceleration) is selected in "#2003 smgst Acceleration and deceleration modes".
When set to "0", the time constant set by "#2008 G1t1" is used.

---Setting range---

0 to 4000 (ms)

#2103 skip_t1 — Skip time constant primary delay / Second-step time constant for soft acceleration/deceleration

Set a primary-delay time constant for variable speed skip acceleration and deceleration, or for an occasion where a skip command issues acceleration/deceleration time constant enabled (R1).
The time constant will be enabled when C1 (cutting feed with primary delay) or C3 (exponential acceleration and linear deceleration) is selected in "#2003 smgst Acceleration and deceleration modes".
When the soft acceleration/deceleration is selected, the second-step time constant will be used.
When set to "0", the time constant set by "#2008 G1t1" is used.

---Setting range---

0 to 5000 (ms)

#2106 Index unit — Indexing unit

Set the indexing unit to which the rotary axis can be positioned.

---Setting range---

0 to 360 (°)

#2109 Rapid (H-precision) — Rapid traverse rate for high-accuracy control mode

Set the rapid traverse rate for each axis in the high-accuracy control mode. "#2001 rapid" will be used when "0" is set.

---Setting range---

0 to 1000000 (mm/min)

#2110 Clamp (H-precision) — Cutting feed clamp speed for high-accuracy control mode

Set the cutting feed maximum speed for each axis in the high-accuracy control mode. "#2002 clamp" will be used when "0" is set.

---Setting range---

0 to 1000000 (mm/min)

#2111 Blf valid — Quadrant protrusion compensation valid

Set whether to enable the quadrant protrusion compensation.

0: Disable
1: Enable

If either of "#2112 Blf motor inertia", "#2115 Blf motor stl trq" or "#2113 Blf visc friction" is set to "0", quadrant protrusion compensation will not work even if this parameter is set to "1".

#2112 Blf motor inertia — Motor inertia

Set the motor inertia for quadrant protrusion compensation.
Refer to the servo manual and input the value appropriate for the motor.

---Setting range---

1 to 32000 (10^{-6}kgm^2)

#2113 Blf visc friction — Viscous friction

Set the viscous friction for quadrant protrusion compensation.
After setting the other parameters to the appropriate values, monitor the machine end and gradually adjust the value.
If this parameter setting is small, a recess will form on the inner side of the circle, and if large, a protrusion will form on the outer side of the circle. When the value is appropriate, a spike-shaped quadrant protrusion will form based on normal step-shaped backlash.

---Setting range---

1 to 32767 (1/16 Nm/(rad/s))

#2114 Blf fwdg — Compensation FF gain

Set the feed forward gain for quadrant protrusion compensation.
After setting the other parameters to the appropriate values, monitor the machine end and gradually adjust the value.
If this parameter setting is small, a large quadrant protrusion will form, and if large, a recess will form on the inner side of the circle.

---Setting range---

0 to 1000 (%)

#2115 Blf motor stl trq — Motor stall torque

Set the motor rated current for quadrant protrusion compensation.
Refer to the servo manual and input the value appropriate for the motor.

---Setting range---

1 to 16000 (1/256 Nm)

(PR) #2118 SscDrSel — Speed monitor Door selection

Select which door group of the speed monitoring the spindle belongs to.

0000: Door 1 group.
0001: Door 1 group.
0002: Door 2 group.
0003: Door 1 and 2 group.

The speed monitoring will not be executed when "#2313 SV113 SSF8/BitF" is OFF regardless of this parameter.
The selected door group must be set when setting the synchronous control.
The spindle/C axis control enables the door selection in "#3071 SscDrSelSp" for the corresponding spindle.

#2121 vbacklash valid **Variable backlash valid/continuous or Variable backlash II valid**

Select whether the variable backlash is to be disabled/enabled/continuous, or variable backlash II enabled.

0: Disable
1: Enable
2: Continuous
3: Enable variable backlash II

("#2011 G0back" and "#2012 G1back" will not work unless "0: Disable" is selected.)

#2122 G0vback+ **Variable G0 backlash +**

Set the compensation amount for the range of each position during rapid traverse.
(+: B1, =: B2, -: B3 on the compensation amount table)

---Setting range---

-99999999 to 99999999 (Interpolation unit)

#2123 G0vback= **Variable G0 backlash =**

Set the compensation amount for the range of each position during rapid traverse.
(+: B1, =: B2, -: B3 on the compensation amount table)

---Setting range---

-99999999 to 99999999 (Interpolation unit)

#2124 G0vback- **Variable G0 backlash -**

Set the compensation amount for the range of each position during rapid traverse.
(+: B1, =: B2, -: B3 on the compensation amount table)

---Setting range---

-99999999 to 99999999 (Interpolation unit)

#2125 G1vback+ **Variable G1 backlash +**

Set the compensation amount for the range of each position during cutting feed.
(+: A1, =: A2, -: A3 on the compensation amount table)

---Setting range---

-99999999 to 99999999(Interpolation unit)

#2126 G1vback= **Variable G1 backlash =**

Set the compensation amount for the range of each position during cutting feed.
(+: A1, =: A2, -: A3 on the compensation amount table)

---Setting range---

-99999999 to 99999999 (Interpolation unit)

#2127 G1vback- **Variable G1 backlash -**

Set the compensation amount for the range of each position during cutting feed.
(+: A1, =: A2, -: A3 on the compensation amount table)

---Setting range---

-99999999 to 99999999 (Interpolation unit)

#2128 G1vback feed1 **G1 variable backlash compensation amount changeover speed 1**

Set the speed range during cutting feed.
(The speed less than 1 is the low speed, and the speed exceeding 2 is the high speed.)
Note that the speed range is identified in the order of low, high and medium speed. Consider whether the set value should be larger or smaller than other values.

---Setting range---

0 to 480000 (mm/min)

#2129 G1vback feed2 **G1 variable backlash compensation amount changeover speed 2**

Set the range of the speed during cutting feed.
(The speed less than 1 is the low speed, and the speed exceeding 2 is the high speed.)
Note that the speed range is identified in the order of low, high and medium speed. Consider whether the set value should be larger or smaller than other values.

---Setting range---

0 to 480000 (mm/min)

#2130 G1vback dist1 **G1 variable backlash compensation amount changeover distance 1**

Set the range of the distance during cutting feed.
(The distance less than 1 is the small distance, and the distance exceeding 2 is the large distance.)
Note that the distance range is identified in the order of small, large and medium. Consider whether the set value should be larger or smaller than other values.

---Setting range---

0 to 999999.999999 (mm)

#2131 G1vback dist2 **G1 variable backlash compensation amount changeover distance 2**

Set the range of the distance during cutting feed.
(The distance less than 1 is the small distance, and the distance exceeding 2 is the large distance.)
Note that the distance range is identified in the order of small, large and medium. Consider whether the set value should be larger or smaller than other values.

---Setting range---

0 to 999999.999999 (mm)

#2132	vback pos1	Variable backlash compensation amount changeover end point position 1

Set the range of the center of the end point position.
(The range less than position 1 is the - range, and the range exceeding position 2 is the + range.)
The end point position range is determined in the order of -, + , and center. Consider whether the set value should be larger or smaller than other values.
(Note 1) If continuous variable backlash is set with "#2121 vbacklash valid", position 1 will be set as the position - point and position 2 will be set as the position + point.
(Note 2) When the size relation of the compensation amount changeover speed and distance 1 and 2 is not appropriate while the variable backlash compensation is valid, the followings will be applied:If the backlash speed and distance are smaller than the compensation amount changeover speed and distance 1, both the speed and distance will be small; if larger than the compensation amount changeover speed and distance 2, both the speed and distance will be large.

---Setting range---

-999999.999999 to 999999.999999 (mm)

#2133	vback pos2	Variable backlash compensation amount changeover end point position 2

Set the range of the center of the end point position.
(The range less than position 1 is the - range, and the range exceeding position 2 is the + range.)
The end point position range is determined in the order of -, + , and center. Consider whether the set value should be larger or smaller than other values.
(Note 1) If continuous variable backlash is set with "#2121 vbacklash valid", position 1 will be set as the position - point and position 2 will be set as the position + point.
(Note 2) When the size relation of the compensation amount changeover speed and distance 1 and 2 is not appropriate while the variable backlash compensation is valid, the followings will be applied:If the backlash speed and distance are smaller than the compensation amount changeover speed and distance 1, both the speed and distance will be small; if larger than the compensation amount changeover speed and distance 2, both the speed and distance will be large.

---Setting range---

-999999.999999 to 999999.999999 (mm)

#2134	vback arc K	Variable backlash arc compensation coefficient

Set the arc compensation coefficient.

---Setting range---

0 to 300 (%)

#2135	vback feed refpt	Variable backlash reference position selection (speed)

Select the speed range to be used as the reference position.

0: Low speed
1: Medium speed
2: High speed

#2136	vback pos refpt	Variable backlash reference position selection (end point position)

Select the end point range to be used as the reference position.

0: Position + range
1: Position center range
2: Position - range

#2137	vback dir refpt	Variable backlash reference position selection (entry direction)

Select the entry direction to be used as the reference position.

0: Entry direction +
1: Entry direction -

#2138	vback pos center	Continuous variable backlash position center point

Set the position center point. (This is used only when continuous variable backlash is set with "#2121 vbacklash valid".) Set a value between "#2132 vback pos1" and "#2133 vbackpos2" for the position center point.
(Note) When the size relation of the compensation amount changeover speed and distance 1 and 2 is not appropriate while the variable backlash compensation is valid, the followings will be applied: If the backlash speed and distance are smaller than the compensation amount changeover speed and distance 1, both the speed and distance will be small; if larger than the compensation amount changeover speed and distance 2, both the speed and distance will be large.

---Setting range---

-999999.999999 to 999999.999999 (mm)

#2139	omrff_off	OMR-FF invalid

Select whether to enable or temporarily disable the OMR-FF control when OMR-FF is valid.

0: Enable
1: Temporarily disable

When "1" is selected while OMR-FF is valid, OMR-FF can be temporarily disabled and conventional feed forward control can be applied instead.

(PR) #2140	Ssc Svof Filter	Speed monitor Error detection time during servo OFF

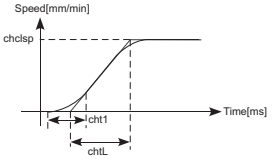
Set the error detection time of command speed monitoring and feedback speed monitoring during servo OFF.
An alarm will occur if the time, for which the speed has been exceeding the safe speed or safe rotation speed, exceeds the error detection time set in this parameter.
If "0" is set, it will be handled as 200 (ms).

---Setting range---

0 to 9999 (ms)

#2141 chtL **Chopping first-step time constant for soft acceleration/deceleration**

Set the first-step time constant for the chopping axis when soft acceleration/deceleration is applied.
Note that, however, there may be cases where actual time constant is shorter than the set time constant, because the time constant is automatically calculated according to the feedrate so that the acceleration rate during acceleration/deceleration (clamp speed/chopping time constant) will be constant.
When "0" is set, "#2007 G1tL" will be valid.



---Setting range---
0 to 4000 (ms)

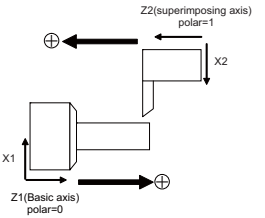
#2142 cht1 **Chopping second-step time constant for soft acceleration/deceleration**

Set the second-step time constant for the chopping axis when soft acceleration/deceleration is applied.
Note that, however, there may be cases where actual time constant is shorter than the set time constant, because the time constant is automatically calculated so that the ratio between first-step and second-step time constant will be constant.
When "0" is set, "#2008 G1t1" will be valid.

---Setting range---
0 to 4000 (ms)

#2143 polar **Control axis relative polarity**

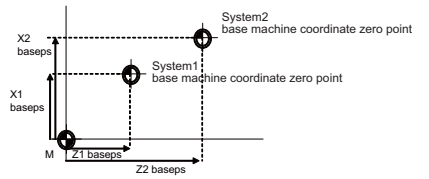
Set "0" for the basic axis, and set the polarity of the superimposing axis relative to the basic axis.
0: Relative to basic axis, polarity is positive
1: Relative to basic axis, polarity is negative



#2144 baseps **Base machine coordinate zero point relative distance**

Set each axis's position of the base machine coordinate zero point when an arbitrary point M on the machine is regarded as a base point.
Unify the directions of all part systems' machine zero point positions with the direction of the machine coordinate system of the 1st part system.
If the 1st part system doesn't have a parallel axis, determine the direction arbitrarily.

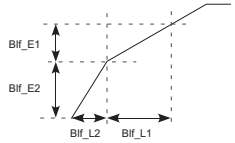
Example: System1(X1, Z1), System2(X2, Z2)



---Setting range---
-99999.999 to 99999.999 (mm)

#2146 BIf_L1 **Reference distance for position-dependent increasing-type backlash compensation 1**

Set the distance for specifying the compensation change rate in position-dependent increasing-type backlash compensation.



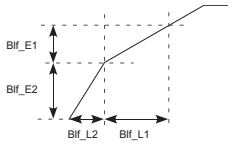
When "#2148 BIf_E1" is set to "0", the position-dependent increasing-type backlash compensation function will be disabled.

---Setting range---

0.000 to 99999.999 (mm)

#2147 BIf_L2 **Reference distance for position-dependent increasing-type backlash compensation 2**

Set the distance for specifying the compensation change rate in position-dependent increasing-type backlash compensation.



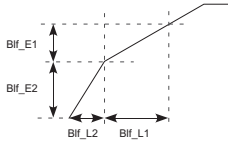
When "#2148 BIf_E1" is set to "0", the position-dependent increasing-type backlash compensation function will be disabled.

---Setting range---

0.000 to 99999.999 (mm)

#2148 BIf_E1 **Reference amount of position-dependent increasing-type backlash compensation 1**

Set the compensation amount for specifying the compensation change rate in position-dependent increasing-type backlash compensation.



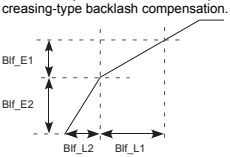
When "#2148 BIf_E1" is set to "0", the position-dependent increasing-type backlash compensation function will be disabled.

---Setting range---

0 to 9999999 (Machine error compensation unit)

#2149 BIf_E2 **Reference amount of position-dependent increasing-type backlash compensation 2**

Set the compensation amount for specifying the compensation change rate in position-dependent increasing-type backlash compensation.



When "#2148 BIf_E1" is set to "0", the position-dependent increasing-type backlash compensation function will be disabled.

---Setting range---

0 to 9999999 (Machine error compensation unit)

#2150 Rot_len **Farthest distance from rotary axis center**

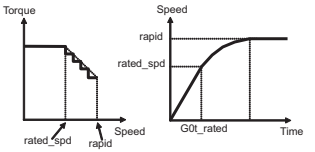
Set the farthest distance of the rotating part from the rotation center for executing the 3D machine interference check.
When "0" is set, this distance will conform to the rotary axis' specification speed.

---Setting range---

0.000 to 99999.999(mm)

#2151	rated_spd	Rated speed

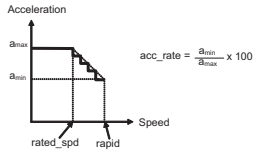
Set the maximum speed which can be driven with the motor's maximum torque.
(Note 1) This parameter's setting value must be smaller than "#2001 rapid Rapid traverse". If bigger, constant inclination acceleration/deceleration will be applied.
(Note 2) If rapid traverse constant inclination multi-step acceleration/deceleration is valid, and also if this parameter is set to "0", constant inclination acceleration/deceleration will be applied.



---Setting range---
0 to 1000000(mm/min)

#2152	acc_rate	Acceleration rate in proportion to the maximum acceleration rate

Set the rate in proportion to the maximum acceleration rate in rapid traverse.
(Note) If this parameter is set to "0" or "100", constant inclination acceleration/deceleration will be applied.



---Setting range---
0 to 100(%)

#2153	G0t_rated	G0 time constant up to rated speed (multi-step acceleration/deceleration)

Set the acceleration rate up to the rated speed of rapid traverse constant inclination multi-step acceleration/deceleration.
(Note) If this parameter is set to "0", constant inclination acceleration/deceleration will be applied.
---Setting range---
0 to 4000(ms)

#2155	hob_fwd_g	Feed forward gain for hobbing machining

Set the feed forward gain when controlling as workpiece axis of tool spindle synchronization II (hobbing).
---Setting range---
0 to 200 (%)

#2157	G1bFx	Maximum per-axis pre-interpolation cutting feed rate

When per-axis acceleration tolerance control is ON:
Specify the maximum speed to be used for calculating each axis' acceleration tolerance. When 0 is set, "#2001 rapid" is used.

When variable-acceleration pre-interpolation acceleration/deceleration is ON:
Specify the maximum speed to be used for calculating each axis' acceleration. When 0 is set, "#1206 G1bF" is used.

When both per-axis acceleration tolerance control and variable-acceleration pre-interpolation acceleration/deceleration are ON:
Specify the maximum speed to be used for calculating each axis' acceleration. When 0 is set, "#1206 G1bF" is used.

When neither per-axis acceleration tolerance control nor variable-acceleration pre-interpolation acceleration/deceleration is ON:
This parameter is disabled.
---Setting range---
0 to 999999(mm/min)

#2158 G1btLx — Per-axis pre-interpolation cutting feed time constant

When per-axis acceleration tolerance control is ON:
Specify the time constant (a time to be taken until reaching the maximum speed) to be used for calculating each axis' acceleration tolerance. When 0 is set, "#2004 G0tL" is used.

When variable-acceleration pre-interpolation acceleration/deceleration is ON:
Specify the time constant (a time to be taken until reaching the maximum speed) to be used for calculating each axis' acceleration. When 0 is set, "#1207 G1btL" is used.

When both per-axis acceleration tolerance control and variable-acceleration pre-interpolation acceleration/deceleration are ON:
Specify the time constant (a time to be taken until reaching the maximum speed) to be used for calculating each axis' acceleration. When 0 is set, "#1207 G1btL" is used.

When neither per-axis acceleration tolerance control nor variable-acceleration pre-interpolation acceleration/deceleration is ON:
This parameter is disabled.

---Setting range---
0 to 5000(ms)

#2159 compx — Accuracy coefficient for each axis

Specify the compensation coefficient to be used for adjusting a path error and clamp speed at a corner for each axis during the high-accuracy control mode.
If the setting value is larger, the edge accuracy will improve, but the cycle time may be longer because the corner speed will slow down.
This parameter is disabled when the per-axis acceleration tolerance control is OFF.

---Setting range---
-1000 to 99 (%)

#2161 exdcax1 — External deceleration speed 1

Set the upper limit value of feedrate for each axis when the external deceleration signal is enabled and external deceleration speed 1 is selected.
This parameter is valid when "#1239 set11/bit6" is set to "1".

---Setting range---
0 to 1000000 (mm/min)

#2162 exdcax2 — External deceleration speed 2

Set the upper limit value of feedrate for each axis when the external deceleration signal is enabled and external deceleration speed 2 is selected.
This parameter is valid when "#1239 set11/bit6" is set to "1".

---Setting range---
0 to 1000000 (mm/min)

#2163 exdcax3 — External deceleration speed 3

Set the upper limit value of feedrate for each axis when the external deceleration signal is enabled and external deceleration speed 3 is selected.
This parameter is valid when "#1239 set11/bit6" is set to "1".

---Setting range---
0 to 1000000 (mm/min)

#2164 exdcax4 — External deceleration speed 4

Set the upper limit value of feedrate for each axis when the external deceleration signal is enabled and external deceleration speed 4 is selected.
This parameter is valid when "#1239 set11/bit6" is set to "1".

---Setting range---
0 to 1000000 (mm/min)

#2165 exdcax5 — External deceleration speed 5

Set the upper limit value of feedrate for each axis when the external deceleration signal is enabled and external deceleration speed 5 is selected.
This parameter is valid when "#1239 set11/bit6" is set to "1".

---Setting range---
0 to 1000000 (mm/min)

#2169 Man meas rtrn dir — Return direction in manual measurement

Select the direction of return operation in manual measurement.
0: Opposite to the contact direction
1: Fixed to the + direction
Attempting return in the - direction will cause the operation alarm "0033 Rtn dir err in manual measure".
2: Fixed to the - direction
Attempting return in the + direction will cause the operation alarm "0033 Rtn dir err in manual measure".

#2170 Lmc1QR — Lost motion compensation gain 1 for high-speed retract

Set the lost motion compensation gain in drilling cycle at high-speed retract (CW: - to + direction, CCW: + to - direction).
Set "-1" when drilling cycle at high-speed retract is not performed.
When set to 0, the performance will follow the setting of "#2171 Lmc2QR (Lost motion compensation gain 2 for high-speed retract)".

---Setting range---
-1, 0 to 200(%)

#2171 Lmc2QR — Lost motion compensation gain 2 for high-speed retract

Set the lost motion compensation gain in drilling cycle at high-speed retract (CW: - to + direction, CCW: + to - direction).
Set "-1" when drilling cycle at high-speed retract is not performed.
When set to "0", the performance will follow the setting of "#2170 Lmc1QR (Lost motion compensation gain 1 for high-speed retract)".

---Setting range---
-1, 0 to 200(%)

#2172 LmcdQR — Lost motion compensation timing for high-speed retract

Set the timing of the lost motion compensation in drilling cycle at high-speed retract.
When set to "0", the performance will follow the setting of "#2239 SV039 LMCD (Lost motion compensation timing)".

---Setting range---
0 to 2000 (ms)

#2173 LmckQR — Lost motion compensation 3 spring constant for high-speed retract

Set the machine system's spring constant when using lost motion compensation type 3 in drilling cycle with high-speed retract.
When set to "0", the performance will follow the setting of "#2285 SV085 LMCk (Lost motion compensation 3 spring constant)".

---Setting range---
0 to 32767(0.01%/μm)

#2174 LmccQR — Lost motion compensation 3 viscous coefficient for high-speed retract

Set the machine system's viscous coefficient when using lost motion compensation type 3 in drilling cycle at high-speed retract.
When set to "0", the performance will follow the setting of "#2286 SV086 LMCc (Lost motion compensation 3 viscous coefficient)".

---Setting range---
0 to 32767(0.01%/μm)

#2175 Special Ax Radius — Special diametral axis radius

Set the radius of the special diametral axis.

---Setting range---
0 to 99999.999 (mm)

#2176 Special Ax Clamp — Special diametral axis clamp speed

Set a clamp speed for the special diametral axis control.
Set the limit speed of the drive system in this parameter.

---Setting range---
0 to 1000000 (°/min)

(Note) For "#2001 rapid" and "#2002 clamp", set speeds on a machining line.
When the value in "#2176 Special Ax Clamp" is smaller than that in "#2001 rapid", "Special Ax Clamp" value will be applied to the clamp speed.

#2177 ManualFeedBtL — Time constant for manual feed rate B

Set the acceleration/deceleration time constant for manual feed rate B.

(Note) When set to "0", this parameter will not be used: conventional acceleration/deceleration will be performed.

---Setting range---
0 to 20000 (ms)

(PR) #2180 S_DIN — Speed observation input door No.

Set the door signal input in the drive unit.
Use this parameter only when the axis with a door signal belongs to several door groups.
The correspondence between the door signals and bits are as follows.
bit0 : Door1 signal
bit1 : Door2 signal
If the axis does not receive any door signal, set to "0".
If 0 is set to the axis to which a door signal is input, the setting of #2118 is applied.
Do not turn ON more than one bit.
Only the door signals set in #2118 can be set.

---Setting range---
0000 to 0002 (HEX)

(PR) #2181 sscfeed1 — Observation speed 1

Set the observation speed, which is at the machine end, in the multi-step speed monitor.
(Note 1) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(mm/min, °/min)
(Note 2) Observation speeds (#2181 to #2186 and #2191 to #2192) need to satisfy the following condition.
If not satisfied, the alarm (Y20 0007) will result.

$$\frac{\text{sscfeed1}\sim 8}{\text{SV018:PIT}} \times \frac{\text{SV002:PC2}}{\text{SV001:PC1}} \leq 32767$$

---Setting range---
0 to 6553500 (mm/min or °/min)

(PR) #2182 sscfeed2 — Observation speed 2

Set the observation speed, which is at the machine end, in the multi-step speed monitor.
(Note 1) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(mm/min, °/min)
(Note 2) Observation speeds (#2181 to #2186 and #2191 to #2192) need to satisfy the following condition.
If not satisfied, the alarm (Y20 0007) will result.

$$\frac{\text{sscfeed1}\sim 8}{\text{SV018:PIT}} \times \frac{\text{SV002:PC2}}{\text{SV001:PC1}} \leq 32767$$

---Setting range---
0 to 6553500 (mm/min or °/min)

(PR) #2183 sscfeed3 Observation speed 3

Set the observation speed, which is at the machine end, in the multi-step speed monitor.
(Note 1) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(mm/min, °/min)
(Note 2) Observation speeds (#2181 to #2186 and #2191 to #2192) need to satisfy the following condition.
If not satisfied, the alarm (Y20 0007) will result.

$$\frac{\text{sscfeed1}\sim 8}{\text{SV018:PIT}} \times \frac{\text{SV002:PC2}}{\text{SV001:PC1}} \leq 32767$$

---Setting range---
0 to 6553500 (mm/min or °/min)

(PR) #2184 sscfeed4 Observation speed 4

Set the observation speed, which is at the machine end, in the multi-step speed monitor.
(Note 1) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(mm/min, °/min)
(Note 2) Observation speeds (#2181 to #2186 and #2191 to #2192) need to satisfy the following condition.
If not satisfied, the alarm (Y20 0007) will result.

$$\frac{\text{sscfeed1}\sim 8}{\text{SV018:PIT}} \times \frac{\text{SV002:PC2}}{\text{SV001:PC1}} \leq 32767$$

---Setting range---
0 to 6553500 (mm/min or °/min)

(PR) #2185 sscfeed5 Observation speed 5

Set the observation speed, which is at the machine end, in the multi-step speed monitor.
(Note 1) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(mm/min, °/min)
(Note 2) Observation speeds (#2181 to #2186 and #2191 to #2192) need to satisfy the following condition.
If not satisfied, the alarm (Y20 0007) will result.

$$\frac{\text{sscfeed1}\sim 8}{\text{SV018:PIT}} \times \frac{\text{SV002:PC2}}{\text{SV001:PC1}} \leq 32767$$

---Setting range---
0 to 6553500 (mm/min or °/min)

(PR) #2186 sscfeed6 Observation speed 6

Set the observation speed, which is at the machine end, in the multi-step speed monitor.
(Note 1) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(mm/min, °/min)
(Note 2) Observation speeds (#2181 to #2186 and #2191 to #2192) need to satisfy the following condition.
If not satisfied, the alarm (Y20 0007) will result.

$$\frac{\text{sscfeed1}\sim 8}{\text{SV018:PIT}} \times \frac{\text{SV002:PC2}}{\text{SV001:PC1}} \leq 32767$$

---Setting range---
0 to 6553500 (mm/min or °/min)

(PR) #2187 chgPLCax PLC axis switchover axis No.

Specify the I/F No. of the PLC axis to use when switching between NC axis and PLC axis.
Set the I/F No. of a vacant PLC axis. Set this parameter to 0 when not used.
---Setting range---
0 to 8

(PR) #2188 S_SigIn Safety observation signal input

This parameter specifies which safety observation signal is input in the drive unit.
The observation speed change signal corresponds to the following bits of the parameter.
bit0: Observation speed change signal 1 is connected.
bit1: Observation speed change signal 2 is connected.
bit2: Observation speed change signal 3 is connected.
If the axis receives no observation speed change signal, set to "0000".
(Note) When a same setting value is set to more than one axis, or when more than one BIT is set to turn ON for one axis, the alarm (Y20 0027) will occur.
---Setting range---
0000 to 0004 (HEX)

#2189 StlTrq(PwrCal) Stall torque for power computation

Specify the stall torque of the servo motor.
This value is used for calculating the servo motor's power consumption.
---Setting range---
0.000 to 1000.000 (N•m)

(PR) #2190 OT_Rreg Designate R register for stored stroke limit I

Set the head R register No. to be used for setting/checking stored stroke limit I.
Eight consecutive R registers from the R register No. set here will be the area for stored stroke limit I.
Changing the areas for stored stroke limit I will be disabled if an R register that is not in the user area is set.
In addition, make sure to set an even number for the head R register No. Changing the areas for stored stroke limit I will be disabled if an odd number is set.
---Setting range---
0 to 29892

(PR) #2191 sscfeed7 Observation speed 7

Set the observation speed, which is at the machine end, in the multi-step speed monitor.
(Note 1) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(mm/min, °/min)
(Note 2) Observation speeds (#2181 to #2186 and #2191 to #2192) need to satisfy the following condition.
If not satisfied, the alarm (Y20 0007) will result.

$$\frac{\text{sscfeed1}\sim 8}{\text{SV018:PIT}} \times \frac{\text{SV002:PC2}}{\text{SV001:PC1}} \leq 32767$$

---Setting range---
0 to 6553500 (mm/min or °/min)

(PR) #2192 sscfeed8 Observation speed 8

Set the observation speed, which is at the machine end, in the multi-step speed monitor.
(Note 1) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(mm/min, °/min)
(Note 2) Observation speeds (#2181 to #2186 and #2191 to #2192) need to satisfy the following condition.
If not satisfied, the alarm (Y20 0007) will result.

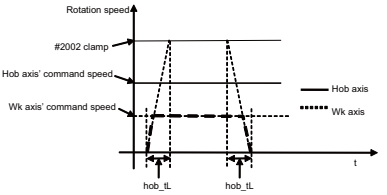
$$\frac{\text{sscfeed1}\sim 8}{\text{SV018:PIT}} \times \frac{\text{SV002:PC2}}{\text{SV001:PC1}} \leq 32767$$

---Setting range---
0 to 6553500 (mm/min or °/min)

#2195 hob_tL Hobbing workpiece axis time constant

Set the constant inclination acceleration/deceleration time constant of the hobbing workpiece axis when issuing a hobbing command while the hobbing spindle is rotating. Hobbing workpiece axis time constant is the constant inclination acceleration/deceleration time constant with respect to #2002 Cutting feed rate for clamp function.
If the setting value of hobbing workpiece axis time constant is out of setting range, set the maximum value in the setting range.

---Setting range---
1 to 4000 (ms)



#2198 G0tMin Minimum time constant for rapid traverse constant inclination acc./dec.

Acceleration/Deceleration is carried out so that the acceleration/deceleration time will not become longer than this parameter's setting when the acceleration/deceleration type of rapid traverse command is constant inclination.
Set a value smaller than "#2004 G0tL".
This parameter is enabled when "#1200 G0_acc" is constant inclination type.
This parameter is enabled only during fixed cycle if "#1253 set25 bit2" (Acceleration/Deceleration mode change in hole drilling cycle) is enabled even if "#1200 G0_acc" is constant inclination type.
This parameter is disabled if 0 or a value larger than "#2004 G0tL" is set.

---Setting range---
0 to 4000 (ms)

#2199 G1tMin Minimum time constant for cutting feed constant inclination acc./dec.

Acceleration/Deceleration is carried out so that the acceleration/deceleration time will not become longer than this parameter's setting when the acceleration/deceleration type of linear interpolation command is constant inclination.
Set a value smaller than "#2007 G1tL".
This parameter is enabled when "#1201 G1_acc" is constant inclination type.
This parameter is enabled only during fixed cycle if "#1253 set25 bit2" (Acceleration/Deceleration mode change in hole drilling cycle) is enabled even if "#1200 G0_acc" is constant inclination type.
This parameter is disabled if 0 or a value larger than "#2007 G1tL" is set.

---Setting range---
0 to 4000 (ms)

#2561 VBL2 VG1 Variable backlash comp II Changeover speed 1

Set the changeover speed at speed normalization.
Set a value smaller than that in "#2562 VBL2 VG0".
Normally, the "#2561 VBL2 VG1" value corresponds to the cutting feedrate, the "#2562 VBL2 VG0" value to the rapid traverse rate.

---Setting range---
1 to 1000000 (mm/min)

#2562 VBL2 VG0 Variable backlash comp II Changeover speed 2

Set the changeover speed at speed normalization.
Set a value greater than that in "#2561 VBL2 VG1".
Normally, the "#2561 VBL2 VG1" value corresponds to the cutting feedrate, the "#2562 VBL2 VG0" value to the rapid traverse rate.

---Setting range---

1 to 1000000 (mm/min)

#2563 VBL2 P1 Variable backlash comp II Stroke position 1

Set the most plus (+) side stroke position among the three.
Set the parameters VBL2 P1 to P3 to be "VBL2 P1 > VBL2 P2 > VBL2 P3".
Normally, divide the axis's stroke by four, and set a dividing position (except for the both ends) to be a stroke position.

---Setting range---

-99999.999 to 99999.999 (mm)

#2564 VBL2 P2 Variable backlash comp II Stroke position 2

Set the middle stroke position among the three.
Set the parameters VBL2 P1 to P3 to be "VBL2 P1 > VBL2 P2 > VBL2 P3".
Normally, divide the axis's stroke by four, and set a dividing position (except for the both ends) to be a stroke position.

---Setting range---

-99999.999 to 99999.999 (mm)

#2565 VBL2 P3 Variable backlash comp II Stroke position 3

Set the most minus (-) side stroke position among the three.
Set the parameters VBL2 P1 to P3 to be "VBL2 P1 > VBL2 P2 > VBL2 P3".
Normally, divide the axis's stroke by four, and set a dividing position (except for the both ends) to be a stroke position.

---Setting range---

-99999.999 to 99999.999 (mm)

#2566 VBL2 BL11 Variable backlash comp II Comp data at changeover spd 1 and stroke pos 1

Set the compensation data (backlash amount) at changeover speed 1 and stroke position 1.
Calculate the current compensation data according to the current speed and position.

---Setting range---

-99999999 to 99999999 (Machine error compensation unit)

#2567 VBL2 BL12 Variable backlash comp II Comp data at changeover spd 1 and stroke pos 2

Set the compensation data (backlash amount) at changeover speed 1 and stroke position 2.
Calculate the current compensation data according to the current speed and position.

---Setting range---

-99999999 to 99999999 (Machine error compensation unit)

#2568 VBL2 BL13 Variable backlash comp II Comp data at changeover spd 1 and stroke pos 3

Set the compensation data (backlash amount) at changeover speed 1 and stroke position 3.
Calculate the current compensation data according to the current speed and position.

---Setting range---

-99999999 to 99999999 (Machine error compensation unit)

#2569 VBL2 BL01 Variable backlash comp II Comp data at changeover spd 2 and stroke pos 1

Set the compensation data (backlash amount) at changeover speed 2 and stroke position 1.
Calculate the current compensation data according to the current speed and position.

---Setting range---

-99999999 to 99999999 (Machine error compensation unit)

#2570 VBL2 BL02 Variable backlash comp II Comp data at changeover spd 2 and stroke pos 2

Set the compensation data (backlash amount) at changeover speed 2 and stroke position 2.
Calculate the current compensation data according to the current speed and position.

---Setting range---

-99999999 to 99999999 (Machine error compensation unit)

#2571 VBL2 BL03 Variable backlash comp II Comp data at changeover spd 2 and stroke pos 3

Set the compensation data (backlash amount) at changeover speed 2 and stroke position 3.
Calculate the current compensation data according to the current speed and position.

---Setting range---

-99999999 to 99999999 (Machine error compensation unit)

#2572 VBL2 FloatTC Variable backlash comp II Time constant in calculating float amt

Set the time constant in calculating the float amount. Set a value greater than the calculation cycle.

---Setting range---

0 to 10000 (ms)

#2573 VBL2 LMMul Variable backlash comp II Multiplier in calculating lost motion amt

Set the multiplier in calculating the lost motion amount. When "1000" is set, the multiplier is "1".

---Setting range---

0 to 1000 (1/1000)

#2574 VBL2 VBound Variable backlash comp II Speed boundary value

Set the boundary value of the speed in calculating the compensation amount.

---Setting range---

1 to 1000000 (mm/min)

#2575 VBL2 CompMag — **Variable backlash comp II Compensation magnification**

Set the compensation magnification in calculating the compensation amount. When "0" is set, the magnification is 100%.

---Setting range---

0 to 300 (%)

#2576 VBL2 CompMul — **Variable backlash comp II Multiplier in calculating compensation amount**

Set the multiplier in calculating the compensation amount. When "1000" is set, the multiplier is "1".

---Setting range---

0 to 1000 (1/1000)

#2577 VBL2 BLE — **Variable backlash comp II Gradually increase amount**

Set the value to subtract from the compensation amount (CMP) at reversing the axis travel direction.

---Setting range---

-99999999 to 99999999 (Machine error compensation unit)

#2578 VBL2 BLL — **Variable backlash comp II Gradually increase travel distance**

Set the travel distance to return to the compensation amount (CMP) from the reverse point of the axis travel direction.

---Setting range---

0 to 99999.999 (mm)

#2579 BLAT_feed — **Feed rate for automatic backlash adjustment**

[M8]

Set the feed rate in adjusting the backlash amount.

It is possible to set this parameter also by carrying out a measurement condition adjustment on the backlash adjustment screen.

---Setting range---

0 to 1000000 (mm/min)

(PR) #2580 index_Gcmd — **Indexing axis G command check**

The commanded G code of the index table indexing axis is checked.

0: Check is not performed.

1: Cutting feed G command is prohibited.

#2581 BLAT_pos — **Measurement position for automatic backlash adjustment**

[M8]

Set the measurement position in measurement condition adjustment and backlash adjustment on the machine coordinate system.

(Note 1) Set the position so that a collision will not occur during adjustment.

(Note 2) Set this parameter for all the axes.

---Setting range---

-99999.999 to 99999.999 (mm)

#2582 BLAT_syn — **Synchronization setting for automatic backlash adjustment**

[M8]

0: Separate backlash adjustment for master axis and slave axis each.

1: Backlash adjustment is applied only to the master axis. The master axis's backlash amount is applied to the slave axis.

(Note 1) Set this parameter for the master axis.

(Note 2) In the case of synchronous control of speed/current command, set to "1".

#2584 VBL2 Vlimit — **Variable backlash compensation 2: Speed to reset compensation scale to 100%**

Specify the speed at which compensation scale is reset to 100%.

When set to "0", this parameter is disabled.

If a set speed is greater than "#2574 VBL2 VBound", the speed is clamped at "#2574 VBL2 VBound".

---Setting range---

0 to 1000000 (mm/min)

#2598 G0tL_2 — **G0 time constant 2 (linear)**

Set a linear control time constant for rapid traverse acceleration/deceleration to be applied when the G0 time constant switchover request signal is ON.

This time constant is enabled when LR (rapid traverse feed with linear acceleration/deceleration) or F (soft acceleration/deceleration) is selected in "#2003 smgst (Acceleration and deceleration modes)".

If #2598 is 0, the time constant set in "#2004 G0tL (G0 time constant)" will be used.

---Setting range---

0 to 4000(ms)

#2599 G0t1_2 — **G0 time constant 2 (primary delay)/2nd-step time constant for soft acceleration/deceleration**

Set a primary-delay time constant for rapid traverse acceleration/deceleration to be applied when the G0 time constant switchover request signal is ON.

This time constant is enabled when R1 (rapid traverse feed with primary delay) or R3 (exponential acceleration and linear deceleration) is selected in "#2003 smgst (Acceleration and deceleration modes)".

If soft acceleration/deceleration is selected, the second-step time constant will be used.

If #2599 is set to 0, the time constant set in "#2005 G0t1 (G0 time constant (primary delay)/2nd-step time constant for soft acceleration/deceleration)" will be used.

---Setting range---

0 to 5000(ms)

(PR) #2614 JH_smgSel — **Jog/handle acceleration/deceleration selection**

Switch jog/handle time constants. Set per axis.

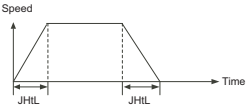
0: Disable

1: (Not used)

2: Enable for handle feed

#2616 JHtL Jog/handle time constant (linear)

Set a linear control time constant for jog/handle feed acceleration/deceleration.
When set to "0", the time constant will be clamped at 1 [ms].



---Setting range---
0 to 4000 (ms)

#2619 thr_clamp Thread cut clamp speed

Specify the maximum cutting feed rate to be applied to thread cutting for each axis.

---Setting range---
1 to 1000000

#2620 thr_t Thread cut time constant

Specify the primary delay time constant to be used in acceleration/deceleration of a thread cut axis.
* This parameter is enabled when either C1 (Primary delay cutting feed) or LC (Linear acceleration/deceleration cutting feed) is selected for the acceleration/deceleration mode (#2003 smgst).

---Setting range---
0 to 4000

#2621 plrapid2 Rapid traverse rate for superimposition control 2

Specify the rapid traverse rate to be applied under 2-axis superimposition control when the axis traverses in the same direction as the other axis that is travelling at a cutting feed rate.

---Setting range---
0 to 1000000(mm/min)

#2622 pl3G0tL G0 time constant (linear) for 3-axis serial superimposition control

Specify the G0 time constant (linear) to be applied under 3-axis serial superimposition control.

---Setting range---
0 to 4000(ms)

#2623 pl3G0t1 G0 time constant (primary delay) for 3-axis serial superimposition control

Specify the G0 time constant (primary delay) to be applied under 3-axis serial superimposition control.

---Setting range---
0 to 5000(ms)

#2624 pl3G1tL G1 time constant (linear) for 3-axis serial superimposition control

Specify the G1 time constant (linear) to be applied under 3-axis serial superimposition control.

---Setting range---
0 to 4000(ms)

#2625 pl3G1t1 G1 time constant (primary delay) for 3-axis serial superimposition control

Specify the G1 time constant (primary delay) to be applied under 3-axis serial superimposition control.

---Setting range---
0 to 5000(ms)

#2626 pl3rapid Rapid traverse rate for 3-axis serial superimposition control

Specify the rapid traverse rate to be applied when all the three superimposed axes are rapid-traversing in a single direction under 3-axis serial superimposition control.

---Setting range---
0 to 1000000(mm/min)

#2627 pl3rapid2 Rapid traverse rate for 3-axis serial superimposition control 2

Specify the rapid traverse rate to be applied under 3-axis serial superimposition control when two of the three superimposed axes are rapid-traversing while the remaining one axis is fed at a cutting feed rate in a single direction.

---Setting range---
0 to 1000000(mm/min)

#2628 pl3rapid3 Rapid traverse rate for 3-axis serial superimposition control 3

Specify the rapid traverse rate to be applied under 3-axis serial superimposition control when one of the three superimposed axes are rapid-traversing while the remaining two axis is fed at a cutting feed rate in a single direction.

---Setting range---
0 to 1000000(mm/min)

#2629 pl3clamp Cutting feed clamp speed for 3-axis serial superimposition control

Specify the cutting feed clamp speed to be applied under 3-axis serial superimposition control when all the three superimposed axes are fed at a cutting feed rate in a single direction.

---Setting range---
0 to 1000000(mm/min)

#2630 pl3clamp2 Cutting feed clamp speed for 3-axis serial superimposition control 2

Specify the cutting feed clamp speed to be applied under 3-axis serial superimposition control when one of the three superimposed axes is rapid-traversing while the other two are fed at a cutting feed rate in a single direction.

---Setting range---
0 to 1000000(mm/min)

#2631 G0olinps **Rapid traverse overlap G00 in-position width**

Specify the in-position width for the rapid traverse overlap at the joint of consecutively given G00 blocks.

---Setting range---

0.000 to 1000.000 (mm)

#2632 G1olinps **Rapid traverse overlap G01 in-position width**

Specify the in-position width for the rapid traverse overlap at the joint of two blocks where G01 is included.

---Setting range---

0.000 to 1000.000 (mm)

#2633 G28olinps **Rapid traverse overlap G28 in-position width**

Specify the in-position width for the rapid traverse overlap at the joint of two blocks where G28/G30 is included.

---Setting range---

0.000 to 1000.000 (mm)

(PR) #2634 SrvFunc01

bit0: Change output units of servo axis cutting torue

Change the output units of the servo axis cutting torque.

0: Output unit 1%

1: Output unit 0.01%

bit1: Select stop method at collision detection

Set the operation when a collision is detected.

0: Emergency stop.

1: Servo alarm occurs to an axis that the collision was detected.

The axes in the part system that the collision was detected will be in an automatic interlocked state.

Related parameters: SV035/bitE-C, SV035/bitB, SV060, CrshStpSel

#2639 tskip_T **Non-sensitive band for torque skip**

Specify a period of time in which torque skip condition is disabled. This is effective when an improper skip is generated due to current flown during acceleration (when G160 is commanded).

---Setting range---

0 to 32767 (ms)

#2641 m_clamp **Manual feed clamp speed**

Specify the maximum speed to be applied to each axis when manual speed clamp is enabled.

When 0 is set, the rapid traverse rate (#2001 rapid) is applied.

---Setting range---

0 to 1000000(mm/min)

#2642 jogfeed **Jog feed rate**

Specify a feed rate to be applied to each axis during jog mode.

When 0 is set, the manual feed rate selected by Manual feedrate method selection (JVS) signal is applied.

---Setting range---

0 to 1000000(mm/min)

(PR) #2643 LdMeter thresholdY **Loadmeter: Caution (Yellow) threshold**

Specify the servo load current (%) at which the loadmeter displays a caution sign (yellow).

If servo load current exceeds the specified value, the loadmeter displays a caution (yellow).

If you wish to avoid showing the caution (yellow), set this parameter to be the same as "#2644 LdMeter thresholdR".

When "0" is set, the value becomes 100% (default).

---Setting range---

0 to 300 (%)

(PR) #2644 LdMeter thresholdR **Loadmeter: Warning (Red) threshold**

Specify the servo load current (%) at which the loadmeter displays a warning sign (red).

If servo load current exceeds the specified value, the loadmeter displays a warning (red).

If you wish to avoid showing the warning (red), set this parameter to be the same as "#2645 LdMeter load max".

When "0" is set, the value becomes 150% (default).

---Setting range---

0 to 300 (%)

(PR) #2645 LdMeter load max **Loadmeter: Maximum servo load current**

Specify the maximum servo load current (%) for loadmeter display.

When "0" is set, the value becomes 200% (default).

---Setting range---

0 to 300 (%)

#2646 distt **Load observation disturbance torque filter time constant**

Set the responsiveness of the process which detects the disturbance torque.

---Setting range---

0 to 1000 (ms) (Default value: 0)

(PR) #2651 RT2G0 **RT2: Minimum value of G0 acce/dece time constant**

Select whether to enable switching of G0 acceleration/deceleration time constant.

0: Disable switching of G0 acceleration/deceleration time constant.

1: Enable switching of G0 acceleration/deceleration time constant.

(PR) #2652 RT2G1 **RT2: Enable switching of G1 acce/dece time constant**

Select whether to enable switching of G1 acceleration/deceleration time constant.

0: Disable switching of G1 acceleration/deceleration time constant.

1: Enable switching of G1 acceleration/deceleration time constant.

#2653 RT2G0tL **RT2: Minimum value of G0 acce/dece time constant**

Set the minimum value of time constant when changing time constant during acceleration and deceleration of G0 command.
Set the time constant which was adjusted when workpiece is not attached.
Note that when 0 is set, the value will be 10 (default).

---Setting range---

0 to 4000(ms)

#2654 RT2G1tLA **RT2: Minimum value of acce/dece time constant after G1 interpolation**

Set the minimum value when changing time constant during acceleration and deceleration of G1 command after interpolation.
Set the time constant which was adjusted when workpiece is not attached.
Note that when 0 is set, the value will be 10 (default).

---Setting range---

0 to 4000(ms)

#2655 RT2G1tLB **RT2: Minimum value of acce/dece time constant before G1 interpolation**

Set the minimum value when changing time constant during acceleration and deceleration of G1 command before interpolation.
Set the time constant which is adjusted when workpiece is not attached.
Note that when 0 is set, the value will be 10 (default).

---Setting range---

0 to 4000(ms)

#2656 RT2 G0rng **RT2: Changing amount of G0 acce/dece time constant**

Set the changing amount of time constant when changing time constant during acceleration and deceleration of G0 command based on the estimated inertia ratio.
Note that when 0 is set, the value will be 10 (default).

---Setting range---

0 to 4000(ms)

#2657 RT2G1rngA **RT2: Changing amount of acce/dece time constant after G1 interpolation**

Set the changing amount of time constant when changing time constant during acceleration and deceleration of G1 command after interpolation based on the estimated inertia ratio.
Note that when 0 is set, the value will be 10 (default).

---Setting range---

0 to 4000(ms)

#2658 RT2G1rngB **RT2: Changing amount of acce/dece time constant before G1 interpolation**

Set the changing amount of time constant when changing time constant during acceleration and deceleration of G1 command before interpolation based on the estimated inertia ratio.
Note that when 0 is set, the value will be 10 (default).

---Setting range---

0 to 4000(ms)

#2659 tolerance **Tolerance**

Specify a tolerance (tolerable error) to be used under tolerance control.
Set a tolerable error for fine segment program created by CAM.
(Usually around 0.01(mm))
If 0.000 is set, it is operated with the tolerance of 0.01(mm).
When designating the tolerance amount with the ", K address", this parameter is not used.

---Setting range---

0.000 to 100.000 (mm)

#2660 omrff_inps **OMR-FF in-position width**

Specify the in-position width at which the standard model gain is switched under OMR-FF control.
When set to "0", command deceleration check is performed.

---Setting range---

0.000 to 99.999 (mm)

#2661 ITF3_ILMT **Interference check III torque limit at entering interference warning area**

In interference check III, select whether to limit the torque at entering the interference warning area.

0: No torque limit
(Use "#2213 SV013 (Current limit value)")

1: Limit the torque
(Use "#2214 SV014 (Current limit value in special control)")

(Note) This setting is invalid if spindle/C axis is the target axis. (Torque cannot be limited.)

#2662 ITF3_Clamp **Interference check III clamp speed at entering interference warning area**

In interference check III, if clamping the speed, the clamp speed is set at entering the interference warning area.
(Note) When "0" is set, the speed will not be clamped.

---Setting range---

0 to 1000000 (mm/min)

#2663 IDD CauThreshold **Motor insulation deterioration: Caution threshold**

[C80]
Set the threshold so that "Z38 Insulation deterioration wrn 0001" could occur.
When performing the insulation deterioration detection and the detected value falls below the parameter setting value, "Z38 Insulation deterioration wrn 0001" occurs.
If "0" is set, the standard value (100[0.1 megohm]) will be applied.

---Setting range---

0 to 300 (0.1 megohm)

	#2664	IDD ChgThreshold	Motor insulation deterioration: Replacement threshold

[C80]
Set the threshold so that "Z38 Insulation deterioration wrn 0002" could occur.
When performing the insulation deterioration detection and the detected value falls below the parameter setting value, "Z38 Insulation deterioration wrn 0002" occurs.
If "0" is set, the standard value (10[0.1 megohm]) will be applied.

---Setting range---
0 to 300 (0.1 megohm)

(PR)	#2674	primno	Multiple axis synchronization control: Master axis No.

[M8]
The parameter setting is used for the multiple axis synchronization control.
Specify the master axis No. that corresponds to the axis.

- Enter the sequential NC axis No., with the 1st axis of the 1st part system set as 1.
- You cannot set the No. of the axis targeted for the multiple axis synchronization control in #1068(slavno).
- You cannot set #1068(slavno) for the axis targeted for the multiple axis synchronization control.
- The master axis for multiple axis synchronization control cannot be set in primno.
- For a multi-part system configuration, you cannot set the axes across different part systems.

---Setting range---
0: No master axis
1 to 32: 1st to 32nd axis

(PR)	#2675	tcmp_top	Multiple axis synchronization control: starting tool offset No.

[M8]
This parameter is used for the multiple axis synchronization control.
Specify the starting tool offset No. for the axis.

---Setting range---
0 to 999

	#14301	valVDC	Variable full-closed torsion compensation ON

[M8]
Select whether to enable or disable the variable full-closed torsion compensation.
0: Disable
1: Enable

	#14302	VDCtex_sc	Variable full-closed torsion compensation: time constant magnification

[M8]
Specify the magnification of time constant for variable full-closed torsion compensation (VDCtex1 to 8).
When unused, set the parameter to 0.

---Setting range---
0 to 9999 (%)

	#14303	VDCpex_sc	Variable full-closed torsion compensation: compensation (+) magnification

[M8]
Specify the magnification of variable full-closed torsion compensation value (+) (VDCpex1 to 8).
When unused, set the parameter to 0.

---Setting range---
0 to 32767 (%)

	#14304	VDCnex_sc	Variable full-closed torsion compensation: compensation (-) magnification

[M8]
Specify the magnification of variable full-closed torsion compensation value (-) (VDCnex1 to 8).
When unused, set the parameter to 0.

---Setting range---
0 to 32767 (%)

	#14305	VDCtex_sft	Variable full-closed torsion compensation: compensation time constant shift

[M8]
Specify the shift amount for variable full-closed torsion compensation time constant (VDCtex1 to 8).
When unused, set the parameter to 0.

---Setting range---
-9999 to 9999 (ms)

	#14306	VDCpex_sft	Variable full-closed torsion compensation: compensation value (+) shift

[M8]
Specify the shift amount for variable full-closed torsion compensation value (+) (VDCpex1 to 8).
When unused, set the parameter to 0.

---Setting range---
-32768 to 32767 (0.01 μm)

	#14307	VDCnex_sft	Variable full-closed torsion compensation: compensation value (-) shift

[M8]
Specify the shift amount for variable full-closed torsion compensation value (-) (VDCnex1 to 8).
When unused, set the parameter to 0.

---Setting range---
-32768 to 32767 (0.01 μm)

#14311+5(n-1)	VDCan	Variable full-closed torsion compensation acceleration n

[M8]
Specify the acceleration at which variable full-closed torsion compensation is applied. (n=1 to 8)
Set the acceleration at reversal of machine travel direction.
When unused, set the parameter to 0.

---Setting range---

0 to 2147483647 ($\mu m/s^2$)

#14312+5(n-1)	VDCtexn	Variable full-closed torsion compensation: compensation time constant n

[M8]
Specify the time constant for variable full-closed torsion compensation. (n=1 to 8)
This sets the timing of applying the variable full-closed torsion compensation.
When 0 is set, the compensation is applied at the timing when the speed reaches the acceleration set in Variable full-closed torsion compensation acceleration n.

---Setting range---

0 to 9999 (ms)

#14313+5(n-1)	VDCpexn	Variable full-closed torsion compensation: compensation value n (+)

[M8]
Specify the compensation value of variable full-closed torsion compensation in the positive (+) direction. (n=1 to 8)
Set the length of torsion (+) at reversal of machine travel direction.
When unused, set the parameter to 0.

---Setting range---

0 to 32767 (0.01 µm)

#14314+5(n-1)	VDCnexn	Variable full-closed torsion compensation: compensation value n (-)

[M8]
Specify the compensation value of variable full-closed torsion compensation in the negative (-) direction. (n=1 to 8)
Set the length of torsion (-) at reversal of machine travel direction.
When unused, set the parameter to 0.

---Setting range---

0 to 32767 (0.01 µm)

2.5 Zero Point Return Parameters

#2025 G28rap G28 rapid traverse rate

Set a rapid traverse rate for the dog type reference position return command.
This is not used for the distance-coded reference position detection.

---Setting range---

1 to 1000000 (mm/min)

#2026 G28crp G28 approach speed

Set up the speed of approach to the reference point in the reference point return command. This speed is attained after the system stops with deceleration by dog detection.
In the distance-coded reference position detection, the set value will be applied from the start of reference position establishment.
(Note) The G28 approach speed unit is (10°/min) only when using the Z-phase type encoder (#1226 aux10/bit3=1) for the spindle/C-axis reference position return type. The same unit is used for both the micrometric and sub-micrometric specifications.

---Setting range---

1 to 60000 (mm/min)

#2027 G28sft Reference position shift distance

Set the distance from the electrical zero-point detection position to the reference position.
This is not used for the distance-coded reference position detection.

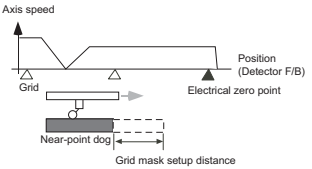
(Note 1) When "#1240 set12/bit2" is ON, a magnification (C: 10-fold, D: 100-fold and E: 1000-fold) corresponding to the input setting unit ("#1003 iunit") will be applied to the setting value.
(Note 2) The sign of setting value is will be following: the direction of "#2030 dir (-) Reference position direction (-)" is plus, and the opposite direction is minus.
(Note 3) When set value is set to minus, the axis moves to electrical zero-point detection position at first and then moves in opposite direction.

---Setting range---

-99.999 to +99.999 (mm)

#2028 grmask Grid mask amount

Set the distance where the grid point will be ignored when near-point dog OFF signals are close to that grid point during reference position return.



The grid mask is valid for one grid.
This is not used for the distance-coded reference position detection.

---Setting range---

0.000 to 99.999 (mm)

#2029 grspc Grid interval

Set the distance between grids.
Generally, set up the value equal to the ball screw pitch. However, if the detector grid interval is not equal to the screw pitch when measured with a linear scale, set up the detector grid interval.
To make the grid space smaller, set a divisor of the grid space.
This is not used for the distance-coded reference position detection.

(Note) Set the grid interval "#2029 grspc" according to the reference encoder for grid interval "#2041 grspcref".
(1) Semi-closed loop control
If "#2041 grspcref" is set to "0" (grid interval by the motor-end), set "#2029 grspc" to the same value as the ball screw pitch.
If "#2041 grspcref" is set to "1" (grid interval by the machine-end), set "#2029 grspc" to the moving amount calculation value per a motor rotation ("#2201 SV001 PC1" / "#2202 SV002 PC2" x "#2218 SV018 PIT").
(2) Full-closed loop control
If "#2041 grspcref" is set to "1" (grid interval by the machine-end), set "#2029 grspc" to the same value as the Z phase pitch.
If "#2041 grspcref" is set to "0" (grid interval by the motor-end), set "#2029 grspc" to the moving amount calculation value per Z phase pitch ("#2202 SV002 PC2" / "#2201 SV001 PC1" x the Z phase pitch of the machine-end).
* If "#2029 grspc" is set to "0", the ball screw pitch (#2218 SV018 PIT) is used instead of the grid interval.

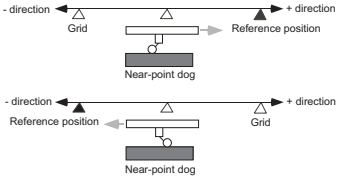
---Setting range---

0.000 to 999.999 (mm)

(PR)	#2030	dir (-)	Reference position direction (-)

Select which side of the near-point dog the reference position is established.
For a rotary axis, select a direction that heads to the zero point from the intermediate point during automatic zero point return.
0: Positive direction
1: Negative direction

Directions in which reference position is established as viewed from the near-point dog



	#2031	noref	Axis without reference position

Select whether the reference position is provided for the axis.
0: Reference position is provided. (Normal controlled axis)
1: No reference position is provided.
When "1" is set, reference position return is not required before automatic operation starts.

	#2032	nochk	Whether reference position return is completed not checked

Select whether to check the reference position return completion.
0: Check the reference position return completion.
1: Not check the reference position return completion.
When "1" is set, the absolute and incremental commands can be executed even if dog type (or Z phase pulse system) reference position return is not completed.
Note that this setting is available for a rotary axis only.

(PR)	#2033	zp_no	Z phase pulse system reference position return spindle encoder No.

Not used. Set to "0".

(PR)	#2034	rfpofs	Distance-coded reference position detection offset

Set the offset value from the position for the initial reference position setting to the machine's actual basic point in reference position return in the distance-coded reference position detection.
Input the value of the machine value counter that is displayed immediately after the reference position is established.
When the power is turned ON and this parameter is set to "0", the manual reference position return is regarded as initial reference position setting.
If this parameter is set to "0", automatic operation won't be available.

---Setting range---

-99999.999 to 99999.999 (mm)

	#2035	srchmax	Distance-coded reference position detection scan distance

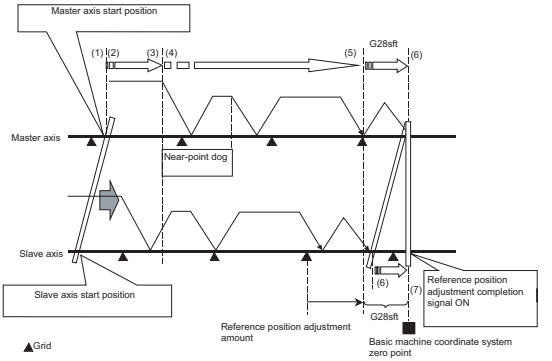
Set the maximum distance for scanning the reference marks when the reference position is not established in the distance-coded reference position detection.
For the scan distance, set the distance that fully covers the number of reference marks as you wish to detect.
(Example) When adding about 10% of additional coverage:
Scan distance = Base reference mark interval [mm] * 2 * 1.1

---Setting range---

0.000 to 99999.999 (mm)

#2036	slv_adjust	Reference position adjustment value

Set the distance from the first grid point after leaving the near point dog on the slave axis to the position where the reference position is actually established in dog-type reference position return in synchronous control. (Reference position shift amount is not included.)
The adjustment value will be automatically set in the slave axis's parameter according to the reference position adjustment complete signal from PLC.
Fine adjustment is also available from the parameter screen.
In the distance-coded reference position detection, the reference position adjustment value will be invalid.



(Note 1) This parameter is enabled when the synchronization at zero point initialization ("#1493 ref_syn" = "1" of the master axis) is applied.
(Note 2) This parameter can be set when one of the following settings is applied.
- Relative position detection ("#2049 type" = "0")
- Dog-type absolute position detection ("#2049 type" = "3")
- Simple absolute position ("#2049 type" = "9")

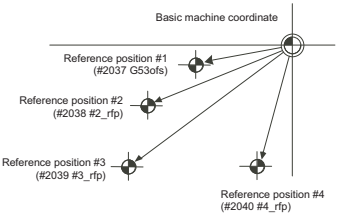
(Note 3) Set "0" when using the speed/current command synchronization control.
(Note 4) A setting unit of this parameter is [mm]. It is not influenced by the content of the following parameters setting.
- "#1003 iunit"
- "#1004 ctrl_unit"
- "#1005 plcunit"
- "#1040 M_inch"
- "#1041 I_inch"
- "#1240 set12/bit2" (Zero point shift amount magnification)

(Note 5) The number of the significant digits after decimal point follows "#1004 ctrl_unit"
(Note 6) A change of this parameter requires reference position return. When the automatic operation starts without reference position return, an alarm will occur.

---Setting range---
0 to 99999.999999 (mm)

#2037	G53ofs	Reference position #1

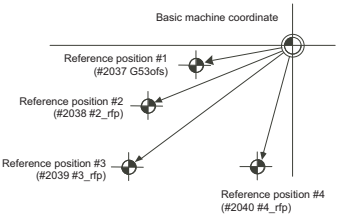
Set the position of the first reference position from the zero point of the basic machine coordinate.



---Setting range---
-99999.999 to 99999.999 (mm)

#2038 #2_rfp Reference position #2

Set the position of the second reference position from the zero point of the basic machine coordinate.

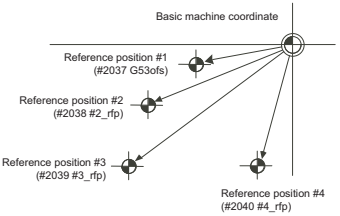


---Setting range---

-99999.999 to 99999.999 (mm)

#2039 #3_rfp Reference position #3

Set the position of the third reference position from the zero point of the basic machine coordinate.

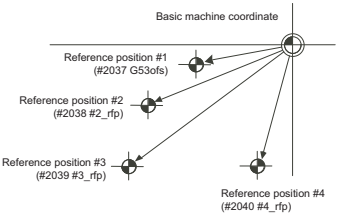


---Setting range---

-99999.999 to 99999.999 (mm)

#2040 #4_rfp Reference position #4

Set the position of the fourth reference position from the zero point of the basic machine coordinate.



---Setting range---

-99999.999 to 99999.999 (mm)

#2041 grspcref Reference encoder for grid interval

[M8]

Select the reference encoder (motor-end or machine-end) based on which the grid interval "#2029 grspc" is set.

0: Motor-end

1: Machine-end

(Note) When an MPI scale made by Mitsubishi Heavy Industries Machine Tool Co., Ltd. is used, set the zero point return parameters so that Z phase of the MPI scale becomes the grid point (electric basic position), and then perform zero point initialization setting.

[C80]

Not used.

2.6 Absolute Position Detection Parameters

(PR) #2049 type Absolute position detection method

Select the absolute position zero point alignment method.
0: Not absolute position detection
1: Stopper method (push against mechanical stopper)
2: Marked point alignment method I (The grid point is the reference position.)
3: Dog-type (align with dog and near point detection switch)
4: Marked point alignment method II (The position with which the mark was aligned is the reference position.)
9: Simple absolute position (Not absolute position detection, but the position when the power is turned off is registered.)

#2050 absdir Basic point of Z direction

Select the direction of the grid point immediately before the machine basic position (basic point of detector) in the marked point alignment.
0: Positive direction
1: Negative direction

#2051 check Check

Set the tolerable range of travel distance (deviation distance) while the power is turned OFF.
If the difference of the positions when the power is turned OFF and when turned ON again is larger than this value, an alarm will be output.
Set "0" to omit the check.
---Setting range---
0 to 99999.999 (mm)

#2054 clpush Current limit (%)

Set the current limit value during the stopper operation in the dogless-type absolute position detection.
The setting value is the ratio of the current limit value to the rated current value.
---Setting range---
0 to 100 (%)

#2055 pushf Push speed

Set the feedrate for the automatic initial setting during stopper method.
---Setting range---
1 to 999 (mm/min)

#2056 aproch Approach

Set the approach distance of the stopper when deciding the absolute position basic point with the stopper method.
After using stopper once, the tool returns with this distance, and then use stopper again.
---Setting range---
0 to 999.999 (mm)

#2057 nrefp Near zero point +

Set the positive direction width where the near reference position signal is output.
When set to "0", the value is the same as #2218 SV018(PIT).
(Note) When "#1240 set12/bit2" is ON, a magnification (C: 10-fold, D: 100-fold, E:1000-fold) corresponding to the input setting increment ("#1003 iunit") will be applied to the setting value.
---Setting range---
0 to 999.999 (mm)
(Input setting increment applied)

#2058 nrefn Near zero point -

Set the negative direction width where the near reference position signal is output.
When set to "0", the value is the same as #2218 SV018(PIT).
(Note) When "#1240 set12/bit2" is ON, a magnification (C: 10-fold, D: 100-fold, E:1000-fold) corresponding to the input setting increment ("#1003 iunit") will be applied to the setting value.
---Setting range---
0 to 999.999 (mm)
(Input setting increment applied)

#2059 zerbas Select zero point parameter and basic point

Select which is to be the zero point coordinate position during absolute position initial setting.
0: Position where the axis was stopped.
1: Grid point just before stopper.

2.7 Servo Parameters

(PR) #2201 SV001 PC1 Motor side gear ratio

Set the gear ratio in the motor side when there is the gear between the servo motor's shaft and machine (ball screw, etc.).
For the rotary axis, set the total deceleration (acceleration) ratio.
Even if the gear ratio is within the setting range, the electronic gears may overflow and an initial parameter error (servo alarm 37) may occur.

For linear servo system
Set to "1".

---Setting range---
1 to 32767

(PR) #2202 SV002 PC2 Machine side gear ratio

Set the gear ratio in the machine side when there is the gear between the servo motor's shaft and machine (ball screw, etc.).
For the rotary axis, set the total deceleration (acceleration) ratio.
Even if the gear ratio is within the setting range, the electronic gears may overflow and an initial parameter error (servo alarm 37) may occur.

For linear servo system
Set to "1".

---Setting range---
1 to 32767

#2203 SV003 PGN1 Position loop gain 1

Set the position loop gain. The standard setting is "33".
The higher the setting value is, the more accurately the command can be followed, and the shorter the settling time in positioning gets, however, note that a bigger shock will be applied to the machine during acceleration/deceleration.
When using the SHG control, also set SV004 (PGN2) and SV057 (SHGC).

When using the OMR-FF control, set the servo rigidity against quadrant projection or cutting load, etc.
For the tracking ability to the command, set by SV106(PGM).

---Setting range---
1 to 200 (rad/s)

#2204 SV004 PGN2 Position loop gain 2

When performing the SHG control, set the value of "SV003 x 8/3" to "SV004".
When not using the SHG control, set to "0".
When using the OMR-FF control, set to "0".

Related parameters: SV003, SV057

---Setting range---
0 to 999 (rad/s)

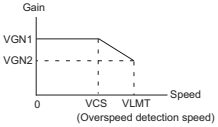
#2205 SV005 VGN1 Speed loop gain 1

Set the speed loop gain.
The higher the setting value is, the more accurate the control will be, however, vibration tends to occur.
If vibration occurs, adjust by lowering by 20 to 30%.
The value should be determined to the 70 to 80% of the value at which the vibration stops.
The value differs depending on servo motors.
Aim at the standard value determined by the servo motor type and load inertia ratio to adjust.

---Setting range---
1 to 30000

#2206 SV006 VGN2 Speed loop gain 2

Set the speed loop gain at the motor limitation speed VLMT (maximum rotation speed x 1.15) with "VCS(SV029: Speed at the change of speed loop gain)".
Use this to suppress noise at high speed rotation during rapid traverse, etc. Then, the speed loop gain decreases at faster speed than the setting value of VCS. When not using, set to "0".



---Setting range---
-1000 to 30000

#2207 SV007 VIL Speed loop delay compensation

Set this when the limit cycle occurs in the full-closed loop, or overshooting occurs in positioning. The speed loop delay compensation method can be selected with SV027/bit1,0.
Normally, use "Changeover type 2". Changeover type 2 controls the occurrence of overshooting by lowering the speed loop lead compensation after the position droop gets 0.
When setting this parameter, make sure to set the torque offset (SV032).

---Setting range---
0 to 32767

#2208 SV008 VIA Speed loop lead compensation

Set the gain of the speed loop integral control.
Standard setting: 1364
Standard setting in the SHG control: 1900
Adjust the value by increasing/decreasing this by about 100 at a time.
Raise this value to improve contour tracking accuracy in high-speed cutting.
Lower this value when the position droop does not stabilize (when the vibration of 10 to 20Hz occurs).

---Setting range---
1 to 9999

#2209 SV009 IQA Current loop q axis lead compensation

Set the fixed value of each motor.
Set the standard value for each motor described in the standard parameter list.

---Setting range---

1 to 20480

#2210 SV010 IDA Current loop d axis lead compensation

Set the fixed value of each motor.
Set the standard value for each motor described in the standard parameter list.

---Setting range---

1 to 20480

#2211 SV011 IQG Current loop q axis gain

Set the fixed value of each motor.
Set the standard value for each motor described in the standard parameter list.

---Setting range---

1 to 8192

#2212 SV012 IDG Current loop d axis gain

Set the fixed value of each motor.
Set the standard value for each motor described in the standard parameter list.

---Setting range---

1 to 8192

#2213 SV013 ILMT Current limit value

Set the current (torque) limit value in a normal operation.
This is a limit value in forward run and reverse run (for linear motors: forward and reverse direction).
When the standard setting value is "800", the maximum torque is determined by the specification of the motor.
Set this parameter as a proportion (%) to the stall current.

---Setting range---

0 - 999 (Stall current %)

#2214 SV014 ILMTsp Current limit value in special control

Set the current (torque) limit value in a special operation (absolute position initial setting, stopper control and etc.).
This is a limit value in forward and reverse directions.
Set to "800" when not using.
Set this parameter as a proportion (%) to the stall current.

---Setting range---

0 - 999 (Stall current %)
However, when SV084/bitB=1, the setting range is from 0 to 32767 (Stall current 0.01%).

#2215 SV015 FFC Acceleration rate feed forward gain

When a relative error in synchronous control is too large, set this parameter to the axis that is delaying.
The standard setting is "0". The standard setting in the SHG control is "100".
To adjust a relative error in acceleration/deceleration, increase the value by 50 at a time.

---Setting range---

0 to 999 (%)

#2216 SV016 LMC1 Lost motion compensation 1

Set this parameter when the protrusion (that occurs due to the non-sensitive band by friction, torsion, backlash, etc.) at quadrant change is too large. This sets the compensation torque at quadrant change (when an axis feed direction is reversed) by the proportion (%) to the stall torque. Whether to enable the lost motion compensation and the method can be set with other parameters.

Type 2: When SV027/bit9, 8=10 (Compatible with obsolete type)
Set the type 2 method compensation torque. The standard setting is double the friction torque.
Related parameters: SV027/bit9,8, SV033/bitF, SV039, SV040, SV041, SV082/bit2

Type 3: When SV082/bit1=1
Set the compensation torque equivalent of dynamic friction amount of the type 3 method compensation amount. The standard setting is double the dynamic friction torque.
Related parameters: SV041, SV082/bit2,1, SV085, SV086

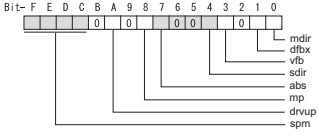
To vary compensation amount according to the direction.
When SV041 (LMC2) is "0", compensate with the value of SV016 (LMC1) in both +/-directions.
If you wish to change the compensation amount depending on the command direction, set this and SV041 (LMC2).
(SV016: + direction, SV041: - direction. However, the directions may be opposite depending on other settings.)
When "-1" is set, the compensation will not be performed in the direction of the command.

---Setting range---

-1 to 200 (Stall current %)
Note that when SV082/bit2 is "1", the setting range is between -1 and 20000 (Stall current 0.01%).

(PR) #2217 SV017 SPEC1 Servo specification 1

Select the servo specifications.
A function is allocated to each bit.
Set this in hexadecimal format.



bit F-C : spm Motor series selection
0: Not used
1: 200V HG motor (Standard)
2: Not used
3: 400V HG-H, HQ-H motor (Standard)
6: 200V LM-F linear motor
7: 200V direct-drive motor
8: 400V LM-F linear motor
9: 400V direct-drive motor
bit B :
Not used. Set to "0".
bit A : drvup Combined drive unit:
0: Normal setting (Combined drive unit: normal)
1: Combined drive unit: one upgrade
bit 9 :
Not used. Set to "0".
bit 8 : mp MPI scale pole number setting
0: 360 poles 1: 720 poles
bit 7 : abs Position control
These parameters are set automatically by the NC system.
0: Incremental 1: Absolute position control
bit 6-5 :
Not used. Set to "0".
bit 4 : sdir Sub side encoder feedback
Set the machine side encoder's installation polarity.
0: Forward polarity 1: Reverse polarity
bit 3 : vfb Speed feedback filter
0: Stop 1: Start (4500Hz)
bit 2 : seqh Ready on sequence
0: Normal 1: High-speed
bit 1 : dfbx Dual feedback control
Control the position FB signal in full closed control by the combination of a motor side encoder and machine side encoder.
0: Stop 1: Start

Related parameters: SV051, SV052
bit 0 : mdir Machine side encoder feedback (for Linear/direct-drive motor)
Set the encoder installation polarity in the linear servo and direct-drive motor control.
0: Forward polarity 1: Reverse polarity

(PR) #2218 SV018 PIT Ball screw pitch/Magnetic pole pitch

For servo motor:
Set the ball screw pitch. For the rotary axis, set to "360".

For direct-drive motor
Set to "360".

For linear motor
Set the ball screw pitch. (For LM-F series, set to "48")

---Setting range---
For general motor: 1 to 32767 (mm/rev)
- For linear motor 1 to 32767 (mm)

(PR) #2219 SV019 RNG1 Sub side encoder resolution

For semi-closed loop control
Set the same value as SV020.

For full-closed loop control
Set the number of pulses per ball screw pitch.

For direct-drive motor
Set the same value as SV020.

For 1000 pulse unit resolution encoder, set the number of pulses in SV019 in increments of 1000 pulse (kp).
The value must be input in increments of 10K pulses (the 1st digit of the setting value is "0").
In this case, make sure to set "0" to SV117.
For high-accuracy binary resolution encoder, set the number of pulses to four bite data of SV117 (high-order) and SV019 (low-order) in pulse (p) unit.
SV117 = number of pulses / 65536 (when =0, set "-1" to SV117)
SV019 = the remainder of number of "pulses / 65536"

---Setting range---
When SV117 = 0, the setting range is from 0 to 32767 (kp)
When SV117≠0
For M800/M80 Series: 0 to 65535 (p)

(PR) #2220 SV020 RNG2 Main side encoder resolution

Normally, set to "0".

For linear motor
Set the number of pulses of the encoder per magnetic pole pitch with SV118.

For direct-drive motor
Set the number of pulses per revolution of the motor side encoder.

For 1000 pulse unit resolution encoder, set the number of pulses to SV020 in increments of 1000 pulse(kp).
The value must be input in increments of 10K pulses (the 1st digit of the setting value is "0").
In this case, make sure to set SV118 to "0". For high-accuracy binary resolution encoder, set the number of pulses to four bite data of SV118 (high-order) and SV020 (low-order) in pulse(p) unit.
SV118 = number of pulses / 65536 (when =0, set "-1" to SV118)
SV019 = the remainder of "number of pulses / 65536"

---Setting range---

When SV118 = 0, the setting range is from 0 to 32767 (kp)
When SV118≠0
For M800/M80 Series: 0 to 65535 (p)

#2221 SV021 OLT Overload detection time constant

Normally, set to "60". (For Mitsubishi adjustment.)

Related parameters: SV022

---Setting range---

1 to 999 (s)

#2222 SV022 OLL Overload detection level

Set the "Overload 1" (Alarm 50) current detection level as percentage to the stall current.
Normally set this parameter to "150". (For Mitsubishi adjustment.)

Related parameters: SV021

---Setting range---

110 to 500 (Stall current %)

#2223 SV023 OD1 Excessive error detection width during servo ON

Set the excessive error detection width in servo ON.
When set to "0", the excessive error alarm detection will be ignored, so do not set to "0".
<Standard setting value>
OD1=OD2= (Rapid traverse rate [mm/min]) / (60×PGN1) / 2 [mm]

Related parameters: SV026

---Setting range---

0 to 32767 (mm)
However, when SV084/bitC=1, the setting range is from 0 to 32767 (μm).

#2224 SV024 INP In-position detection width

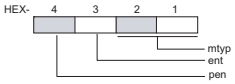
Set the in-position detection width.
Set the positioning accuracy required for the machine.
The lower the setting is, the higher the positioning accuracy will be. However the cycle time (settling time) becomes longer.
The standard setting value is "50".

---Setting range---

1 to 32767 (μm)

(PR) #2225 SV025 MTYP Motor/Encoder type

Set the position encoder type, speed encoder type and motor type.
The setting value is a four-digit hex (HEX).



bit F-C: pen(HEX-4) Position encoder
Semi-closed loop control by general motor
pen=2

Full-closed loop control by general motor
- Ball screw end encoder (OSA405ET2AS, OSA676ET2AS)
  pen=6
- For serial signal output rotary scale (including MDS-EX-HR)
  pen=6
- For rectangular wave signal output linear scale
  pen=8
- For serial signal output linear scale (including MDS-EX-HR and MPI scale)
  pen=A
- For speed command synchronization control
  Primary axis pen=A
  Secondary axis pen=D

For linear motor
pen=A

For direct-drive motor
pen=2

bit B-8: ent(HEX-3) Speed encoder
For general motor: ent=2
For linear motor: ent=A
For direct-drive motor: ent=2

bit 7-0: mtyp(HEX-2,1) Motor type
Set the motor type. Set this with SV017/bitF-C.

For SV017/bitF-C = 1 (200V standard motor series)

HG75	: 41h	HG123	: 64h
HG105	: 42h	HG142	: 65h
HG54	: 43h	HG46	: BAh
HG104	: 44h	HG56	: BBh
HG154	: 45h 4Fh(Note 1)	HG96	: BCh
HG224	: 46h		
HG204	: 47h		
HG354	: 48h		
HG223	: 66h		
HG303	: 68h		
HG453	: 49h		
HG703	: 4Ah		
HG903	: 4Bh		
HG302	: 67h		

(Note 1) When MDS-E-V3 is connected

For SV017/bitF-C = 3 (400V standard motor series)

HG-H75	: 41h	HQ-H903	: 58h
HG-H105	: 42h	HQ-H1103	: 59h
HG-H54	: 43h		
HG-H104	: 44h		
HG-H154	: 45h		
HG-H204	: 47h		
HG-H354	: 48h		
HG-H453	: 49h		
HG-H703	: 4Ah		
HG-H903	: 4Bh		
HG-H1502	: 4Dh		

For linear motor and direct-drive motor, follow the settings stated in respective materials.

#2226 SV026 OD2 Excessive error detection width during servo OFF

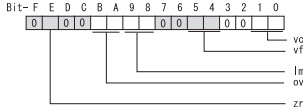
Set the excessive error detection width during servo OFF.
When set to "0", the excessive error alarm detection will be ignored, so do not set to "0".
<Standard setting value>
OD1=OD2= (Rapid traverse rate [mm/min]) / (60×PGN1) / 2 [mm]

Related parameters: SV023

---Setting range---
0 to 32767 (mm)
However, when SV084/bitC=1, the setting range is from 0 to 32767 (μm).

#2227 SV027 SSF1 Servo function 1

Select the servo functions.
A function is assigned to each bit.
Set this in hexadecimal format.



bit F :
Not used. Set to "0".
bit E : zrn2
Set to "1". (Fixed)
bit D :
Not used. Set to "0".
bit C :
Not used. Set to "0".
bit B-A : ovs Overshooting compensation
Set this if overshooting occurs during positioning.
bitB,A=
00: Compensation stop
01: Setting prohibited
10: Setting prohibited
11: Type 3
Set the compensation amount in SV031(OVS1) and SV042(OVS2).

Related parameters: SV031, SV042, SV034/bitF-C
bit 9-8 : lmc Lost motion compensation type
Set this parameter when the protrusion at quadrant change is too large.
Type 2 has an obsolete type compatible control.
bit9,8=
00: Compensation stop
01: Setting prohibited
10: Type 2
11: Setting prohibited
Set the compensation amount in SV016(LMC1) and SV041(LMC2).
(Note) When "SV082/bit1=1", the lost motion compensation type 3 will be selected regardless of this setting.
bit 7 :
Not used. Set to "0".
bit 6 :
Not used. Set to "0".
bit 5-4 : vfct Jitter compensation pulse number
Suppress vibration by machine backlash when axis stops.
bit5,4=
00: Disable
01: 1 pulse
10: 2 pulse
11: 3 pulses
bit 3 :
Not used. Set to "0".
bit 2 :
Not used. Set to "0".
bit 1-0 : vcnt Speed loop delay compensation changeover type selection
Normally, use "Changeover type 2".
bit1,0=
00: Disable
01: Changeover type 1
10: Changeover type 2
11: Setting prohibited

Related parameters: SV007

(PR) #2228 SV028 MSFT Magnetic pole shift amount (for linear/direct-drive motor)

Set this parameter to adjust the motor magnetic pole position and encoder's installation phase when using linear motors or direct-drive motors.
During the DC excitation of the initial setup (SV034/bit4=1), set the same value displayed in "AFLT gain" on the NC monitor screen.

Related parameters: SV034/bit4, SV061, SV062, SV063

For general motor:
Not used. Set to "0".
---Setting range---
-18000 to 18000 (electrical angle 0.01°)

#2229 SV029 VCS Speed at the change of speed loop gain

Noise at high speed rotation including rapid traverse can be reduced by lowering the speed loop gain at high speeds.
Set the speed at which the speed loop gain changes. Use this with SV006 (VGN2).
When not using, set to "0".
---Setting range---
0 to 9999 (r/min)

#2230 SV030 IVC Voltage non-sensitive band compensation

When 100% is set, the voltage reduction amount equivalent to the logical non-energization in the PWM control will be compensated.
When "0" is set, 100% compensation will be performed.
Adjust in increments of 10% from the default value of 100%.
If increased too much, vibration or vibration noise may be generated.

---Setting range---

0 to 255 (%)

#2231 SV031 OVS1 Overshooting compensation 1

This compensates the motor torque when overshooting occurs during positioning. This is valid only when the overshooting compensation (SV027/bitB,A) is selected.

Type 3 SV027/bitB,A=11

Set the compensation amount based on the motor stall current. Observing positioning droop waveform, increase in increments of 1% and find the value where overshooting does not occur.

To vary compensation amount depending on the direction.

When SV042 (OVS2) is "0", change the SV031 (OVS1) value in both of the +/- directions to compensate.
To vary the compensation amount depending on the command direction, set this and SV042 (OVS2).
(SV031: + direction, SV042: - direction. However, the directions may be opposite depending on other settings.)
When "-1" is set, the compensation will not be performed in the direction of the command.

Related parameters: SV027/bitB,A, SV034/bitF-C, SV042, SV082/bit2

---Setting range---

-1 to 100 (Stall current %)
Note that the range will be "-1 - 10000" (Stall current 0.01%) when SV082/bit2 is "1".

#2232 SV032 TOF Torque offset

Set the unbalance torque on vertical axis and inclined axis.
When the vertical axis pull up function is enabled, the pull up compensation direction is determined by this parameter's sign. When set to "0", the vertical axis pull up will not be executed.
This can be used for speed loop delay compensation and collision detection function.
To use load inertia estimation function (drive monitor display), set this parameter, friction torque (SV045) and load inertia display enabling flag(SV035/bitF).

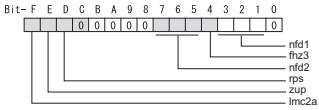
Related parameters: SV007, SV033/bitE, SV059

---Setting range---

-100 to 100 (Stall current %)

#2233 SV033 SSF2 Servo function 2

Select the servo functions.
A function is assigned to each bit.
Set this in hexadecimal format.



bit F : lmc2a Lost motion compensation 2 timing
0: Normal 1: Change
bit E : zup Vertical axis pull up function
0: Stop 1: Enable

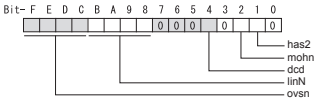
Related parameters: SV032, SV095
bit D : rps Safely limited speed setting increment
Change the setting units of the specified speed signal output speed (SV073).

0: mm/min 1: 100mm/min

Related parameters: SV073
bit C-8 :
Not used. Set to "0".
bit 7-5 : nfd2 Depth of Notch filter 2
Set the depth of Notch filter 2 (SV046).
bit7,6,5=
000: -∞
001: -18.1[dB]
010: -12.0[dB]
011: -8.5[dB]
100: -6.0[dB]
101: -4.1[dB]
110: -2.5[dB]
111: -1.2[dB]
bit 4 : fhz3 Notch filter 3
0: Stop 1: Start (1125Hz)
bit 3-1 : nfd1 Depth of Notch filter 1
Set the depth of Notch filter 1 (SV038).
bit3,2,1=
000: -∞
001: -18.1[dB]
010: -12.0[dB]
011: -8.5[dB]
100: -6.0[dB]
101: -4.1[dB]
110: -2.5[dB]
111: -1.2[dB]
bit 0 :
Not used. Set to "0".

#2234 SV034 SSF3 Servo function 3

Select the servo functions.
A function is assigned to each bit.
Set this in hexadecimal format.



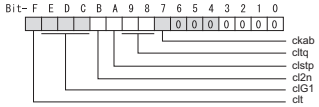
bit F-C: ovsn Overshooting compensation type 3 Non-sensitive band
Set the non-sensitive band of the model position droop overshooting amount in increments of 2µm. In the feed forward control, set the non-sensitive band of the model position droop and ignore the overshooting of the model.
0 : 0 µm, 1: 2 µm, 2: 4µm,---, E : 28 µm, F: 30µm
bit B-8 : linN The number of parallel connections when using linear motors (for linear)
Set to"2" to perform 1 amplifier 2 motor control by linear servo.
bit 7-5 :
Not used. Set to "0".
bit 4 : dcd (linear/direct-drive motor)
0: Normal setting 1: DC excitation mode

Related parameters: SV061, SV062, SV063
bit 3 :
Not used. Set to "0".
bit 2 : mohn Thermistor temperature detection (linear/direct-drive motor)
0: Normal setting 1: Disable
bit 1 : has HAS control
This stabilizes the speed overshooting by torque saturation phenomenon.
0: Normal setting 1: Enable

Related parameters: SV084/bitF
bit 0 :
Not used. Set to "0".

#2235 SV035 SSF4 Servo function 4

Select the servo functions.
A function is assigned to each bit.
Set this in hexadecimal format.



bit F: clt Inertia ratio display

0: Setting for normal use

1: Display the total inertia ratio estimated at acceleration/deceleration at the inertia ratio on the servo monitor screen
To display it on the screen, set an imbalance torque and friction torque to both SV032 and SV045 and repeat acceleration/deceleration operations for several times.

bit E-C: clG1 G1 Collision detection level

Set the collision detection level in the collision detection method 1 during cutting feed (G1) in multiples of that of rapid traverse (G0). When set to "0", detection of collision detection method 1 during cutting feed will be ignored.

G1 Collision detection level = G0 collision detection level (SV060) × clG1

bit B: cl2n Collision detection method 2

0: Enable 1: Disable

bit A: clstp Collision detection method 1 disabled during stop

0: Collision detection method 1 enabled during stop

1: Collision detection method 1 disabled during stop

bit 9-8: cltq Retract torque in collision detection

Set the retract torque in collision detection using the ratio of motor's maximum torque.

bit9,8=

00: 100%

01: 90%

10: 80% (Standard)

11: 70%

bit 7: ckab No signal detection 2

Set this to use rectangular wave output linear scale.
This enables the detection of No signal 2 (alarm 21).

0: Disable 1: Enable

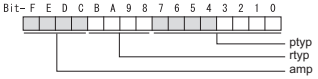
bit 6-0:

Not used. Set to "0".

(PR) #2236 SV036 PTYP Power supply type/ Regenerative resistor type

MDS-E/EH Series: Power supply type

When connecting a power supply unit, set a code for each power supply unit.



bit F-C : amp

Set the power backup function to be used.

No function used : 0
Deceleration and stop function at power failure : 8
Retraction function at power failure : C

bit B-8 : rtyp

Not used. Set to "0".

bit 7-0 : ptyp External emergency stop setting

When the emergency stop input signal of the power supply unit is "disabled"

Power supply unit is not connected	: 00
MDS-E-CV-37 / MDS-EH-CV-37	: 04
MDS-E-CV-75 / MDS-EH-CV-75	: 08
MDS-E-CV-110 / MDS-EH-CV-110	: 11
MDS-E-CV-185 / MDS-EH-CV-185	: 19
MDS-E-CV-300 / MDS-EH-CV-300	: 30
MDS-E-CV-370 / MDS-EH-CV-370	: 37
MDS-E-CV-450 / MDS-EH-CV-450	: 45
MDS-E-CV-550 / MDS-EH-CV-550	: 55
MDS-EH-CV-750	: 75

When the emergency stop input signal of the power supply unit is "enabled"
(Note) Set the power supply rotary switch to "4".

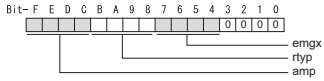
Power supply unit is not connected	: 00
MDS-E-CV-37 / MDS-EH-CV-37	: 44
MDS-E-CV-75 / MDS-EH-CV-75	: 48
MDS-E-CV-110 / MDS-EH-CV-110	: 51
MDS-E-CV-185 / MDS-EH-CV-185	: 59
MDS-E-CV-300 / MDS-EH-CV-300	: 70
MDS-E-CV-370 / MDS-EH-CV-370	: 77
MDS-E-CV-450 / MDS-EH-CV-450	: 85
MDS-E-CV-550 / MDS-EH-CV-550	: 95
MDS-EH-CV-750	: B5

MDS-EM/EMH Series

Not used. Set to "0000".
External emergency stop power supply type is set by spindle parameter (SP032).

MDS-EJ/EJH Series: Regenerative resistor type

Set the regenerative resistor type.



bit F-8 : amp(bit F-C) / rtyp(bit B-8)

Resistor built-in drive unit	: 10
Setting prohibited	: 11
MR-RB032	: 12
MR-RB12 or GZG200W39OHMK	: 13
MR-RB32 or GZG200W120OHMK 3 units connected in parallel	: 14
MR-RB30 or GZG200W39OHMK 3 units connected in parallel	: 15
MR-RB50 or GZG300W39OHMK 3 units connected in parallel	: 16
MR-RB31 or GZG200W20OHMK 3 units connected in parallel	: 17
MR-RB51 or GZG300W20OHMK 3 units connected in parallel	: 18
Setting prohibited	: 19-1F
Setting prohibited	: 20-23
FCUA-RB22	: 24
FCUA-RB37	: 25
FCUA-RB55	: 26
FCUA-RB75/2	: 27
Setting prohibited	: 28
R-UNIT2	: 29
Setting prohibited	: 2A-2C
FCUA-RB75/2 2 units connected in parallel	: 2D
FCUA-RB55 2 units connected in parallel	: 2E
Setting prohibited	: 2F
MR-RB1H-4	: 33
MR-RB3M-4	: 34
MR-RB3G-4	: 35
MR-RB5G-4	: 36

bit 7-4 : emgx External emergency stop function

Set the external emergency stop function.
0: Disable 4: Enable

bit 3-0 :

Not used. Set to "0".

#2237 SV037 JL Load inertia scale

Set the motor axis conversion total load inertia including motor itself in proportion to the motor inertia.
SV037(JL)=(Jm+Jl)/Jm×100
Jm: Motor inertia
Jl: Motor axis conversion load inertia

For linear motor, set the gross mass of the moving sections in kg unit.

<<Drive monitor load inertia ratio display>>
Set SV035/bitF=1 and imbalance torque and friction torque to both SV032 and SV045, and then repeat acceleration/deceleration for several times.

---Setting range---
For general motor: 0 to 5000 (%)
For linear motor 0 to 5000 (kg)

#2238 SV038 FHz1 Notch filter frequency 1

Set the vibration frequency to suppress when machine vibration occurs.
(Normally, do not set 80 or less.)
Set to "0" when not using.

Related parameters: SV033/bit3-1, SV115

---Setting range---
0 to 5000 (Hz)

#2239 SV039 LMCD Lost motion compensation timing

Set this when the timing of lost motion compensation type 2 does not match.
Adjust increments of 10 at a time.

---Setting range---
0 to 2000 (ms)

#2240 SV040 LMCT Lost motion compensation non-sensitive band

Set the non-sensitive band of the lost motion compensation in the feed forward control.
When "0" is set, 2μm is the actual value to be set. Adjust increments of 1μm.

---Setting range---
0 to 255 (μm)

#2241 SV041 LMC2 Lost motion compensation 2

Set this with SV016 (LMC1) only when you wish to vary the lost motion compensation amount depending on the command directions.
Normally, set to "0".

---Setting range---
-1 to 200 (Stall current %)
Note that when SV082/bit2 is "1", the setting range is between -1 and 20000 (Stall current 0.01%).

#2242 SV042 OVS2 Overshooting compensation 2

Set this with SV031 (OVS1) only when you wish to vary the overshooting compensation amount depending on the command directions.
Normally, set to "0".

---Setting range---
-1 to 100 (Stall current %)
Note that when SV082/bit2 is "1", the setting range is between -1 and 10000 (Stall current 0.01%).

#2243 SV043 OBS1 Disturbance observer filter frequency

Set the disturbance observer filter band.
Normally, set to "100". Setting values of 49 or less is equal to "0" setting.
To use the disturbance observer, also set SV037 (JL) and SV044 (OBS2).
When disturbance observer related parameters are changed, lost motion compensation needs to be readjusted.
Set to "0" when not using.

---Setting range---
0 to 1000 (rad/s)

#2244 SV044 OBS2 Disturbance observer gain

Set the disturbance observer gain. The standard setting is "100 to 300".
To use the disturbance observer, also set SV037 (JL) and SV043 (OBS1).
When disturbance observer related parameters are changed, lost motion compensation needs to be readjusted.
Set to "0" when not using.

---Setting range---
0 to 500 (%)

#2245 SV045 TRUB Friction torque

Set the frictional torque when using the collision detection function.
To use load inertia estimation function (drive monitor display), set this parameter, imbalance torque (SV032) and load inertia display enabling flag (SV035/bitF).

---Setting range---
0 to 255 (Stall current %)

#2246 SV046 FHz2 Notch filter frequency 2

Set the vibration frequency to suppress when machine vibration occurs.
(Normally, do not set 80 or less.)
Set to "0" when not using.

Related parameters: SV033/bit7-5, SV115

---Setting range---
0 to 5000 (Hz)

#2247 SV047 EC Inductive voltage compensation gain

Set the inductive voltage compensation gain. Standard setting value is "100".
If the current FB peak exceeds the current command peak, lower the gain.

---Setting range---
0 to 200 (%)

#2248 SV048 EMGrt Vertical axis drop prevention time

Input the time required to prevent the vertical axis from dropping by delaying READY OFF until the brake works at an emergency stop.
Increase in increments of 100ms at a time, find and set the value where the axis does not drop.
When using a motor with a break of HG(-H) Series and HQ-H Series, set to "200ms" as a standard.
When the pull up function is enabled (SV033/bitE=1), the pull up is established during the drop prevention time.
(Note) Set the vertical axis drop prevention time even if a motor with a break is not used with the drive unit axis connected to CN4 connector of the power supply unit.

Related parameters: SV033/bitE, SV055, SV056

---Setting range---

0 to 20000 (ms)
The vertical axis pull up is not executed when "0" is set.

#2249 SV049 PGN1sp Position loop gain 1 in spindle synchronous control

Set the position loop gain during spindle synchronization control (synchronous tapping and synchronization control with spindle C-axis).
Set the same value as that of the position loop gain for spindle synchronous tapping control.
When performing the SHG control, set this parameter with SV050 (PGN2sp) and SV058 (SHGCsp).
When changing the value, change the value of "#2017 tap_g Axis servo gain".

---Setting range---

1 to 200 (rad/s)

#2250 SV050 PGN2sp Position loop gain 2 in spindle synchronous control

When using SHG control during spindle synchronous control (synchronous tapping and synchronization control with spindle C-axis), set this parameter with SV049 (PGN1sp) and SV058 (SHGCsp).
Make sure to set the value 8/3 times that of SV049.
When not using the SHG control, set to "0".

---Setting range---

0 to 999 (rad/s)

#2251 SV051 DFBT Dual feedback control time constant

Set the control time constant in dual feed back.
When "0" is set, it operates at 1ms.
The higher the time constant is, the closer it gets to the semi-closed control, so the limit of the position loop gain will be raised.

For linear servo/direct-drive motor system
Not used. Set to "0".

Related parameters: SV017/bit1, SV052

---Setting range---

0 to 9999 (ms)

#2252 SV052 DFBN Dual feedback control non-sensitive band

Set the non-sensitive band in the dual feedback control.
Normally, set to "0".

For linear servo/direct-drive motor system
Not used. Set to "0".

Related parameters: SV017/bit1, SV052

---Setting range---

0 to 9999 (μm)

#2253 SV053 OD3 Excessive error detection width in special control

Set the excessive error detection width when servo ON in a special control (initial absolute position setting, stopper control and etc.).
When "0" is set, excessive error detection will not be performed when servo ON during a special control.

---Setting range---

0 to 32767 (mm)
However, when SV084/bitC=1, the setting range is from 0 to 32767 (μm).

#2254 SV054 ORE Overrun detection width in closed loop control

Set the overrun detection width in the full-closed loop control.
When the gap between the motor side encoder and the linear scale (machine side encoder) exceeds the value set by this parameter, it will be judged as overrun and "Alarm 43" will be detected.
When "-1" is set, if the differential velocity between the motor side encoder and the machine side encoder exceeds the 30% of the maximum motor speed, it will be judged as overrun and "Alarm 43" will be detected.
When "0" is set, overrun will be detected with a 2mm width.

For linear servo/direct-drive motor system
Not used. Set to "0".

---Setting range---

-1 to 32767 (mm)
However, when SV084/bitD=1, the setting range is from -1 to 32767 (μm).

#2255 SV055 EMGx Max. gate off delay time after emergency stop

Set the time required between an emergency stop and forced READY OFF.
Set the maximum value "+ 100ms" of the SV056 setting value of the servo drive unit electrified by the same power supply unit.
When executing the vertical axis drop prevention, the gate off will be delayed for the length of time set at SV048 even when SV055's is smaller than that of SV048.

Related parameters: SV048, SV056

---Setting range---

0 to 20000 (ms)

#2256 SV056 EMGt Deceleration time constant at emergency stop

Set the time constant used for the deceleration control at emergency stop.
Set the time required to stop from rapid traverse rate (rapid).
The standard setting value is EMGt≤G0tL×0.9.
However, note that the standard setting value differs from the above-mentioned value when the setting value of "#2003:smgst Acceleration and deceleration modes bit 3-0:Rapid traverse acceleration/deceleration type" is 8 or F. Refer to Instruction Manual of the drive unit (section "5.5.1 Deceleration Control") for details.

Related parameters: SV048, SV055

---Setting range---

0 to 20000 (ms)

#2257 SV057 SHGC SHG control gain

When performing the SHG control, set to SV003(PGN1)×6.
When not using the SHG control, set to "0".
When using the OMR-FF control, set to "0".

Related parameters: SV003, SV004

---Setting range---

0 to 1200 (rad/s)

#2258 SV058 SHGCsp SHG control gain in spindle synchronous control

When using SHG control during spindle synchronization control (synchronous tapping and synchronous control with spindle C-axis), set this parameter with SV049 (PGN1sp) and SV050 (PGN2sp).
Make sure to set the value 6 times that of SV049.
When not using the SHG control, set to "0".

---Setting range---

0 to 1200 (rad/s)

#2259 SV059 TCNV Collision detection torque estimated gain

Set the torque estimated gain when using the collision detection function.
The standard setting value is the same as the load inertia ratio (SV037 setting value) including motor inertia.
Set to "0" when not using the collision detection function.

Related parameters: SV032, SV035/bitF-8, SV037, SV045, SV060

<<Drive monitor load inertia ratio display>>
Set SV035/bitF=1 and imbalance torque and friction torque to both SV032 and SV045, and then repeat acceleration/deceleration for several times.

---Setting range---

For general motor: 0 to 5000 (%)
For linear motor: 0 to 5000 (kg)

#2260 SV060 TLMT Collision detection level

When using the collision detection function, set the collision detection level at the G0 feeding.
When "0" is set, none of the collision detection function will work.

Related parameters: SV032, SV035/bitF-8, SV037, SV045, SV059

---Setting range---

0 to 999 (Stall current %)

#2261 SV061 DA1NO D/A output ch1 data No. / Initial DC excitation level

Input the data number you wish to output to the D/A output channel 1.
When using the 2-axis drive unit, set "-1" to the axis that the data will not be output.

When the DC excitation is running (SV034/bit4=1):
Use this when the DC excitation is running (SV034/bit4=1) to adjust the initial magnetic pole position (when measuring the magnetic pole shift amount) for linear motor and direct-drive motor.
Set the initial excitation level in DC excitation control.
Set 10% as standard.
Related parameters: SV062, SV063

---Setting range---

-32768 to 32767
When the DC excitation is running (SV034/bit4=1): 0 to 100 (Stall current %)

#2262 SV062 DA2NO D/A output ch2 data No. / Final DC excitation level

Input the data number you wish to output to the D/A output channel 2.
When using the 2-axis drive unit, set "-1" to the axis that the data will not be output.

When the DC excitation is running (SV034/bit4=1):
Use this when the DC excitation is running (SV034/bit4=1) to adjust the initial magnetic pole position (when measuring the magnetic pole shift amount) for linear motor and direct-drive motor.
Set the final excitation level in DC excitation control.
Set 10% as standard.
When the magnetic pole shift amount measurement value is unsteady, adjust the value in increments of 5%.
Related parameters: SV061, SV063

---Setting range---

-32768 to 32767
When the DC excitation is running (SV034/bit4=1): 0 to 100 (Stall current %)

#2263 SV063 DA1MPY D/A output ch1 output scale / Initial DC excitation time

Set output scale of the D/A output channel 1 in increment of 1/100.
When "0" is set, the magnification is the same as when "100" is set.

When the DC excitation is running (SV034/bit4=1):
Use this when the DC excitation is running (SV034/bit4=1) to adjust the initial magnetic pole position (when measuring the magnetic pole shift amount) for linear motor and direct-drive motor.
Set the initial excitation time in DC excitation control.
Set 1000ms as standard.
When the magnetic pole shift amount measurement value is unsteady, adjust the value in increments of 500ms.
Related parameters: SV061, SV062

---Setting range---
-32768 to 32767 (1/100-fold)
When the DC excitation is running (SV034/bit4=1): 0 to 10000 (ms)

#2264 SV064 DA2MPY D/A output ch2 output scale

Set output scale of the D/A output channel 2 in increment of 1/100.
When "0" is set, the magnification is the same as when "100" is set.

---Setting range---
-32768 to 32767 (1/100-fold)

#2265 SV065 TLC Machine end compensation gain

The shape of the machine end is compensated by compensating the spring effect from the machine end to the motor end.
Set the machine end compensation gain. Measure the error amount by roundness measurement and estimate the setting value by the following formula.

Compensation amount (μm) = Command speed F(mm/min)2 * SV065 / (Radius R(mm) * SV003 * 16,200,000)

Set to "0" when not using.

---Setting range---
-30000 to 30000 (Acceleration ratio 0.1%)

#2266-2272 SV066 - SV072

This parameter is set automatically by the NC system.

(PR) #2273 SV073 FEEDout Specified speed output speed

Set the specified speed.
Also set SV082/bit9,8 to output digital signal.

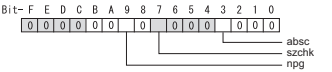
---Setting range---
0 to 32767 (r/min)
However, when SV033/bitD=1, the setting range is from 0 to 32767 (100mm/min).
(Only for MDS-E/EH and MDS-EM/EMH)

#2274-2280 SV074 - SV080

This parameter is set automatically by the NC system.

(PR) #2281 SV081 SPEC2 Servo specification 2

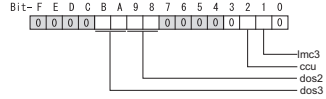
Select the servo functions.
A function is assigned to each bit.
Set this in hexadecimal format.



bit F-A:
Not used. Set to "0".
bit 9: npg Earth fault detection
0: Disable 1: Enable (standard)
Set "0" and it is constantly "Enable" for MDS-EJ/EJH Series.
bit 8:
Not used. Set to "0".
bit 7: szchk Distance-coded reference scale reference mark
0: Check at 4 points (standard) 1: Check at 3 points
bit 6-4:
Not used. Set to "0".
bit 3: absc Distance-coded reference scale
0: Disable 1: Enable
bit 2-0:
Not used. Set to "0".

#2282	SV082 SSF5	Servo function 5

Select the servo functions.
A function is assigned to each bit.
Set this in hexadecimal format.

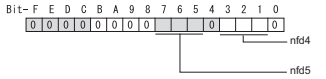


bit F-C:
Not used. Set to "0".
bit B-A: dos3 Digital signal output 3 selection
bitB,A=
00: Disable
01: Setting prohibited
10: Contactor control signal output (For MDS-EJ/EJH)
11: Setting prohibited
bit 9-8: dos2 Digital signal output 2 selection
bit9,8=
00: Disable
01: Specified speed output
10: Setting prohibited
11: Setting prohibited
bit 7-3:
Not used. Set to "0".
bit 2: ccu Lost motion overshoot compensation compensation amount setting increment
0: Stall current % 1: Stall current 0.01%
bit 1: lmc3 Lost motion compensation type 3
Set this when protrusion at a quadrant change is too big.
0: Stop 1: Start

Related parameters: SV016, SV041, SV085, SV086
bit 0:
Not used. Set to "0".

#2283	SV083 SSF6	Servo function 6

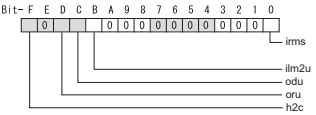
Select the servo functions.
A function is assigned to each bit.
Set this in hexadecimal format.



bit F-8 :
Not used. Set to "0".
bit 7-5 : nfd5 Depth of Notch filter 5
Set the depth of Notch filter 5 (SV088).
bit7,6,5=
000: -∞
001: -18.1[dB]
010: -12.0[dB]
011: -8.5[dB]
100: -6.0[dB]
101: -4.1[dB]
110: -2.5[dB]
111: -1.2[dB]
bit 4 :
Not used. Set to "0".
bit 3-1 : nfd4 Depth of Notch filter 4
Set the depth of Notch filter 4 (SV087).
bit3,2,1=
000: -∞
001: -18.1[dB]
010: -12.0[dB]
011: -8.5[dB]
100: -6.0[dB]
101: -4.1[dB]
110: -2.5[dB]
111: -1.2[dB]
bit 0 :
Not used. Set to "0".

#2284 SV084 SSF7 Servo function 7

Select the servo functions.
A function is assigned to each bit.
Set this in hexadecimal format.



bit F : h2c HAS control cancel amount
0: 1/4 (standard) 1: 1/2

Related parameters: SV034/bit1
bit E :
Not used. Set to "0".
bit D : oru Overrun detection width unit
0: mm (normal setting) 1: µm
bit C : odu Excessive error detection width unit
0: mm (normal setting) 1: µm
bit B : ilm2u Current limit value (SV014) in special control setting unit
0: Stall current % (normal setting) 1: Stall current 0.01%
bit A-1 :
Not used. Set to "0".
bit 0 : irms Motor current display
0: Motor q axis current display (normal) 1: Motor effective current display

#2285 SV085 LMCk Lost motion compensation 3 spring constant

Set the machine system's spring constant when selecting lost motion compensation type 3.
When not using, set to "0".

Related parameters: SV016, SV041, SV082/bit2,1, SV086
---Setting range---
0 to 32767 (0.01%/µm)

#2286 SV086 LMCc Lost motion compensation 3 viscous coefficient

Set the machine system's viscous coefficient when selecting lost motion compensation type 3.
When not using, set to "0".

Related parameters: SV016, SV041, SV082/bit2,1, SV086
---Setting range---
0 to 32767 (0.01%•s/mm)

#2287 SV087 FHz4 Notch filter frequency 4

Set the vibration frequency to suppress when machine vibration occurs.
(Normally, do not set 80 or less.)
Set to "0" when not using.

Related parameters: SV083/bit3-1, SV115
---Setting range---
0 to 5000 (Hz)

#2288 SV088 FHz5 Notch filter frequency 5

Set the vibration frequency to suppress when machine vibration occurs.
(Normally, do not set 80 or less.)
Set to "0" when not using.

Related parameters: SV083/bit7-5, SV115
---Setting range---
0 to 5000 (Hz)

#2289 SV089

Not used. Set to "0".

#2290 SV090

Not used. Set to "0".

#2291 SV091 LMC4G Lost motion compensation 4 gain

Use this with LMC compensation type 3. As the delay in path tracking is monitored and compensated, the delay in path tracking will be minimized even if machine friction amount changes by aging. Use the lost motion compensation amount (SV016) * 5 (10% of the dynamic friction torque) as the target. The higher the setting value is, the more accurate the quadrant change be; however, the more likely vibrations occur.
---Setting range---
0 to 20000 (Stall current 0.01%)

#2292 SV092

Not used. Set to "0".

#2293 SV093

Not used. Set to "0".

#2294 SV094 MPV Magnetic pole position error detection speed

The magnetic pole position detection function monitors the command speed and motor speed at the position command stop and detects the magnetic pole position error alarm (3E) if any. Set the error detection level for the command speed and motor speed at the position command stop.
Be aware when setting the parameter as the setting units for general motors and linear motors are different.

<<For general motor>>
When the command speed error detection level is set to "0", the magnetic pole position error (3E) is detected at 10r/min.
Set "10" as standard.
This detects the magnetic pole position error (3E) when the motor rotation speed is 100r/min and more.

<<For linear motor>>
When the command motor speed level is set to "0", the magnetic pole position error (3E) is detected at 1mm/s.
Set "10" as standard.
This detects the magnetic pole position error (3E) when the motor speed is 10mm/s and more.

---Setting range---
0 to 31999

<<For general motor>>
Ten-thousands digit, Thousands digit ---------- Command speed error detection level (10r/min)
Hundreds digit, Tens digit, Ones digit ---------- Motor speed error detection level (10r/min)

<<For linear motor>>
Ten-thousands digit, Thousands digit ---------- Command speed error detection speed level (1mm/s)
Hundreds digit, Tens digit, Ones digit ---------- Motor speed error detection level (1mm/s)

#2295 SV095 ZUPD Vertical axis pull up distance

Set this parameter to adjust the pull up distance when the vertical axis pull up function is enabled.
When the pull up function is enabled and this parameter is set to "0", for a rotary motor, 8/1000 of a rotation at the motor end is internally set as the pull up distance, and for a linear motor, 80[μm] is set.

Related parameters:
SV032 : The pull up direction is determined. When "0" is set, pull up control is not executed.
SV033/bitE : Start-up of the pull up function
SV048 : Set the drop prevention time. When "0" is set, pull up control is not executed.

---Setting range---
-32768 to 32767 (μm)

#2296-2305 SV096 - SV105

Not used. Set to "0".

#2306 SV106 PGM OMR-FF scale model gain

Set the scale model gain (position response) in OMR-FF control.
Set the same value as SV003(PGN1).
Increase the setting value to perform a high-speed machining such as a fine arc or to improve the path error.Lower the value when vibration occurs during acceleration/deceleration.
Set to "0" when not using OMR-FF control.

---Setting range---
0 to 300 (rad/s)

#2307-2311 SV107 - SV111

Not used. Set to "0".

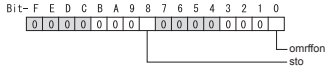
#2312 SV112 IFF OMR-FF current feed forward gain

Set the current feed forward rate in OMR-FF control.
The standard setting is "10000".
Setting value of 0 is equal to "10000(100%)" setting.
Set to "0" when not using OMR-FF control.

---Setting range---
0 to 32767 (0.01%)

#2313 SV113 SSF8 Servo function 8

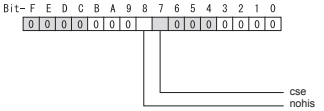
Select the servo functions.
A function is assigned to each bit.
Set this in hexadecimal format.



bit F-9 :
Not used. Set to "0".
bit 8 : sto Dedicated wiring STO function
Set this parameter to use dedicated wiring STO function.
0: Dedicated wiring STO function unused 1: Dedicated wiring STO function used
(Only for MDS-E/EH and MDS-EJ/EJH)
bit 7-1 :
Not used. Set to "0".
bit 0 : omrffon OMR-FF control enabled
0: Disable 1: Enable

#2314 SV114 SSF9 Servo function 9

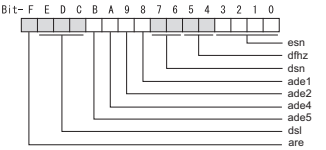
Select the servo functions.
A function is assigned to each bit.
Set this in hexadecimal format.



bit F-9 :
Not used. Set to "0".
bit 8 : nohis History of communication error alarm between NC and DRV (34, 36, 38, 39)
0: Enable 1: Disable
bit 7 : cse Command speed monitoring function
0: Disable 1: Enable (Normal setting)
bit 6-0 :
Not used. Set to "0".

#2315 SV115 SSF10 Servo function 10

Select the servo functions.
A function is assigned to each bit.
Set this in hexadecimal format.



bit F : are Notch filter5 all frequencies adapted
When enabled, Notch filter5 all frequencies adaptive range is not limited regardless of SV115/bit4,5 setting.
0: Disable 1: Enable
bit E-C: dsl Notch filter frequency display
Switch the "AFLT frequency" display on drive monitor screen to check every notch filter frequency. When the selected notch filter is not used, "0" is displayed.

bitE,D,C=
000 : Estimated resonance frequency (Normal display)
001 : Notch filter 1 frequency
010 : Notch filter 2 frequency
011 : Notch filter 3 frequency (always displays 1125Hz)
100 : Notch filter 4 frequency
101 : Notch filter 5 frequency
Other settings: setting prohibited
bit B : ade5 Notch filter 5 / Adaptive follow-up function
0: Disable 1: Enable
bit A : ade4 Notch filter 4 / Adaptive follow-up function
0: Disable 1: Enable
bit 9 : ade2 Notch filter 2 / Adaptive follow-up function
0: Disable 1: Enable
bit 8 : ade1 Notch filter 1 / Adaptive follow-up function
0: Disable 1: Enable
bit 7-6 : dsn Estimated resonance frequency display holding time
Set the estimated resonance frequency display holding time to the "AFLT frequency" display on drive monitor screen.

bit7,6=
00: 4 [s]
01: 8 [s]
10: 12 [s]
11: 16 [s]
bit 5-4 : dfhz Notch filter frequency range
Set the adaptive range of the notch filter frequency. When the adaptive follow-up function is enabled and if the estimated resonance frequency exists in the set range, the notch filter will be adapted. Normally set this parameter to "00".

bit5,4=
00: -10 to 10 [%]
01: -20 to 20 [%]
10: -30 to 30 [%]
11: -40 to 40 [%]
bit 3-0 : esn Sensitivity of estimated resonance frequency
Set the sensitivity of the estimated resonance frequency. Smaller setting value enables to detect smaller vibration component, however, adaptive movement will be repeated frequently. Normally set this parameter to "0".

0 : Normal setting (same sensitivity as A) 1 : Sensitivity high to F : Sensitivity low

#2316 SV116 SSF11 Servo function 11

Not used. Set to "0000".

(PR) #2317 SV117 RNG1ex Expansion sub side encoder resolution

For high-accuracy binary resolution encoder, set the number of pulses to four bite data of SV117 (high-order) and SV019 (low-order) by pulse (p).
When SV117=0, the setting unit of SV019 is (kp).
Refer to SV019 for details.

Related parameters: SV019, SV020, SV118

---Setting range---

-1 to 32767

(PR) #2318 SV118 RNG2ex Expansion main side encoder resolution

When using high-accuracy binary resolution encoder, set the number of pulses to four bite data of SV118 (high-order) and SV020 (low-order) by pulse (p).
When SV118=0, the setting unit of SV020 is (kp).
Refer to SV020 for details.

Related parameters: SV019, SV020, SV117

---Setting range---

-1 to 32767

#2319-2328 SV119 - SV128

Not used. Set to "0".

#2329 SV129 Kwf Synchronous control feed forward filter frequency

Set the acceleration rate feed forward filter frequency in high-speed synchronous tapping control. The standard setting is "600".

Related parameters: SV244

---Setting range---

0 to 32767 (rad/s)

(PR) #2330 SV130 RPITS Base reference mark interval

Set the base reference mark intervals of distance-coded reference scale. When the distance-coded reference scale is not used, set to "0".
The interval of basic reference mark (SV130) and auxiliary interval (SV131) must be in the specified relationship. Other settings cause the initial parameter error (alarm 37).
Following is the specified relationship.

The quotient of (SV130×1000) / SV131 must be 4 or more and leaves no remainder.

Related parameters: SV081/bit7,3, SV131, SV134 to SV137

---Setting range---

0 to 32767 (mm)

(PR) #2331 SV131 DPITS Auxiliary reference mark interval

Set the auxiliary interval of reference mark in the distance-coded reference scale. When the distance-coded reference scale is not used, set to "0".
The interval of basic reference mark (SV130) and auxiliary interval (SV131) must be in the specified relationship. Other settings cause the initial parameter error (alarm 37).
Following is the specified relationship.

The quotient of (SV130×1000) / SV131 must be 4 or more and leaves no remainder.

Related parameters: SV081/bit7,3, SV130, SV134 to SV137

---Setting range---

0 to 32767 (μm)

#2332 SV132

Not used. Set to "0".

#2333 SV133

Not used. Set to "0".

#2334 SV134 RRn0 Distance-coded reference check / revolution counter

Set this parameter to operate distance-coded reference check when using distance-coded reference scale.
During the distance-coded reference check initial setup (SV137:RAER=-1), set the following items on the NC drive monitor screen after the distance-coded reference check initial setup warning A3 turns OFF.

SV134=Rn, SV135=Pn, SV136=MPOS

When reference point is set, the warning A3 turns OFF.
To enable the distance-coded reference check function, SV081/bit3=1setting and a battery option are needed.

Related parameters: SV081/bit3,7, SV130, SV131, SV134 to SV137

---Setting range---

-32768 to 32767

#2335 SV135 RPn0H — Distance-coded reference check /position within one rotation High

Set this parameter to operate distance-coded reference check when using distance-coded reference scale.
During the distance-coded reference check initial setup (SV137:RAER=-1), set the following items on the NC drive monitor screen after the distance-coded reference check initial setup warning A3 turns OFF.

SV134=Rn, SV135=Pn, SV136=MPOS

When reference point is set, the warning A3 turns OFF.
To enable the distance-coded reference check function, SV081/bit3=1setting and a battery option are needed.

Related parameters: SV081/bit3,7, SV130, SV131, SV134 to SV137

---Setting range---

-32768 to 32767

#2336 SV136 RPn0L — Distance-coded reference check / position within one rotation Low

Set this parameter to operate distance-coded reference check when using distance-coded reference scale.
During the distance-coded reference check initial setup (SV137:RAER=-1), set the following items on the NC drive monitor screen after the distance-coded reference check initial setup warning A3 turns OFF.

SV134=Rn, SV135=Pn, SV136=MPOS

When reference point is set, the warning A3 turns OFF.
To enable the distance-coded reference check function, SV081/bit3=1setting and a battery option are needed.

Related parameters: SV081/bit3,7, SV130, SV131, SV134 to SV137

---Setting range---

-32768 to 32767

#2337 SV137 RAER — Distance-coded reference check allowable width

For the distance-coded reference check function when using distance-coded reference scale, set the allowable gap from the reference point position data calculated by the main side encoder. When the gap exceeds the allowable range, reference point created by distance-code is judged as wrong and detects alarm 42.
The standard setting value is "basic reference mark interval (SV130) / 4".
SV137=0 setting carries out the same operation as the standard setting value.
SV137=-1 setting enables the distance-coded reference initial set up mode and displays setting values of SV134 to SV136 on NC drive monitor.
To enable the distance-coded reference check function, SV081/bit3=1setting and a battery option are needed.
When SV137=32767, the distance-coded reference check function is disabled.

Related parameters: SV081/bit3,7, SV130, SV131, SV134 to SV136

---Setting range---

-1 to 32767 (mm)

#2338-2397 SV138 - SV197

Not used. Set to "0".

#2398 SV198 NSE — No signal 2 special detection width

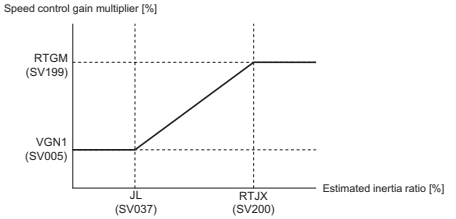
Set the special detection width for the no signal 2 (alarm 21).
This detects no signal 2 (alarm 21) when machine side feedback is not invoked even if the motor side encoder feedback exceeds this setting in the rectangular wave signal output linear scale.
When "0" is set, the detection will be performed with a 15µm width.

---Setting range---

0 to 32767 (µm)

#2399 SV199 RTGM — Real-time tuning: maximum adaptive gain multiplier

In case that machine resonance is induced when mounting a workpiece, the speed loop gain is switched automatically in response to inertia by setting the speed loop gain and workpiece inertia multiplier in advance.
The speed loop gain SV199(RTGM) changes in response to the estimated inertia ratio SV200(RTJX) based on the speed loop gain SV005(VGN1) and the inertia multiplier SV037(JL) which were adjusted when no workpiece was mounted.
When SV199 is set to "0", the adaptation of the speed loop gain will be disabled.



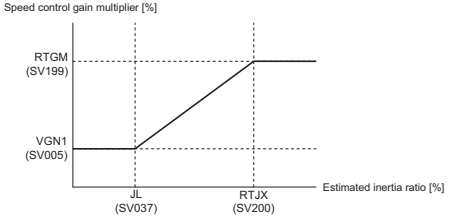
Related parameters: SV005, SV037, SV200

---Setting range---

0 to 5000 (%)

#2400 SV200 RTJX **Real-time tuning: maximum adaptive inertia ratio**

In case that machine resonance is induced when mounting a workpiece, the speed loop gain is switched automatically in response to inertia by setting the speed loop gain and workpiece inertia multiplier in advance.
The speed loop gain SV199(RTGM) changes in response to the estimated inertia ratio SV200(RTJX) based on the speed loop gain SV005(VGN1) and the inertia multiplier SV037(JL) which were adjusted when no workpiece was mounted.
When SV199 is set to "0", the adaptation of the speed loop gain will be disabled.



Related parameters: SV005, SV037, SV199

---Setting range---

0 to 5000 (%)

#2401-2405 SV201 - SV205

Not used. Set to "0".

#2406 SV206 FCTC **Full-closed torsion compensation control torsion amount**

Set the compensation amount of full-closed torsion compensation function.
Set the torsion amount between the motor-end position and the machine-end position right after the stop as a standard setting value.
When not using, set to "0".

---Setting range---

0 to 32767 (0.01μm)

#2407-2436 SV207 - SV236

Not used. Set to "0".

(PR) #2437 SV237 TCF **Torque command filter**

Set the filter for the torque command.
The standard value is "3000" when using HG46, HG56, or HG96.

---Setting range---

0 to 5000 (rad/s)

#2438-2443 SV238 - SV243

Not used. Set to "0".

(PR) #2444 SV244 DUNIT **Communication interpolation unit for communication among drive units**

Set the communication interpolation unit among drive units in high-speed synchronous tapping control.
When set to "0", it will be regarded as 20 (0.05μm) is set.

Related parameters: SV129

---Setting range---

0 to 2000 (1/μm)

#2445-2456 SV245 - SV256

Not used. Set to "0".

2.8 Spindle Specification Parameters

#3001 slimt 1 Limit rotation speed (Gear: 00)

Set the spindle rotation speed for maximum motor speed when gear 00 is selected.
Set the spindle rotation speed for the S analog output=10V during analog spindle control.

---Setting range---

0 to 999999 (r/min)

#3002 slimt 2 Limit rotation speed (Gear: 01)

Set the spindle rotation speed for maximum motor speed when gear 01 is selected.
Set the spindle rotation speed for the S analog output=10V during analog spindle control.

---Setting range---

0 to 999999 (r/min)

#3003 slimt 3 Limit rotation speed (Gear: 10)

Set the spindle rotation speed for maximum motor speed when gear 10 is selected.
Set the spindle rotation speed for the S analog output=10V during analog spindle control.

---Setting range---

0 to 999999 (r/min)

#3004 slimt 4 Limit rotation speed (Gear: 11)

Set the spindle rotation speed for maximum motor speed when gear 11 is selected.
Set the spindle rotation speed for the S analog output=10V during analog spindle control.

---Setting range---

0 to 999999 (r/min)

#3005 smax 1 Maximum rotation speed (Gear: 00)

Set the maximum spindle rotation speed which is actually commanded when gear 00 is selected.
Set this as smax1(#3005)<= slimit1(#3001).
By comparing the S command value and the values of gear 1 - 4, a spindle gear shift command will be output automatically.

---Setting range---

0 to 999999 (r/min)

#3006 smax 2 Maximum rotation speed (Gear: 01)

Set the maximum spindle rotation speed which is actually commanded when gear 01 is selected.
Set this as smax2(#3006)<= slimit2(#3002).
By comparing the S command value and the values of gear 1 - 4, a spindle gear shift command will be output automatically.

---Setting range---

0 to 999999 (r/min)

#3007 smax 3 Maximum rotation speed (Gear: 10)

Set the maximum spindle rotation speed which is actually commanded when gear 10 is selected.
Set this as smax3(#3007)<= slimit3(#3003).
By comparing the S command value and the values of gear 1 - 4, a spindle gear shift command will be output automatically.

---Setting range---

0 to 999999 (r/min)

#3008 smax 4 Maximum rotation speed (Gear: 11)

Set the maximum spindle rotation speed which is actually commanded when gear 11 is selected.
Set this as smax4(#3008)<= slimit4(#3004).
By comparing the S command value and the values of gear 1 - 4, a spindle gear shift command will be output automatically.

---Setting range---

0 to 999999 (r/min)

#3009 ssift 1 Shift rotation speed (Gear: 00)

Set the spindle speed for gear shifting with gear 00.
(Note) Setting too large value may cause a gear nick when changing gears.

---Setting range---

0 to 32767 (r/min)

#3010 ssift 2 Shift rotation speed (Gear: 01)

Set the spindle speed for gear shifting with gear 01.
(Note) Setting too large value may cause a gear nick when changing gears.

---Setting range---

0 to 32767 (r/min)

#3011 ssift 3 Shift rotation speed (Gear: 10)

Set the spindle speed for gear shifting with gear 10.
(Note) Setting too large value may cause a gear nick when changing gears.

---Setting range---

0 to 32767 (r/min)

#3012 ssift 4 Shift rotation speed (Gear: 11)

Set the spindle speed for gear shifting with gear 11.
(Note) Setting too large value may cause a gear nick when changing gears.

---Setting range---

0 to 32767 (r/min)

#3013 stap 1 Synchronous tapping 1st step rotation speed (Gear: 00)

Set the speed which switches from 1st step to 2nd step in synchronous tapping multi-step acceleration/deceleration control when gear 00 is selected.
The inclination of linear acceleration/deceleration control for 1st step is determined by the ratio of "stap1"(#3013) to "stapt1"(#3017).
When the inclination is not set after 2nd step or it is higher than that of 1st step, the acceleration/deceleration control is executed with the same inclination as the 1st step for the rotation speed of "stap1" or higher.

---Setting range---

0 to 99999 (r/min)

#3014 stap 2 **Synchronous tapping 1st step rotation speed (Gear: 01)**

Set the speed which switches from 1st step to 2nd step in synchronous tapping multi-step acceleration/deceleration control when gear 01 is selected.
The inclination of linear acceleration/deceleration control for 1st step is determined by the ratio of "stap2"(#3014) to "stapt2"(#3018).
When the inclination is not set after 2nd step or it is higher than that of 1st step, the acceleration/deceleration control is executed with the same inclination as the 1st step for the rotation speed of "stap2" or higher.

---Setting range---
0 to 99999 (r/min)

#3015 stap 3 **Synchronous tapping 1st step rotation speed (Gear: 10)**

Set the speed which switches from 1st step to 2nd step in synchronous tapping multi-step acceleration/deceleration control when gear 10 is selected.
The inclination of linear acceleration/deceleration control for 1st step is determined by the ratio of "stap3"(#3015) to "stapt3"(#3019).
When the inclination is not set after 2nd step or it is higher than that of 1st step, the acceleration/deceleration control is executed with the same inclination as the 1st step for the rotation speed of "stap3" or higher.

---Setting range---
0 to 99999 (r/min)

#3016 stap 4 **Synchronous tapping 1st step rotation speed (Gear: 11)**

Set the speed which switches from 1st step to 2nd step in synchronous tapping multi-step acceleration/deceleration control when gear 11 is selected.
The inclination of linear acceleration/deceleration control for 1st step is determined by the ratio of "stap4"(#3016) to "stapt4"(#3020).
When the inclination is not set after 2nd step or it is higher than that of 1st step, the acceleration/deceleration control is executed with the same inclination as the 1st step for the rotation speed of "stap4" or higher.

---Setting range---
0 to 99999 (r/min)

#3017 stapt 1 **Synchronous tapping 1st step acceleration/deceleration time constant (Gear: 00)**

Set the time constant for synchronous tapping 1st step linear acceleration/deceleration control when gear 00 is selected. (linear acceleration/deceleration pattern)

---Setting range---
1 to 5000 (ms)

#3018 stapt 2 **Synchronous tapping 1st step acceleration/deceleration time constant (Gear: 01)**

Set the time constant for synchronous tapping 1st step linear acceleration/deceleration control when gear 01 is selected. (linear acceleration/deceleration pattern)

---Setting range---
1 to 5000 (ms)

#3019 stapt 3 **Synchronous tapping 1st step acceleration/deceleration time constant (Gear: 10)**

Set the time constant for synchronous tapping 1st step linear acceleration/deceleration control when gear 10 is selected. (linear acceleration/deceleration pattern)

---Setting range---
1 to 5000 (ms)

#3020	stapt 4	Synchronous tapping 1st step acceleration/deceleration time constant (Gear: 11)

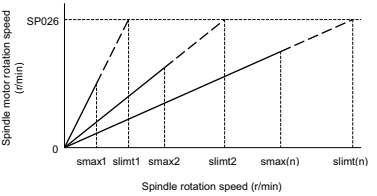
Set the time constant for synchronous tapping 1st step linear acceleration/deceleration control when gear 11 is selected. (linear acceleration/deceleration pattern)

---Setting range---

1 to 5000 (ms)

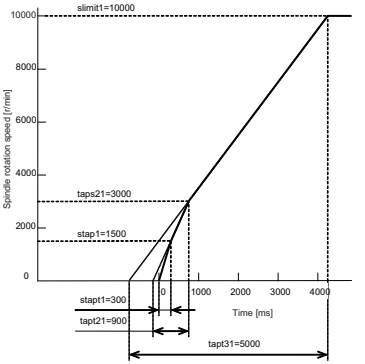
< Relation of spindle limit rotation speed and spindle maximum rotation speed >

The spindle rotation speed which can be attained at the spindle motor's maximum rotation speed is set for the limit rotation speed (slimt). This value is obtained by multiplying the gear ratio on the spindle motor maximum rotation speed (SP026). Set the maximum rotation speed (smax) when the rotation speed is to be limited according to the machine specifications, such as the spindle gear specifications. Up to four value can be set for gear changeover.

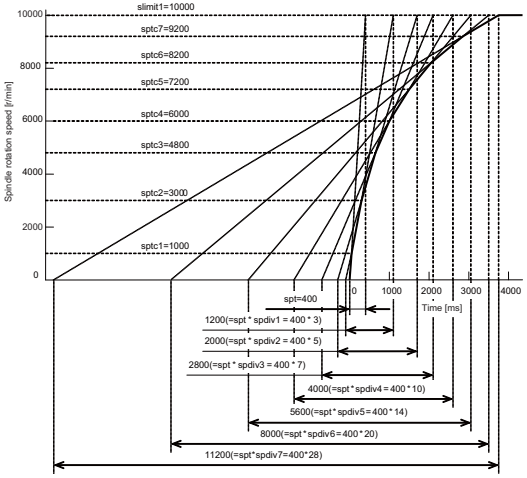


< Synchronous tapping multi-step acceleration/deceleration control parameter >

The acceleration/deceleration control can be set up to three steps in synchronous tapping control to carry out an optimal acceleration/deceleration control in accordance with the spindle motor characteristics whose output torque steps down when exceeding the base rotation speed.
Set the inclination for 2nd step or subsequent steps when the maximum rotation speed exceeds the base rotation speed during synchronous tapping control.
When the inclination is not set after 2nd step or it is higher than that of 1st step, the acceleration/deceleration control is executed with the same inclination as the 1st step for all the rotation speed.



< Spindle synchronization multi-step acceleration/deceleration control parameter >
The acceleration/deceleration control can be set up to eight steps in spindle synchronization control to carry out an optimal acceleration/deceleration control in accordance with the spindle motor characteristics whose output torque steps down when exceeding the base rotation speed and further attenuate in output stepdown zone.
For 2nd step or subsequent steps, the specification allows to set the time constant magnification and changeover rotation speed based on the acceleration/deceleration setting of the 1st step.
Set the value of limit rotation speed or higher as the changeover rotation speed for the step not to be shifted when not carrying out a step shift.



#3021

Not used. Set to "0".

#3022 sgear Encoder gear ratio

Set the deceleration rate of the encoder to the spindle when inputting ABZ pulse output encoder feedback to NC during analog spindle control.
0: 1/1
1: 1/2
2: 1/4
3: 1/8
---Setting range---
0 to 3

#3023 smini Minimum rotation speed

Set the minimum spindle speed.
If an S command below this setting is issued, the spindle will rotate at the minimum speed set by this parameter.
---Setting range---
0 to 32767 (r/min)

(PR) #3024 sout Spindle connection

Select the connection method with a spindle drive unit.
0: No unit to connect
1: Optical digital communication (Mitsubishi spindle drive unit)
2 - 5: S-analog (Analog spindle drive unit)
---Setting range---
0 to 5

(PR) #3025 enc-on Spindle encoder

Set the connection specifications of a spindle's encoder.
0: Without encoder feedback when using analog spindle and connecting to NC
1: With encoder feedback when using analog spindle and connecting to NC
2: Mitsubishi spindle drive unit
---Setting range---
0 to 2

#3026 cs_ori Selection of winding in orientation mode

Select the coil control in orientation mode for the spindle motor which performs coil changeover.
0: Perform coil changeover based on the command from NC. (depending on the setting of parameter #1239/bit0)
1: Use the coil L

#3027 cs_syn Selection of winding in spindle synchronization control mode

Select the coil control in spindle synchronization control mode for the spindle motor which performs coil changeover.
0: Perform coil changeover based on the command from NC. (depending on the setting of parameter #1239/bit0)
1: Use the coil H

#3028 sprcmm **Tap cycle M command selection**

Set the M codes for the spindle forward run/reverse run commands during tapping cycle.
High-order 3 digits: Set the M code for spindle forward run command.
Low-order 3 digits: Set the M code for spindle reverse run command.
When "0" is set, it is handled assuming that "3004" is set (the M code for spindle forward run command is "3" and the M code for spindle reverse run command is "4").

---Setting range---
0 to 999999

#3029 tapsel **Asynchronous tap gear selection**

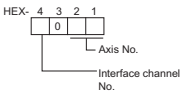
Select the speed which is compared with S command at gear selection when using asynchronous tapping control with the spindle which performs gear changeover.
0: Synchronous tapping 1st step rotation speed (stap)--- Multi-step acceleration/deceleration is not used.
1: Maximum speed (smax)--- Multi-step acceleration/deceleration is used.
This parameter is enabled only when "#1272 ext08/bit1 is 1".

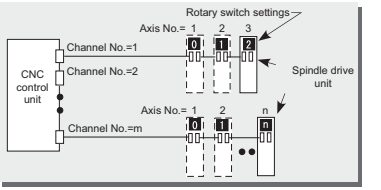
#3030

Not used. Set to "0".

(PR) #3031 smcp_no **Drive unit I/F channel No. (spindle)**

Set the interface channel No. of CNC control unit to which the spindle is connected and the axis No. within each channel.
Set this parameter in 4-digit (hexadecimal) format.





HEX-4 : Drive unit interface channel No.
HEX-3 : Not used. Set to "0".
HEX-2, 1 : Axis No.
For an analog spindle, set to "0000".

---Setting range---
0000, 1001 to 1010, 2001 to 2010

#3032

Not used. Set to "0".

(PR) #3035 spunit **Output unit**

Select the data unit for communication with the spindle drive unit.
This selection is applied to the data communicated between the NC and spindle drive unit as well as the spindle movement data. Although the standard setting is B (0.001deg), set the same value as "#1004 ctrl_unit" when using Spindle/C axis control.
B: 0.001deg (1μm)
C: 0.0001deg (0.1μm)
D: 0.00001deg (10nm)
E: 0.000001deg (1nm)

#3037 taps21 **Synchronous tapping 2nd step rotation speed (Gear: 00)**

Set the speed which switches from 2nd step to 3rd step in synchronous tapping multi-step acceleration/deceleration control when gear 00 is selected.
The inclination of linear acceleration/deceleration control for 2nd step is determined by the ratio of "taps21"(#3037) to "tapt21"(#3041).
When the inclination is not set for 3rd step or it is higher than that of 2nd step, the acceleration/deceleration control is executed with the same inclination as the 2nd step for the rotation speed of "taps21" or higher.

---Setting range---
0 to 99999 (r/min)

#3038 taps22 **Synchronous tapping 2nd step rotation speed (Gear: 01)**

Set the speed which switches from 2nd step to 3rd step in synchronous tapping multi-step acceleration/deceleration control when gear 01 is selected.
The inclination of linear acceleration/deceleration control for 2nd step is determined by the ratio of "taps22"(#3038) to "tapt22"(#3042).
When the inclination is not set for 3rd step or it is higher than that of 2nd step, the acceleration/deceleration control is executed with the same inclination as the 2nd step for the rotation speed of "taps22" or higher.

---Setting range---
0 to 99999 (r/min)

#3039 taps23 **Synchronous tapping 2nd step rotation speed (Gear: 10)**

Set the speed which switches from 2nd step to 3rd step in synchronous tapping multi-step acceleration/deceleration control when gear 10 is selected.
The inclination of linear acceleration/deceleration control for 2nd step is determined by the ratio of "taps23"(#3039) to "tapt23"(#3043).
When the inclination is not set for 3rd step or it is higher than that of 2nd step, the acceleration/deceleration control is executed with the same inclination as the 2nd step for the rotation speed of "taps23" or higher.

---Setting range---
0 to 99999 (r/min)

#3040 taps24 — Synchronous tapping 2nd step rotation speed (Gear: 11)

Set the speed which switches from 2nd step to 3rd step in synchronous tapping multi-step acceleration/deceleration control when gear 11 is selected.
The inclination of linear acceleration/deceleration control for 2nd step is determined by the ratio of "taps24"(#3040) to "tapt24"(#3044).
When the inclination is not set for 3rd step or it is higher than that of 2nd step, the acceleration/deceleration control is executed with the same inclination as the 2nd step for the rotation speed of "taps24" or higher.

---Setting range---
0 to 99999 (r/min)

#3041 tapt21 — Synchronous tapping 2nd step acceleration/deceleration time constant (Gear: 00)

Set the time constant for synchronous tapping 2nd step linear acceleration/deceleration control when gear 00 is selected.

---Setting range---
1 to 5000 (ms)

#3042 tapt22 — Synchronous tapping 2nd step acceleration/deceleration time constant 2 (Gear: 01)

Set the time constant for synchronous tapping 2nd step linear acceleration/deceleration control when gear 01 is selected.

---Setting range---
1 to 5000 (ms)

#3043 tapt23 — Synchronous tapping 2nd step acceleration/deceleration time constant (Gear: 10)

Set the time constant for synchronous tapping 2nd step linear acceleration/deceleration control when gear 10 is selected.

---Setting range---
1 to 5000 (ms)

#3044 tapt24 — Synchronous tapping 2nd step acceleration/deceleration time constant (Gear: 11)

Set the time constant for synchronous tapping 2nd step linear acceleration/deceleration control when gear 11 is selected.

---Setting range---
1 to 5000 (ms)

#3045 tapt31 — Synchronous tapping 3rd step acceleration/deceleration time constant (Gear: 00)

Set the time constant for synchronous tapping 3rd step linear acceleration/deceleration control when gear 00 is selected.
The inclination of linear acceleration/deceleration control for 3rd step is determined by the ratio of slimit1(#3001) to tapt31(#3045).

---Setting range---
1 to 5000 (ms)

#3046 tapt32 — Synchronous tapping 3rd step acceleration/deceleration time constant (Gear: 01)

Set the time constant for synchronous tapping 3rd step linear acceleration/deceleration control when gear 01 is selected.
The inclination of linear acceleration/deceleration control for 3rd step is determined by the ratio of slimit2(#3002) to tapt32(#3046).

---Setting range---
1 to 5000 (ms)

#3047 tapt33 — Synchronous tapping 3rd step acceleration/deceleration time constant (Gear: 10)

Set the time constant for synchronous tapping 3rd step linear acceleration/deceleration control when gear 10 is selected.
The inclination of linear acceleration/deceleration control for 3rd step is determined by the ratio of slimit3(#3003) to tapt33(#3047).

---Setting range---
1 to 5000 (ms)

#3048 tapt34 — Synchronous tapping 3rd step acceleration/deceleration time constant (Gear: 11)

Set the time constant for synchronous tapping 3rd step linear acceleration/deceleration control when gear 11 is selected.
The inclination of linear acceleration/deceleration control for 3rd step is determined by the ratio of slimit4(#3004) to tapt34(#3048).

---Setting range---
1 to 5000 (ms)

#3049 spt — Spindle synchronization acceleration/deceleration time constant

Set the acceleration/deceleration time constant under spindle synchronization control.
The inclination of acceleration/deceleration control is determined by the ratio to limit rotation speed (slimit). Set the same value for the reference axis and synchronous axis.
The time constant for 2nd step or subsequent steps is the magnification setting on the basis of this setting value.

---Setting range---
0 to 9999 (ms)

#3050 sprlv — Spindle synchronization rotation speed attainment level

Set the level of speed difference between the basic and synchronous spindles during spindle synchronization control. Setting of the synchronous spindle side is enabled. When the difference becomes below the setting level, the spindle speed synchronization complete signal will turn ON.

---Setting range---
0 to 4095 (pulse) (1 pulse = 0.088°)

#3051 spplv **Spindle phase synchronization attainment level**

Set the level of phase difference between the basic and synchronous spindles during spindle synchronization. Setting of the synchronous spindle side is validated. When the difference becomes below the setting level, the spindle phase synchronization complete signal will go ON.

---Setting range---

0 to 4095 (pulse) (1 pulse = 0.088°)

#3052 spplr **Spindle synchronization relative polarity**

Set the polarity to match the rotation direction between the spindles which perform synchronization control under spindle synchronization control.

0: Positive polarity (Spindle CW rotation at motor CW rotation)

1: Negative polarity (Spindle CCW rotation at motor CW rotation)

---Setting range---

0000/0001 (HEX)

#3053 sppst **Spindle encoder Z -phase position**

Set the deviation amount from the spindle's basic point to the spindle encoder's Z phase.

Obtain the deviation amount, considering a clockwise direction as positive when viewed from the spindle's front side.

---Setting range---

0 to 359999 (1/1000°)

#3054 sptc1 **Spindle synchronization multi-step acceleration/deceleration changeover speed 1**

Set the speed which switches from 1st step to 2nd step in spindle synchronization multi-step acceleration/deceleration control. Set the same value for the reference axis and synchronous axis.

Set the value of limit rotation speed (slimit) or higher not to carry out a step shift.

---Setting range---

0 to 99999 (r/min)

#3055 sptc2 **Spindle synchronization multi-step acceleration/deceleration changeover speed 2**

Set the speed which switches from 2nd step to 3rd step in spindle synchronization multi-step acceleration/deceleration control. Set the same value for the reference axis and synchronous axis.

Set the value of limit rotation speed (slimit) or higher not to carry out a step shift.

---Setting range---

0 to 99999 (r/min)

#3056 sptc3 **Spindle synchronization multi-step acceleration/deceleration changeover speed 3**

Set the speed which switches from 3rd step to 4th step in spindle synchronization multi-step acceleration/deceleration control. Set the same value for the reference axis and synchronous axis.

Set the value of limit rotation speed (slimit) or higher not to carry out a step shift.

---Setting range---

0 to 99999 (r/min)

#3057 sptc4 **Spindle synchronization multi-step acceleration/deceleration changeover speed 4**

Set the speed which switches from 4th step to 5th step in spindle synchronization multi-step acceleration/deceleration control. Set the same value for the reference axis and synchronous axis.

Set the value of limit rotation speed (slimit) or higher not to carry out a step shift.

---Setting range---

0 to 99999 (r/min)

#3058 sptc5 **Spindle synchronization multi-step acceleration/deceleration changeover speed 5**

Set the speed which switches from 5th step to 6th step in spindle synchronization multi-step acceleration/deceleration control. Set the same value for the reference axis and synchronous axis.

Set the value of limit rotation speed (slimit) or higher not to carry out a step shift.

---Setting range---

0 to 99999 (r/min)

#3059 sptc6 **Spindle synchronization multi-step acceleration/deceleration changeover speed 6**

Set the speed which switches from 6th step to 7th step in spindle synchronization multi-step acceleration/deceleration control. Set the same value for the reference axis and synchronous axis.

Set the value of limit rotation speed (slimit) or higher not to carry out a step shift.

---Setting range---

0 to 99999 (r/min)

#3060 sptc7 **Spindle synchronization multi-step acceleration/deceleration changeover speed 7**

Set the speed which switches from 7th step to 8th step in spindle synchronization multi-step acceleration/deceleration control. Set the same value for the reference axis and synchronous axis.

Set the value of limit rotation speed (slimit) or higher not to carry out a step shift.

---Setting range---

0 to 99999 (r/min)

#3061 spdiv1 **Time constant magnification for changeover speed 1**

Set the acceleration/deceleration time constant to be used at the speed of changeover speed 1 (sptc1) and higher in spindle synchronization multi-step acceleration/deceleration control. Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---

0 to 127

#3062 spdiv2 **Time constant magnification for changeover speed 2**

Set the acceleration/deceleration time constant to be used at the speed of changeover speed 2 (sptc2) and higher in spindle synchronization multi-step acceleration/deceleration control. Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---

0 to 127

	#3063	spdiv3	Time constant magnification for changeover speed 3

Set the acceleration/deceleration time constant to be used at the speed of changeover speed 3 (sptc3) and higher in spindle synchronization multi-step acceleration/deceleration control. Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---

0 to 127

	#3064	spdiv4	Time constant magnification for changeover speed 4

Set the acceleration/deceleration time constant to be used at the speed of changeover speed 4 (sptc4) and higher in spindle synchronization multi-step acceleration/deceleration control. Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---

0 to 127

	#3065	spdiv5	Time constant magnification for changeover speed 5

Set the acceleration/deceleration time constant to be used at the speed of changeover speed 5 (sptc5) and higher in spindle synchronization multi-step acceleration/deceleration control. Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---

0 to 127

	#3066	spdiv6	Time constant magnification for changeover speed 6

Set the acceleration/deceleration time constant to be used at the speed of changeover speed 6 (sptc6) and higher in spindle synchronization multi-step acceleration/deceleration control. Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---

0 to 127

	#3067	spdiv7	Time constant magnification for changeover speed 7

Set the acceleration/deceleration time constant to be used at the speed of changeover speed 7 (sptc7) and higher in spindle synchronization multi-step acceleration/deceleration control. Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---

0 to 127

	#3068	symtm1	Phase synchronization start confirmation time

Set the time to confirm that synchronization is attained before spindle phase synchronization control is started.

When "0" is set, the time will be 500ms. When "100" or less is set, the time will be 100ms.

---Setting range---

0 to 9999 (ms)

	#3069	symtm2	Phase synchronization end confirmation time

Set a period of waiting time for spindle phase synchronization control's completion as a time in which the speed stays within the attainment range.

When "0" is set, the time will be 500ms. When "100" or less is set, the time will be 100ms.

---Setting range---

0 to 9999 (ms)

	#3070	syprt	Phase synchronization alignment speed

Set the amount of speed fluctuation of synchronous spindle during spindle phase synchronization control. Set this as a proportion to commanded speed.

When "0" is set, the amount will be 5%.

---Setting range---

0 to 100 (%)

(PR)	#3071	SscDrSelSp	Speed monitor Door selection

Select which door group of the speed monitoring a spindle belongs to.

0000: Belong to the door 1 group.
0001: Belong to the door 1 group.
0002: Belong to the door 2 group.
0003: Belong to the door 1 and 2 groups.

(Note) Speed monitoring function is validated when "SP229/bitF=1".

---Setting range---

0000 to 0003 (HEX)

(PR)	#3072	Ssc Svof Filter Sp	Speed monitor Error detection time during servo OFF

Set the error detection time for when an error of command speed monitoring or feedback speed monitoring is detected during servo OFF.

The alarm will occur if actual speed exceeds safe speed or safe rotation speed for a period of time longer than this setting.

When "0" is set, the detection time will be 200 (ms).

(Note) Speed monitoring function is validated when "SP229/bitF=1".

---Setting range---

0 to 9999 (ms)

	#3074	GBsp	Guide bushing spindle synchronization control

Set the reference spindle and G/B spindle.

1: Reference spindle
2: Guide bushing spindle
0: Other

(PR) #3077 Sname — Spindle command name

Specify a spindle name to be used for giving a spindle command.
When spindle command name has been set for all the spindles, the spindle name type is used. If 0 is set to any spindle, the spindle No. type is selected.
(Note) Do not set an identical name to two or more of all the spindles.

---Setting range---

0 to 9

#3098 IDD CauThresholdSp — Motor insulation deterioration: Caution threshold

[C80]
Set the threshold so that "Z38 Insulation deterioration wrn 0001" could occur.
When performing the insulation deterioration detection and the detected value falls below the parameter setting value, "Z38 Insulation deterioration wrn 0001" occurs.
If "0" is set, the standard value (100[0.1 megohm]) will be applied.

---Setting range---

0 to 300 (0.1 megohm)

#3099 IDD ChgThresholdSp — Motor insulation deterioration: Replacement threshold

[C80]
Set the threshold so that "Z38 Insulation deterioration wrn 0002" could occur.
When performing the insulation deterioration detection and the detected value falls below the parameter setting value, "Z38 Insulation deterioration wrn 0002" occurs.
If "0" is set, the standard value (10[0.1 megohm]) will be applied.

---Setting range---

0 to 300 (0.1 megohm)

#3101 sp_t 1 — Acceleration/deceleration time constant with S command (Gear: 00)

Set the acceleration/deceleration time constant with S command (speed operation mode) when gear 00 is selected. Set the linear acceleration/deceleration time up to limit rotation speed (slimit1). Set the short time constant that the motor torque at acceleration is always saturated, however, when an abnormal noise or V-belt slip occurs, increase the time constant.

---Setting range---

0 to 30000 (ms)

#3102 sp_t 2 — Acceleration/deceleration time constant with S command (Gear: 01)

Set the acceleration/deceleration time constant with S command (speed operation mode) when gear 01 is selected. Set the linear acceleration/deceleration time up to limit rotation speed (slimit2). Set the short time constant that the motor torque at acceleration is always saturated, however, when an abnormal noise or V-belt slip occurs, increase the time constant.

---Setting range---

0 to 30000 (ms)

#3103 sp_t 3 — Acceleration/deceleration time constant with S command (Gear: 10)

Set the acceleration/deceleration time constant with S command (speed operation mode) when gear 10 is selected. Set the linear acceleration/deceleration time up to limit rotation speed (slimit3). Set the short time constant that the motor torque at acceleration is always saturated, however, when an abnormal noise or V-belt slip occurs, increase the time constant.

---Setting range---

0 to 30000 (ms)

#3104 sp_t 4 — Acceleration/deceleration time constant with S command (Gear: 11)

Set the acceleration/deceleration time constant with S command (speed operation mode) when gear 11 is selected. Set the linear acceleration/deceleration time up to limit rotation speed (slimit4). Set the short time constant that the motor torque at acceleration is always saturated, however, when an abnormal noise or V-belt slip occurs, increase the time constant.

---Setting range---

0 to 30000 (ms)

#3105 sut — Speed reach range

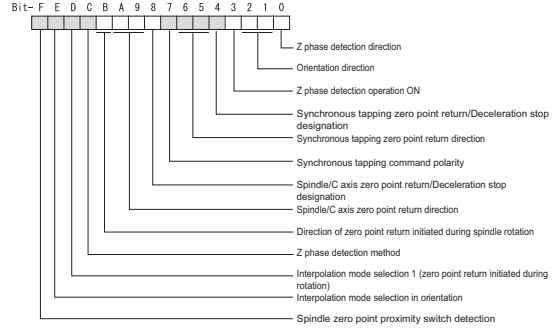
Set the speed deviation rate with respect to the commanded speed, at which the speed reach signal will be output.
It will be 15% when set to "0".
If the speed deviation is smaller than 45r/min, it will be set as 45r/min.

---Setting range---

0 to 100 (%)

#3106	zrn_typ	Zero point return specifications

Select the zero point return specification.
Functions are allocated to each bit.
Set this in hexadecimal format.



bitF: Spindle zero point detection with proximity switch
0: Normal
1: Enable spindle zero point detection using proximity switch

bitE: Control mode selection in orientation
Select non-interpolation mode when vibration occurs since the gain is high during the orientation.
0: Interpolation mode (Use the interpolation mode gain "SP002".)
1: Non-interpolation mode (Use the non-interpolation mode gain "SP001")

bitD: Interpolation mode selection 1 (zero point return initiated during rotation)
0: Non-interpolation mode
1: Interpolation mode

bitC: Z phase detection method
0: Follows Z phase detection direction (bit0).
1: Rotates in the commanded direction at Z phase detection speed to detect Z phase.
* To enable Z phase detection operation, set the parameter "#3106 zrn_typ bit3 (Z phase detection operation ON)" to "1".

bitB: Direction of zero point return initiated during spindle rotation
[M8]
0: Follow the setting of zero point return direction
- Follow the direction setting of orientation (bit2-1)
- Follow the setting of synch tap zero return (bit6-5)
- Follow the setting of spindle C axis zero return (bitA-9)

1: Follow the spindle rotation direction

bitA-9: Spindle/C axis zero point return direction
bitA,9=
00: Short-cut
01: Forward run
10: Reverse run

bit8: Designate zero point return
0: Compatible operation with our conventional series (Automatically return to zero point simultaneously with C-axis changeover)
1: Standard setting

bit7: Synchronous tapping command polarity
0: Forward direction
1: Reverse direction (The standard setting when spindle and motor are directly coupled)

bit6-5: Synchronous tapping zero point return direction
bit 6,5=
00: Short-cut
01: Forward run
10: Reverse run

bit4: Designate zero point return
0: Automatically return to zero point before synchronous tapping is started (tapping phase alignment)
1: Not return to zero point and immediately synchronous tapping is started

bit3: Z phase detection operation ON
0: When Z phase is not detected, detect Z phase during the rotation executed by a rotation command without performing the detection operation.
1: When Z phase is not detected, perform the detection operation according to the settings of bitC and bit0, and then rotate the motor according to a rotation command.

bit2-1: Orientation direction
bit 2,1=
00: Short-cut
01: Forward run
10: Reverse run

bit0: Z phase detection direction
0: Forward direction
1: Reverse direction

#3107 ori_spd — Orientation command speed

Set the spindle speed during orientation command.
When the spindle is not running or running to the different direction with the orientation, the orientation is carried out with this speed after a stop. When the spindle is running to the same direction with the orientation, this parameter does not have a meaning because it decelerates directly and the orientation is carried out.

---Setting range---

1 to 99999 (r/min)

#3108 ori_sft — Position shift amount for orientation

The orientation stop position can be moved by this parameter setting although normally the position is Z-phase position.
During multi-point orientation control, the stop position is determined by the total value of this parameter and the position data for multi-point orientation of PLC input.

---Setting range---

-35999 to 35999 (0.01°)

#3109 zdetspd — Z phase detection speed

For the first S command after power is turned ON, the spindle rotates at the speed of setting value for this parameter until Z phase is detected twice.
When "#3106/bitF = 1" (Spindle zero point proximity switch detection enabled), also proximity switch is detected.

(Note) When spindle zero point proximity switch detection is enabled, the rotation direction of the orientation/zero point return (synchronous tapping, spindle/C axis) will follow Z phase detection direction. And the speed will follow Z phase detection speed.

---Setting range---

1 to 99999 (r/min)

#3110 tap_spd — Synchronous tapping zero point return speed

Set the zero point return speed during synchronous tapping control.

---Setting range---

1 to 99999 (r/min)

#3111 tap_sft — Synchronous tapping zero point return shift amount

Set the zero point return shift amount during synchronous tapping control. Zero point angle shifts from Z phase according to the setting angle.

---Setting range---

0 to 35999 (0.01°)

#3112 cax_spd — Spindle C axis zero point return speed

Set the zero point return speed during spindle C axis control.

---Setting range---

1 to 99999 (r/min)

#3113 cax_sft — Spindle C axis zero point return shift amount

Set the spindle C axis zero point return shift amount. Zero point angle shifts from Z phase according to the setting angle.

---Setting range---

0 to 359999 (0.001°)

#3114 cax_para_chg — Spindle/C axis parameter switch

Parameter switches when switching the encoder system between normal spindle control and C axis control, such as using spindle side encoder only for C axis control in spindle drive system. It is validated with replacing a certain servo parameter of the corresponding servo axis to a spindle parameter.

0: Not switch
1: Switch

---Setting range---

0/1 (Standard: 0)

#3115 sp2_t1 — Time constant in orientation/interpolation mode automatic reference position return (Gear: 00)

Set the linear acceleration/deceleration time constant for zero point return control (#3106/bit4,8) which is automatically started at the time of switching orientation control, C axis control and synchronous tapping control when gear 00 is selected. The inclination is determined by the ratio to limit rotation speed (slimit1). Set the sufficiently large value compared to the acceleration/deceleration time constant with S command (sp_t1) so that the output torque is not saturated. When executing C axis zero point return manually, it depends on the axis specification parameter.

---Setting range---

0 to 30000 (ms)

#3116 sp2_t2 — Time constant in orientation/interpolation mode automatic reference position return (Gear: 01)

Set the linear acceleration/deceleration time constant for zero point return control (#3106/bit4,8) which is automatically started at the time of switching orientation control, C axis control and synchronous tapping control when gear 01 is selected. The inclination is determined by the ratio to limit rotation speed (slimit2). Set the sufficiently large value compared to the acceleration/deceleration time constant with S command (sp_t2) so that the output torque is not saturated. When executing C axis zero point return manually, it depends on the axis specification parameter.

---Setting range---

0 to 30000 (ms)

#3117 sp2_t3 **Time constant in orientation/interpolation mode automatic reference position return (Gear: 10)**

Set the linear acceleration/deceleration time constant for zero point return control (#3106/bit4,8) which is automatically started at the time of switching orientation control, C axis control and synchronous tapping control when gear 10 is selected. The inclination is determined by the ratio to limit rotation speed (slimit3). Set the sufficiently large value compared to the acceleration/deceleration time constant with S command (sp_t3) so that the output torque is not saturated. When executing C axis zero point return manually, it depends on the axis specification parameter.

---Setting range---

0 to 30000 (ms)

#3118 sp2_t4 **Time constant in orientation/interpolation mode automatic reference position return (Gear: 11)**

Set the linear acceleration/deceleration time constant for zero point return control (#3106/bit4,8) which is automatically started at the time of switching orientation control, C axis control and synchronous tapping control when gear 11 is selected. The inclination is determined by the ratio to limit rotation speed (slimit4). Set the sufficiently large value compared to the acceleration/deceleration time constant with S command (sp_t4) so that the output torque is not saturated. When executing C axis zero point return manually, it depends on the axis specification parameter.

---Setting range---

0 to 30000 (ms)

#3120 staptr **Time constant reduction rate in high-speed synchronous tapping**

When performing high-speed synchronous tapping control(#1281/bit5), set the reduction rate of the time constant compared to the time constant in normal synchronous tapping.
(Setting "0" or "100" will be regarded as reduction rate zero, so the time constant won't be reduced.)
E.g.) When set to "10", time constant in high-speed synchronous tapping will be 90% of that in normal synchronous tapping.

---Setting range---

0 to 100(%)

#3121 tret **Turret indexing**

Select the validity of turret indexing.

0: Invalid
1: Valid

#3122 GRC **Turret side gear ratio**

Set the number of teeth on the turret side when the gear selection command (control input 4/bit6, 5) is set to 00. Set a value of GRC so that the ratio of GRC to the spindle side gear ratio (#13057 SP057) will be 1:N (an integer).
If GRC is set to "0", it will be regarded as "1".

---Setting range---

0 to 32767

#3123 tret_spd **Turret indexing speed**

Set the turret end indexing speed when in turret indexing.
When this parameter is set to 0, it follows the value set for Orientation command speed (#3107).

---Setting range---

0 to 32767(r/min)

#3124 tret_t **Turret indexing time constant**

Set the acceleration/deceleration time constant to reach Limit rotation speed (slimt1) at gear 00 when in turret indexing. Set this parameter to a larger value than time constant in orientation (#3115).

---Setting range---

0 to 30000 (ms)

#3125 tret_inpos **Turret indexing in-position width**

Set the position error range in which the index positioning complete signal is output when in turret indexing. When this parameter is set to 0, the value of In-position width (#13024 SP024) will be used for this width.

---Setting range---

0 to 32767(1°/1000)

#3126 tret_fin_off **Index positioning complete signal OFF time**

Set the time to forcedly turn OFF the index positioning complete signal since the indexing start signal turns ON. If this period of time has not passed yet, the index positioning complete signal will not turn ON even at the completion of index positioning.

---Setting range---

0 to 10000 (ms)

#3127 SPECSP Spindle specification

bit3: Spindle rotation direction

Define the relationship between the motor's actual direction of rotation and the spindle rotation signals (Spindle forward run start/Spindle reverse run start).

0: Forward
1: Reverse

bit1: Spindle cycle counter direction

Specify whether the cycle counter counts up or down during the spindle forward run.

0: Count up during forward run
1: Count down during forward run

bit0: Output conditions of spindle changeover mode and spindle speed reach signals

0: Conventional operation
- Spindle changeover mode signal
  When the spindle stop signal is ON and when a gear recommended by NC and the one selected in ladder program are different, the spindle changeover mode signal is output to the spindle drive unit.
- Spindle speed reach signal
  Spindle speed reach signal is turn ON/OFF according to the FB signal.

1: Operation when the gear responds to the neutral state under full-closed control
- Spindle changeover mode signal
  When both the spindle stop signal and the spindle gear shift signal are ON, the spindle changeover mode signal is output to the spindle drive unit.
- Spindle speed reach signal
  During gear changeover (while gear changeover is being commanded), the spindle speed reach signal is turned ON/OFF according to the virtual spindle-end speed that is calculated by multiplying the motor-end speed by the gear ratio (motor-end gear teeth/spindle-end gear teeth).

---Setting range---

0x0000 to 0xffff (hexadecimal)

#3128 ori_spec Orientation control specification

bit1: High-speed proximity-switch orientation

[M8]

Select whether to enable high-speed proximity-switch orientation.

This orientation can be used when Proximity-switch spindle zero point detection (#3106 zrn_typ/bitF) is enabled.

0: Disable
1: Enable

[C80]

Not used.

bit0: Orientation in-position advance output

Reduce the orientation time by detecting an in-position faster.

The in-position detection width is changed from SP024(#13024) to ori_inp2.

0: Invalid
1: Valid

---Setting range---

0x0000 to 0xffff (hexadecimal)

#3129 cax_spec Spindle/C axis control specification

bit5 : Retention of coordinate system setting offset at switchover to C axis mode

[M8]

Select whether to retain the offset for the coordinate system setting(G92/G50) or local coordinate system setting (G52) when the control is switched to C axis mode.

0: Not retain the offset for coordinate system setting
1: Retain the offset for coordinate system setting

[C80]

Not used.

bit4: Gain switchover for all the axes within the part system when C axis is selected

0: The gains of servo axes except C axis are not switched when C axis is selected.
1: The gains of servo axes except C axis are switched when C axis is selected.

#2203(PGN1) SV003 --> #2249(PGN1sp) SV049
#2204(PGN2) SV004 --> #2250(PGN2sp) SV050
#2257(SHGC) SV057 --> #2258(SHGCsp) SV058

bit3: Mode selection at reset when the program command method is selected

0: Spindle mode
1: The mode at reset is retained.

This parameter is enabled when the program command method is selected (#3129 cax_spec/bit0=1).

bit2: Mode selection at Power ON when the program command method is selected

0: Spindle mode
1: C axis mode

This parameter is enabled when the program command method is selected (#3129 cax_spec/bit0=1).

bit1: Coordinate system setting when the deceleration stop type (no zero point return) is selected

Select the C axis coordinate system setting method when the deceleration stop type (no zero point return) is selected.

0: Establish the coordinates of the deceleration stop position by using the Z-phase position as the coordinate zero point.
1: The deceleration stop position is used as the coordinate zero point.

bit0: Spindle position control changeover method

Select the method of changing the mode between C axis and spindle.

0: PLC signal method
1: Program command method

#3130 syn_spec — Spindle synchronization control specification

bit2: Error compensation between reference and synchronized spindles
0: Error compensation is performed.
1: Error compensation is not performed.
*Set this parameter for the synchronized spindle.
bit1: Phase alignment method selection
0: Phase alignment method type 1 (step alignment method)
1: Phase alignment method type 2 (multi-step acceleration/deceleration method)
*Set this parameter for the synchronized spindle.
bit0: Tool spindle synchronization II (hobbing) automatic compensation selection
0: No compensation.
1: Compensate hobbing axis delay (advance) with workpiece axis.

#3131 tap_spec — Synchronous tapping control specification

Not used. Set to "0000".

#3132 ori_inp2 — 2nd in-position width for orientation

Set the in-position width when in-position advance output control (#3128/bit0) is valid. Reduce the orientation time by setting a bigger value than the value of conventional SP024 and detecting an in-position faster.
Conventional SP024 is used for 2nd in-position signal detection width.
---Setting range---
0 to 32767 (1deg/1000)

#3133 spherr — Hobbing axis delay (advance) allowable angle

Set the allowable angle between the commanded position and actual position of hobbing axis when it is in tool spindle synchronization II (hobbing) mode (X18AE ON), and also when hobbing axis and workpiece axis are synchronizing (X18A9 ON).
---Setting range---
0 to 32767 (1deg/1000)

#3134 sphtc — Primary delay time constant for hobbing axis automatic compensation

Set the primary delay time constant of hobbing axis automatic compensation primary delay filter control in tool spindle synchronization II (hobbing).
When set to 0, primary delay filter control is invalid.
---Setting range---
0 to 32767 (ms)

#3135 sfwd_g — Feed forward gain for hobbing axis

Set the feed forward gain for the hobbing axis in tool spindle synchronization II (hobbing) mode.
---Setting range---
0 to 200 (%)

#3137 stap_ax_off — High-speed synchronous tapping disabled axis

Not used. Set to "0".

#3138 motor_type — Spindle motor type

Set the spindle motor type. The set type will be displayed on the drive monitor screen, and it will be also output to the system configuration data.
---Setting range---
Character string within 26 characters including A-Z, a-z, 0-9, "." (decimal point), "-" (hyphen), "/" (slash)
(Cleared by inputting "0".)

(PR) #3139 sp_srvdrv — Spindle-mode servo control

Select whether to enable spindle control using a servo drive unit and servo motor (spindle-mode servo control).
0: Disable spindle-mode servo control
1: Enable spindle-mode servo control

(PR) #3140 S_DINSp — Speed observation input door No.

Set the door signal input in the drive unit.
Use this parameter only when the axis with a door signal belongs to several door groups.
The correspondence between the door signals and bits are as follows.
bit0 : Door1 signal
bit1 : Door2 signal
If the axis does not receive any door signal, set to "0".
An error (Y20 0027) will occur in the following cases.
- Several bits are enabled.
- Any bit other than those set in "#3071 S_DSISp" is enabled.
---Setting range---
0000 to 0002 (HEX)

(PR) #3141 spsscfeed1 — Observation speed 1

[M8]
Set the observation speed, which is at the machine end, in the multi-step speed monitor.

(Note) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(deg/min)
---Setting range---
0 to 6553500 (deg/min)
[C80]
Not used.

(PR) #3142 spsscfeed2 Observation speed 2

[M8]
Set the observation speed, which is at the machine end, in the multi-step speed monitor.

(Note) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(deg/min)

---Setting range---
0 to 6553500 (deg/min)
[C80]
Not used.

(PR) #3143 spsscfeed3 Observation speed 3

[M8]
Set the observation speed, which is at the machine end, in the multi-step speed monitor.

(Note) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(deg/min)

---Setting range---
0 to 6553500 (deg/min)
[C80]
Not used.

(PR) #3144 spsscfeed4 Observation speed 4

[M8]
Set the observation speed, which is at the machine end, in the multi-step speed monitor.

(Note) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(deg/min)

---Setting range---
0 to 6553500 (deg/min)
[C80]
Not used.

(PR) #3145 S_SigInSP Safety observation signal input

[M8]
This parameter specifies which observation speed change signal is input in the drive unit. The observation speed change signal corresponds to the following bits of the parameter.
bit0: Observation speed change signal 1 is connected.
bit1: Observation speed change signal 2 is connected.
bit2: Observation speed change signal 3 is connected.
If the axis receives no observation speed change signal, set to "0000".
(Note) When a same setting value is set to more than one axis, or when more than one BIT is set to turn ON for one axis, the alarm (Y20 0027) will occur.

---Setting range---
0000 to 0004 (HEX)
[C80]
Not used.

#3146 RatedOutL(PwrCal) Short-time rated output for power computation (L-coil)

Specify the short-time rated output of the spindle motor (for L-coil).
This value is used for calculating the power consumption of the spindle motor.

---Setting range---
0 to 99999999 (W)

#3147 RatedOutH(PwrCal) Short-time rated output for power computation (H-coil)

Specify the short-time rated output of the spindle motor (for H-coil).
This value is used for calculating the power consumption of the spindle motor.
This parameter is used also when the coil switch function is OFF.

---Setting range---
0 to 99999999 (W)

(PR) #3148 sycmpctm Temporary error cancel calculation delay time

Temporary error cancel calculation delay time
When a period of time set in this parameter has elapsed after turning-ON of the spindle chuck close (SPCMPC) signal, you can temporarily cancel spindle sync error by turning ON the spindle sync error temporary cancel (SPDRPO) signal.
If the specified time has not elapsed when the spindle sync error temporary cancel (SPDRPO) signal is turned ON, temporary cancel of spindle sync error is enabled first when the time of this parameter has elapsed.
When 0 is set in this parameter, the delay time will be 284(ms).

---Setting range---
0 to 3000 (msec)

(PR) #3149 spsscfeed5 Observation speed 5

[M8]
Set the observation speed, which is at the machine end, in the multi-step speed monitor.

(Note) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(deg/min)

---Setting range---
0 to 6553500 (deg/min)
[C80]
Not used.

(PR) #3150 spsscfeed6 Observation speed 6

[M8]
Set the observation speed, which is at the machine end, in the multi-step speed monitor.

(Note) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(deg/min)

---Setting range---
0 to 6553500 (deg/min)
[C80]
Not used.

(PR) #3151 spsscfeed7 Observation speed 7

[M8]
Set the observation speed, which is at the machine end, in the multi-step speed monitor.

(Note) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(deg/min)

---Setting range---
0 to 6553500 (deg/min)
[C80]
Not used.

(PR) #3152 spsscfeed8 Observation speed 8

[M8]
Set the observation speed, which is at the machine end, in the multi-step speed monitor.

(Note) When the setting value is larger than 18000, the last 2 digits will be ignored.
Ex. 1234567 -> 1234500(deg/min)

---Setting range---
0 to 6553500 (deg/min)
[C80]
Not used.

#3153 cms1 Spindle viscous friction coefficient 1

Set a viscous friction coefficient for spindle.
This parameter is to estimate the cutting torque of spindle.
#13018(SP018)/bit5=0: Mechanical gear 1-step
#13018(SP018)/bit5=1: Coil changeover H

---Setting range---
0 to ± 9999999 (0.00001%/rpm)

#3154 cms2 Spindle viscous friction coefficient 2

Set a viscous friction coefficient for spindle.
This parameter is to estimate the cutting torque of spindle.
#13018(SP018)/bit5=0: Mechanical gear 2-step
#13018(SP018)/bit5=1: Coil changeover L

---Setting range---
0 to ± 9999999 (0.00001%/rpm)

#3155 cms3 Spindle viscous friction coefficient 3

Set a viscous friction coefficient for spindle.
This parameter is to estimate the cutting torque of spindle.
#13018(SP018)/bit5=0: Mechanical gear 3-step
#13018(SP018)/bit5=1: Coil changeover Not use

---Setting range---
0 to ± 9999999 (0.00001%/rpm)

#3156 cms4 Spindle viscous friction coefficient 4

Set a viscous friction coefficient for spindle.
This parameter is to estimate the cutting torque of spindle.
#13018(SP018)/bit5=0: Mechanical gear 4-step
#13018(SP018)/bit5=1: Coil changeover Not use

---Setting range---
0 to ± 9999999 (0.00001%/rpm)

#3157 fms1 Spindle coulomb friction coefficient 1

Set a coulomb friction coefficient for spindle.
This parameter is to estimate the cutting torque of spindle.
#13018(SP018)/bit5=0: Mechanical gear 1-step
#13018(SP018)/bit5=1: Coil changeover H

---Setting range---
0 to ± 9999999 (0.0001%/Nm)

#3158 fms2 Spindle coulomb friction coefficient 2

Set a coulomb friction coefficient for spindle.
This parameter is to estimate the cutting torque of spindle.
#13018(SP018)/bit5=0: Mechanical gear 2-step
#13018(SP018)/bit5=1: Coil changeover L

---Setting range---
0 to ± 9999999 (0.0001%/Nm)

#3159 fms3 Spindle coulomb friction coefficient 3

Set a coulomb friction coefficient for spindle.
This parameter is to estimate the cutting torque of spindle.
#13018(SP018)/bit5=0: Mechanical gear 3-step
#13018(SP018)/bit5=1: Coil changeover Not use

---Setting range---
0 to ± 9999999 (0.0001%/Nm)

#3160 fms4 **Spindle coulomb friction coefficient 4**

Set a coulomb friction coefficient for spindle.
This parameter is to estimate the cutting torque of spindle.
#13018(SP018)/bit5=0: Mechanical gear 4-step
#13018(SP018)/bit5=1: Coil changeover Not use

---Setting range---
0 to ± 9999999 (0.0001%/Nm)

#3166 disttrq_t **Disturbance torque detection filter time constant**

Set the responsiveness in detecting the disturbance torque.

---Setting range---
0 to 1000(ms) (Default value: 0)

#3168 StlTrqSPSV(PwrCal) **Stall torque of spindle-mode servo motor for power computation**

Specify the stall torque of spindle-mode servo motor.
This value is used for calculating the power consumption of the spindle-mode servo motor.

---Setting range---
0.000 to 1000.000 (Nm)

#3169 rotspzsp **Spindle-mode rotary axis Motor zero speed (For spindle-mode rotary axis only)**

Set the motor rotation speed to which the zero speed detection is executed. When the motor speed goes below the set speed, the zero speed detection turns ON.
The standard setting value is "50".
When the setting value is "0", it is on the standard setting value.

---Setting range---
0 to 1000(r/min)

#3170 rotspsdts **Spindle-mode rotary axis Speed detection setting value (For spindle-mode rotary axis only)**

Set the motor speed to which the speed detection is executed. When the motor speed goes below the set speed, the speed detection turns ON.
The standard setting value is 10% of the "#3001 slimt1" setting value.
When the setting value is "0", it is on the standard setting value.

---Setting range---
0 to 32767(r/min)

(PR) #3171 CrshStpSel **Select spindle stop method at collision detection**

Select spindle stop method at collision detection
Select the spindle stop method when a collision is detected with an axis whose setting of "#2634 Select stop method at collision detection" is 1.
bit0: Spindle decelerates to stop if the collision was detected in $1
bit1: Spindle decelerates to stop if the collision was detected in $2
bit2: Spindle decelerates to stop if the collision was detected in $3
bit3: Spindle decelerates to stop if the collision was detected in $4

If 0 is set, spindle does not stop when a collision is detected in any part system.
It is possible to set more than one part system.

---Setting range---
0 to F (HEX)

(PR) #3192 LdMeter thresholdY **Loadmeter: Caution (Yellow) threshold**

Specify the spindle load (%) at which the loadmeter displays a caution sign (yellow).
If spindle load exceeds the specified value, the loadmeter displays a caution (yellow).
If you wish to avoid showing the caution (yellow), set this parameter to be the same as #3193 LdMeter thresholdR.
When "0" is set, the value becomes 100% (default).

---Setting range---
0 to 300 (%)

(PR) #3193 LdMeter thresholdR **Loadmeter: Warning (Red) threshold**

Specify the spindle load (%) at which the loadmeter displays a warning sign (red).
If spindle load exceeds the specified value, the loadmeter displays a warning (red).
If you wish to avoid showing the warning (red), set this parameter to be the same as #3194 LdMeter load max.
When "0" is set, the value becomes 150% (default).

---Setting range---
0 to 300 (%)

(PR) #3194 LdMeter load max **Loadmeter: Maximum spindle load**

Specify the maximum spindle load (%) for loadmeter display.
When "0" is set, the value becomes 200% (default).

---Setting range---
0 to 300 (%)

(PR) #3195 mgrsptyp **Spindle's machine group setting type**

Spindle's machine group setting type
Specify which of the spindle's machine group No. parameters to use for the machine groupwise alarm stop function.
0: #3196 mgrspnum1 (Spindle's machine group No. 1)
1: #3197 mgrspnum2 (Spindle's machine group No. 2)

---Setting range---
0/1

(PR) #3196 mgrspnum1 **Spindle's machine group No. 1**

Spindle's machine group No. 1
Specify the machine group No. to which each spindle belongs.
This parameter is enabled when the parameter "#3195mgrsptyp (Spindle's machine group setting type)" is set to 0.

---Setting range---
0 to 32

(PR) #3197 mgrspnum2 Spindle's machine group No. 2

Spindle's machine group No. 2
Specify the machine group No. to which each spindle belongs, by setting the corresponding bit. This parameter is enabled when the parameter "#3195mgrsptyp (Spindle's machine group setting type)" is set to 1.

---Setting range---
00 to FF
Set this in hexadecimal format.

#13501 vfths11 Variable speed thread multi-step accel/decel changeover speed 1 (Gear00)

Set the spindle speed for changing the 1st step's acceleration/deceleration time constant at gear 00.

---Setting range---
0 to 99999(r/min)

#13502 vfths12 Variable speed thread multi-step accel/decel changeover speed 1 (Gear01)

Set the spindle speed for changing the 1st step's acceleration/deceleration time constant at gear 01.

---Setting range---
0 to 99999(r/min)

#13503 vfths13 Variable speed thread multi-step accel/decel changeover speed 1 (Gear10)

Set the spindle speed for changing the 1st step's acceleration/deceleration time constant at gear 10.

---Setting range---
0 to 99999(r/min)

#13504 vfths14 Variable speed thread multi-step accel/decel changeover speed 1 (Gear11)

Set the spindle speed for changing the 1st step's acceleration/deceleration time constant at gear 11.

---Setting range---
0 to 99999(r/min)

#13505 vftht11 Variable speed thread multi-step accel/decel change time constant 1 (Gear00)

Set the time constant to reach the variable speed thread multi-step acceleration/deceleration change-over speed 1 at gear 00.

---Setting range---
0 to 30000(10msec)

#13506 vftht12 Variable speed thread multi-step accel/decel change time constant 1 (Gear01)

Set the time constant to reach the variable speed thread multi-step acceleration/deceleration change-over speed 1 at gear 01.

---Setting range---
0 to 30000(10msec)

#13507 vftht13 Variable speed thread multi-step accel/decel change time constant 1 (Gear10)

Set the time constant to reach the variable speed thread multi-step acceleration/deceleration change-over speed 1 at gear 10.

---Setting range---
0 to 30000(10msec)

#13508 vftht14 Variable speed thread multi-step accel/decel change time constant 1 (Gear11)

Set the time constant to reach the variable speed thread multi-step acceleration/deceleration change-over speed 1 at gear 11.

---Setting range---
0 to 30000(10msec)

#13509 vfths21 Variable speed thread multi-step accel/decel changeover speed 2 (Gear00)

Set the spindle speed for changing the 2nd step's acceleration/deceleration time constant at gear 00.

---Setting range---
0 to 99999(r/min)

#13510 vfths22 Variable speed thread multi-step accel/decel changeover speed 2 (Gear01)

Set the spindle speed for changing the 2nd step's acceleration/deceleration time constant at gear 01.

---Setting range---
0 to 99999(r/min)

#13511 vfths23 Variable speed thread multi-step accel/decel changeover speed 2 (Gear10)

Set the spindle speed for changing the 2nd step's acceleration/deceleration time constant at gear 10.

---Setting range---
0 to 99999(r/min)

#13512 vfths24 Variable speed thread multi-step accel/decel changeover speed 2 (Gear11)

Set the spindle speed for changing the 2nd step's acceleration/deceleration time constant at gear 11.

---Setting range---
0 to 99999(r/min)

#13513 vftht21 Variable speed thread multi-step accel/decel change time constant 2 (Gear00)

Set the time constant to reach the variable speed thread multi-step acceleration/deceleration change-over speed 2 at gear 00.

---Setting range---
0 to 30000(10msec)

#13514 vftht22 Variable speed thread multi-step accel/decel change time constant 2 (Gear01)

Set the time constant to reach the variable speed thread multi-step acceleration/deceleration change-over speed 2 at gear 01.

---Setting range---

0 to 30000(10msec)

#13515 vftht23 Variable speed thread multi-step accel/decel change time constant 2 (Gear10)

Set the time constant to reach the variable speed thread multi-step acceleration/deceleration change-over speed 2 at gear 10.

---Setting range---

0 to 30000(10msec)

#13516 vftht24 Variable speed thread multi-step accel/decel change time constant 2 (Gear11)

Set the time constant to reach the variable speed thread multi-step acceleration/deceleration change-over speed 2 at gear 11.

---Setting range---

0 to 30000(10msec)

#13517 vftht31 Variable speed thread multi-step accel/decel change time constant 3 (Gear00)

Set the time constant to reach the limit rotation speed at gear 00.

---Setting range---

0 to 30000(10msec)

#13518 vftht32 Variable speed thread multi-step accel/decel change time constant 3 (Gear01)

Set the time constant to reach the limit rotation speed at gear 01.

---Setting range---

0 to 30000(10msec)

#13519 vftht33 Variable speed thread multi-step accel/decel change time constant 3 (Gear10)

Set the time constant to reach the limit rotation speed at gear 10.

---Setting range---

0 to 30000(10msec)

#13520 vftht34 Variable speed thread multi-step accel/decel change time constant 3 (Gear11)

Set the time constant to reach the limit rotation speed at gear 11.

---Setting range---

0 to 30000(10msec)

#13521 spt2 Spindle synchronization acceleration/deceleration time constant (Gear: 01)

Spindle synchronization acceleration/deceleration time constant (Gear: 01)

Specify the acceleration/deceleration time constant to be used when the rotation speed of spindle synchronization command is changed with the 2nd gear selected under the spindle-mode servo control or spindle synchronization control.

---Setting range---

0 to 9999(ms)

#13522 sptc21 Spindle sync multistep acceleration/deceleration changeover speed 1 (Gear: 01)

Specify the spindle speed at which a changeover to the 1st step's acceleration/deceleration time constant is made when the 2nd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13523 sptc22 Spindle sync multistep acceleration/deceleration changeover speed 2 (Gear: 01)

Specify the spindle speed at which a changeover to the 2nd step's acceleration/deceleration time constant is made when the 2nd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13524 sptc23 Spindle sync multistep acceleration/deceleration changeover speed 3 (Gear: 01)

Specify the spindle speed at which a changeover to the 3rd step's acceleration/deceleration time constant is made when the 2nd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13525 sptc24 Spindle sync multistep acceleration/deceleration changeover speed 4 (Gear: 01)

Specify the spindle speed at which a changeover to the 4th step's acceleration/deceleration time constant is made when the 2nd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13526 sptc25 Spindle sync multistep acceleration/deceleration changeover speed 5 (Gear: 01)

Specify the spindle speed at which a changeover to the 5th step's acceleration/deceleration time constant is made when the 2nd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13527 sptc26 Spindle sync multistep acceleration/deceleration changeover speed 6 (Gear: 01)

Specify the spindle speed at which a changeover to the 6th step's acceleration/deceleration time constant is made when the 2nd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13528	sptc27	Spindle sync multistep acceleration/deceleration changeover speed 7 (Gear: 01)

Specify the spindle speed at which a changeover to the 7th step's acceleration/deceleration time constant is made when the 2nd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13529	spdiv21	Time constant magnification for changeover speed 1 (Gear: 01)

Time constant magnification for changeover speed 1 (Gear: 01)

Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 1 (sptc21) to the spindle sync multi-step acceleration/deceleration changeover speed 2 (sptc22) when the 2nd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt2).

---Setting range---

0 to 127

#13530	spdiv22	Time constant magnification for changeover speed 2 (Gear: 01)

Time constant magnification for changeover speed 2 (Gear: 01)

Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 2 (sptc22) to the spindle sync multi-step acceleration/deceleration changeover speed 3 (sptc23) when the 2nd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt2).

---Setting range---

0 to 127

#13531	spdiv23	Time constant magnification for changeover speed 3 (Gear: 01)

Time constant magnification for changeover speed 3 (Gear: 01)

Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 3 (sptc23) to the spindle sync multi-step acceleration/deceleration changeover speed 4 (sptc24) when the 2nd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt2).

---Setting range---

0 to 127

#13532	spdiv24	Time constant magnification for changeover speed 4 (Gear: 01)

Time constant magnification for changeover speed 4 (Gear: 01)

Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 4 (sptc24) to the spindle sync multi-step acceleration/deceleration changeover speed 5 (sptc25) when the 2nd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt2).

---Setting range---

0 to 127

#13533	spdiv25	Time constant magnification for changeover speed 5 (Gear: 01)

Time constant magnification for changeover speed 5 (Gear: 01)

Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 5 (sptc25) to the spindle sync multi-step acceleration/deceleration changeover speed 6 (sptc26) when the 2nd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt2).

---Setting range---

0 to 127

#13534	spdiv26	Time constant magnification for changeover speed 6 (Gear: 01)

Time constant magnification for changeover speed 6 (Gear: 01)

Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 6 (sptc26) to the spindle sync multi-step acceleration/deceleration changeover speed 7 (sptc27) when the 2nd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt2).

---Setting range---

0 to 127

#13535	spdiv27	Time constant magnification for changeover speed 7 (Gear: 01)

Time constant magnification for changeover speed 7 (Gear: 01)

Specify the acceleration/deceleration time constant to be used for the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 7 (sptc27) or a higher speed when the 2nd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt2).

---Setting range---

0 to 127

#13536	spt3	Spindle synchronization acceleration/deceleration time constant(Gear: 10)

Spindle synchronization acceleration/deceleration time constant(Gear: 10)

Specify the acceleration/deceleration time constant to be used when the commanded spindle synchronization rotation speed is changed with the 3rd gear selected during the spindle-mode servo control or spindle synchronization control.

---Setting range---

0 to 9999(ms)

#13537 sptc31 Spindle sync multistep acceleration/deceleration changeover speed 1 (Gear: 10)

Specify the spindle speed at which a changeover to the 1st step's acceleration/deceleration time constant is made when the 3rd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13538 sptc32 Spindle sync multistep acceleration/deceleration changeover speed 2 (Gear: 10)

Specify the spindle speed at which a changeover to the 2nd step's acceleration/deceleration time constant is made when the 3rd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13539 sptc33 Spindle sync multistep acceleration/deceleration changeover speed 3 (Gear: 10)

Specify the spindle speed at which a changeover to the 3rd step's acceleration/deceleration time constant is made when the 3rd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13540 sptc34 Spindle sync multistep acceleration/deceleration changeover speed 4 (Gear: 10)

Specify the spindle speed at which a changeover to the 4th step's acceleration/deceleration time constant is made when the 3rd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13541 sptc35 Spindle sync multistep acceleration/deceleration changeover speed 5 (Gear: 10)

Specify the spindle speed at which a changeover to the 5th step's acceleration/deceleration time constant is made when the 3rd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13542 sptc36 Spindle sync multistep acceleration/deceleration changeover speed 6 (Gear: 10)

Specify the spindle speed at which a changeover to the 6th step's acceleration/deceleration time constant is made when the 3rd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13543 sptc37 Spindle sync multistep acceleration/deceleration changeover speed 7 (Gear: 10)

Specify the spindle speed at which a changeover to the 7th step's acceleration/deceleration time constant is made when the 3rd step gear is selected.

---Setting range---

0 to 99999(r/min)

#13544 spdiv31 Time constant magnification for changeover speed 1 (Gear: 10)

Time constant magnification for changeover speed 1 (Gear: 10)

Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 1 (sptc31) to the spindle sync multi-step acceleration/deceleration changeover speed 2 (sptc32) when the 3rd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt3).

---Setting range---

0 to 127

#13545 spdiv32 Time constant magnification for changeover speed 2 (Gear: 10)

Time constant magnification for changeover speed 2 (Gear: 10)

Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 2 (sptc32) to the spindle sync multi-step acceleration/deceleration changeover speed 3 (sptc33) when the 3rd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt3).

---Setting range---

0 to 127

#13546 spdiv33 Time constant magnification for changeover speed 3 (Gear: 10)

Time constant magnification for changeover speed 3 (Gear: 10)

Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 3 (sptc33) to the spindle sync multi-step acceleration/deceleration changeover speed 4 (sptc34) when the 3rd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt3).

---Setting range---

0 to 127

#13547 spdiv34 Time constant magnification for changeover speed 4 (Gear: 10)

Time constant magnification for changeover speed 4 (Gear: 10)

Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 4 (sptc34) to the spindle sync multi-step acceleration/deceleration changeover speed 5 (sptc35) when the 3rd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt3).

---Setting range---

0 to 127

#13548 spdiv35 Time constant magnification for changeover speed 5 (Gear: 10)

Time constant magnification for changeover speed 5 (Gear: 10)
Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 5 (sptc35) to the spindle sync multi-step acceleration/deceleration changeover speed 6 (sptc36) when the 3rd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt3).

---Setting range---
0 to 127

#13549 spdiv36 Time constant magnification for changeover speed 6 (Gear: 10)

Time constant magnification for changeover speed 6 (Gear: 10)
Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 6 (sptc36) to the spindle sync multi-step acceleration/deceleration changeover speed 7 (sptc37) when the 3rd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt3).

---Setting range---
0 to 127

#13550 spdiv37 Time constant magnification for changeover speed 7 (Gear: 10)

Time constant magnification for changeover speed 7 (Gear: 10)
Specify the acceleration/deceleration time constant to be used for the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 7 (sptc37) or a higher speed when the 3rd step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt3).

---Setting range---
0 to 127

#13551 spt4 Spindle synchronization acceleration/deceleration time constant (Gear: 11)

Spindle synchronization acceleration/deceleration time constant (Gear: 11)
Specify the acceleration/deceleration time constant to be used when the commanded spindle synchronization rotation speed is changed with the 4th gear selected during the spindle-mode servo control or spindle synchronization control.

---Setting range---
0 to 9999(ms)

#13552 sptc41 Spindle sync multistep acceleration/deceleration changeover speed 1 (Gear: 11)

Specify the spindle speed at which a changeover to the 1st step's acceleration/deceleration time constant is made when the 4th step gear is selected.

---Setting range---
0 to 99999(r/min)

#13553 sptc42 Spindle sync multistep acceleration/deceleration changeover speed 2 (Gear: 11)

Specify the spindle speed at which a changeover to the 2nd step's acceleration/deceleration time constant is made when the 4th step gear is selected.

---Setting range---
0 to 99999(r/min)

#13554 sptc43 Spindle sync multistep acceleration/deceleration changeover speed 3 (Gear: 11)

Specify the spindle speed at which a changeover to the 3rd step's acceleration/deceleration time constant is made when the 4th step gear is selected.

---Setting range---
0 to 99999(r/min)

#13555 sptc44 Spindle sync multistep acceleration/deceleration changeover speed 4 (Gear: 11)

Specify the spindle speed at which a changeover to the 4th step's acceleration/deceleration time constant is made when the 4th step gear is selected.

---Setting range---
0 to 99999(r/min)

#13556 sptc45 Spindle sync multistep acceleration/deceleration changeover speed 5 (Gear: 11)

Specify the spindle speed at which a changeover to the 5th step's acceleration/deceleration time constant is made when the 4th step gear is selected.

---Setting range---
0 to 99999(r/min)

#13557 sptc46 Spindle sync multistep acceleration/deceleration changeover speed 6 (Gear: 11)

Specify the spindle speed at which a changeover to the 6th step's acceleration/deceleration time constant is made when the 4th step gear is selected.

---Setting range---
0 to 99999(r/min)

#13558 sptc47 Spindle sync multistep acceleration/deceleration changeover speed 7 (Gear: 11)

Specify the spindle speed at which a changeover to the 7th step's acceleration/deceleration time constant is made when the 4th step gear is selected.

---Setting range---
0 to 99999(r/min)

#13559 spdiv41 Time constant magnification for changeover speed 1 (Gear: 11)

Time constant magnification for changeover speed 1 (Gear: 11)
Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 1 (sptc41) to the spindle sync multi-step acceleration/deceleration changeover speed 2 (sptc42) when the 4th step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt4).

---Setting range---
0 to 127

#13560 spdiv42 Time constant magnification for changeover speed 2 (Gear: 11)

Time constant magnification for changeover speed 2 (Gear: 11)
Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 2 (sptc42) to the spindle sync multi-step acceleration/deceleration changeover speed 3 (sptc43) when the 4th step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt4).

---Setting range---
0 to 127

#13561 spdiv43 Time constant magnification for changeover speed 3 (Gear: 11)

Time constant magnification for changeover speed 3 (Gear: 11)
Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 3 (sptc43) to the spindle sync multi-step acceleration/deceleration changeover speed 4 (sptc44) when the 4th step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt4).

---Setting range---
0 to 127

#13562 spdiv44 Time constant magnification for changeover speed 4 (Gear: 11)

Time constant magnification for changeover speed 4 (Gear: 11)
Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 4 (sptc44) to the spindle sync multi-step acceleration/deceleration changeover speed 5 (sptc45) when the 4th step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt4).

---Setting range---
0 to 127

#13563 spdiv45 Time constant magnification for changeover speed 5 (Gear: 11)

Time constant magnification for changeover speed 5 (Gear: 11)
Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 5 (sptc45) to the spindle sync multi-step acceleration/deceleration changeover speed 6 (sptc46) when the 4th step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt4).

---Setting range---
0 to 127

#13564 spdiv46 Time constant magnification for changeover speed 6 (Gear: 11)

Time constant magnification for changeover speed 6 (Gear: 11)
Specify the acceleration/deceleration time constant to be used in a range of the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 6 (sptc46) to the spindle sync multi-step acceleration/deceleration changeover speed 7 (sptc47) when the 4th step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt4).

---Setting range---
0 to 127

#13565 spdiv47 Time constant magnification for changeover speed 7 (Gear: 11)

Time constant magnification for changeover speed 7 (Gear: 11)
Specify the acceleration/deceleration time constant to be used for the spindle-mode servo control/spindle synchronization multi-step acceleration/deceleration changeover speed 7 (sptc47) or a higher speed when the 4th step gear is selected. Set this as a magnification with respect to the spindle-mode servo control/spindle synchronization acceleration/deceleration time constant (spt4).

---Setting range---
0 to 127

(PR) #43001 sgear_tret Turret gear change ON

Select whether to enable turret gear change control (gear change at the spindle gear ratios SGRA1 to SGRB4) for a spindle that is under semi-closed loop control.
0: Disable
1: Enable

#43002 SGRA1 Spindle-side gear ratio 1

This ratio is enabled under turret gear change control.
Specify the number of spindle-side gear teeth for gear selection command GI1=0/GI2=0.
When 0 is set, the operation will be the same as when 1 is set.

---Setting range---
0 to 32767

#43003 SGRA2 Spindle-side gear ratio 2

This ratio is enabled under turret gear change control.
Specify the number of spindle-side gear teeth for gear selection command GI1=0/GI2=0.
When 0 is set, the operation will be the same as when 1 is set.

---Setting range---
0 to 32767

#43004 SGRA3 Spindle-side gear ratio 3

This ratio is enabled under turret gear change control.
Specify the number of spindle-side gear teeth for gear selection command GI1=0/GI2=0.
When 0 is set, the operation will be the same as when 1 is set.

---Setting range---

0 to 32767

#43005 SGRA4 Spindle-side gear ratio 4

This ratio is enabled under turret gear change control.
Specify the number of spindle-side gear teeth for gear selection command GI1=0/GI2=0.
When 0 is set, the operation will be the same as when 1 is set.

---Setting range---

0 to 32767

#43006 SGRB1 Motor shaft-side gear ratio 1

This ratio is enabled under turret gear change control.
Specify the number of teeth of the motor shaft side gear 1 for gear selection command GI1=0/GI2=0.
When 0 is set, the operation will be the same as when 1 is set.

---Setting range---

0 to 32767

#43007 SGRB2 Motor shaft-side gear ratio 2

This ratio is enabled under turret gear change control.
Specify the number of teeth of the motor shaft side gear 1 for gear selection command GI1=0/GI2=0.
When 0 is set, the operation will be the same as when 1 is set.

---Setting range---

0 to 32767

#43008 SGRB3 Motor shaft-side gear ratio 3

This ratio is enabled under turret gear change control.
Specify the number of teeth of the motor shaft side gear 1 for gear selection command GI1=0/GI2=0.
When 0 is set, the operation will be the same as when 1 is set.

---Setting range---

0 to 32767

#43009 SGRB4 Motor shaft-side gear ratio 4

This ratio is enabled under turret gear change control.
Specify the number of teeth of the motor shaft side gear 1 for gear selection command GI1=0/GI2=0.
When 0 is set, the operation will be the same as when 1 is set.

---Setting range---

0 to 32767

#43046 smax_tap1 Synchro tapping spindle Max rotation speed (Gear: 00)

Specify the maximum rotation speed in synchronous tapping multi-step acceleration/deceleration control when gear 00 is selected.
Inclination of 3rd linear acceleration/deceleration control is determined by the ratio of smax-_tap1(#43046) and tapt31(#3045).
When 0 is set to smax_tap1, use smax1(#3005).
When smax_tap1 is smax1 or more, use smax1.

---Setting range---

0 to 99999 (r/min)

#43047 smax_tap2 Synchro tapping spindle Max rotation speed (Gear: 01)

Specify the maximum rotation speed in synchronous tapping multi-step acceleration/deceleration control when gear 01 is selected.
Inclination of 3rd linear acceleration/deceleration control is determined by the ratio of smax-_tap2(#43047) and tapt32(#3046).
When 0 is set to smax_tap2, use smax2(#3006).
When smax_tap2 is smax2 or more, use smax2.

---Setting range---

0 to 99999 (r/min)

#43048 smax_tap3 Synchro tapping spindle Max rotation speed (Gear: 10)

Specify the maximum rotation speed in synchronous tapping multi-step acceleration/deceleration control when gear 10 is selected.
Inclination of 3rd linear acceleration/deceleration control is determined by the ratio of smax-_tap3(#43048) and tapt33(#3047).
When 0 is set to smax_tap3, use smax3(#3007).
When smax_tap3 is smax3 or more, use smax3.

---Setting range---

0 to 99999 (r/min)

#43049 smax_tap4 Synchro tapping spindle Max rotation speed (Gear: 11)

Specify the maximum rotation speed in synchronous tapping multi-step acceleration/deceleration control when gear 11 is selected.
Inclination of 3rd linear acceleration/deceleration control is determined by the ratio of smax-_tap4(#43049) and tapt34(#3048).
When 0 is set to smax_tap4, use smax4(#3008).
When smax_tap4 is smax4 or more, use smax4.

---Setting range---

0 to 99999 (r/min)

#43070 loadrate_warn **Spindle motor equivalent load factor excess warning**

[M8]
Specify the equivalent load factor of the spindle motor that causes the warning at the start of automatic operation.
The warning appears when the equivalent load factor has exceeded the specified value.
0: Disable the warning
1 to 200: Warning display threshold [%]
[C80]
Not used.

#43071 sp_spd_flc_dtc_p **Delay time for starting spindle speed fluctuation detection**

[M8]
This parameter is used when address P is omitted from the spindle speed fluctuation detection command (G162).
Specify a length of delay time from when G162 command is given to when the control detects a fluctuation. This delay time is also applied to a change in spindle speed command. A change in spindle speed command means a difference in the final command given to the spindle drive unit.
---Setting range---
0 to 99.999 (s)
[C80]
Not used.

#43072 sp_spd_flc_dtc_r **Allowable spindle speed fluctuation rate**

[M8]
Specify the allowable spindle speed fluctuation rate to be applied to the spindle speed fluctuation detection command (G162) from which address R is omitted.
When "0" is set, the allowable rate is 15%.
If a speed deviation with respect to the command speed is smaller than 45 r/min, the speed deviation is treated as 45 r/min.
---Setting range---
0 to 100 (%)
[C80]
Not used.

#43073 sp_spd_flc_dtc_i **Allowable spindle speed fluctuation range**

[M8]
Specify the allowable spindle speed fluctuation range to be applied to the spindle speed fluctuation detection command (G162) from which address I is omitted.
When "0" is set, the allowable range is treated as 45 r/min.
---Setting range---
0 to 999999 (r/min)
[C80]
Not used.

#43074 zdet_num **Maximum number of revolutions for Z phase detection**

[M8]
Specify the maximum number of revolutions for the Z phase detection of proximity-switch orientation.
If Z phase is not yet detected when the spindle has reached the specified number of revolutions, the operation error (M01 0301) occurs.
When this parameter is "0", the maximum number of revolutions is treated as 2.
---Setting range---
0 to 255 (revolutions)
[C80]
Not used.

(PR) #43076 GRA1ex **Spindle-side extended gear ratio 1**

[M8]
Specify the number of spindle-side gear teeth for "Gear selection command (Control input 4/bit6, 5) = 00".
When 0 is set, extended gear ratio is disabled.
When not using extended gear ratio, set 0.
---Setting range---
0 to 2147483647

(PR) #43077 GRA2ex **Spindle-side extended gear ratio 2**

[M8]
Specify the number of spindle-side gear teeth for "Gear selection command (Control input 4/bit6, 5) = 01".
When 0 is set, extended gear ratio is disabled.
When not using extended gear ratio, set 0.
---Setting range---
0 to 2147483647

(PR) #43078 GRA3ex **Spindle-side extended gear ratio 3**

[M8]
Specify the number of spindle-side gear teeth for "Gear selection command (Control input 4/bit6, 5) = 10".
When 0 is set, extended gear ratio is disabled.
When not using extended gear ratio, set 0.
---Setting range---
0 to 2147483647

(PR) #43079 GRA4ex **Spindle-side extended gear ratio 4**

[M8]
Specify the number of spindle-side gear teeth for "Gear selection command (Control input 4/bit6, 5) = 11".
When 0 is set, extended gear ratio is disabled.
When not using extended gear ratio, set 0.
---Setting range---
0 to 2147483647

(PR) #43080 GRB1ex Motor-side extended gear ratio 1

[M8]
Specify the number of motor-side gear teeth for "Gear selection command (Control input 4/bit6, 5) = 00".
When 0 is set, extended gear ratio is disabled.
When not using extended gear ratio, set 0.

---Setting range---

0 to 2147483647

(PR) #43081 GRB2ex Motor-side extended gear ratio 2

[M8]
Specify the number of motor-side gear teeth for "Gear selection command (Control input 4/bit6, 5) = 01".
When 0 is set, extended gear ratio is disabled.
When not using extended gear ratio, set 0.

---Setting range---

0 to 2147483647

(PR) #43082 GRB3ex Motor-side extended gear ratio 3

[M8]
Specify the number of motor-side gear teeth for "Gear selection command (Control input 4/bit6, 5) = 10".
When 0 is set, extended gear ratio is disabled.
When not using extended gear ratio, set 0.

---Setting range---

0 to 2147483647

(PR) #43083 GRB4ex Motor-side extended gear ratio 4

[M8]
Specify the number of motor-side gear teeth for "Gear selection command (Control input 4/bit6, 5) = 11".
When 0 is set, extended gear ratio is disabled.
When not using extended gear ratio, set 0.

---Setting range---

0 to 2147483647

#43084 protect_sp_st_tmp Spindle protection start temperature

[M8]
Specify the motor temperature at which spindle protection starts.
When the spindle motor temperature reaches the set temperature or higher, the acceleration/deceleration time constant is switched from that of S command to that for spindle protection.
Set a temperature that is the same as or higher than the spindle protection cancel temperature.
When 0 is set, the spindle acceleration/deceleration time constant is not switched according to the temperature.

---Setting range---

0 to 200 (°C)

#43085 protect_sp_rls_tmp Spindle protection cancel temperature

[M8]
Specify the motor temperature at which spindle protection is cancelled.
When the spindle motor temperature drops below the set temperature, the acceleration/deceleration time constant is switched from that for spindle protection to that of S command.
Set a temperature that is the same as or lower than the spindle protection start temperature.
When the set temperature is 0 or higher than the spindle protection start temperature, the cancel temperature is set 10 degrees lower than the start temperature.

---Setting range---

0 to 200 (°C)

#43086 protect_sp_t1 Acceleration/Deceleration time constant during spindle protection (Gear: 00))

[M8]
Specify the acceleration/deceleration time constant for S command (speed operation mode) to be applied to the spindle motor (gear 00) that is being protected against increased temperature.
Set the linear acceleration/deceleration time to reach the limit rotation speed (slimit1).
When 0 or any value smaller than "#3101 sp_t1" is set, switchover of the time constant is disabled, and acceleration/deceleration is performed with the time constant "#3101 sp_t1".

---Setting range---

0 to 30000 (ms)

#43087 protect_sp_t2 Acceleration/Deceleration time constant during spindle protection (Gear: 01))

[M8]
Specify the acceleration/deceleration time constant for S command (speed operation mode) to be applied to the spindle motor (gear 01) that is being protected against increased temperature.
Set the linear acceleration/deceleration time to reach the limit rotation speed (slimit2).
When 0 or any value smaller than "#3102 sp_t2" is set, switchover of the time constant is disabled, and acceleration/deceleration is performed with the time constant "#3102 sp_t2".

---Setting range---

0 to 30000 (ms)

#43088 protect_sp_t3 Acceleration/Deceleration time constant during spindle protection (Gear: 10)

[M8]
Specify the acceleration/deceleration time constant for S command (speed operation mode) to be applied to the spindle motor (gear 10) that is being protected against increased temperature.
Set the linear acceleration/deceleration time to reach the limit rotation speed (slimit3).
When 0 or any value smaller than "#3103 sp_t3" is set, switchover of the time constant is disabled, and acceleration/deceleration is performed with the time constant "#3103 sp_t3".

---Setting range---

0 to 30000 (ms)

#43089	protect_sp_t4	Acceleration/Deceleration time constant during spindle protection (Gear: 11)

[M8]
Specify the acceleration/deceleration time constant for S command (speed operation mode) to be applied to the spindle motor (gear 11) that is being protected against increased temperature.
Set the linear acceleration/deceleration time to reach the limit rotation speed (slimit4).
When 0 or any value smaller than "#3104 sp_t4" is set, switchover of the time constant is disabled, and acceleration/deceleration is performed with the time constant "#3104 sp_t4".

---Setting range---

0 to 30000 (ms)

2.9 Spindle Parameters

#13001 SP001 PGV Position loop gain non-interpolation mode

Set the position loop gain for "Non-interpolation" control mode.
When the setting value increases, the command tracking ability will enhance and the positioning settling time can be shorter. However, the impact on the machine during acceleration/deceleration will increase.
Use the selection command, the control mode "bit 2, 1, 0 = 000" in control input 4.
(Note) The control mode is commanded by NC.

---Setting range---
1 to 200 (1/s)

#13002 SP002 PGN Position loop gain interpolation mode

Set the position loop gain for "interpolation" control mode.
When the setting value increases, the command tracking ability will enhance and the positioning settling time can be shorter. However, the impact on the machine during acceleration/deceleration will increase.
Use the selection command, the control mode "bit 2, 1, 0 = 010 or 100" in control input 4.
(Note) The control mode is commanded by NC.
When carrying out the SHG control, set SP035/bitC to "1".

---Setting range---
1 to 200 (1/s)

#13003 SP003 PGS Position loop gain spindle synchronization

Set the position loop gain for "spindle synchronization" control mode.
When the setting value increases, the command tracking ability will enhance and the positioning settling time can be shorter. However, the impact on the machine during acceleration/deceleration will increase.
Use the selection command, the control mode "bit 2, 1, 0 = 001" in control input 4.
(Note 1) The control mode is commanded by NC.
When carrying out the SHG control, set SP036/bit4 to "1".
(Note 2) Set the same value for the basic and synchronous spindles in spindle synchronization.

---Setting range---
1 to 200 (1/s)

#13004 SP004

Not used. Set to "0".

#13005 SP005 VGN1 Speed loop gain 1

Set the speed loop gain.
Set this according to the load inertia size.
The higher setting value will increase the accuracy of control, however, vibration tends to occur.
If vibration occurs, adjust by lowering by 20 to 30%.
The final value should be 70 to 80% of the value at which the vibration stops.

---Setting range---
1 to 9999

#13006 SP006 VIA1 Speed loop lead compensation 1

Set the speed loop integral control gain.
The standard setting is "1900". Adjust the value by increasing/decreasing the value by about 100.
Raise this value to improve the contour tracking accuracy in high-speed cutting.
Lower this value when the position droop does not stabilize (when the vibration of 10 to 20Hz occurs).

---Setting range---
1 to 9999

#13007 SP007 VIL1 Speed loop delay compensation 1

Set this parameter when the limit cycle occurs in the full-closed loop or overshooting occurs in positioning.
When setting this parameter, make sure to set the torque offset "SP050(TOF)".
When not using, set to "0".

---Setting range---
0 to 32767

#13008 SP008 VGN2 Speed loop gain 2

Normally SP005(VGN1) is used.
By setting "SP035/bit1, SP035/bit9 or SP036/bit1=1", gain 2 can be used according to the application.
Gain 2 can also be used by setting "Speed gain set 2 changeover request (control input 5/ bitC) = 1".
Refer to SP005(VGN1) for adjustment procedures.

---Setting range---
1 to 9999

#13009 SP009 VIA2 Speed loop lead compensation 2

Normally SP006(VIA1) is used.
By setting "SP035/bit1, SP035/bit9 or SP036/bit1=1", gain 2 can be used according to the application.
Gain 2 can also be used by setting "Speed gain set 2 changeover request (control input 5/ bitC) = 1".
Refer to SP006(VIA1) for adjustment procedures.

---Setting range---
1 to 9999

#13010 SP010 VIL2 Speed loop delay compensation 2

Normally SP007(VIL1) is used.
By setting "SP035/bit1, SP035/bit9 or SP036/bit1=1", gain 2 can be used according to the application.
Gain 2 can also be used by setting "Speed gain set 2 changeover request (control input 5/ bitC) = 1".
Refer to SP007(VIL1) for adjustment procedures.

---Setting range---
0 to 32767

#13011 SP011

Not used. Set to "0".

#13012 SP012

Not used. Set to "0".

#13013 SP013

Not used. Set to "0".

#13014 SP014 PY1 Minimum excitation rate 1

Set the minimum value for the variable excitation rate. The standard setting is "50".
Set to "0" when using an IPM spindle motor.
If noise including gear noise is loud, select a small value. However, a larger setting value is more effective for impact response.

(Note) When setting a value at "50 or more", check if there is no problem with gear noise, motor excitation noise, vibration during low-speed rotation or vibration when the servo is locked during orientation stop, etc.
When setting a value at "less than 50", check if there is no problem with the impact load response or rigidity during servo lock.

---Setting range---
0 to 100 (%)

#13015 SP015 PY2 Minimum excitation rate 2

Normally, SP014(PY1) is used.
By setting "SP035/bit2, SP035/bitA or SP036/bit2=1", the excitation rate 2 can be used according to the application.
The excitation rate 2 can also be used by setting "the minimum excitation rate 2 changeover request (control input 5/ bitB) = 1". Refer to SP014(PY1) for adjustment procedures.
Set to "0" when using an IPM spindle motor.

---Setting range---
0 to 100 (%)

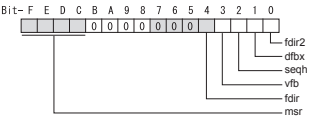
#13016 SP016 DDT Phase alignment deceleration rate

Set the single-rotation position alignment deceleration rate for orientation stopping, phase alignment while rotating and switching from non-interpolation mode to spindle synchronization mode while rotating.
When the load inertia is larger, the setting value should be smaller.
When the setting value is larger, the orientation in-position and single-rotation position alignment complete faster, but the impact applied on the machine will increase.
To change the deceleration rate only during rotation command (command $F \Delta T \neq 0$), set this parameter together with SP070 (KDDT).

---Setting range---
1 to 32767 (0.1(r/min)/ms)

(PR) #13017 SP017 SPEC1 Spindle specification 1

Select the spindle specification.
A function is allocated to each bit.
Set this in hexadecimal format.

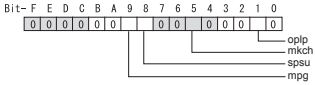


bit F-C : msr Motor series selection
0: 200V specification IM spindle motor
1: 200V specification IPM spindle motor
2: 400V specification IM spindle motor
3: 400V specification IPM spindle motor
4: 200V specification Tool spindle motor
bit B-5 :
Not used. Set to "0".
bit 4 : fdir Position feedback
Set the machine side encoder's installation polarity.
0: Forward polarity 1: Reverse polarity
bit 3 : vfb Speed feedback filter
0: Disable 1: Enable (4500Hz)
bit 2 : seqh READY ON sequence
0: Normal 1: High-speed
bit 1 : dfbx Dual feedback control
Control the position FB signal in full closed control by the combination of a motor side encoder and machine side encoder.
0: Stop 1: Start

Related parameters: SP051, SP052
bit 0 : fdir2 Speed feedback polarity
Set the motor side encoder's installation polarity by a built-in motor.
0: Forward polarity 1: Reverse polarity

(PR) #13018 SP018 SPEC2 Spindle specification 2

Select the spindle specification.
A function is allocated to each bit.
Set this in hexadecimal format.



bit F-A :
Not used. Set to "0".
bit 9 : mpg Earth fault detection
0: Disable 1: Enable (standard)
Set "0" and it is constantly "Enable" for MDS-EJ-SP Series.
bit 8 : spsu Command speed limit value
0: 33,750 r/min 1: 135,000 r/min
bit 7-6 :
Not used. Set to "0".
bit 5 : mkch Coil switch function
0: Disable 1: Enable
bit 4-2 :
Not used. Set to "0".
bit 1 : oplp Open loop control
This allows the operation in which no encoder feedback signals are used.
It is used when adjusting the encoder, etc.
0: Disable 1: Enable
bit 0 :
Not used. Set to "0".

(PR) #13019 SP019 RNG1 Sub side encoder resolution

[For semi-closed loop]
Set the same value as SP020 (RNG2). (Refer to the explanation of SP020.)

[For full-closed loop]
Set the number of pulses per revolution of the machine side encoder.

When using ABZ pulse output encoder (OSE-1024-3-15-68), set this combined with SP097(RNG1ex).
SP019 = 4096
SP097 = -1

---Setting range---
When SP097=0, the setting range is from 0 to 32767 (kp)
When SP097≠0
For M800/M80 Series: 0 to 65535 (p)

(PR) #13020 SP020 RNG2 Main side encoder resolution

Set the number of pulses per revolution of the motor side encoder.
When using the encoder interface unit MDS-EX-HR, use this with SP098(RNG2ex).

Encoder
TS5691(128 teeth): SP020 = 2000
TS5691(180 teeth): SP020 = 2880
TS5691(256 teeth): SP020 = 4000
TS5691(384 teeth): SP020 = 6000
TS5691(512 teeth): SP020 = 8000

TS5690(64 teeth): SP020 = 2000
TS5690(90 teeth): SP020 = 2880
TS5690(128 teeth): SP020 = 4000
TS5690(192 teeth): SP020 = 6000
TS5690(256 teeth): SP020 = 8000
TS5690(384 teeth): SP020 =12000

ERM280(1200 teeth): SP020 = 4800
ERM280(2048 teeth): SP020 = 8000

MPCI : SP020 = 7200
MBE205: SP020 = 2000

---Setting range---
When SP098=0, the setting range is from 0 to 32767 (kp)
When SP098≠0
For M800/M80 Series: 0 to 65535 (p)

(PR) #13021 SP021 OLT Overload detection time constant

Set the detection time constant of Overload 1 (Alarm 50). (For Mitsubishi adjustment)
Normally, set to "60".
Set to "300" when using an IPM spindle motor.
---Setting range---
1 to 15300 (s)

#13022 SP022 OLL Overload detection level

Set the current detection level of "Overload 1" (Alarm 50) as a percentage against the motor short-time rated output current. (For Mitsubishi adjustment)
Normally, set to "120".
Set to "100" when using an IPM spindle motor.
---Setting range---
1 to 200 (Short-time rated %)

#13023 SP023 OD1 — Excessive error detection width (interpolation mode - spindle synchronization)

Set the excessive error detection width for the interpolation mode and spindle synchronization.
The standard setting is "120".
When set to "0", the excessive error detection will be ignored, so do not set to "0".

---Setting range---

1 to 32767 (°)

#13024 SP024 INP — In-position width

Set the in-position detection width.
Set the positioning accuracy required to the machine.
Lower setting value increases the positioning accuracy, but makes the cycle time (settling time) longer.
The standard setting is "875".

---Setting range---

0 to 32767 (1°/1000)

#13025 SP025 INP2 — 2nd in-position width

Use this when detecting an in-position different from normal in-position width such as advancing the in-position signal. The adjustment procedure is the same as SP024 (INP).
The standard setting is "875".

---Setting range---

0 to 32767 (1°/1000)

(PR) #13026 SP026 TSP — Maximum motor speed

Set the maximum motor speed.
If the motor speed exceeds the set maximum speed, an overspeed alarm will occur.

---Setting range---

1 to 32767 (r/min)

#13027 SP027 ZSP — Motor zero speed

Set the motor speed for detecting zero speed.
If the motor speed drops below the set speed, the zero speed signal turns ON.
The standard setting is "50".

---Setting range---

1 to 1000 (r/min)

#13028 SP028 SDTS — Speed detection set value

Set the motor speed for detecting the speed.
If the motor speed drops below the set speed, the speed detection signal turns ON.
The standard setting is 10% of the maximum motor speed.

---Setting range---

10 to 32767 (r/min)

#13029 SP029 SDTR — Speed detection reset width

Set the hysteresis width in which the speed detection changes from ON to OFF.
If the setting value is small, the speed detection will chatter easily.
The standard setting is "30".

---Setting range---

10 to 1000 (r/min)

#13030 SP030 SDT2 — 2nd speed detection setting value

Set the specified speed of the specified speed output.
When carrying out digital output of the specified speed output, set SP229/bitC to "1".
It is not available for MDS-EJ-SP Series.

---Setting range---

0 to 32767 (r/min)

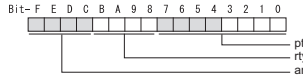
(PR) #13031 SP031 MTYP — Motor type

Set the control system of the spindle drive unit.
2200: Semi closed loop control
4200: Full closed loop control by using spindle side ABZ pulse output encoder
6200: Full closed loop control by using spindle side serial output encoder

(PR) #13032 SP032 PTYP Power supply type/ Regenerative resistor type

MDS-E/EH Series: Power supply type

When connecting a power supply unit, set a code for each power supply unit.



bit F-C : amp

Set the power backup function to be used.
No function used : 0
Deceleration and stop function at power failure : 8
Retraction function at power failure: C

bit B-8 : rtyp

Not used. Set to "0".

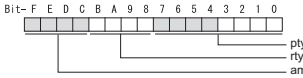
bit 7-0 : ptyp External emergency stop setting

When the emergency stop input signal of the power supply unit is "disabled"
Power supply unit is not connected : 00
MDS-E-CV-37 / MDS-EH-CV-37 : 04
MDS-E-CV-75 / MDS-EH-CV-75 : 08
MDS-E-CV-110 / MDS-EH-CV-110 : 11
MDS-E-CV-185 / MDS-EH-CV-185 : 19
MDS-E-CV-300 / MDS-EH-CV-300 : 30
MDS-E-CV-370 / MDS-EH-CV-370 : 37
MDS-E-CV-450 / MDS-EH-CV-450 : 45
MDS-E-CV-550 / MDS-EH-CV-550 : 55
MDS-EH-CV-750 : 75

When the emergency stop input signal of the power supply unit is "enabled"
(Note) Set the power supply rotary switch to "4".
Power supply unit is not connected : 00
MDS-E-CV-37 / MDS-EH-CV-37 : 44
MDS-E-CV-75 / MDS-EH-CV-75 : 48
MDS-E-CV-110 / MDS-EH-CV-110 : 51
MDS-E-CV-185 / MDS-EH-CV-185 : 59
MDS-E-CV-300 / MDS-EH-CV-300 : 70
MDS-E-CV-370 / MDS-EH-CV-370 : 77
MDS-E-CV-450 / MDS-EH-CV-450 : 85
MDS-E-CV-550 / MDS-EH-CV-550 : 95
MDS-EH-CV-750 : B5

MDS-EM/EMH Series: Power supply type

Set as follows for the spindle drive section of the MDS-EM/EMH-SPV3.



bit F-C : amp

Not used. Set to "0".

bit B-8 : rtyp

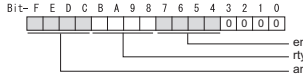
Not used. Set to "0".

bit 7-0 : ptyp External emergency stop setting

Normal
MDS-EM:20, MDS-EMH:22
External emergency stop function
MDS-EM:60, MDS-EMH:62

MDS-EJ-SP Series: Regenerative resistor type

Set the regenerative resistor type.



bit F-8 : amp(bit F-C) / rtyp(bit B-8)

Setting prohibited	: 10-12
MR-RB12 or GZG200W39OHMK	: 13
MR-RB32 or GZG200W120OHMK 3 units connected in parallel	: 14
MR-RB30 or GZG200W39OHMK 3 units connected in parallel	: 15
MR-RB50 or GZG300W39OHMK 3 units connected in parallel	: 16
Setting prohibited	: 17-1F
Setting prohibited	: 20-23
FCUA-RB22	: 24
FCUA-RB37	: 25
FCUA-RB55	: 26
FCUA-RB75/2 1 unit	: 27
R-UNIT1	: 28
R-UNIT2	: 29
R-UNIT3	: 2A
R-UNIT4	: 2B
R-UNIT5	: 2C
FCUA-RB75/2 2 units connected in parallel	: 2D
FCUA-RB55/2 2 units connected in parallel	: 2E
Setting prohibited	: 2F

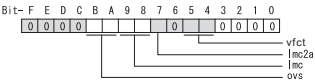
bit 7-4 : emgx External emergency stop function

Set the external emergency stop function.
0: Disable 4: Enable

bit 3-0 :
Not used. Set to "0".

#13033 SP033 SFNC1 Spindle function 1

Select the spindle specification.
A function is allocated to each bit.
Set this in hexadecimal format.

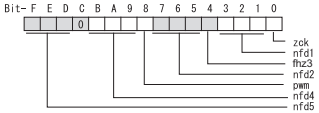


bit F-C :
Not used. Set to "0".
bit B-A : ovs Overshoot compensation
Set this parameter when overshooting occurs during positioning.
bitB,A=
00: Compensation stop
01: Setting prohibited
10: Setting prohibited
11: Compensation type 3

Set the compensation amount in SP043(OVS1) and SP042(OVS2).
bit 9-8 : lmc Lost motion compensation type2
Set this parameter when the protrusion at quadrant change is too large.
bit9,8=
00: Compensation stop
01: Setting prohibited
10: Compensation type 2
11: Setting prohibited
bit 7 : lmc2a Lost motion compensation 2 timing
0: Normal 1: Change
bit 6 :
Not used. Set to "0".
bit 5-4 : vfct Jitter compensation pulse number
Suppress vibration by machine backlash when axis stops.
bit5,4=
00: Disable
01: 1 pulse
10: 2 pulse
11: 3 pulses
bit 3-0 :
Not used. Set to "0".

#13034 SP034 SFNC2 Spindle function 2

Select the spindle function.
A function is allocated to each bit.
Set this in hexadecimal format.

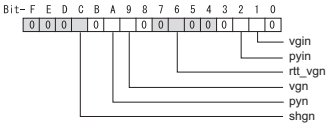


bit F-D : nfd5 Depth of Notch filter 5
Set the depth of Notch filter 5 (SP088).
bit F,E,D=
000: -∞
001: -18.1[dB]
010: -12.0[dB]
011: -8.5[dB]
100: -6.0[dB]
101: -4.1[dB]
110: -2.5[dB]
111: -1.2[dB]

bit C :
Not used. Set to "0".
bit B-9 : nfd4 Depth of Notch filter 4
Set the depth of Notch filter 4 (SP087).
bit B,A,9=
000: -∞
001: -18.1[dB]
010: -12.0[dB]
011: -8.5[dB]
100: -6.0[dB]
101: -4.1[dB]
110: -2.5[dB]
111: -1.2[dB]
bit 8 : pwm Current control
0: Standard current control 1: High frequency current control
bit 7-5 : nfd2 Depth of Notch filter 2
Set the depth of Notch filter 2 (SP046).
bit7,6,5=
000: -∞
001: -18.1[dB]
010: -12.0[dB]
011: -8.5[dB]
100: -6.0[dB]
101: -4.1[dB]
110: -2.5[dB]
111: -1.2[dB]
bit 4 : fhz3 Notch filter 3
0: Stop 1: Start (1125Hz)
bit 3-1 : nfd1 Depth of Notch filter 1
Set the depth of Notch filter 1 (SP038).
bit3,2,1=
000: -∞
001: -18.1[dB]
010: -12.0[dB]
011: -8.5[dB]
100: -6.0[dB]
101: -4.1[dB]
110: -2.5[dB]
111: -1.2[dB]
bit 0 :
Not used. Set to "0".

(PR) #13035 SP035 SFNC3 Spindle function 3

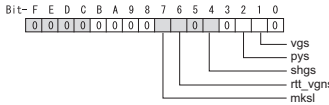
Select the spindle function.
A function is allocated to each bit.
Set this in hexadecimal format.



bit F-D :
Not used. Set to "0".
bit C : shgn SHG control in interpolation mode
0: Stop 1: Start
When using the OMR-FF control, set to "0".
bit B :
Not used. Set to "0".
bit A : pyn Excitation rate selection in interpolation mode
0: Select Excitation rate 1 1: Select Excitation rate 2
bit 9 : vgn Speed loop gain set selection in interpolation mode
0: Select Set 1 1: Select Set 2
bit 8-7 :
Not used. Set to "0".
bit 6 : rtt_vgn Real-time tuning I in non-interpolation mode / speed gain adaptation stop
0: Stop 1: Start
bit 5-3 :
Not used. Set to "0".
bit 2 : pyin Excitation rate selection in non-interpolation mode
The excitation rate after the in-position can be selected.
0: Select Excitation rate 1 1: Select Excitation rate 2
bit 1 : vgin Speed loop gain set selection in non-interpolation mode
The speed loop gain set after the in-position can be selected.
0: Select Set 1 1: Select Set 2
bit 0 :
Not used. Set to "0".

(PR) #13036 SP036 SFNC4 Spindle function 4

Select the spindle function.
A function is allocated to each bit.
Set this in hexadecimal format.



bit F-8 :
Not used. Set to "0".
bit 7 : mksl Coil selection in spindle synchronization mode
0: Select the coil commanded during synchronization 1: Select high-speed coil
bit 6 : rtt_vgns Real-time tuning I in spindle synchronization mode / speed gain adaptation stop
0: Stop 1: Start
bit 5 :
Not used. Set to "0".
bit 4 : shgs SHG control in spindle synchronization mode
0: Stop 1: Start
When using the OMR-FF control, set to "0".
bit 3 :
Not used. Set to "0".
bit 2 : pys Excitation rate selection in spindle synchronization mode
0: Select Excitation rate 1 1: Select Excitation rate 2
bit 1 : vgs Speed loop gain set selection in spindle synchronization mode
0: Select Set 1 (SP005,SP006,SP007) 1: Select Set 2 (SP008,SP009,SP010)
bit 0 :
Not used. Set to "0".

#13037 SP037 JL Load inertia scale

Set the motor axis conversion total load inertia including motor itself in proportion to the motor inertia.
SV037(JL)=(Jm+Jl)/Jm×100
Jm: Motor inertia
Jl: Motor axis conversion load inertia
---Setting range---
0 to 5000 (%)

#13038 SP038 FHz1 Notch filter frequency 1

Set the vibration frequency to suppress when machine vibration occurs.
(Enabled at 50 or more.)
When not using, set to "0".

Related parameters: SP034/bit3-1
---Setting range---
0 to 5000 (Hz)

#13039 SP039 LMCD Lost motion compensation timing

Set this parameter when the lost motion compensation type2 timing does not match.
Adjust by increasing the value by 10 at a time.

---Setting range---

0 to 2000 (ms)

#13040 SP040 LMCT Lost motion compensation non-sensitive band

Set the non-sensitive band of the lost motion compensation in the feed forward control.
When "0" is set, 2°/1000 is set. Adjust by increasing the value by 1°/1000 at a time.

---Setting range---

-32768 to 32767 (1°/1000)

#13041 SP041 LMC2 Lost motion compensation 2

Set this parameter with SP048(LMC1) only to vary the lost motion compensation amount depending on the command directions.
Normally, set to "0".

---Setting range---

-1 to 200 (Short-time rated %)
Note that when SP227/bit2 is "1", the range will be -1 to 20000 (Short-time rated 0.01%).

#13042 SP042 OVS2 Overshooting compensation 2

Set this parameter with SP043(OVS1) only to vary the lost motion compensation amount depending on the command directions.
Normally, set to "0".

---Setting range---

-1 to 100 (Short-time rated %)
Note that when SP227/bit2 is "1", the range will be -1 to 10000 (Short-time rated 0.01%).

#13043 SP043 OVS1 Overshooting compensation 1

Set this parameter when overshooting occurs during positioning. This compensates the motor torque during positioning.
This is valid only when the overshooting compensation SP033 (SFNC1/ovs) is selected.

[Type 3 "When SP033/ bitB,A=11"]
Use this when performing overshoot compensation in the feed forward control during arc cutting mode.
Set the compensation amount based on the motor short-time rated current.
Increase the value in increments of 1% to find the value where overshooting ceases.

[To vary compensation amount depending on the direction]
When SV042 (OVS2) is "0", change the SP043 (OVS1) value in both +/- directions to compensate.
To change the compensation amount depending on the command direction, set this with SP042 (OVS2).
(SP043: + direction, SP042: - direction, However, the directions may be opposite depending on other settings.)
When "-1" is set, the compensation will not be performed in the command direction.

---Setting range---

-1 to 100 (Short-time rated %)
Note that when SP227/bit2 is "1", the range will be -1 to 10000 (Short-time rated 0.01%).

#13044 SP044 OBS2 Disturbance observer gain

Set the disturbance observer gain. The standard setting is "100".
To use the disturbance observer, also set SP037(JL), SP045(OBS1) and SP226/ bitE.
When not using, set to "0".

---Setting range---

0 to 500 (%)

#13045 SP045 OBS1 Disturbance observer filter frequency

Set the disturbance observer filter band.
Normally, set to "100".
To use the disturbance observer, also set SP037(JL), SP044(OBS2) and SP226/ bitE.
When not using, set to "0".

---Setting range---

0 to 1000 (rad/s)

#13046 SP046 FHz2 Notch filter frequency 2

Set the vibration frequency to suppress when machine vibration occurs.
(Enabled at 50 or more.)
When not using, set to "0".

Related parameters: SP034/bit7-5

---Setting range---

0 to 5000 (Hz)

#13047 SP047 EC Inductive voltage compensation gain

Set the inductive voltage compensation gain. Normally, set to "100".
Lower the gain when the current FB peak exceeds the current command peak.

---Setting range---

0 to 200 (%)

#13048 SP048 LMC1 Lost motion compensation 1

Set this parameter when the protrusion (that occurs due to the non-sensitive band by friction, torsion, backlash, etc.) at quadrant change is too large.
This sets the compensation torque at quadrant change (when an axis feed direction is reversed) by Short-time rated %.
Whether to enable the lost motion compensation and the method can be set with other parameters.

[Type 2 "When SP033/bit9,8=10"]
Set the compensation amount based on the motor short-time rated current.
The standard setting is double of the friction torque. The compensation amount will be 0 when "0" is set.

Related parameters: SP033/bit9-8, SP039, SP040, SP041, SP227/bit2

[To vary compensation amount depending on the direction]
When SP041 (LMC2) is "0", change SP048 (LMC1) value in both of +/- directions to compensate.
To vary the compensation amount depending on the command direction, set this with SP041 (LMC2).
(SP048: + direction, SP041: - direction, However, the directions may be opposite depending on other settings.)
When "-1" is set, the compensation will not be performed in the command direction.

---Setting range---

-1 to 200 (Short-time rated %)
Note that when SP227/bit2 is "1", the range will be -1 to 20000 (Short-time rated 0.01%).

#13049 SP049 FFC Acceleration rate feed forward gain

When a relative error in the synchronous control is too large, set this parameter to the axis that is delaying.
The standard setting is "0". The standard setting in the SHG control is "50".
Adjust relative errors in acceleration/deceleration by increasing the value by 50.

---Setting range---

0 to 999 (%)

#13050 SP050 TOF Torque offset

Set the imbalance torque.

---Setting range---

-100 to 100 (Short-time rated %)

#13051 SP051 DFBT Dual feed back control time constant

Set the control time constant in dual feed back.
When the function is valid, the standard setting is "100". When "0" is set, the value is 1 ms.
When the time constant is increased, the operation will get closer to the semi-closed control and the limit of the position loop gain will be raised.
However, this cannot be used when the spindle slip occurs in machine configuration such as V-belt drive.

Related parameters: SP017/bit1, SP052

---Setting range---

0 to 9999 (ms)

#13052 SP052 DFBN Dual feedback control non-sensitive band

Set the non-sensitive band in the dual feedback control.
Normally set to "0".

Related parameters: SP017/bit1, SP051

---Setting range---

0 to 9999 (1/1000°)

#13053 SP053 ODS Excessive error detection width (non-interpolation mode)

Set the excessive error detection width in non-interpolation mode.
Standard setting value: ODS = Maximum motor speed [r/min] × 6/PGV/2

When set to "0", the excessive error detection will not be performed.

---Setting range---

0 to 32767 (°)

#13054 SP054 ORE Overrun detection width in closed loop control

Set the overrun detection width in the full-closed loop control.
When the gap between the motor side encoder and the machine side encoder exceeds the set value, it is judged as an overrun and "Alarm 43" is detected.
When "-1" is set, if the differential velocity between the motor side encoder and the machine side encoder exceeds the 30% of the maximum motor speed, it will be judged as overrun and "Alarm 43" will be detected.
When "0" is set, overrun will be detected with 2°.
In the full-closed loop control, normally set this parameter to "360". During V-belt drive, set to "-1".

---Setting range---

-1 to 32767 (°)

#13055 SP055 EMGx Max. gate off delay time after emergency stop

Set the time required to forcibly execute READY OFF after the emergency stop is input.
Normally set to "20000".
When "0" is set, READY OFF is forcibly executed with "7000ms".
When the set time is shorter than the time to decelerate and stop, the spindle will stop with the dynamic brake after the set time is out.
When using the power backup system, set a value which is not exceeded the initial communication timeout time of NC (5000[ms]).

Related parameters: SP056, SP230

---Setting range---

0 to 29900 (ms)

#13056 SP056 EMGt **Deceleration time constant at emergency stop**

Set the time constant used for the deceleration control at emergency stop. Set the time required to stop from the maximum motor speed (TSP).
When "0" is set, the deceleration control is executed with "7000ms".

Related parameters: SP055, SP230

---Setting range---
0 to 29900 (ms)

(PR) #13057 SP057 GRA1 **Spindle side gear ratio 1**

Set the number of gear teeth on the spindle side when "the gear selection command (control input 4/bit6, 5)" is set to "00".

---Setting range---
1 to 32767

(PR) #13058 SP058 GRA2 **Spindle side gear ratio 2**

Set the number of gear teeth on the spindle side when "the gear selection command (control input 4/bit6, 5)" is set to "01".

---Setting range---
1 to 32767

(PR) #13059 SP059 GRA3 **Spindle side gear ratio 3**

Set the number of gear teeth on the spindle side when "the gear selection command (control input 4/bit6, 5)" is set to "10".

---Setting range---
1 to 32767

(PR) #13060 SP060 GRA4 **Spindle side gear ratio 4**

Set the number of gear teeth on the spindle side when "the gear selection command (control input 4/bit6, 5)" is set to "11".

---Setting range---
1 to 32767

(PR) #13061 SP061 GRB1 **Motor side gear ratio 1**

Set the number of gear teeth on the motor side when "the gear selection command (control input 4/bit6, 5)" is set to "00".

---Setting range---
1 to 32767

(PR) #13062 SP062 GRB2 **Motor side gear ratio 2**

Set the number of gear teeth on the motor side when "the gear selection command (control input 4/bit6, 5)" is set to "01".

---Setting range---
1 to 32767

(PR) #13063 SP063 GRB3 **Motor side gear ratio 3**

Set the number of gear teeth on the motor side when "the gear selection command (control input 4/bit6, 5)" is set to "10".

---Setting range---
1 to 32767

(PR) #13064 SP064 GRB4 **Motor side gear ratio 4**

Set the number of gear teeth on the motor side when "the gear selection command (control input 4/bit6, 5)" is set to "11".

---Setting range---
1 to 32767

#13065 SP065 TLM1 **Torque limit 1**

Set the torque limit value when the torque limit (spindle control input 1/bitA, 9, 8) is set to "001" (TL3, TL2, TL1 = 001).

---Setting range---
0 to 999 (Short-time rated %)

#13066 SP066 TLM2 **Torque limit 2**

Set the torque limit value when the torque limit (spindle control input 1/bitA, 9, 8) is set to "010" (TL3, TL2, TL1 = 010).

---Setting range---
0 to 999 (Short-time rated %)

#13067 SP067 TLM3 **Torque limit 3**

Set the torque limit value when the torque limit (spindle control input 1/bitA, 9, 8) is set to "011" (TL3, TL2, TL1 = 011).

---Setting range---
0 to 999 (Short-time rated %)

#13068 SP068

Not used.

#13069 SP069 PCMP **Phase alignment completion width**

Set the single-rotation position alignment completion width for phase alignment and changing from non-interpolation to spindle synchronization mode during rotation.
Set the rotation error that is required to the machine.
When the setting value decreases, the rotation error will decrease, but the cycle time (settling time) will get longer. The standard setting is "875".

---Setting range---
0 to 32767 (1°/1000)

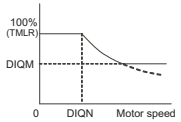
#13070 SP070 KDDT **Phase alignment deceleration rate scale**

Set the scale for SP016 (DDT) to change the deceleration rate only during rotation command (command F $\Delta T \neq 0$).
When the setting value increases, the single-rotation position alignment will be completed faster, but the impact to the machine will also increase. When not using, set to "0".

---Setting range---
0 to 255 (1/16-fold)

#13071 SP071 DIQM **Variable current limit during deceleration, lower limit value**

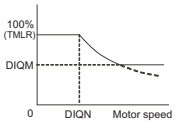
Set this parameter to adjust the deceleration time by changing the current limit value during deceleration depending on the motor speed.
As shown below, set the lower limit rate of the current limit in SP071 (DIQM), and use with SP072 (DIQN).
When DIQM is set to 100%, the standard current limit value in deceleration (TMLR) is applied.



---Setting range---
0 to 999 (%)

#13072 SP072 DIQN **Variable current limit during deceleration, break point speed**

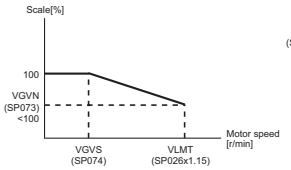
Set this parameter to adjust the deceleration time by changing the current limit value during deceleration depending on the motor speed.
As shown below, set the lower limit rate of the current limit in SP071 (DIQM), and use with SP072 (DIQN).
When DIQM is set to 100%, the standard current limit value in deceleration (TMLR) is applied.



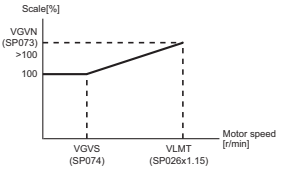
---Setting range---
1 to 32767 (r/min)

#13073 SP073 VGVN **Variable speed gain target value**

If noise is bothersome during high speed rotation, it may be reduced by lowering the speed loop gain at high speed.
Set this value to ensure the adequate response by suppressing noise and vibration at low speeds and increasing the speed loop gain at high speeds for a high-speed spindle of machining center, etc.
As shown below, set the speed loop gain rate for the overspeed detection speed in SP073 (VGVN), and use with SP074 (VGVS).
When not using, set to "0".
The overspeed detection speed (VLMT) is 115% of the maximum motor speed (TSP).
This function can be used when either Speed loop gain set 1 or Speed loop gain set 2 is selected.



When lowering the speed loop gain at high speed

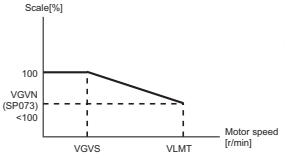


When increasing the speed loop gain at high speed

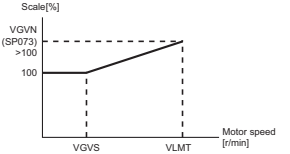
---Setting range---
0 to 999 (%)

#13074	SP074 VGVS	Variable speed gain change start speed

If noise is bothersome during high speed rotation, it may be reduced by lowering the speed loop gain at high speed.
Set this value to ensure the adequate response by suppressing noise and vibration at low speeds and increasing the speed loop gain at high speeds for a high-speed spindle of machining center, etc.
As shown below, set the speed loop gain rate for the overspeed detection speed in SP073 (VGVN), and use with SP074 (VGVS).
When not using, set to "0".
The overspeed detection speed (VLMT) is 115% of the maximum motor speed (TSP).
This function can be used when either Speed loop gain set 1 or Speed loop gain set 2 is selected.



When lowering the speed loop gain at high speed



When increasing the speed loop gain at high speed

---Setting range---
0 to 32767 (r/min)

#13075	SP075 DWSH	Slip compensation scale during regeneration high-speed coil

Set the slip frequency scale during deceleration.
Normally, set to "0". (For Mitsubishi adjustment)
---Setting range---
0 to 255 (1/16-fold)

#13076	SP076 DWSL	Slip compensation scale during regeneration low-speed coil

Set the slip frequency scale at deceleration when using the low-speed coil.
Normally, set to "0". (For Mitsubishi adjustment)
---Setting range---
0 to 255 (1/16-fold)

#13077	SP077 IQA	Q axis current lead compensation

Set the current loop gain.
To use the coil switch function, set the current loop gain for when the high-speed coil is selected.
The setting value is determined by the motor's electrical characteristics so that the value is fixed to each motor used.
Set the value given in the spindle parameter list. (For Mitsubishi adjustment)
---Setting range---
1 to 20480

#13078	SP078 IDA	D axis current lead compensation

Set the current loop gain.
To use the coil switch function, set the current loop gain for when the high-speed coil is selected.
The setting value is determined by the motor's electrical characteristics so that the value is fixed to each motor used.
Set the value given in the spindle parameter list. (For Mitsubishi adjustment)
---Setting range---
1 to 20480

#13079	SP079 IQG	Q axis current gain

Set the current loop gain.
To use the coil switch function, set the current loop gain for when the high-speed coil is selected.
The setting value is determined by the motor's electrical characteristics so that the value is fixed to each motor used.
Set the value given in the spindle parameter list. (For Mitsubishi adjustment)
---Setting range---
1 to 8192

#13080	SP080 IDG	D axis current gain

Set the current loop gain.
To use the coil switch function, set the current loop gain for when the high-speed coil is selected.
The setting value is determined by the motor's electrical characteristics so that the value is fixed to each motor used.
Set the value given in the spindle parameter list. (For Mitsubishi adjustment)
---Setting range---
1 to 8192

#13081	SP081 IQAL	Q axis current lead compensation low-speed coil

When using coil switch function, set the current loop gain for when the low-speed coil is selected.
The setting value is determined by the motor's electrical characteristics so that the value is fixed to each motor used.
Set the value given in the spindle parameter list. (For Mitsubishi adjustment)
---Setting range---
1 to 20480

#13082 SP082 IDAL D axis current lead compensation low-speed coil

When using coil switch function, set the current loop gain for when the low-speed coil is selected.
The setting value is determined by the motor's electrical characteristics so that the value is fixed to each motor used.
Set the value given in the spindle parameter list. (For Mitsubishi adjustment)

---Setting range---
1 to 20480

#13083 SP083 IQGL Q axis current gain low-speed coil

When using coil switch function, set the current loop gain for when the low-speed coil is selected.
The setting value is determined by the motor's electrical characteristics so that the value is fixed to each motor used.
Set the value given in the spindle parameter list. (For Mitsubishi adjustment)

---Setting range---
1 to 8192

#13084 SP084 IDGL D axis current gain low-speed coil

When using coil switch function, set the current loop gain for when the low-speed coil is selected.
The setting value is determined by the motor's electrical characteristics so that the value is fixed to each motor used.
Set the value given in the spindle parameter list. (For Mitsubishi adjustment)

---Setting range---
1 to 8192

#13085 SP085

Not used. Set to "0".

#13086 SP086

Not used. Set to "0".

#13087 SP087 FHz4 Notch filter frequency 4

Set the vibration frequency to suppress when machine vibration occurs.
(Enabled at 50 or more.)
When not using, set to "0".

Related parameters: SP034/bitB-9

---Setting range---
0 to 5000 (Hz)

#13088 SP088 FHz5 Notch filter frequency 5

Set the vibration frequency to suppress when machine vibration occurs.
(Enabled at 50 or more.)
When not using, set to "0".

Related parameters: SP034/bitF-D

---Setting range---
0 to 5000 (Hz)

#13089 SP089 TMKQ Spindle output stabilizing gain Q axis

Set the magnification of the torque current stabilizing gain. (For Mitsubishi adjustment)
When set to "0", the torque current stabilization is disabled.
When not using, set to "0".

---Setting range---
0 to 32767

#13090 SP090 TMKD Spindle output stabilizing gain D axis

Set the magnification of the excitation current stabilizing gain. (For Mitsubishi adjustment)
When set to "0", the excitation current stabilization is disabled.
When not using, set to "0".

---Setting range---
0 to 32767

#13091 SP091

Not used. Set to "0".

#13092 SP092

Not used. Set to "0".

#13093 SP093

Not used. Set to "0".

#13094 SP094 MPV Magnetic pole error detection speed

In the magnetic pole position detection function, the command motor speed and motor speed during the position command stop are monitored.
Set the command motor speed level and motor speed level during the position command stop in "r/min" unit.
When the command motor speed level is set to "0", the magnetic pole position error is detected at 10r/min.
Set to "10" as a standard setting when the magnetic pole position error detection function is enabled.
This detects the magnetic pole position error when the motor speed is "100r/min".

Ten-thousands digit, Thousands digit ---------- Command motor speed level (10r/min)
Hundreds digit, Tens digit, Ones digit ---------- Motor speed level (10r/min)

---Setting range---
0 to 31999

#13095 SP095 VIAX Lead compensation scale during high-response acceleration/deceleration

Set the magnification against delay/lead compensation (SP006) of the high-response acceleration/deceleration (valid when SP226/ bitD is set to "1").
Normally, set to "0". Set this parameter to suppress overshooting when the speed is reached.

---Setting range---
0 to 10000 (0.01%)

#13096 SP096 SDW Speed slowdown allowable width

When the spindle slows down due to multiple cutting, set the processable speed as percentage against the NC command speed.
When "0" is set, the magnification is the same as when "85" is set. When set to "-1", the allowable width will be disabled.

---Setting range---

-1,0 to 100(%)

#13097 SP097 RNG1ex Extension sub side encoder resolution

When setting the machine side encoder resolution in pulse (p) unit, set the number of pulses to four bite data of SP097 (high-order) and SP019 (low-order) in pulse (p) unit.

When SP097=0, the setting unit of SP019 is (kp).
Refer to SP019 for details.

Related parameters: SP019, SP020, SP098

---Setting range---

-1 to 32767

#13098 SP098 RNG2ex Extension main side encoder resolution

When setting the motor side encoder resolution in pulse (p) unit, set the number of pulses to four bite data of SP098 (high-order) and SP020 (low-order) in pulse (p) unit.

When SP098=0, the setting unit of SP020 is (kp).
Refer to SP020 for details.

Related parameters: SP019, SP020, SP097

---Setting range---

-1 to 32767

#13099-13105 SP099-SP105

Not used. Set to "0".

#13106 SP106 PGM OMR-FF scale model gain

Set the scale model gain (position response) in OMR-FF control.
Set the same value as SV002(PGN).
Increase the setting value to perform a high-speed machining such as a fine arc or to improve the path error.
Lower the value when vibration occurs during acceleration/deceleration.
Set to "0" when not using OMR-FF control.

---Setting range---

0 to 300 (rad/s)

#13107-13111 SP107-SP111

Not used. Set to "0".

#13112 SP112 IFF OMR-FF current feed forward gain

Set the current feed forward rate in OMR-FF control.
The standard setting is "10000".
Setting value of 0 is equal to "10000(100%)" setting.
Set to "0" when not using OMR-FF control.

---Setting range---

0 to 32767 (0.01%)

#13113 SP113 OPLP Current command value for open loop

Set the current command value for when the open loop control is enabled.
When "0" is set, the state will be the same as when "50" is set.
When not using, set to "0".
The open loop control is enabled when "SP018/bit1" is set to "1".

---Setting range---

0 to 999 (Short-time rated %)

#13114 SP114 MKT Coil changeover gate cutoff timer

Set the time required to cut off the gate when turning OFF/ON the coil switch contactor.
The value should be longer than the coil switch contactor's OFF/ON time.
The standard setting is "150".

---Setting range---

0 to 3500 (ms)

#13115 SP115 MKT2 Coil changeover current limit timer

Set the time required to limit the current immediately after the coil switch contactor ON/OFF is completed and the gate is turned ON.
The standard setting is "250".

---Setting range---

0 to 3500 (ms)

#13116 SP116 MKIL Coil changeover current limit value

Set the time required to limit the current immediately after the coil switch contactor ON/OFF is completed and the gate is turned ON.
The standard setting is "120".

---Setting range---

0 to 999 (Short-time rated %)

#13117 SP117 SETM Excessive speed deviation timer

Set the time to detect the speed excessive error alarm.
Set the time required to the machine.
The standard setting is "12".

---Setting range---

0 to 60 (s)

(PR) #13118 SP118 MSFT Magnetic pole shift amount

Set the magnetic pole shift amount of IPM spindle motor.
During DC excitation of the initial setup: Set the same value displayed in the "AFLT gain" on the NC monitor screen in SP225/bit4=1.
When not using, set to "0".

---Setting range---

-18000 to 18000 (electrical angle 0.01°)

#13119 SP119

Not used. Set to "0".

#13120 SP120

Not used. Set to "0".

#13121 SP121 MP Kpp Magnetic pole detection position loop gain

Set the position loop gain in the magnetic polar detection loop.
This is used in the initial magnetic polar detection when the IPM spindle motor is turned ON.
Set to "0" when using an IM spindle motor.

---Setting range---

0 to 32767

#13122 SP122 MP Kvp Magnetic pole detection speed loop gain

Set the speed loop gain in the magnetic polar detection loop.
This is used in the initial magnetic polar detection when the IPM spindle motor is turned ON.
Set to "0" when using an IM spindle motor.

---Setting range---

0 to 32767

#13123 SP123 MP Kvi Magnetic pole detection speed loop lead compensation

Set the speed loop lead compensation in the magnetic polar detection loop.
This is used in the initial magnetic polar detection when the IPM spindle motor is turned ON.
Set to "0" when using an IM spindle motor.

---Setting range---

0 to 32767

#13124 SP124 ILMTsp Magnetic pole detection current limit value

Set the current limit value for the magnetic polar detection loop.
This is used in the initial magnetic polar detection when the IPM spindle motor is turned ON.
Set to "0" when using an IM spindle motor.

---Setting range---

0 to 999 (Short-time rated %)

#13125 SP125 DA1NO D/A output ch1 data No. / Initial DC excitation level

Input the desired data number to D/A output channel.
When using the 2-axis drive unit, set "-1" to the axis that the data will not be output.

When the DC excitation is running:
Use in the DC excitation function.
DC excitation: Set the initial excitation level when SP225/bit4=1.
When "0" is set, the state will be the same as when "20" is set.

---Setting range---

-32768 to 32767

#13126 SP126 DA2NO D/A output ch2 data No. / Final DC excitation level

Input the desired data number to D/A output channel.
When using the 2-axis drive unit, set "-1" to the axis that the data will not be output.

When the DC excitation is running:
Use in the DC excitation function.
DC excitation: Set the final excitation level when SP225/bit4=1.
When "0" is set, the state will be the same as when "50" is set.

---Setting range---

-32768 to 32767

#13127 SP127 DA1MPY D/A output ch1 output scale / Initial DC excitation time

Set the output scale in increments of 1/100.
When "0" is set, the scale is the same as when "100" is set.

When the DC excitation is running:
Use in the DC excitation function.
DC excitation: Set the initial excitation time when SP225/bit4=1.
When "0" is set, the state will be the same as when "10000" is set.

---Setting range---

-32768 to 32767 (1/100-fold)

#13128 SP128 DA2MPY D/A output ch2 output scale

Set the output scale in increments of 1/100.
When "0" is set, the scale is the same as when "100" is set.

---Setting range---

-32768 to 32767 (1/100-fold)

(PR) #13129-13141 SP129-SP141

Set the unique constants for the spindle motor. (High-speed coil)
The setting value is determined by the motor's mechanical and electrical characteristics and specifications, so normally set the value given in the spindle parameter list.

(PR) #13142 SP142

Set the unique constants for the spindle motor. (High-speed coil)
The setting value is determined by the motor's mechanical and electrical characteristics and specifications, so normally set the value given in the spindle parameter list.
For IPM spindle motor
This parameter is used in initial magnetic pole detection of IPM spindle motor.
(1) Pulse application time: Set it in [µs] unit.(0 < application time < 350)
(2) Pulse application coil: To select a low-speed coil, add 1000 to the pulse application time.
(3) Polarity of estimated magnetic pole: When it is set to the reverse polarity, add "-" to the total of (1) and (2).
E.g.: When performing 333µs pulse-applied magnetic pole estimation in a low-speed coil and selecting the reverse polarity for the estimated polarity
SP142 = -(333+1000) = -1333

(PR) #13143-13160 SP143-SP160

Set the unique constants for the spindle motor. (High-speed coil)
The setting value is determined by the motor's mechanical and electrical characteristics and specifications, so normally set the value given in the spindle parameter list.

(PR) #13161-13192 SP161-SP192

Set the unique constants for the spindle motor. (Low-speed coil)
The setting value is determined by the motor's mechanical and electrical characteristics and specifications, so normally set the value given in the spindle parameter list.

#13193 SP193 LMR Change magnification for load meter standard output (High-speed coil)

Set the standard output to be displayed as 100% in load meter using the short-time rated output ratio.
To display the continuous rated output as 100%, set as follows.
Continuous rated output/Short-time rated output × 100
When "0" is set, normal display will be applied.
It is not available for MDS-EJ-SP Series.

---Setting range---
0 to 100 (%)

#13194 SP194 LMN Base speed for load meter standard output (High-speed coil)

Set the base speed of the standard output to be displayed as 100% in load meter.
When "0" is set, the base speed of the short-time rated output will be applied.
It is not available for MDS-EJ-SP Series.

---Setting range---
0 to 32767 (r/min)

#13195 SP195 LMRL Change magnification for load meter standard output (Low-speed coil)

Set the standard output to be displayed as 100% in load meter using the short-time rated output ratio.
To display the continuous rated output as 100%, set as follows.
Continuous rated output/Short-time rated output × 100
When "0" is set, normal display will be applied.
It is not available for MDS-EJ-SP Series.

---Setting range---
0 to 100 (%)

#13196 SP196 LMNL Base speed for load meter standard output (Low-speed coil)

Set the base speed of the standard output to be displayed as 100% in load meter.
When "0" is set, the base speed of the short-time rated output will be applied.
It is not available for MDS-EJ-SP Series.

---Setting range---
0 to 32767 (r/min)

#13197-13198 SP197-SP198

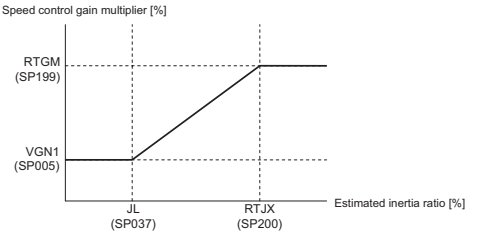
Not used. Set to "0".

#13199 SP199 RTGM Real-time tuning: maximum adaptive gain multiplier

In case that machine resonance is induced when mounting a workpiece, the speed loop gain is switched automatically in response to inertia by setting the speed loop gain and workpiece inertia multiplier in advance.

The speed loop gain SP199(RTGM) changes in response to the estimated inertia ratio SP200(RTJX) based on the speed loop gain SP005(VGN1) and the inertia multiplier SP037(JL) which were adjusted when no workpiece was mounted.

When SP199 is set to "0", the adaptation of the speed loop gain will be disabled.



Related parameters: SP005, SP037, SP200

---Setting range---

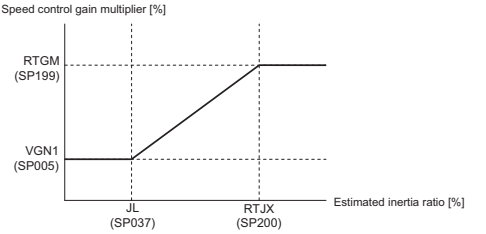
0 to 5000 (%)

#13200 SP200 RTJX Real-time tuning: maximum adaptive inertia ratio

In case that machine resonance is induced when mounting a workpiece, the speed loop gain is switched automatically in response to inertia by setting the speed loop gain and workpiece inertia multiplier in advance.

The speed loop gain SP199(RTGM) changes in response to the estimated inertia ratio SP200(RTJX) based on the speed loop gain SP005(VGN1) and the inertia multiplier SP037(JL) which were adjusted when no workpiece was mounted.

When SP199 is set to "0", the adaptation of the speed loop gain will be disabled.



Related parameters: SP005, SP037, SP199

---Setting range---

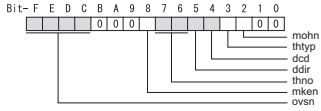
0 to 5000 (%)

#13201-13224 SP201-SP224

Not used. Set to "0".

#13225 SP225 SFNC5 Spindle function 5

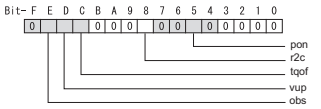
Select the spindle functions.
Functions are allocated to each bit.
Set this in hexadecimal format.



bit F-C: ovsn Overshooting compensation type 3 non-sensitive band
Set the non-sensitive band of the overshooting compensation type 3 in increments of 2°/1000.
In the feed forward control, set the non-sensitive band for the model position droop and ignore the model overshooting. Set to "2°/1000" as a standard.
bit B-9:
Not used. Set to "0".
bit 8: mken Coil switch allowance in deceleration control
This enables a coil changeover while decelerating after an emergency stop for a spindle motor with coil changeover specification. A coil changeover may enable an excessive load inertia to stop within the maximum delay time.
0: Normal (Disable)
1: Enable
bit 7-6: thno
Select the thermistor characteristics.
When SP225/bit3=0 (N type) is selected
bit7,6=
00: For Mitsubishi spindle motor
01: Setting prohibited
10: Setting prohibited
11: Setting prohibited
When SP225/bit3=1 (P type) is selected
bit7,6=
00: KTY84-130 (Manufactured by Philips)
01: Setting prohibited
10: Pt1000 (Platinum resistance temperature detector)
11: Setting prohibited
bit 5: ddir Proximity switch signal enable edge
0: Falling edge 1: Rising edge
bit 4: dcd DC excitation mode
0: Normal 1: Start
bit 3: thtyp
Select the thermistor type.
0: Type N thermistor (Mitsubishi standard)
1: Type P thermistor or platinum resistance temperature detector
bit 2: mohn Thermistor temperature detection
0: Normal 1: Disable (Except for TS5690/5691)
bit 1-0:
Not used. Set to "0".

#13226 SP226 SFNC6 Spindle function 6

Select the spindle functions.
Functions are allocated to each bit.
Set this in hexadecimal format.



bit F :
Not used. Set to "0".
bit E : obs Disturbance observer
0: Normal 1: Enable
bit D : vup High response acceleration / deceleration
This suppresses a temporal delay which occurs when the target speed is attained from acceleration and when the spindle stops from deceleration.
0: Normal acceleration/deceleration 1: High response acceleration/deceleration Enable
bit C : tqof Spindle output stabilization during acceleration
0: Normal 1: Disable
bit B-9 :
Not used. Set to "0".
bit 8 : r2c Temperature compensation adjustment indicator
0: Normal 1: Display
bit 7-6 :
Not used. Set to "0".
bit 5 : pon IPM spindle pulse application magnetic pole estimation
0: Normal 1: Enable
bit 4-0 :
Not used. Set to "0".

#13227 SP227 SFNC7 Spindle function 7

Select the spindle functions.
Functions are allocated to each bit.
Set this in hexadecimal format.

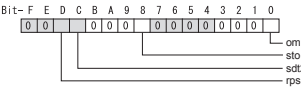
bit F-C : dis Digital signal input selection
0: No signal
4: Proximity switch signal detection
Other settings: setting prohibited
bit B-A : dos3 Digital signal output 3 selection (MDS-EJ-SP/SP2)
bitB,A=
00: Disable
01: Setting prohibited
10: Contactor control signal output
11: Setting prohibited
bit 9-3 :
Not used. Set to "0".
bit 2 : ccu Lost motion/overshoot compensation compensation amount setting unit
0: Short-time rated % 1: Short-time rated 0.01%
bit 1-0 :
Not used. Set to "0".

#13228 SP228 SFNC8 Spindle function 8

Not used. Set to "0000".

#13229 SP229 SFNC9 Spindle function 9

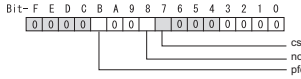
Select the spindle functions.
Functions are allocated to each bit.
Set this in hexadecimal format.



bit F-E :
Not used. Set to "0".
bit D : rps Safely limited speed setting unit
0: Normal 1: 100°/min
bit C : sdt2 Specified speed output digital signal 2 output
0: Normal 1: Enable
bit B-9 :
Not used. Set to "0".
bit 8 : sto Dedicated wiring STO function
Set this parameter to use dedicated wiring STO function.
0: Dedicated wiring STO function unused 1: Dedicated wiring STO function used
(Only for MDS-E/EH and MDS-EJ/EJH)
bit 7-1 :
Not used. Set to "0".
bit 0 : omrffon OMR-FF control enabled
0: Disable 1: Enable

#13230 SP230 SFNC10 Spindle function 10

Select the spindle functions.
Functions are allocated to each bit.
Set this in hexadecimal format.



bit F-C :
Not used. Set to "0".
bit B : pfdsr
Set the spindle stop operation at a power failure when the deceleration and stop function at power failure is enabled.
Normal (Coast to a stop at power failure) : 0
Deceleration and stop at power failure : 1
bit A-9 :
Not used. Set to "0".
bit 8 : nohis History of communication error alarm between NC and DRV(34,36,38,39)
0: Enable 1: Disable
bit 7 : cse Spindle C axis command speed monitoring function
0: Normal setting (function disabled) 1: Function enabled
bit 6-0 :
Not used. Set to "0".
Related parameters: SP055, SP056

#13231 SP231

Not used. Set to "0000".

#13232 SP232

Not used. Set to "0000".

#13233 SP233 IVC Voltage non-sensitive band compensation

When 100% is set, the voltage equivalent to the logical non-energized time will be compensated.
When "0" is set, 100% compensation will be performed.
Adjust in increments of 10% from the default value 100%.
If the value is too large, vibration or vibration noise may be generated.

---Setting range---

0 to 255 (%)

#13234 SP234

Not used. Set to "0".

(PR) #13235 SP235 R2H Temperature compensation gain

Set the magnification in converting the thermistor temperature to the control compensation amount.
When "0" is set, the temperature compensation function is disabled.
When not using, or when using an IPM spindle motor, set to "0".

---Setting range---

0 to 400 (%)

(PR) #13236 SP236 WIH Temperature compensation time constant

Set the delay time constant from the thermistor temperature to the control compensation amount.
When "0" is set, the delay time constant is disabled.
When not using, or when using an IPM spindle motor, set to "0".

---Setting range---

0 to 150 (min)

(PR) #13237 SP237 TCF Torque command filter

Set the filter for the torque command.
The standard value is "500".

---Setting range---

0 to 5000 (rad/s)

(PR) #13238-13240 SP238-SP240

Not used. Set to "0".

(PR) #13241-13256 SP241-SP256

This is automatically set by the NC system.

2.10 Spindle-type Servo Parameters

#52001 SVSPEC Spindle-mode servo: Specification

[Exclusive for spindle-mode servo motor]

bit0 Selection of position loop gain when C axis is selected

0: Use the position loop gain (#52203 SV003, #52204 SV004, #52257 SV057)

1: Use the spindle sync control position loop gain (#52249 SV049, #52250 SV050, #52258 SV058)

bit1 Selection of sync tap cycle position loop gain

0: Use the position loop gain (#52203 SV003, #52204 SV004, #52257 SV057)

1: Use the spindle sync control position loop gain (#52249 SV049, #52250 SV050, #52258 SV058)

---Setting range---

00 to FFFF (HEX)

#52002 svzsp Spindle-mode servo: Motor zero speed

[Exclusive for spindle-mode servo motor]

Specify the motor rotation speed at which zero speed detection is carried out. When the actual motor speed drops to the specified speed or below, the zero speed detection signal turns ON. The standard setting value is "50", which is applied when 0 is set in this parameter.

---Setting range---

0 to 1000(r/min)

#52003 svsdts Spindle-mode servo: Speed detection set value

[Exclusive for spindle-mode servo motor]

Specify the motor speed at which speed detection is carried out.

When the actual motor speed drops to the specified speed or below, the speed detection signal turns ON. The standard setting value is 10% of "#3001 slimt 1", and is applied when 0 is set in this parameter.

---Setting range---

0 to 32767(r/min)

#52004 svtlm1 Spindle-mode servo: Torque limit 1

[Exclusive for spindle-mode servo motor]

Specify the torque limit value to be applied when Torque limit (Control input 1/bitA,9,8)=001.

---Setting range---

0 to 999 (Short-time rated %)

#52005 svtlm2 Spindle-mode servo: Torque limit 2

[Exclusive for spindle-mode servo motor]

Specify the torque limit value to be applied when Torque limit (Control input 1/bitA,9,8)=010.

---Setting range---

0 to 999 (Short-time rated %)

#52006 svtlm3 Spindle-mode servo: Torque limit 3

[Exclusive for spindle-mode servo motor]

Specify the torque limit value to be applied when Torque limit (Control input 1/bitA,9,8)=011.

---Setting range---

0 to 999 (Short-time rated %)

#52201-52456 SV001-SV256 Spindle-type Servo Parameters

The description and setting range for these parameters are the same as Servo parameters "SV001" to "SV256". Refer to "Servo Parameters" for details.

(Note) Set the same value to #52203 SV003(PGN) for the basic and synchronous spindles in spindle synchronization.

2.11 Rotary Axis Configuration Parameters

(PR) #7900 RCDAX_I — Orthogonal coordinate horizontal axis name

Set the name of the horizontal axis in the orthogonal coordinate system.
Set "0" when horizontal axis is not used.

---Setting range---

A,B,C,U,V,W,X,Y,Z
2-digit of A to Z and 1 to 9
0: Mechanical axis specifications

(PR) #7901 RCDAX_J — Orthogonal coordinate vertical axis name

Set the name of the vertical axis in the orthogonal coordinate system.
Set "0" when vertical axis is not used.

---Setting range---

A,B,C,U,V,W,X,Y,Z
2-digit of A to Z and 1 to 9
0: Mechanical axis specifications

(PR) #7902 RCDAX_K — Orthogonal coordinate height axis name

Set the name of the height axis in the orthogonal coordinate system.
Set "0" when height axis is not used.

---Setting range---

A,B,C,U,V,W,X,Y,Z
2-digit of A to Z and 1 to 9
0: Mechanical axis specifications

#7903 G92_CRD — Origin zero set coordinate selection

Select the coordinate to preset when issuing an origin zero command (G92X_Y_Z_;).
0: Tool center coordinate
1: Holder center coordinate

#7904 NO_TIP — Tool handle feed function selection

Select whether to enable the tool handle feed.
0: Enable (tool handle feed)
1: Disable (standard)

#7905 NO_ABS — Selection of tool axis travel amount display at manual ABS switch ON/OFF

Select how to update the display of tool axis travel amount.
0: Update at ABS switch OFF
1: Update at every ON and OFF of ABS switch

#7906 PASSTYP — Singular point passage type

Select the movement after passing a singular point.
0: Type 1
A/B axis rotation angle will be in the same sign direction as that when the tool center point control started.
1: Type 2
C axis rotation amount on the singular point will be smaller.

#7907 CHK_ANG — Near singular judgment angle

Set the angle for judging a position near the singular point.
When "0.000" is set, it will operate as 1.000(°).

---Setting range---

0.000 to 5.000 (°)

#7908 SLCT_PRG_COORD — Programming coordinate system selection

Select the coordinate system for the programming coordinate.
0: Table coordinate system (coordinate system that rotates together with workpiece)
1: Workpiece coordinate system

#7909 IJK_VEC_MR — Posture vector mirror image selection

Select whether to enable the mirror image on the posture vector (IJK) when Type 2 is selected in "#7906 PASSTYP".
0: Disable
1: Enable

#7910 SLCT_INT_MODE — Interpolation method selection

Select the interpolation method.
When combining spline interpolation 2 and tool center point control, only the joint interpolation method is valid.
0: Joint interpolation method
1: Single axis rotation interpolation method

#7911 SLCT_STANDARD_POS — Rotary axis basic position selection

Select the basic position of the rotary axis.
0: Workpiece coordinate zero point
1: The position when the tool center point is commanded.

(Note) Even if the position is changed, it is not changed during tool center point control. It is changed when next tool center point control will be commanded.

#7912 NO_MANUAL — Selection of 3-dimensional manual feed

Select whether to enable the 3-dimensional manual feed
0: Enable (3-dimensional manual feed)
1: Disable (standard manual feed)

#7913 MCHN_SPEED_CTRL — Machine speed fluctuation suppression

Select whether to suppress the machine speed fluctuation due to rotary axis movement.
0: Not suppress
1: Suppress

(Note) This parameter is disabled when SSS control is enabled.

#7914 ROT_PREFILT Rotary axis prefilter time constant

Set the time constant for rotary axis prefilter.
Setting this parameter can smoothen the tool angle change (rotary axis' motion) under tool center point control.
Possible to do this setting on [High-accuracy parameter] screen, which you can reach by going to [Set-up] Screen and selecting [User parameter].
When set to "0", "Rotary axis prefiltering" will be disabled.

---Setting range---

0 to 200 (ms)

#7915 SLCT_SLOPE_CRD_MOD Rotary axis basic position in inclined surface machining

Set the basic position of rotary axis to establish the feature coordinate system when inclined surface machining is commanded.
* The position will not change when inclined surface machining is running. It will change when the next inclined surface machining is commanded.

0: At zero degree
1: At the start position

#7916 ROT_ERR_MODE Rotation center error compensation method

Select the compensation method of rotation center error.

0: Compensation with orthogonal axis only.
1: Compensation with orthogonal and rotary axes.

(PR) #7917 SLCT_G53_6_ROTAX G53.6 rotary axes rotation order

Specify in which order to rotate the rotary axes when the address Q is unspecified in G53.6 and when the number of simultaneous contour control axes is limited to 4.

0: In the order of primary and secondary rotary axes
1: In the order of secondary and primary rotary axes

#7918 SLCT_ROTAX_ANS Selection of solution for defining primary rotary axis angle

[M8]
Select the solution that defines the calculated angle of the primary rotary axis when address P is omitted from G53.1 or G53.6 command.

0: Default solution of each machine type
1: Solution that makes the primary rotary axis value positive
2: Solution that makes the primary rotary axis value negative

(PR) #7920 SLCT_T1 Rotary axis selection

Select in which axis direction to rotate the tool rotating type base-side rotary axis.
If the tool axis is inclined, use the second digit to set the axis direction in which the tool axis is inclined.

0: Invalid
1: I axis rotation
2: J axis rotation
3: K axis rotation

(Note) 0 to 99 can be set from the screen, but if an invalid value is set, the operation error (M01 0127) will occur when the power supply is turned ON.

---Setting range---

0 to 3
12, 13, 21, 23, 31, 32

(PR) #7921 TIANGT1 Inclination angle

Set the inclination angle if the tool-rotation type base-side rotary axis is inclined. Set the angle regarding CCW direction of the inclined plane as plus direction.

---Setting range---

-359.999 to 359.999 (°)
(Follow as "#1003 iunit Input setup unit".)

(PR) #7922 ROTAXT1 Rotary axis name

Set the name of the tool rotating type base-side rotary axis.

---Setting range---

A,B,C,U,V,W,X,Y,Z
2-digit of A to Z and 1 to 9
0: Mechanical axis specifications

#7923 DIR_T1 Rotation direction

[M8]
Set the rotation direction of the tool rotating type base-side rotary axis.
The rotation direction specifications vary according to the setting of "#1450 5axis_Spec/bit3" (Select specifications of rotation direction parameter).
- When "#1450 5axis_Spec/bit3" = "0"
The specifications vary for each function.
- When "#1450 5axis_Spec/bit3" = "1"
The specifications are common to the functions.

0: When the tool motion viewed from the workpiece is in right-hand screw direction, it is taken as the positive direction.
1: When the tool motion viewed from the workpiece is in left-hand screw direction, it is taken as the positive direction.

#7924 COFST1H Horizontal axis rotation center offset

Set the distance in the horizontal axis direction between the rotation centers of the tool-side rotary axis and the base-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7925 COFST1V Vertical axis rotation center offset

Set the distance in the vertical axis direction between the rotation centers of the tool-side rotary axis and the base-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7926 COFST1T Height axis rotation center offset

Set the distance in the height axis direction between the rotation centers of the tool-side rotary axis and the base-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7927 CERRT1H Horizontal axis rotation center error compensation amount

Set the error compensation amount in the horizontal axis direction of the tool rotating type base-side rotary axis rotation center.
When tool rotating type base rotary axis is I axis rotation, set the position deviation of J axis rotation.
When tool rotating type base rotary axis is J axis rotation, set the position deviation of K axis rotation.
When tool rotating type base rotary axis is K axis rotation, set the position deviation of I axis rotation.

---Setting range---

-99999.999 to 99999.999 (mm)
(Follow as "#1006 mcmpunit Machine error compensation unit".)

#7928 CERRT1V Vertical axis rotation center error compensation amount

Set the error compensation amount in the vertical axis direction of the tool rotating type base-side rotary axis rotation center.
When tool rotating type base rotary axis is I axis rotation, set the position deviation of K axis rotation.
When tool rotating type base rotary axis is J axis rotation, set the position deviation of I axis rotation.
When tool rotating type base rotary axis is K axis rotation, set the position deviation of J axis rotation.

---Setting range---

-99999.999 to 99999.999 (mm)
(Follow as "#1006 mcmpunit Machine error compensation unit".)

(PR) #7930 SLCT_T2 Rotary axis selection

Select in which axis direction to rotate the tool rotating type tool-side rotary axis.
If the tool axis is inclined, use the second digit to set the axis direction in which the tool axis is inclined.

0: Invalid
1: I axis rotation
2: J axis rotation
3: K axis rotation

(Note) 0 to 99 can be set from the screen, but if an invalid value is set, the operation error (M01 0127) will occur when the power supply is turned ON.

---Setting range---

0 to 3
12, 13, 21, 23, 31, 32

(PR) #7931 TIANGT2 Inclination angle

Set the inclination angle if the tool-rotation type tool-side rotary axis is inclined. Set the angle regarding CCW direction of the inclined plane as plus direction.

---Setting range---

-359.999 to 359.999 (°)
(Follow as "#1003 iunit Input setup unit".)

(PR) #7932 ROTAXT2 Rotary axis name

Set the name of the tool rotating type tool-side rotary axis.

---Setting range---

A,B,C,U,V,W,X,Y,Z
2-digit of A to Z and 1 to 9
0: Mechanical axis specifications

#7933 DIR_T2 Rotation direction

[M8]
Set the rotation direction of the tool rotating type tool-side rotary axis.
The rotation direction specifications vary according to the setting of "#1450 5axis_Spec/bit3" (Select specifications of rotation direction parameter).
- When "#1450 5axis_Spec/bit3" = "0"
The specifications vary for each function.
- When "#1450 5axis_Spec/bit3" = "1"
The specifications are common to the functions.

0: When the tool motion viewed from the workpiece is in right-hand screw direction, it is taken as the positive direction.
1: When the tool motion viewed from the workpiece is in left-hand screw direction, it is taken as the positive direction.

#7934 COFST2H Horizontal axis rotation center offset

Set the distance in the horizontal axis direction between the spindle holder center and the rotation center of the tool-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7935 COFST2V Vertical axis rotation center offset

Set the distance in the vertical axis direction between the spindle holder center and the rotation center of the tool-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7936 COFST2T Height axis rotation center offset

Set the distance in the height axis direction between the spindle holder center and the rotation center of the tool-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7937 CERRT2H Horizontal axis rotation center error compensation amount

Set the error compensation amount in the horizontal axis direction of the tool rotating type tool-side rotary axis rotation center.
When tool rotating type tool rotary axis is I axis rotation, set the position deviation of J axis rotation.
When tool rotating type tool rotary axis is J axis rotation, set the position deviation of K axis rotation.
When tool rotating type tool rotary axis is K axis rotation, set the position deviation of I axis rotation.

---Setting range---

-99999.999 to 99999.999 (mm)
(Follow as "#1006 mcmpunit Machine error compensation unit".)

#7938 CERRT2V Vertical axis rotation center error compensation amount

Set the error compensation amount in the vertical axis direction of the tool rotating type tool-side rotary axis rotation center.
When tool rotating type tool rotary axis is I axis rotation, set the position deviation of K axis rotation.
When tool rotating type tool rotary axis is J axis rotation, set the position deviation of I axis rotation.
When tool rotating type tool rotary axis is K axis rotation, set the position deviation of J axis rotation.

---Setting range---

-99999.999 to 99999.999 (mm)
(Follow as "#1006 mcmpunit Machine error compensation unit".)

(PR) #7940 SLCT_W1 Rotary axis selection

Set in which axis direction to rotate the table rotating type base-side rotary axis.
If the tool axis is inclined, use the second digit to set the axis direction in which the tool axis is inclined.

0: Invalid
1: I axis rotation
2: J axis rotation
3: K axis rotation

(Note) 0 to 99 can be set from the screen, but if an invalid value is set, the operation error (M01 0127) will occur when the power supply is turned ON.

---Setting range---

0 to 3
12, 13, 21, 23, 31, 32

(PR) #7941 TIANGW1 Inclination angle

Set the inclination angle if the table-rotation type base-side rotary axis is inclined. Set the angle regarding CCW direction of the inclined plane as plus direction.

---Setting range---

-359.999 to 359.999 (°)
(Follow as "#1003 iunit Input setup unit".)

(PR) #7942 ROTAXW1 Rotary axis name

Set the name of the table rotating type base-side rotary axis.

---Setting range---

A,B,C,U,V,W,X,Y,Z
2-digit of A to Z and 1 to 9
0: Mechanical axis specifications

#7943 DIR_W1 Rotation direction

[M8]
Set the rotation direction for the table rotating type base-side rotary axis.
The rotation direction specifications vary according to the setting of "#1450 5axis_Spec/bit3" (Select specifications of rotation direction parameter).
- When "#1450 5axis_Spec/bit3" = "0"
The specifications vary for each function.
- When "#1450 5axis_Spec/bit3" = "1"
The specifications are common to the functions.

0: When the tool motion viewed from the workpiece is in right-hand screw direction, it is taken as the positive direction.
1: When the tool motion viewed from the workpiece is in left-hand screw direction, it is taken as the positive direction.

#7944 COFSW1H Horizontal axis rotation center offset

When all axes are at the machine zero point, set the distance in the horizontal axis direction from the machine zero point to the rotation center of the base-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7945 COFSW1V Vertical axis rotation center offset

When all axes are at the machine zero point, set the distance in the vertical axis direction from the machine zero point to the rotation center of the base-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7946 COFSW1T Height axis rotation center offset

When all axes are at the machine zero point, set the distance in the height axis direction from the machine zero point to the rotation center of the base-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7947 CERRW1H Horizontal axis rotation center error compensation amount

Set the error compensation amount in the horizontal axis direction of the table rotating type base-side rotary axis rotation center.
When table rotating type base rotary axis is I axis rotation, set the position deviation of J axis rotation.
When table rotating type base rotary axis is J axis rotation, set the position deviation of K axis rotation.
When table rotating type base rotary axis is K axis rotation, set the position deviation of I axis rotation.

---Setting range---

-99999.999 to 99999.999 (mm)
(Follow as "#1006 mcmpunit Machine error compensation unit".)

#7948 CERRW1V Vertical axis rotation center error compensation amount

Set the error compensation amount in the vertical axis direction of the table rotating type base-side rotary axis rotation center.
When table rotating type base rotary axis is I axis rotation, set the position deviation of K axis rotation.
When table rotating type base rotary axis is J axis rotation, set the position deviation of I axis rotation.
When table rotating type base rotary axis is K axis rotation, set the position deviation of J axis rotation.

---Setting range---

-99999.999 to 99999.999 (mm)
(Follow as "#1006 mcmpunit Machine error compensation unit".)

(PR) #7950 SLCT_W2 Rotary axis selection

Set in which direction to rotate the table rotating type workpiece-side rotary axis.
If the tool axis is inclined, use the second digit to set the axis direction in which the tool axis is inclined.

0: Invalid
1: I axis rotation
2: J axis rotation
3: K axis rotation

(Note) 0 to 99 can be set from the screen, but if an invalid value is set, the operation error (M01 0127) will occur when the power supply is turned ON.

---Setting range---

0 to 3
12, 13, 21, 23, 31, 32

(PR) #7951 TIANGW2 Inclination angle

Set the inclination angle if the table rotating type workpiece-side rotary axis is inclined. Set the angle regarding CCW direction of the inclined plane as minus direction.

---Setting range---

-359.999 to 359.999 (°)
(Follow as "#1003 iunit Input setup unit".)

(PR) #7952 ROTAXW2 Rotary axis name

Set the name of the table rotating type workpiece-side rotary axis.

---Setting range---

A,B,C,U,V,W,X,Y,Z
2-digit of A to Z and 1 to 9
0: Mechanical axis specifications

#7953 DIR_W2 Rotation direction

[M8]
Set the rotation direction for the table rotating type workpiece-side rotary axis.
The rotation direction specifications vary according to the setting of "#1450 5axis_Spec/bit3" (Select specifications of rotation direction parameter).
- When "#1450 5axis_Spec/bit3" = "0"
The specifications vary for each function.
- When "#1450 5axis_Spec/bit3" = "1"
The specifications are common to the functions.

0: When the tool motion viewed from the workpiece is in right-hand screw direction, it is taken as the positive direction.
1: When the tool motion viewed from the workpiece is in left-hand screw direction, it is taken as the positive direction.

#7954 COFSW2H Horizontal axis rotation center offset

When all axes are at the machine zero point, set the distance in the horizontal axis direction between rotation centers of the base-side rotary axis and the workpiece-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7955 COFSW2V Vertical axis rotation center offset

When all axes are at the machine zero point, set the distance in the vertical axis direction between rotation centers of the base-side rotary axis and the workpiece-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7956 COFSW2T Height axis rotation center offset

When all axes are at the machine zero point, set the distance in the height axis direction between rotation centers of the base-side rotary axis and the workpiece-side rotary axis.

---Setting range---

-99999.999 to 99999.999 (mm)

#7957 CERRW2H Horizontal axis rotation center error compensation amount

Set the error compensation amount in the horizontal axis direction of the table rotating type workpiece-side rotary axis rotation center.
When table rotating type workpiece side rotary axis is I axis rotation, set the position deviation of J axis rotation.
When table rotating type workpiece side rotary axis is J axis rotation, set the position deviation of K axis rotation.
When table rotating type workpiece side rotary axis is K axis rotation, set the position deviation of I axis rotation.

---Setting range---

-99999.999 to 99999.999 (mm)
(Follow as "#1006 mcmpunit Machine error compensation unit".)

#7958	CERRW2V	Vertical axis rotation center error compensation amount

Set the error compensation amount in the vertical axis direction of the table rotating type workpiece-side rotary axis rotation center.
When table rotating type workpiece side rotary axis is I axis rotation, set the position deviation of K axis rotation.
When table rotating type workpiece side rotary axis is J axis rotation, set the position deviation of I axis rotation.
When table rotating type workpiece side rotary axis is K axis rotation, set the position deviation of J axis rotation.

---Setting range---

-99999.999 to 99999.999 (mm)
(Follow as "#1006 mcmpunit Machine error compensation unit".)

#7960	Rot1 Ang Geo Dev1	Angular deviation 1 of center line of 1st rotary axis

When 1st rotary axis is I axis rotation, set the angular deviation of J axis rotation.
When 1st rotary axis is J axis rotation, set the angular deviation of K axis rotation.
When 1st rotary axis is K axis rotation, set the angular deviation of I axis rotation.

---Setting range---

-1.000000 to 1.000000 (deg)

#7961	Rot1 Ang Geo Dev2	Angular deviation 2 of center line of 1st rotary axis

When 1st rotary axis is I axis rotation, set the angular deviation of K axis rotation.
When 1st rotary axis is J axis rotation, set the angular deviation of I axis rotation.
When 1st rotary axis is K axis rotation, set the angular deviation of J axis rotation.

---Setting range---

-1.000000 to 1.000000 (deg)

#7962	Rot2 Ang Geo Dev1	Angular deviation 1 of center line of 2nd rotary axis

When 2nd rotary axis is I axis rotation, set the angular deviation of J axis rotation.
When 2nd rotary axis is J axis rotation, set the angular deviation of K axis rotation.
When 2nd rotary axis is K axis rotation, set the angular deviation of I axis rotation.

---Setting range---

-1.000000 to 1.000000 (deg)

#7963	Rot2 Ang Geo Dev2	Angular deviation 2 of center line of 2nd rotary axis

When 2nd rotary axis is I axis rotation, set the angular deviation of K axis rotation.
When 2nd rotary axis is J axis rotation, set the angular deviation of I axis rotation.
When 2nd rotary axis is K axis rotation, set the angular deviation of J axis rotation.

---Setting range---

-1.000000 to 1.000000 (deg)

2.12 PLC Timer

#16000-16703	T0 - T703	PLC timer <10ms/100ms>

Set the time for the timer used in the PLC program (ladder).
The 10ms timer and 100ms timer are identified by the command used.
(Note1) This setting value is valid when bit selection parameter "#6449/bit0" is set to "0".
(Note2) Setting the timer setting value from the setting and display unit
The timer T setting value can be set with the following two methods.
- Method to validate the setting value (Kn) programmed with the sequence program (fixed timer)
- Method to validate the setting value set from the setting and display unit (variable timer)

(Note3) As described bellow, the setting method of timer T and No. of points can be set with the bit selection parameters (#6454/bit0 to bit3).
- #6454/bit0=0, bit1=0, bit2=0, bit3=0
  No. of points: 0
  Range: None
  Setting method: All fixed timers
- #6454/bit0=1, bit1=0, bit2=0, bit3=0
  No. of points: 100
  Range: #16000 to #16099
  Setting method: Set above range with variable timers.
- #6454/bit0=0, bit1=1, bit2=0, bit3=0
  No. of points:200
  Range: #16000 to #16199
  Setting method: Set above range with variable timers.
- #6454/bit0=1, bit1=1, bit2=0, bit3=0
  No. of points: 300
  Range: #16000 to #16299
  Setting method: Set above range with variable timers.
- #6454/bit0=0, bit1=0, bit2=1, bit3=0
  No. of points: 400
  Range: #16000 to #16399
  Setting method: Set above range with variable timers.
- #6454/bit0=1, bit1=0, bit2=1, bit3=0
  No. of points: 500
  Range: #16000 to #16499
  Setting method: Set above range with variable timers.
- #6454/bit0=0, bit1=1, bit2=1, bit3=0
  No. of points: 600
  Range: #16000 to #16599
  Setting method: Set above range with variable timers.
- #6454/bit0=1, bit1=1, bit2=1, bit3=0
  No. of points: All points
  Range: #16000 to #16703
  Setting method: All variable timers

---Setting range---
0 to 32767(x 10ms or x 100ms)

2.13 PLC Integrated Timer

#17000-17063	ST0 - ST63	PLC integrated timer <100ms INC.>

Set the time for the integrated timer used with the PLC program (ladder).
(Note1) This setting value is valid when bit selection parameter "#6449/bit0" is set to "0".
(Note2) Setting the timer setting value from the setting and display unit
The timer T setting value can be set with the following two methods.
- Method to validate the setting value (Kn) programmed with the sequence program (fixed integrated timer)
- Method to validate the setting value set from the setting and display unit (variable integrated timer)

(Note3) As described bellow, the setting method of timer ST and No. of points can be set with the bit selection parameters (#6453/bit5 to bit7).
- #6453/bit5=0, bit6=0, bit7=0
  No. of points: 0
  Range: None
  Setting method: All fixed integrated timers
- #6453/bit5=1, bit6=0, bit7=0
  No. of points: 20
  Range: #17000 to #17019
  Setting method: Set above range with variable integrated timer.
- #6453/bit5=0, bit6=1, bit7=0
  No. of points: 40
  Range: #17000 to #17039
  Setting method: Set above range with variable integrated timer.
- #6453/bit5=1, bit6=1, bit7=0
  No. of points: All points
  Range: #17000 to #17063
  Setting method: All variable integrated timers

---Setting range---
0 to 32767(x 100ms)

2.14 PLC Counter

#17200-17455	C000 - C255	Counter

Set the time for the counter used with the PLC program (ladder).
(Note1) This setting value is valid when bit selection parameter "#6449/bit1" is set to "0".
(Note2) Setting the counter setting value from the setting and display unit
The counter C setting value can be set with the following two methods.
- Method to validate the setting value (Kn) programmed with the sequence program (fixed counter)
- Method to validate the setting value set from the setting and display unit (variable counter)

(Note3) As described bellow, the setting method of counter C and No. of points can be set with the bit selection parameters (#6454/bit4 to bit7).
- #6454/bit4=0, bit5=0, bit6=0, bit7=0
  No. of points: 0
  Range: None
  Setting method: All fixed counters
- #6454/bit4=1, bit5=0, bit6=0, bit7=0
  No. of points: 40
  Range: #17200 to #17239
  Setting method: Set above range with variable counter.
- #6454/bit4=0, bit5=1, bit6=0, bit7=0
  No. of points: 80
  Range: #17200 to #17279
  Setting method: Set above range with variable counter.
- #6454/bit4=1, bit5=1, bit6=0, bit7=0
  No. of points: 120
  Range: #17200 to #17319
  Setting method: Set above range with variable counter.
- #6454/bit4=0, bit5=0, bit6=1, bit7=0
  No. of points: 160
  Range: #17200 to #17359
  Setting method: Set above range with variable counter.
- #6454/bit4=1, bit5=0, bit6=1, bit7=0
  No. of points: 200
  Range: #17200 to #17399
  Setting method: Set above range with variable counter.
- #6454/bit4=0, bit5=1, bit6=1, bit7=0
  No. of points: 240
  Range: #17200 to #17439
  Setting method: Set above range with variable counter.
- #6454/bit4=1, bit5=1, bit6=1, bit7=0
  No. of points: All points
  Range: #17200 to #17455
  Setting method: All variable counters

---Setting range---
0 to 32767

2.15 PLC Constants

#18001-18150 R7500,7501 - R7798,7799 PLC constant (Base area)

Set the value to be set in the data type R register used in the PLC program (ladder).
Even if the data is set in the R register that corresponds to the PLC side when this parameter is displayed. The screen will not change.Enter a different screen once, and then select this screen again.

---Setting range---

-2 to the power of 31 to 2 to the power of 31 -1

#18151-18900 R8300,8301 - R9798,9799 PLC constant (Extension area)

Set the value to be set in the data type R register(R8300 to R9799) used in the PLC program (ladder).
Even if the data is set in the R register that corresponds to the PLC side when this parameter is displayed, the screen will not change. Enter a different screen once, and then select this screen again.
#18151 to #18900 is used as the PLC constant extended area.
The area is valid for the number of PLC constant extension points ("#1326 PLC Const Ext. Num" setting value), starting with #18151.

---Setting range---

-2 to the power of 31 to 2 to the power of 31 -1

2.16 PLC Bit Selection

(Note) Even if the data is set in the R register(R7800 to R7897) that corresponds to the PLC side when this parameter is displayed, the screen will not change.Enter a different screen once, and then select this screen again.
#6449 to #6496 are PLC operation parameters used by MITSUBISHI.
Refer to the PLC Development Manual and the PLC Programming Manual for details.

#6401-6448 R7800-Low - R7823-High Bit selection

These bit type parameters are used in the user PLC (ladder).

#6449 R7824-Low Bit selection

bit7: Control unit thermal alarm valid
bit6: Setting and display unit thermal management valid (This function may not be available for some NC models.)
bit5: Set to "0".
bit4: Battery alarm/warning detection disabled
(Note) When the parameter is set to "1", the "Battery alarm" signal and the "Battery warning" signal will not be turned ON, and the alarm messages will not be displayed.
bit3: Counter C retention
bit2: Integrated timer ST retention
bit1: PLC counter program valid
bit0: PLC timer program valid

#6450 R7824-High Bit selection

bit7: Set to "0".
bit6: External alarm message display (This function may not be available for some NC models.)
bit5: Alarm/operator change (This function may not be available for some NC models.)
bit4: Full screen display of message (This function may not be available for some NC models.)
bit3: Set to "0".
bit2: Operator message valid
bit1: Alarm message display interface
1: R method
0: F method
bit0: Alarm message valid

#6451 R7825-Low Bit selection

bit7-4: Set to "0".
bit3:
[M8]
Set to "0".
[C80]
Select the key input switch setting.
0: Key code is processed without going through the sequence program.
1: Key code is processed through the sequence program.
(Note) When this parameter is 1, key data is set in KEYOUT(R212) through a sequence program, and is enabled. Even if the key data is not changed through a sequence program, make sure to loop-back the key data read from KEYIN(R8) of the NC to R212 of the PLC. Without this loop-back, the key becomes disabled. If the program on the PLC side is at a stop (including a case when STOP is selected by the RUN/STOP switch), key data does not go through the PLC.
bit2: Built-in edit function edit invalid (This function may not be available for some NC models.)
bit1: Set to "0".
bit0: Built-in edit function valid (This function may not be available for some NC models.)

#6452 R7825-High Bit selection

bit7: Set to "0".
bit6: Branch destination label check valid
bit5: Set to "0".
bit4: Serial handy terminal communication valid
bit3-0: Set to "0".

#6453 R7826-Low Bit selection

bit7-5 : Integrated timer ST Variable/fixed Number of points setting
bit4-3 : Set to "0".
bit2-0 : Message language change code

#6454 R7826-High Bit selection

bit7-4 : Counter C Variable/fixed Number of points setting
bit3-0 : Timer T Variable/fixed Number of points setting

#6455 R7827-Low Bit selection

bit7: Enable ladder program writing during RUN
bit6: Enable ladder program writing during RUN (in high-speed processing)
bit5-4: Set to "0".
bit3: Display type switching for operator message
1: R method
0: F method
bit2-0: R device access variables decimal point valid region

#6456	R7827-High	Bit selection

[M8]
bit7-5: Set to "0".
bit4: Motor insulation degradation detection valid
bit3: Set to "0".
bit2: PLC/PLF instruction Holding PLC in STOP state valid
bit1-0: Set to "0".
[C80]
bit7-5: Set to "0".
bit4: Motor insulation deterioration detection ON
bit3: Motor insulation deterioration warning ON
bit2-0: Set to "0".

#6457-6458	R7828-Low - R7828-High	Bit selection

High-speed input specification 1

#6459-6460	R7829-Low - R7829-High	Bit selection

High-speed input specification 2

#6461-6462	R7830-Low - R7830-High	Bit selection

High-speed output specification 1

#6463-6464	R7831-Low - R7831-High	Bit selection

High-speed output specification 2

#6465-6466	R7832-Low - R7832-High	Bit selection

High-speed input specification 3

#6467-6468	R7833-Low - R7833-High	Bit selection

High-speed input specification 4

#6469-6470	R7834-Low - R7834-High	Bit selection

Set to "0".

#6471	R7835-Low	Bit selection

[M8]
Set to "0".
[C80]
bit7-1: Set to "0".
bit0: ERROR LED display
Select the display specifications of ERROR LED (red) when only minor errors occur.
0: Turning OFF when only minor errors occur.
1: Turning ON when only minor errors occur.

#6472	R7835-High	Bit selection

Set to "0".

#6473-6474	R7836-Low - R7836-High	Bit selection

High-speed output specification 3

#6475-6476	R7837-Low - R7837-High	Bit selection

High-speed output specification 4

#6477-6480	R7838-Low - R7839-High	Bit selection

Set to "0".

#6481-6496	R7840-Low - R7847-High	Bit selection

This is reserved for debugging by MITSUBISHI. Set to "0".

#6497-6596	R7848-Low - R7897-High	Bit selection

These bit type parameters are used in the user PLC (ladder).

2.17 Machine Error Compensation Parameters

(PR) #4000 Pinc — Machine error compensation increment method

Select the method to set the machine error compensation data.
0: Absolute amount method
1: Incremental amount method

#4001 cmpax — Basic axis <n-th axis>

Set a name of the basic axis for machine error compensation.
(1) For pitch error compensation, set the name of the axis to be compensated.
(2) For relative position compensation, set the name of the axis to be the basic axis.
Set "system No. + axis name" when using the multi-part system.
(Example) Z axis for 2nd part system: 2Z

When two or more same name exist, set "axis name + serial number".
The serial number is common to all systems.
(Example) If C axis of the 1st system has 2 axes, and another C axis in the 2nd system has 1 axis, set the C axis of the 2nd system as "C3".

---Setting range---
Abbreviation as X, Y, Z, U, V, W, A, B, C, etc.

#4002 drcax — Compensation axis <n-th axis>

Set a name of the compensation axis for machine error compensation.
(1) For pitch error compensation, set the same axis name as in "#4001 cmpax".
(2) For relative position compensation, set the name of the axis to be actually compensated.
Set "system No. + axis name" when using the multi-part system.
(Example) Z axis for 2nd part system: 2Z

When two or more same name exist, set "axis name + serial number".
The serial number is common to all systems.
(Example) If C axis of the 1st system has 2 axes, and another C axis in the 2nd system has 1 axis, set the C axis of the 2nd system as "C3".

---Setting range---
Abbreviation as X, Y, Z, U, V, W, A, B, C, etc.

#4003 rdvno — Division point number at reference position <n-th axis>

Set the compensation data No. corresponding to the reference position. As the reference position is actually the base position, there is no compensation No. Therefore set the number that is decremented by 1.
(Note) When two-way pitch error compensation is enabled, set compensation data No. corresponding to reference point in shifting in plus direction.

---Setting range---
4101 to 5124

#4004 mdvno — Division point number at the most negative side <n-th axis>

Set the compensation data No. at the farthest end on the negative side.
(Note) When the axis moves in positive direction with two-way pitch error compensation enabled, set compensation data No. of which locates on the nearest point to negative side. The compensation point should be set with even number.

---Setting range---
4101 to 5124

#4005 pdvno — Division point number at the most positive side <n-th axis>

Set the compensation data No. at the farthest end on the positive side.
(Note) When the axis moves in negative direction with two-way pitch error compensation enabled, set compensation data No. of which locates on the nearest point to positive side. The compensation point should be set with even number.

---Setting range---
4101 to 5124

#4006 sc — Compensation scale factor <n-th axis>

Set the scale factor for the compensation amount.

---Setting range---
0 to 99

#4007 spcdv — Division interval <n-th axis>

Set the interval to divide the basic axis.
Each compensation data will be the compensation amount for each of these intervals.

---Setting range---
0.001 to 9999.999 (mm)

#4008 twopc — Two-way pitch error compensation <n-th axis>

Select whether to enable two-way pitch error compensation.
0: Disable
1: Enable

#4009 refcmp — Reference position compensation amount <n-th axis>

When two-way pitch error compensation is enabled, set the compensation amount of the reference position when the axis moves to the position from the opposite direction of the zero point return.

---Setting range---
-32768 to 32767
(Note) The actual compensation amount will be the value obtained by multiplying the setting value with the compensation scale.

#4101-5999

Set the compensation amount for each axis.

---Setting range---

-32768 to 32767

(Note) The actual compensation amount will be the value obtained by multiplying the setting value with the compensation scale.

2.18 Macro List

#7001 M[01] Code

Set the M code used for calling out the macro with the M command.
Select codes to be entered other than the codes basically required by the machine and M codes of M0, M1, M2, M30, M96 through M99, and M198.
This is valid when "#1195 Mmac" is set to "1".

---Setting range---

0 to 9999

#7002 M[01] TYPE

Set the macro call out type.

0: Equivalent to M98 P****;
1: Equivalent to G65 P****;
2: Equivalent to G66 P****;
3: Equivalent to G66.1 P****;
4: Equivalent to G144 D0 A****;
(Sub part system control II complete wait method)
5: Equivalent to G144 D1 A****;
(Sub part system control II parallel process method)

#7003 M[01] Program No.

Set the No. of the program or file name to be called out. The file name can contain up to 32 characters.

---Setting range---

Program name or file name (up to 32 characters)

#7011 M[02] Code

The setting method is same as "#7001".

#7012 M[02] Type

The setting method is same as "#7002".

#7013 M[02] Program No.

The setting method is same as "#7003".

#7021 M[03] Code

The setting method is same as "#7001".

#7022 M[03] Type

The setting method is same as "#7002".

#7023 M[03] Program No.

The setting method is same as "#7003".

#7031 M[04] Code

The setting method is same as "#7001".

#7032 M[04] Type

The setting method is same as "#7002".

#7033 M[04] Program No.

The setting method is same as "#7003".

#7041 M[05] Code

The setting method is same as "#7001".

#7042 M[05] Type

The setting method is same as "#7002".

#7043 M[05] Program No.

The setting method is same as "#7003".

#7051 M[06] Code

The setting method is same as "#7001".

#7052 M[06] Type

The setting method is same as "#7002".

#7053 M[06] Program No.

The setting method is same as "#7003".

#7061 M[07] Code

The setting method is same as "#7001".

#7062 M[07] Type

The setting method is same as "#7002".

#7063 M[07] Program No.

The setting method is same as "#7003".

#7071 M[08] Code

The setting method is same as "#7001".

#7072 M[08] Type

The setting method is same as "#7002".

#7073 M[08] Program No.

The setting method is same as "#7003".

#7081 M[09] Code

The setting method is same as "#7001".

#7082 M[09] Type

The setting method is same as "#7002".

#7083 M[09] Program No.

The setting method is same as "#7003".

#7091 M[10] Code

The setting method is same as "#7001".

#7092 M[10] Type

The setting method is same as "#7002".

#7093 M[10] Program No.

The setting method is same as "#7003".

#7102 M2mac Type

Set the type for when calling out the macro with the 2nd miscellaneous command.
The macro will be called out with the "#1170 M2name" address command when "#1198 M2mac" is set to "1".
The setting method is same as "M call macro".

---Setting range---

0 to 3

#7103 M2mac Program No.

Set the program No. for when calling out the macro with the 2nd miscellaneous command.
The macro will be called out with the "#1170 M2name" address command when "#1198 M2mac" is set to "1".
The setting method is same as "M call macro".

---Setting range---

Program name or file name (up to 32 characters)

#7201 G[01] Code

Set the G code to be used when calling the macro with a G command.
Do not set a G code used in the system.
G101 to G110 and G200 to G202 are user macro I codes. However, if a parameter is set for the G code call code, the G code call will have the priority, and these cannot be used as the user macro I.

---Setting range---

1 to 999

#7202 G[01] Type

Set the macro call out type.
0: Equivalent to M98 P ΔΔΔΔ ;
1: Equivalent to G65 P ΔΔΔΔ ;
2: Equivalent to G66 P ΔΔΔΔ ;
3: Equivalent to G66.1 P ΔΔΔΔ ;

---Setting range---

0 to 3

#7203 G[01] Program No.

Set the No. of the program or file name to be called out. The file name can contain up to 32 characters.

---Setting range---

Program name or file name (up to 32 characters)

#7211 G[02] Code

The setting method is same as "#7201".

#7212 G[02] Type

The setting method is same as "#7202".

#7213 G[02] Program No.

The setting method is same as "#7203".

#7221 G[03] Code

The setting method is same as "#7201".

#7222 G[03] Type

The setting method is same as "#7202".

#7223 G[03] Program No.

The setting method is same as "#7203".

#7231 G[04] Code

The setting method is same as "#7201".

#7232 G[04] Type

The setting method is same as "#7202".

#7233 G[04] Program No.

The setting method is same as "#7203".

#7241 G[05] Code

The setting method is same as "#7201".

#7242 G[05] Type

The setting method is same as "#7202".

#7243 G[05] Program No.

The setting method is same as "#7203".

#7251 G[06] Code

The setting method is same as "#7201".

#7252 G[06] Type

The setting method is same as "#7202".

#7253 G[06] Program No.

The setting method is same as "#7203".

#7261 G[07] Code

The setting method is same as "#7201".

#7262 G[07] Type

The setting method is same as "#7202".

#7263 G[07] Program No.

The setting method is same as "#7203".

#7271 G[08] Code

The setting method is same as "#7201".

#7272 G[08] Type

The setting method is same as "#7202".

#7273 G[08] Program No.

The setting method is same as "#7203".

#7281 G[09] Code

The setting method is same as "#7201".

#7282 G[09] Type

The setting method is same as "#7202".

#7283 G[09] Program No.

The setting method is same as "#7203".

#7291 G[10] Code

The setting method is same as "#7201".

#7292 G[10] Type

The setting method is same as "#7202".

#7293 G[10] Program No.

The setting method is same as "#7203".

#7302 Smac Type

Set the type No. for when calling the macro with an S command.
This is valid when "#1196 Smac" is set to "1".
The setting method is same as "M call macro".

---Setting range---

0 to 3

#7303 Smac Program No.

Set the program No. for when calling the macro with an S command.
This is valid when "#1196 Smac" is set to "1".
The setting method is same as "M call macro".

---Setting range---

Program name or file name (up to 32 characters)

#7312 Tmac Type

Set the type for when calling the macro with a T command.
This is valid when "#1197 Tmac" is set to "1".
The setting method is same as "M call macro".

---Setting range---

0 to 3

#7313 Tmac Program No.

Set the program No. for when calling the macro with a T command.
This is valid when "#1197 Tmac" is set to "1".
The setting method is same as "M call macro".

---Setting range---

Program name or file name (up to 32 characters)

#7314 Man Tmac prg No.

[M8]
Specify the macro program number to be called with the T code input through a manual numerical value command.
When a nonzero value is set in the parameter, macro call is executed irrespective of the setting of "#1197 Tmac".

---Setting range---

Program name or file name (up to 32 characters)
(Entering "0" clears the setting value.)

#7322 G200 type

Specify the macro call type.
0: Equivalent to M98 P ****;
1: Equivalent to G65 P ****;
2: Equivalent to G66 P ****;
3: Equivalent to G66.1 P ****;

---Setting Range---

0 to 3

#7323 G200 program No.

Specify the figures in the hundreds and higher places of the macro program No. to be called.

---Setting Range---

90 to 99, or 1000100 to 1999999

(Note) To set the program No. to "1000100 to 1999999", set the macro call out type to 0 (M98) or 1 (G65).

#7332 G300 type

The setting method is same as "#7322".

#7333 G300 program No.

The setting method is same as "#7323".

#7342 G400 type

The setting method is same as "#7322".

#7343 G400 program No.

The setting method is same as "#7323".

#7352 G500 type

The setting method is same as "#7322".

#7353 G500 program No.

The setting method is same as "#7323".

#7362 G600 type

The setting method is same as "#7322".

#7363 G600 program No.

The setting method is same as "#7323".

#7372 G700 type

The setting method is same as "#7322".

#7373 G700 program No.

The setting method is same as "#7323".

#7382 G800 type

The setting method is same as "#7322".

#7383 G800 program No.

The setting method is same as "#7323".

#7392 G900 type

The setting method is same as "#7322".

#7393 G900 program No.

The setting method is same as "#7323".

#7401 ASCII[01] Valid

The ASCII code macro parameters (#7402 to 7405) are validated.

0: Invalid
1: Valid

#7402 ASCII[01] Code

Set the ASCII code used to call macros with the ASCII code.

L system: A,B,D,F,H,I,J,K,M,Q,R,S,T
M system: A,B,F,H,I,K,M,Q,R,S,T

#7403 ASCII[01] Type

Set the macro call type.

0: M98
1: G65
2: G66
3: G66.1

#7404 ASCII[01] Program No.

Set the program No. called with macro call.

---Setting range---

Program name or file name (up to 32 characters)

#7405 ASCII[01] Variable

When the call type is "0", set the variable No. set after the ASCII code.

---Setting range---

100 to 149

#7411 ASCII[02] Valid

The ASCII code macro parameters (#7412 to 7415) are validated.

0: Invalid
1: Valid

#7412 ASCII[02] Code

Set the ASCII code used to call macros with the ASCII code.

L system: A,B,D,F,H,I,J,K,M,Q,R,S,T
M system: A,B,F,H,I,K,M,Q,R,S,T

#7413 ASCII[02] Type

Set the macro call type.

0: M98
1: G65
2: G66
3: G66.1

#7414 ASCII[02] Program No.

Set the program No. called with macro call.

---Setting range---

Program name or file name (up to 32 characters)

#7415 ASCII[02] Variable

When the call type is "0", set the variable No. set after the ASCII code.

---Setting range---

100 to 149

2.19 Position Switches

(Note) The parameters #7741 to #7814 (position switch No. 25 to 32) are only for C80.

#7500 Pcheck **High-speed switching of position switch**

Specify whether to perform position switch area checking at high speeds.
0: Do not perform position switch area checking at high speed (do it the same as before).
1: Perform position switch area checking at high speed.
[C80]
For C80, whether the setting is "0" or "1", the operation of "1" is always performed.

#7501+10(n-1) PSWn axis **Axis name**

"n" represents the posistion switch No.(n=1 to 24)
Specify the name of the axis for which a position switch is provided.
---Setting range---
[M8]
X, Y, Z, U, V, W, A, B, or C axis address
[C80]
NC axis: the NC axis address such as X, Y, Z, U, V
PLC axis: the PLC axis No. such as 1, 2, 3, 4, 5, 6, 7, 8

#7502+10(n-1) PSWn dog1 **Imaginary dog position 1**

"n" represents the posistion switch No.(n=1 to 24)
When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
For the device No., refer to the PLC Interface Manual.
---Setting range---
-99999.999 to 99999.999 (mm)

#7503+10(n-1) PSWn dog2 **Imaginary dog position 2**

"n" represents the posistion switch No.(n=1 to 24)
When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
For the device No., refer to the PLC Interface Manual.
---Setting range---
-99999.999 to 99999.999 (mm)

#7504+10(n-1) PSWn check **Selection of area check method**

"n" represents the posistion switch No.(n=1 to 24)
When position switch area checking at high speed is selected, specify the mode of area checking, i.e., whether to use the command type machine position or detector feedback position, for each position switch.
0: Use the command type machine position as the machine position for position switch area checking.
1: Use the detector feedback position as the machine position for position switch area checking.
[M8]
(Note) This parameter is valid only when "1" set in "#7500 Pcheck".

#7741+10(n-25) PSWn axis **Axis name**

[C80]
"n" represents the posistion switch No.(n=25 to 32)
Specify the name of the axis for which a position switch is provided.
---Setting range---
PLC axis: the PLC axis No. such as 1, 2, 3, 4, 5, 6, 7, 8

#7742+10(n-25) PSWn dog1 **Imaginary dog position 1**

[C80]
"n" represents the posistion switch No.(n=25 to 32)
When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
For the device No., refer to the PLC Interface Manual.
---Setting range---
-99999.999 to 99999.999 (mm)

#7743+10(n-25) PSWn dog2 **Imaginary dog position 2**

[C80]
"n" represents the posistion switch No.(n=25 to 32)
When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
For the device No., refer to the PLC Interface Manual.
---Setting range---
-99999.999 to 99999.999 (mm)

#7744+10(n-25) PSWn check **Selection of area check method**

[C80]
"n" represents the posistion switch No.(n=25 to 32)
When position switch area checking at high speed is selected, specify the mode of area checking, i.e., whether to use the command type machine position or detector feedback position, for each position switch.
0: Use the command type machine position as the machine position for position switch area checking.
1: Use the detector feedback position as the machine position for position switch area checking.

2.20 RIO Device Allocation Parameters [M8]

(PR) #53001 RIO dev assign RIO device allocation method

[M8]

Select whether the fixed allocation method or arbitrary allocation method is used to assign devices to each remote I/O unit station.

0: Fixed allocation

1: Arbitrary allocation

(PR) #53011 RIO CH No. #1 Remote I/O channel No. for allocation

[M8]

Specify the channel No. of the 1st remote I/O unit station.

* When 0 is set, all the RIO allocation parameters of the 1st station will be disabled.

---Setting range---

0,1 to 3

(PR) #53012 RIO Station No. #1 Remote I/O station No. for allocation

[M8]

Specify the station No. of the 1st remote I/O unit station.

* Set this parameter to be the same as the rotary switch of the remote I/O unit to which PLC devices are assigned.

---Setting range---

0 to 63

(PR) #53013 DI dev name #1 DI device name #1

[M8]

Specify the name of DI allocation devices for the 1st remote I/O unit station.

* When 0 is set, this will be left blank.

---Setting range---

0, X, R, ZR

(PR) #53014 DI dev No. #1 DI device number #1

[M8]

Specify the head device No. of DI allocation devices for the 1st remote I/O unit station.

For device X: Hexadecimal

For others: Decimal

* This parameter changes to 0 if you change the device name DI dev name #n.
* Specify DI dev name #1 ahead of this parameter.
* The devices corresponding to the occupied station of the operation panel cannot be set.

---Setting range---

Decimal: 0 to 65535

Hexadecimal: 0 to FFFF

(PR) #53015 DO dev name #1 DO device name #1

[M8]

Specify the name of DO allocation devices for the 1st remote I/O unit station.

* When 0 is set, this will be left blank.

---Setting range---

0, Y, R, ZR

(PR) #53016 DO dev No. #1 DO device number #1

[M8]

Specify the head device No. of DO allocation devices for the 1st remote I/O unit station.

For device Y: Hexadecimal

For others: Decimal

* This parameter changes to 0 if you change the device name DO dev name #n.
* Specify DO dev name #n ahead of this parameter.
* The devices corresponding to the occupied station of the operation panel cannot be set.

---Setting range---

Decimal: 0 to 65535

Hexadecimal: 0 to FFFF

(PR) #53017 DI Hi-Spd #1 High-speed input designation #1

[M8]

Select at which speed to input 32 points of input data to the 1st remote I/O unit station: PLC high-speed or PLC medium-speed.

0: PLC medium-speed

1: PLC high-speed

(PR) #53018 DO Hi-Spd #1 High-speed output designation #1

[M8]

Select at which speed to output 32 points of output data from the 1st remote I/O unit station: PLC high-speed or PLC medium-speed.

0: PLC medium-speed

1: PLC high-speed

Parameter list for RIO device 2nd and following stations

[M8]

Parameter Nos and Names for the RIO device 2nd and following stations are shown below.
Refer to the description of RIO 1st station by replacing its station No. (or # No) for details of each parameter.

	RIO CH No.	RIO Sta. No.	DI dev name	DI dev No.	DO dev name	DO dev No.	DI Hi-Spd	DO Hi-Spd
#1 Station No.:1	#53011 RIO CH No. #1	#53012 RIO Sta. No. #1	#53013 DI dev name #1	#53014 DI dev No. #1	#53015 DO dev name #1	#53016 DO dev No. #1	#53017 DI Hi-Spd #1	#53018 DO Hi-Spd #1
#2 Station No.:2	#53021 RIO CH No. #2	#53022 RIO Sta. No. #2	#53023 DI dev name #2	#53024 DI dev No. #2	#53025 DO dev name #2	#53026 DO dev No. #2	#53027 DI Hi-Spd #2	#53028 DO Hi-Spd #2
#3 Station No.:3	#53031 RIO CH No. #3	#53032 RIO Sta. No. #3	#53033 DI dev name #3	#53034 DI dev No. #3	#53035 DO dev name #3	#53036 DO dev No. #3	#53037 DI Hi-Spd #3	#53038 DO Hi-Spd #3
#4 Station No.:4	#53041 RIO CH No. #4	#53042 RIO Sta. No. #4	#53043 DI dev name #4	#53044 DI dev No. #4	#53045 DO dev name #4	#53046 DO dev No. #4	#53047 DI Hi-Spd #4	#53048 DO Hi-Spd #4
#5 Station No.:5	#53051 RIO CH No. #5	#53052 RIO Sta. No. #5	#53053 DI dev name #5	#53054 DI dev No. #5	#53055 DO dev name #5	#53056 DO dev No. #5	#53057 DI Hi-Spd #5	#53058 DO Hi-Spd #5
#6 Station No.:6	#53061 RIO CH No. #6	#53062 RIO Sta. No. #6	#53063 DI dev name #6	#53064 DI dev No. #6	#53065 DO dev name #6	#53066 DO dev No. #6	#53067 DI Hi-Spd #6	#53068 DO Hi-Spd #6
#7 Station No.:7	#53071 RIO CH No. #7	#53072 RIO Sta. No. #7	#53073 DI dev name #7	#53074 DI dev No. #7	#53075 DO dev name #7	#53076 DO dev No. #7	#53077 DI Hi-Spd #7	#53078 DO Hi-Spd #7
#8 Station No.:8	#53081 RIO CH No. #8	#53082 RIO Sta. No. #8	#53083 DI dev name #8	#53084 DI dev No. #8	#53085 DO dev name #8	#53086 DO dev No. #8	#53087 DI Hi-Spd #8	#53088 DO Hi-Spd #8
#9 Station No.:9	#53091 RIO CH No. #9	#53092 RIO Sta. No. #9	#53093 DI dev name #9	#53094 DI dev No. #9	#53095 DO dev name #9	#53096 DO dev No. #9	#53097 DI Hi-Spd #9	#53098 DO Hi-Spd #9
#10 Station No.:10	#53101 RIO CH No. #10	#53102 RIO Sta. No. #10	#53103 DI dev name #10	#53104 DI dev No. #10	#53105 DO dev name #10	#53106 DO dev No. #10	#53107 DI Hi-Spd #10	#53108 DO Hi-Spd #10
#11 Station No.:11	#53111 RIO CH No. #11	#53112 RIO Sta. No. #11	#53113 DI dev name #11	#53114 DI dev No. #11	#53115 DO dev name #11	#53116 DO dev No. #11	#53117 DI Hi-Spd #11	#53118 DO Hi-Spd #11
#12 Station No.:12	#53121 RIO CH No. #12	#53122 RIO Sta. No. #12	#53123 DI dev name #12	#53124 DI dev No. #12	#53125 DO dev name #12	#53126 DO dev No. #12	#53127 DI Hi-Spd #12	#53128 DO Hi-Spd #12
#13 Station No.:13	#53131 RIO CH No. #13	#53132 RIO Sta. No. #13	#53133 DI dev name #13	#53134 DI dev No. #13	#53135 DO dev name #13	#53136 DO dev No. #13	#53137 DI Hi-Spd #13	#53138 DO Hi-Spd #13
#14 Station No.:14	#53141 RIO CH No. #14	#53142 RIO Sta. No. #14	#53143 DI dev name #14	#53144 DI dev No. #14	#53145 DO dev name #14	#53146 DO dev No. #14	#53147 DI Hi-Spd #14	#53148 DO Hi-Spd #14
#15 Station No.:15	#53151 RIO CH No. #15	#53152 RIO Sta. No. #15	#53153 DI dev name #15	#53154 DI dev No. #15	#53155 DO dev name #15	#53156 DO dev No. #15	#53157 DI Hi-Spd #15	#53158 DO Hi-Spd #15
#16 Station No.:16	#53161 RIO CH No. #16	#53162 RIO Sta. No. #16	#53163 DI dev name #16	#53164 DI dev No. #16	#53165 DO dev name #16	#53166 DO dev No. #16	#53167 DI Hi-Spd #16	#53168 DO Hi-Spd #16
#17 Station No.:17	#53171 RIO CH No. #17	#53172 RIO Sta. No. #17	#53173 DI dev name #17	#53174 DI dev No. #17	#53175 DO dev name #17	#53176 DO dev No. #17	#53177 DI Hi-Spd #17	#53178 DO Hi-Spd #17
#18 Station No.:18	#53181 RIO CH No. #18	#53182 RIO Sta. No. #18	#53183 DI dev name #18	#53184 DI dev No. #18	#53185 DO dev name #18	#53186 DO dev No. #18	#53187 DI Hi-Spd #18	#53188 DO Hi-Spd #18
#19 Station No.:19	#53191 RIO CH No. #19	#53192 RIO Sta. No. #19	#53193 DI dev name #19	#53194 DI dev No. #19	#53195 DO dev name #19	#53196 DO dev No. #19	#53197 DI Hi-Spd #19	#53198 DO Hi-Spd #19
#20 Station No.:20	#53201 RIO CH No. #20	#53202 RIO Sta. No. #20	#53203 DI dev name #20	#53204 DI dev No. #20	#53205 DO dev name #20	#53206 DO dev No. #20	#53207 DI Hi-Spd #20	#53208 DO Hi-Spd #20
#21 Station No.:21	#53211 RIO CH No. #21	#53212 RIO Sta. No. #21	#53213 DI dev name #21	#53214 DI dev No. #21	#53215 DO dev name #21	#53216 DO dev No. #21	#53217 DI Hi-Spd #21	#53218 DO Hi-Spd #21
#22 Station No.:22	#53221 RIO CH No. #22	#53222 RIO Sta. No. #22	#53223 DI dev name #22	#53224 DI dev No. #22	#53225 DO dev name #22	#53226 DO dev No. #22	#53227 DI Hi-Spd #22	#53228 DO Hi-Spd #22
#23 Station No.:23	#53231 RIO CH No. #23	#53232 RIO Sta. No. #23	#53233 DI dev name #23	#53234 DI dev No. #23	#53235 DO dev name #23	#53236 DO dev No. #23	#53237 DI Hi-Spd #23	#53238 DO Hi-Spd #23
#24 Station No.:24	#53241 RIO CH No. #24	#53242 RIO Sta. No. #24	#53243 DI dev name #24	#53244 DI dev No. #24	#53245 DO dev name #24	#53246 DO dev No. #24	#53247 DI Hi-Spd #24	#53248 DO Hi-Spd #24
#25 Station No.:25	#53251 RIO CH No. #25	#53252 RIO Sta. No. #25	#53253 DI dev name #25	#53254 DI dev No. #25	#53255 DO dev name #25	#53256 DO dev No. #25	#53257 DI Hi-Spd #25	#53258 DO Hi-Spd #25
#26 Station No.:26	#53261 RIO CH No. #26	#53262 RIO Sta. No. #26	#53263 DI dev name #26	#53264 DI dev No. #26	#53265 DO dev name #26	#53266 DO dev No. #26	#53267 DI Hi-Spd #26	#53268 DO Hi-Spd #26

	RIO CH No.	RIO Sta. No.	DI dev name	DI dev No.	DO dev name	DO dev No.	DI Hi-Spd	DO Hi-Spd
#27 Station No.:27	#53271 RIO CH No. #27	#53272 RIO Sta. No. #27	#53273 DI dev name #27	#53274 DI dev No. #27	#53275 DO dev name #27	#53276 DO dev No. #27	#53277 DI Hi-Spd #27	#53278 DO Hi-Spd #27
#28 Station No.:28	#53281 RIO CH No. #28	#53282 RIO Sta. No. #28	#53283 DI dev name #28	#53284 DI dev No. #28	#53285 DO dev name #28	#53286 DO dev No. #28	#53287 DI Hi-Spd #28	#53288 DO Hi-Spd #28
#29 Station No.:29	#53291 RIO CH No. #29	#53292 RIO Sta. No. #29	#53293 DI dev name #29	#53294 DI dev No. #29	#53295 DO dev name #29	#53296 DO dev No. #29	#53297 DI Hi-Spd #29	#53298 DO Hi-Spd #29
#30 Station No.:30	#53301 RIO CH No. #30	#53302 RIO Sta. No. #30	#53303 DI dev name #30	#53304 DI dev No. #30	#53305 DO dev name #30	#53306 DO dev No. #30	#53307 DI Hi-Spd #30	#53308 DO Hi-Spd #30
#31 Station No.:31	#53311 RIO CH No. #31	#53312 RIO Sta. No. #31	#53313 DI dev name #31	#53314 DI dev No. #31	#53315 DO dev name #31	#53316 DO dev No. #31	#53317 DI Hi-Spd #31	#53318 DO Hi-Spd #31
#32 Station No.:32	#53321 RIO CH No. #32	#53322 RIO Sta. No. #32	#53323 DI dev name #32	#53324 DI dev No. #32	#53325 DO dev name #32	#53326 DO dev No. #32	#53327 DI Hi-Spd #32	#53328 DO Hi-Spd #32
#33 Station No.:33	#53331 RIO CH No. #33	#53332 RIO Sta. No. #33	#53333 DI dev name #33	#53334 DI dev No. #33	#53335 DO dev name #33	#53336 DO dev No. #33	#53337 DI Hi-Spd #33	#53338 DO Hi-Spd #33
#34 Station No.:34	#53341 RIO CH No. #34	#53342 RIO Sta. No. #34	#53343 DI dev name #34	#53344 DI dev No. #34	#53345 DO dev name #34	#53346 DO dev No. #34	#53347 DI Hi-Spd #34	#53348 DO Hi-Spd #34
#35 Station No.:35	#53351 RIO CH No. #35	#53352 RIO Sta. No. #35	#53353 DI dev name #35	#53354 DI dev No. #35	#53355 DO dev name #35	#53356 DO dev No. #35	#53357 DI Hi-Spd #35	#53358 DO Hi-Spd #35
#36 Station No.:36	#53361 RIO CH No. #36	#53362 RIO Sta. No. #36	#53363 DI dev name #36	#53364 DI dev No. #36	#53365 DO dev name #36	#53366 DO dev No. #36	#53367 DI Hi-Spd #36	#53368 DO Hi-Spd #36
#37 Station No.:37	#53371 RIO CH No. #37	#53372 RIO Sta. No. #37	#53373 DI dev name #37	#53374 DI dev No. #37	#53375 DO dev name #37	#53376 DO dev No. #37	#53377 DI Hi-Spd #37	#53378 DO Hi-Spd #37
#38 Station No.:38	#53381 RIO CH No. #38	#53382 RIO Sta. No. #38	#53383 DI dev name #38	#53384 DI dev No. #38	#53385 DO dev name #38	#53386 DO dev No. #38	#53387 DI Hi-Spd #38	#53388 DO Hi-Spd #38
#39 Station No.:39	#53391 RIO CH No. #39	#53392 RIO Sta. No. #39	#53393 DI dev name #39	#53394 DI dev No. #39	#53395 DO dev name #39	#53396 DO dev No. #39	#53397 DI Hi-Spd #39	#53398 DO Hi-Spd #39
#40 Station No.:40	#53401 RIO CH No. #40	#53402 RIO Sta. No. #40	#53403 DI dev name #40	#53404 DI dev No. #40	#53405 DO dev name #40	#53406 DO dev No. #40	#53407 DI Hi-Spd #40	#53408 DO Hi-Spd #40
#41 Station No.:41	#53411 RIO CH No. #41	#53412 RIO Sta. No. #41	#53413 DI dev name #41	#53414 DI dev No. #41	#53415 DO dev name #41	#53416 DO dev No. #41	#53417 DI Hi-Spd #41	#53418 DO Hi-Spd #41
#42 Station No.:42	#53421 RIO CH No. #42	#53422 RIO Sta. No. #42	#53423 DI dev name #42	#53424 DI dev No. #42	#53425 DO dev name #42	#53426 DO dev No. #42	#53427 DI Hi-Spd #42	#53428 DO Hi-Spd #42
#43 Station No.:43	#53431 RIO CH No. #43	#53432 RIO Sta. No. #43	#53433 DI dev name #43	#53434 DI dev No. #43	#53435 DO dev name #43	#53436 DO dev No. #43	#53437 DI Hi-Spd #43	#53438 DO Hi-Spd #43
#44 Station No.:44	#53441 RIO CH No. #44	#53442 RIO Sta. No. #44	#53443 DI dev name #44	#53444 DI dev No. #44	#53445 DO dev name #44	#53446 DO dev No. #44	#53447 DI Hi-Spd #44	#53448 DO Hi-Spd #44
#45 Station No.:45	#53451 RIO CH No. #45	#53452 RIO Sta. No. #45	#53453 DI dev name #45	#53454 DI dev No. #45	#53455 DO dev name #45	#53456 DO dev No. #45	#53457 DI Hi-Spd #45	#53458 DO Hi-Spd #45
#46 Station No.:46	#53461 RIO CH No. #46	#53462 RIO Sta. No. #46	#53463 DI dev name #46	#53464 DI dev No. #46	#53465 DO dev name #46	#53466 DO dev No. #46	#53467 DI Hi-Spd #46	#53468 DO Hi-Spd #46
#47 Station No.:47	#53471 RIO CH No. #47	#53472 RIO Sta. No. #47	#53473 DI dev name #47	#53474 DI dev No. #47	#53475 DO dev name #47	#53476 DO dev No. #47	#53477 DI Hi-Spd #47	#53478 DO Hi-Spd #47
#48 Station No.:48	#53481 RIO CH No. #48	#53482 RIO Sta. No. #48	#53483 DI dev name #48	#53484 DI dev No. #48	#53485 DO dev name #48	#53486 DO dev No. #48	#53487 DI Hi-Spd #48	#53488 DO Hi-Spd #48
#49 Station No.:49	#53491 RIO CH No. #49	#53492 RIO Sta. No. #49	#53493 DI dev name #49	#53494 DI dev No. #49	#53495 DO dev name #49	#53496 DO dev No. #49	#53497 DI Hi-Spd #49	#53498 DO Hi-Spd #49
#50 Station No.:50	#53501 RIO CH No. #50	#53502 RIO Sta. No. #50	#53503 DI dev name #50	#53504 DI dev No. #50	#53505 DO dev name #50	#53506 DO dev No. #50	#53507 DI Hi-Spd #50	#53508 DO Hi-Spd #50
#51 Station No.:51	#53511 RIO CH No. #51	#53512 RIO Sta. No. #51	#53513 DI dev name #51	#53514 DI dev No. #51	#53515 DO dev name #51	#53516 DO dev No. #51	#53517 DI Hi-Spd #51	#53518 DO Hi-Spd #51
#52 Station No.:52	#53521 RIO CH No. #52	#53522 RIO Sta. No. #52	#53523 DI dev name #52	#53524 DI dev No. #52	#53525 DO dev name #52	#53526 DO dev No. #52	#53527 DI Hi-Spd #52	#53528 DO Hi-Spd #52
#53 Station No.:53	#53531 RIO CH No. #53	#53532 RIO Sta. No. #53	#53533 DI dev name #53	#53534 DI dev No. #53	#53535 DO dev name #53	#53536 DO dev No. #53	#53537 DI Hi-Spd #53	#53538 DO Hi-Spd #53
#54 Station No.:54	#53541 RIO CH No. #54	#53542 RIO Sta. No. #54	#53543 DI dev name #54	#53544 DI dev No. #54	#53545 DO dev name #54	#53546 DO dev No. #54	#53547 DI Hi-Spd #54	#53548 DO Hi-Spd #54

	RIO CH No.	RIO Sta. No.	DI dev name	DI dev No.	DO dev name	DO dev No.	DI Hi-Spd	DO Hi-Spd
#55 Station No.:55	#53551 RIO CH No. #55	#53552 RIO Sta. No. #55	#53553 DI dev name #55	#53554 DI dev No. #55	#53555 DO dev name #55	#53556 DO dev No. #55	#53557 DI Hi-Spd #55	#53558 DO Hi-Spd #55
#56 Station No.:56	#53561 RIO CH No. #56	#53562 RIO Sta. No. #56	#53563 DI dev name #56	#53564 DI dev No. #56	#53565 DO dev name #56	#53566 DO dev No. #56	#53567 DI Hi-Spd #56	#53568 DO Hi-Spd #56
#57 Station No.:57	#53571 RIO CH No. #57	#53572 RIO Sta. No. #57	#53573 DI dev name #57	#53574 DI dev No. #57	#53575 DO dev name #57	#53576 DO dev No. #57	#53577 DI Hi-Spd #57	#53578 DO Hi-Spd #57
#58 Station No.:58	#53581 RIO CH No. #58	#53582 RIO Sta. No. #58	#53583 DI dev name #58	#53584 DI dev No. #58	#53585 DO dev name #58	#53586 DO dev No. #58	#53587 DI Hi-Spd #58	#53588 DO Hi-Spd #58
#59 Station No.:59	#53591 RIO CH No. #59	#53592 RIO Sta. No. #59	#53593 DI dev name #59	#53594 DI dev No. #59	#53595 DO dev name #59	#53596 DO dev No. #59	#53597 DI Hi-Spd #59	#53598 DO Hi-Spd #59
#60 Station No.:60	#53601 RIO CH No. #60	#53602 RIO Sta. No. #60	#53603 DI dev name #60	#53604 DI dev No. #60	#53605 DO dev name #60	#53606 DO dev No. #60	#53607 DI Hi-Spd #60	#53608 DO Hi-Spd #60
#61 Station No.:61	#53611 RIO CH No. #61	#53612 RIO Sta. No. #61	#53613 DI dev name #61	#53614 DI dev No. #61	#53615 DO dev name #61	#53616 DO dev No. #61	#53617 DI Hi-Spd #61	#53618 DO Hi-Spd #61
#62 Station No.:62	#53621 RIO CH No. #62	#53622 RIO Sta. No. #62	#53623 DI dev name #62	#53624 DI dev No. #62	#53625 DO dev name #62	#53626 DO dev No. #62	#53627 DI Hi-Spd #62	#53628 DO Hi-Spd #62
#63 Station No.:63	#53631 RIO CH No. #63	#53632 RIO Sta. No. #63	#53633 DI dev name #63	#53634 DI dev No. #63	#53635 DO dev name #63	#53636 DO dev No. #63	#53637 DI Hi-Spd #63	#53638 DO Hi-Spd #63
#64 Station No.:64	#53641 RIO CH No. #64	#53642 RIO Sta. No. #64	#53643 DI dev name #64	#53644 DI dev No. #64	#53645 DO dev name #64	#53646 DO dev No. #64	#53647 DI Hi-Spd #64	#53648 DO Hi-Spd #64
#65 Station No.:65	#53651 RIO CH No. #65	#53652 RIO Sta. No. #65	#53653 DI dev name #65	#53654 DI dev No. #65	#53655 DO dev name #65	#53656 DO dev No. #65	#53657 DI Hi-Spd #65	#53658 DO Hi-Spd #65
#66 Station No.:66	#53661 RIO CH No. #66	#53662 RIO Sta. No. #66	#53663 DI dev name #66	#53664 DI dev No. #66	#53665 DO dev name #66	#53666 DO dev No. #66	#53667 DI Hi-Spd #66	#53668 DO Hi-Spd #66
#67 Station No.:67	#53671 RIO CH No. #67	#53672 RIO Sta. No. #67	#53673 DI dev name #67	#53674 DI dev No. #67	#53675 DO dev name #67	#53676 DO dev No. #67	#53677 DI Hi-Spd #67	#53678 DO Hi-Spd #67
#68 Station No.:68	#53681 RIO CH No. #68	#53682 RIO Sta. No. #68	#53683 DI dev name #68	#53684 DI dev No. #68	#53685 DO dev name #68	#53686 DO dev No. #68	#53687 DI Hi-Spd #68	#53688 DO Hi-Spd #68
#69 Station No.:69	#53691 RIO CH No. #69	#53692 RIO Sta. No. #69	#53693 DI dev name #69	#53694 DI dev No. #69	#53695 DO dev name #69	#53696 DO dev No. #69	#53697 DI Hi-Spd #69	#53698 DO Hi-Spd #69
#70 Station No.:70	#53701 RIO CH No. #70	#53702 RIO Sta. No. #70	#53703 DI dev name #70	#53704 DI dev No. #70	#53705 DO dev name #70	#53706 DO dev No. #70	#53707 DI Hi-Spd #70	#53708 DO Hi-Spd #70
#71 Station No.:71	#53711 RIO CH No. #71	#53712 RIO Sta. No. #71	#53713 DI dev name #71	#53714 DI dev No. #71	#53715 DO dev name #71	#53716 DO dev No. #71	#53717 DI Hi-Spd #71	#53718 DO Hi-Spd #71
#72 Station No.:72	#53721 RIO CH No. #72	#53722 RIO Sta. No. #72	#53723 DI dev name #72	#53724 DI dev No. #72	#53725 DO dev name #72	#53726 DO dev No. #72	#53727 DI Hi-Spd #72	#53728 DO Hi-Spd #72
#73 Station No.:73	#53731 RIO CH No. #73	#53732 RIO Sta. No. #73	#53733 DI dev name #73	#53734 DI dev No. #73	#53735 DO dev name #73	#53736 DO dev No. #73	#53737 DI Hi-Spd #73	#53738 DO Hi-Spd #73
#74 Station No.:74	#53741 RIO CH No. #74	#53742 RIO Sta. No. #74	#53743 DI dev name #74	#53744 DI dev No. #74	#53745 DO dev name #74	#53746 DO dev No. #74	#53747 DI Hi-Spd #74	#53748 DO Hi-Spd #74
#75 Station No.:75	#53751 RIO CH No. #75	#53752 RIO Sta. No. #75	#53753 DI dev name #75	#53754 DI dev No. #75	#53755 DO dev name #75	#53756 DO dev No. #75	#53757 DI Hi-Spd #75	#53758 DO Hi-Spd #75
#76 Station No.:76	#53761 RIO CH No. #76	#53762 RIO Sta. No. #76	#53763 DI dev name #76	#53764 DI dev No. #76	#53765 DO dev name #76	#53766 DO dev No. #76	#53767 DI Hi-Spd #76	#53768 DO Hi-Spd #76
#77 Station No.:77	#53771 RIO CH No. #77	#53772 RIO Sta. No. #77	#53773 DI dev name #77	#53774 DI dev No. #77	#53775 DO dev name #77	#53776 DO dev No. #77	#53777 DI Hi-Spd #77	#53778 DO Hi-Spd #77
#78 Station No.:78	#53781 RIO CH No. #78	#53782 RIO Sta. No. #78	#53783 DI dev name #78	#53784 DI dev No. #78	#53785 DO dev name #78	#53786 DO dev No. #78	#53787 DI Hi-Spd #78	#53788 DO Hi-Spd #78
#79 Station No.:79	#53791 RIO CH No. #79	#53792 RIO Sta. No. #79	#53793 DI dev name #79	#53794 DI dev No. #79	#53795 DO dev name #79	#53796 DO dev No. #79	#53797 DI Hi-Spd #79	#53798 DO Hi-Spd #79
#80 Station No.:80	#53801 RIO CH No. #80	#53802 RIO Sta. No. #80	#53803 DI dev name #80	#53804 DI dev No. #80	#53805 DO dev name #80	#53806 DO dev No. #80	#53807 DI Hi-Spd #80	#53808 DO Hi-Spd #80
#81 Station No.:81	#53811 RIO CH No. #81	#53812 RIO Sta. No. #81	#53813 DI dev name #81	#53814 DI dev No. #81	#53815 DO dev name #81	#53816 DO dev No. #81	#53817 DI Hi-Spd #81	#53818 DO Hi-Spd #81
#82 Station No.:82	#53821 RIO CH No. #82	#53822 RIO Sta. No. #82	#53823 DI dev name #82	#53824 DI dev No. #82	#53825 DO dev name #82	#53826 DO dev No. #82	#53827 DI Hi-Spd #82	#53828 DO Hi-Spd #82

	RIO CH No.	RIO Sta. No.	DI dev name	DI dev No.	DO dev name	DO dev No.	DI Hi-Spd	DO Hi-Spd
#83 Station No.:83	#53831 RIO CH No. #83	#53832 RIO Sta. No. #83	#53833 DI dev name #83	#53834 DI dev No. #83	#53835 DO dev name #83	#53836 DO dev No. #83	#53837 DI Hi-Spd #83	#53838 DO Hi-Spd #83
#84 Station No.:84	#53841 RIO CH No. #84	#53842 RIO Sta. No. #84	#53843 DI dev name #84	#53844 DI dev No. #84	#53845 DO dev name #84	#53846 DO dev No. #84	#53847 DI Hi-Spd #84	#53848 DO Hi-Spd #84
#85 Station No.:85	#53851 RIO CH No. #85	#53852 RIO Sta. No. #85	#53853 DI dev name #85	#53854 DI dev No. #85	#53855 DO dev name #85	#53856 DO dev No. #85	#53857 DI Hi-Spd #85	#53858 DO Hi-Spd #85
#86 Station No.:86	#53861 RIO CH No. #86	#53862 RIO Sta. No. #86	#53863 DI dev name #86	#53864 DI dev No. #86	#53865 DO dev name #86	#53866 DO dev No. #86	#53867 DI Hi-Spd #86	#53868 DO Hi-Spd #86
#87 Station No.:87	#53871 RIO CH No. #87	#53872 RIO Sta. No. #87	#53873 DI dev name #87	#53874 DI dev No. #87	#53875 DO dev name #87	#53876 DO dev No. #87	#53877 DI Hi-Spd #87	#53878 DO Hi-Spd #87
#88 Station No.:88	#53881 RIO CH No. #88	#53882 RIO Sta. No. #88	#53883 DI dev name #88	#53884 DI dev No. #88	#53885 DO dev name #88	#53886 DO dev No. #88	#53887 DI Hi-Spd #88	#53888 DO Hi-Spd #88
#89 Station No.:89	#53891 RIO CH No. #89	#53892 RIO Sta. No. #89	#53893 DI dev name #89	#53894 DI dev No. #89	#53895 DO dev name #89	#53896 DO dev No. #89	#53897 DI Hi-Spd #89	#53898 DO Hi-Spd #89
#90 Station No.:90	#53901 RIO CH No. #90	#53902 RIO Sta. No. #90	#53903 DI dev name #90	#53904 DI dev No. #90	#53905 DO dev name #90	#53906 DO dev No. #90	#53907 DI Hi-Spd #90	#53908 DO Hi-Spd #90
#91 Station No.:91	#53911 RIO CH No. #91	#53912 RIO Sta. No. #91	#53913 DI dev name #91	#53914 DI dev No. #91	#53915 DO dev name #91	#53916 DO dev No. #91	#53917 DI Hi-Spd #91	#53918 DO Hi-Spd #91
#92 Station No.:92	#53921 RIO CH No. #92	#53922 RIO Sta. No. #92	#53923 DI dev name #92	#53924 DI dev No. #92	#53925 DO dev name #92	#53926 DO dev No. #92	#53927 DI Hi-Spd #92	#53928 DO Hi-Spd #92
#93 Station No.:93	#53931 RIO CH No. #93	#53932 RIO Sta. No. #93	#53933 DI dev name #93	#53934 DI dev No. #93	#53935 DO dev name #93	#53936 DO dev No. #93	#53937 DI Hi-Spd #93	#53938 DO Hi-Spd #93
#94 Station No.:94	#53941 RIO CH No. #94	#53942 RIO Sta. No. #94	#53943 DI dev name #94	#53944 DI dev No. #94	#53945 DO dev name #94	#53946 DO dev No. #94	#53947 DI Hi-Spd #94	#53948 DO Hi-Spd #94
#95 Station No.:95	#53951 RIO CH No. #95	#53952 RIO Sta. No. #95	#53953 DI dev name #95	#53954 DI dev No. #95	#53955 DO dev name #95	#53956 DO dev No. #95	#53957 DI Hi-Spd #95	#53958 DO Hi-Spd #95
#96 Station No.:96	#53961 RIO CH No. #96	#53962 RIO Sta. No. #96	#53963 DI dev name #96	#53964 DI dev No. #96	#53965 DO dev name #96	#53966 DO dev No. #96	#53967 DI Hi-Spd #96	#53968 DO Hi-Spd #96
#97 Station No.:97	#53971 RIO CH No. #97	#53972 RIO Sta. No. #97	#53973 DI dev name #97	#53974 DI dev No. #97	#53975 DO dev name #97	#53976 DO dev No. #97	#53977 DI Hi-Spd #97	#53978 DO Hi-Spd #97
#98 Station No.:98	#53981 RIO CH No. #98	#53982 RIO Sta. No. #98	#53983 DI dev name #98	#53984 DI dev No. #98	#53985 DO dev name #98	#53986 DO dev No. #98	#53987 DI Hi-Spd #98	#53988 DO Hi-Spd #98
#99 Station No.:99	#53991 RIO CH No. #99	#53992 RIO Sta. No. #99	#53993 DI dev name #99	#53994 DI dev No. #99	#53995 DO dev name #99	#53996 DO dev No. #99	#53997 DI Hi-Spd #99	#53998 DO Hi-Spd #99
#100 Station No.:100	#54001 RIO CH No. #100	#54002 RIO Sta. No. #100	#54003 DI dev name #100	#54004 DI dev No. #100	#54005 DO dev name #100	#54006 DO dev No. #100	#54007 DI Hi-Spd #100	#54008 DO Hi-Spd #100
#101 Station No.:101	#54011 RIO CH No. #101	#54012 RIO Sta. No. #101	#54013 DI dev name #101	#54014 DI dev No. #101	#54015 DO dev name #101	#54016 DO dev No. #101	#54017 DI Hi-Spd #101	#54018 DO Hi-Spd #101
#102 Station No.:102	#54021 RIO CH No. #102	#54022 RIO Sta. No. #102	#54023 DI dev name #102	#54024 DI dev No. #102	#54025 DO dev name #102	#54026 DO dev No. #102	#54027 DI Hi-Spd #102	#54028 DO Hi-Spd #102
#103 Station No.:103	#54031 RIO CH No. #103	#54032 RIO Sta. No. #103	#54033 DI dev name #103	#54034 DI dev No. #103	#54035 DO dev name #103	#54036 DO dev No. #103	#54037 DI Hi-Spd #103	#54038 DO Hi-Spd #103
#104 Station No.:104	#54041 RIO CH No. #104	#54042 RIO Sta. No. #104	#54043 DI dev name #104	#54044 DI dev No. #104	#54045 DO dev name #104	#54046 DO dev No. #104	#54047 DI Hi-Spd #104	#54048 DO Hi-Spd #104
#105 Station No.:105	#54051 RIO CH No. #105	#54052 RIO Sta. No. #105	#54053 DI dev name #105	#54054 DI dev No. #105	#54055 DO dev name #105	#54056 DO dev No. #105	#54057 DI Hi-Spd #105	#54058 DO Hi-Spd #105
#106 Station No.:106	#54061 RIO CH No. #106	#54062 RIO Sta. No. #106	#54063 DI dev name #106	#54064 DI dev No. #106	#54065 DO dev name #106	#54066 DO dev No. #106	#54067 DI Hi-Spd #106	#54068 DO Hi-Spd #106
#107 Station No.:107	#54071 RIO CH No. #107	#54072 RIO Sta. No. #107	#54073 DI dev name #107	#54074 DI dev No. #107	#54075 DO dev name #107	#54076 DO dev No. #107	#54077 DI Hi-Spd #107	#54078 DO Hi-Spd #107

	RIO CH No.	RIO Sta. No.	DI dev name	DI dev No.	DO dev name	DO dev No.	DI Hi-Spd	DO Hi-Spd
#108 Station No.:108	#54081 RIO CH No. #108	#54082 RIO Sta. No. #108	#54083 DI dev name #108	#54084 DI dev No. #108	#54085 DO dev name #108	#54086 DO dev No. #108	#54087 DI Hi-Spd #108	#54088 DO Hi-Spd #108
#109 Station No.:109	#54091 RIO CH No. #109	#54092 RIO Sta. No. #109	#54093 DI dev name #109	#54094 DI dev No. #109	#54095 DO dev name #109	#54096 DO dev No. #109	#54097 DI Hi-Spd #109	#54098 DO Hi-Spd #109
#110 Station No.:110	#54101 RIO CH No. #110	#54102 RIO Sta. No. #110	#54103 DI dev name #110	#54104 DI dev No. #110	#54105 DO dev name #110	#54106 DO dev No. #110	#54107 DI Hi-Spd #110	#54108 DO Hi-Spd #110
#111 Station No.:111	#54111 RIO CH No. #111	#54112 RIO Sta. No. #111	#54113 DI dev name #111	#54114 DI dev No. #111	#54115 DO dev name #111	#54116 DO dev No. #111	#54117 DI Hi-Spd #111	#54118 DO Hi-Spd #111
#112 Station No.:112	#54121 RIO CH No. #112	#54122 RIO Sta. No. #112	#54123 DI dev name #112	#54124 DI dev No. #112	#54125 DO dev name #112	#54126 DO dev No. #112	#54127 DI Hi-Spd #112	#54128 DO Hi-Spd #112
#113 Station No.:113	#54131 RIO CH No. #113	#54132 RIO Sta. No. #113	#54133 DI dev name #113	#54134 DI dev No. #113	#54135 DO dev name #113	#54136 DO dev No. #113	#54137 DI Hi-Spd #113	#54138 DO Hi-Spd #113
#114 Station No.:114	#54141 RIO CH No. #114	#54142 RIO Sta. No. #114	#54143 DI dev name #114	#54144 DI dev No. #114	#54145 DO dev name #114	#54146 DO dev No. #114	#54147 DI Hi-Spd #114	#54148 DO Hi-Spd #114
#115 Station No.:115	#54151 RIO CH No. #115	#54152 RIO Sta. No. #115	#54153 DI dev name #115	#54154 DI dev No. #115	#54155 DO dev name #115	#54156 DO dev No. #115	#54157 DI Hi-Spd #115	#54158 DO Hi-Spd #115
#116 Station No.:116	#54161 RIO CH No. #116	#54162 RIO Sta. No. #116	#54163 DI dev name #116	#54164 DI dev No. #116	#54165 DO dev name #116	#54166 DO dev No. #116	#54167 DI Hi-Spd #116	#54168 DO Hi-Spd #116
#117 Station No.:117	#54171 RIO CH No. #117	#54172 RIO Sta. No. #117	#54173 DI dev name #117	#54174 DI dev No. #117	#54175 DO dev name #117	#54176 DO dev No. #117	#54177 DI Hi-Spd #117	#54178 DO Hi-Spd #117
#118 Station No.:118	#54181 RIO CH No. #118	#54182 RIO Sta. No. #118	#54183 DI dev name #118	#54184 DI dev No. #118	#54185 DO dev name #118	#54186 DO dev No. #118	#54187 DI Hi-Spd #118	#54188 DO Hi-Spd #118
#119 Station No.:119	#54191 RIO CH No. #119	#54192 RIO Sta. No. #119	#54193 DI dev name #119	#54194 DI dev No. #119	#54195 DO dev name #119	#54196 DO dev No. #119	#54197 DI Hi-Spd #119	#54198 DO Hi-Spd #119
#120 Station No.:120	#54201 RIO CH No. #120	#54202 RIO Sta. No. #120	#54203 DI dev name #120	#54204 DI dev No. #120	#54205 DO dev name #120	#54206 DO dev No. #120	#54207 DI Hi-Spd #120	#54208 DO Hi-Spd #120
#121 Station No.:121	#54211 RIO CH No. #121	#54212 RIO Sta. No. #121	#54213 DI dev name #121	#54214 DI dev No. #121	#54215 DO dev name #121	#54216 DO dev No. #121	#54217 DI Hi-Spd #121	#54218 DO Hi-Spd #121
#122 Station No.:122	#54221 RIO CH No. #122	#54222 RIO Sta. No. #122	#54223 DI dev name #122	#54224 DI dev No. #122	#54225 DO dev name #122	#54226 DO dev No. #122	#54227 DI Hi-Spd #122	#54228 DO Hi-Spd #122
#123 Station No.:123	#54231 RIO CH No. #123	#54232 RIO Sta. No. #123	#54233 DI dev name #123	#54234 DI dev No. #123	#54235 DO dev name #123	#54236 DO dev No. #123	#54237 DI Hi-Spd #123	#54238 DO Hi-Spd #123
#124 Station No.:124	#54241 RIO CH No. #124	#54242 RIO Sta. No. #124	#54243 DI dev name #124	#54244 DI dev No. #124	#54245 DO dev name #124	#54246 DO dev No. #124	#54247 DI Hi-Spd #124	#54248 DO Hi-Spd #124
#125 Station No.:125	#54251 RIO CH No. #125	#54252 RIO Sta. No. #125	#54253 DI dev name #125	#54254 DI dev No. #125	#54255 DO dev name #125	#54256 DO dev No. #125	#54257 DI Hi-Spd #125	#54258 DO Hi-Spd #125
#126 Station No.:126	#54261 RIO CH No. #126	#54262 RIO Sta. No. #126	#54263 DI dev name #126	#54264 DI dev No. #126	#54265 DO dev name #126	#54266 DO dev No. #126	#54267 DI Hi-Spd #126	#54268 DO Hi-Spd #126
#127 Station No.:127	#54271 RIO CH No. #127	#54272 RIO Sta. No. #127	#54273 DI dev name #127	#54274 DI dev No. #127	#54275 DO dev name #127	#54276 DO dev No. #127	#54277 DI Hi-Spd #127	#54278 DO Hi-Spd #127
#128 Station No.:128	#54281 RIO CH No. #128	#54282 RIO Sta. No. #128	#54283 DI dev name #128	#54284 DI dev No. #128	#54285 DO dev name #128	#54286 DO dev No. #128	#54287 DI Hi-Spd #128	#54288 DO Hi-Spd #128

	RIO CH No.	RIO Sta. No.	DI dev name	DI dev No.	DO dev name	DO dev No.	DI Hi-Spd	DO Hi-Spd
#129 Station No.:129	#54291 RIO CH No. #129	#54292 RIO Sta. No. #129	#54293 DI dev name #129	#54294 DI dev No. #129	#54295 DO dev name #129	#54296 DO dev No. #129	#54297 DI Hi-Spd #129	#54298 DO Hi-Spd #129
#130 Station No.:130	#54301 RIO CH No. #130	#54302 RIO Sta. No. #130	#54303 DI dev name #130	#54304 DI dev No. #130	#54305 DO dev name #130	#54306 DO dev No. #130	#54307 DI Hi-Spd #130	#54308 DO Hi-Spd #130
#131 Station No.:131	#54311 RIO CH No. #131	#54312 RIO Sta. No. #131	#54313 DI dev name #131	#54314 DI dev No. #131	#54315 DO dev name #131	#54316 DO dev No. #131	#54317 DI Hi-Spd #131	#54318 DO Hi-Spd #131
#132 Station No.:132	#54321 RIO CH No. #132	#54322 RIO Sta. No. #132	#54323 DI dev name #132	#54324 DI dev No. #132	#54325 DO dev name #132	#54326 DO dev No. #132	#54327 DI Hi-Spd #132	#54328 DO Hi-Spd #132
#133 Station No.:133	#54331 RIO CH No. #133	#54332 RIO Sta. No. #133	#54333 DI dev name #133	#54334 DI dev No. #133	#54335 DO dev name #133	#54336 DO dev No. #133	#54337 DI Hi-Spd #133	#54338 DO Hi-Spd #133
#134 Station No.:134	#54341 RIO CH No. #134	#54342 RIO Sta. No. #134	#54343 DI dev name #134	#54344 DI dev No. #134	#54345 DO dev name #134	#54346 DO dev No. #134	#54347 DI Hi-Spd #134	#54348 DO Hi-Spd #134
#135 Station No.:135	#54351 RIO CH No. #135	#54352 RIO Sta. No. #135	#54353 DI dev name #135	#54354 DI dev No. #135	#54355 DO dev name #135	#54356 DO dev No. #135	#54357 DI Hi-Spd #135	#54358 DO Hi-Spd #135
#136 Station No.:136	#54361 RIO CH No. #136	#54362 RIO Sta. No. #136	#54363 DI dev name #136	#54364 DI dev No. #136	#54365 DO dev name #136	#54366 DO dev No. #136	#54367 DI Hi-Spd #136	#54368 DO Hi-Spd #136
#137 Station No.:137	#54371 RIO CH No. #137	#54372 RIO Sta. No. #137	#54373 DI dev name #137	#54374 DI dev No. #137	#54375 DO dev name #137	#54376 DO dev No. #137	#54377 DI Hi-Spd #137	#54378 DO Hi-Spd #137
#138 Station No.:138	#54381 RIO CH No. #138	#54382 RIO Sta. No. #138	#54383 DI dev name #138	#54384 DI dev No. #138	#54385 DO dev name #138	#54386 DO dev No. #138	#54387 DI Hi-Spd #138	#54388 DO Hi-Spd #138
#139 Station No.:139	#54391 RIO CH No. #139	#54392 RIO Sta. No. #139	#54393 DI dev name #139	#54394 DI dev No. #139	#54395 DO dev name #139	#54396 DO dev No. #139	#54397 DI Hi-Spd #139	#54398 DO Hi-Spd #139
#140 Station No.:140	#54401 RIO CH No. #140	#54402 RIO Sta. No. #140	#54403 DI dev name #140	#54404 DI dev No. #140	#54405 DO dev name #140	#54406 DO dev No. #140	#54407 DI Hi-Spd #140	#54408 DO Hi-Spd #140
#141 Station No.:141	#54411 RIO CH No. #141	#54412 RIO Sta. No. #141	#54413 DI dev name #141	#54414 DI dev No. #141	#54415 DO dev name #141	#54416 DO dev No. #141	#54417 DI Hi-Spd #141	#54418 DO Hi-Spd #141
#142 Station No.:142	#54421 RIO CH No. #142	#54422 RIO Sta. No. #142	#54423 DI dev name #142	#54424 DI dev No. #142	#54425 DO dev name #142	#54426 DO dev No. #142	#54427 DI Hi-Spd #142	#54428 DO Hi-Spd #142
#143 Station No.:143	#54431 RIO CH No. #143	#54432 RIO Sta. No. #143	#54433 DI dev name #143	#54434 DI dev No. #143	#54435 DO dev name #143	#54436 DO dev No. #143	#54437 DI Hi-Spd #143	#54438 DO Hi-Spd #143
#144 Station No.:144	#54441 RIO CH No. #144	#54442 RIO Sta. No. #144	#54443 DI dev name #144	#54444 DI dev No. #144	#54445 DO dev name #144	#54446 DO dev No. #144	#54447 DI Hi-Spd #144	#54448 DO Hi-Spd #144
#145 Station No.:145	#54451 RIO CH No. #145	#54452 RIO Sta. No. #145	#54453 DI dev name #145	#54454 DI dev No. #145	#54455 DO dev name #145	#54456 DO dev No. #145	#54457 DI Hi-Spd #145	#54458 DO Hi-Spd #145
#146 Station No.:146	#54461 RIO CH No. #146	#54462 RIO Sta. No. #146	#54463 DI dev name #146	#54464 DI dev No. #146	#54465 DO dev name #146	#54466 DO dev No. #146	#54467 DI Hi-Spd #146	#54468 DO Hi-Spd #146
#147 Station No.:147	#54471 RIO CH No. #147	#54472 RIO Sta. No. #147	#54473 DI dev name #147	#54474 DI dev No. #147	#54475 DO dev name #147	#54476 DO dev No. #147	#54477 DI Hi-Spd #147	#54478 DO Hi-Spd #147
#148 Station No.:148	#54481 RIO CH No. #148	#54482 RIO Sta. No. #148	#54483 DI dev name #148	#54484 DI dev No. #148	#54485 DO dev name #148	#54486 DO dev No. #148	#54487 DI Hi-Spd #148	#54488 DO Hi-Spd #148
#149 Station No.:149	#54491 RIO CH No. #149	#54492 RIO Sta. No. #149	#54493 DI dev name #149	#54494 DI dev No. #149	#54495 DO dev name #149	#54496 DO dev No. #149	#54497 DI Hi-Spd #149	#54498 DO Hi-Spd #149

	RIO CH No.	RIO Sta. No.	DI dev name	DI dev No.	DO dev name	DO dev No.	DI Hi-Spd	DO Hi-Spd
#150 Station No.:150	#54501 RIO CH No. #150	#54502 RIO Sta. No. #150	#54503 DI dev name #150	#54504 DI dev No. #150	#54505 DO dev name #150	#54506 DO dev No. #150	#54507 DI Hi-Spd #150	#54508 DO Hi-Spd #150
#151 Station No.:151	#54511 RIO CH No. #151	#54512 RIO Sta. No. #151	#54513 DI dev name #151	#54514 DI dev No. #151	#54515 DO dev name #151	#54516 DO dev No. #151	#54517 DI Hi-Spd #151	#54518 DO Hi-Spd #151
#152 Station No.:152	#54521 RIO CH No. #152	#54522 RIO Sta. No. #152	#54523 DI dev name #152	#54524 DI dev No. #152	#54525 DO dev name #152	#54526 DO dev No. #152	#54527 DI Hi-Spd #152	#54528 DO Hi-Spd #152
#153 Station No.:153	#54531 RIO CH No. #153	#54532 RIO Sta. No. #153	#54533 DI dev name #153	#54534 DI dev No. #153	#54535 DO dev name #153	#54536 DO dev No. #153	#54537 DI Hi-Spd #153	#54538 DO Hi-Spd #153
#154 Station No.:154	#54541 RIO CH No. #154	#54542 RIO Sta. No. #154	#54543 DI dev name #154	#54544 DI dev No. #154	#54545 DO dev name #154	#54546 DO dev No. #154	#54547 DI Hi-Spd #154	#54548 DO Hi-Spd #154
#155 Station No.:155	#54551 RIO CH No. #155	#54552 RIO Sta. No. #155	#54553 DI dev name #155	#54554 DI dev No. #155	#54555 DO dev name #155	#54556 DO dev No. #155	#54557 DI Hi-Spd #155	#54558 DO Hi-Spd #155
#156 Station No.:156	#54561 RIO CH No. #156	#54562 RIO Sta. No. #156	#54563 DI dev name #156	#54564 DI dev No. #156	#54565 DO dev name #156	#54566 DO dev No. #156	#54567 DI Hi-Spd #156	#54568 DO Hi-Spd #156
#157 Station No.:157	#54571 RIO CH No. #157	#54572 RIO Sta. No. #157	#54573 DI dev name #157	#54574 DI dev No. #157	#54575 DO dev name #157	#54576 DO dev No. #157	#54577 DI Hi-Spd #157	#54578 DO Hi-Spd #157
#158 Station No.:158	#54581 RIO CH No. #158	#54582 RIO Sta. No. #158	#54583 DI dev name #158	#54584 DI dev No. #158	#54585 DO dev name #158	#54586 DO dev No. #158	#54587 DI Hi-Spd #158	#54588 DO Hi-Spd #158
#159 Station No.:159	#54591 RIO CH No. #159	#54592 RIO Sta. No. #159	#54593 DI dev name #159	#54594 DI dev No. #159	#54595 DO dev name #159	#54596 DO dev No. #159	#54597 DI Hi-Spd #159	#54598 DO Hi-Spd #159
#160 Station No.:160	#54601 RIO CH No. #160	#54602 RIO Sta. No. #160	#54603 DI dev name #160	#54604 DI dev No. #160	#54605 DO dev name #160	#54606 DO dev No. #160	#54607 DI Hi-Spd #160	#54608 DO Hi-Spd #160
#161 Station No.:161	#54611 RIO CH No. #161	#54612 RIO Sta. No. #161	#54613 DI dev name #161	#54614 DI dev No. #161	#54615 DO dev name #161	#54616 DO dev No. #161	#54617 DI Hi-Spd #161	#54618 DO Hi-Spd #161
#162 Station No.:162	#54621 RIO CH No. #162	#54622 RIO Sta. No. #162	#54623 DI dev name #162	#54624 DI dev No. #162	#54625 DO dev name #162	#54626 DO dev No. #162	#54627 DI Hi-Spd #162	#54628 DO Hi-Spd #162
#163 Station No.:163	#54631 RIO CH No. #163	#54632 RIO Sta. No. #163	#54633 DI dev name #163	#54634 DI dev No. #163	#54635 DO dev name #163	#54636 DO dev No. #163	#54637 DI Hi-Spd #163	#54638 DO Hi-Spd #163
#164 Station No.:164	#54641 RIO CH No. #164	#54642 RIO Sta. No. #164	#54643 DI dev name #164	#54644 DI dev No. #164	#54645 DO dev name #164	#54646 DO dev No. #164	#54647 DI Hi-Spd #164	#54648 DO Hi-Spd #164
#165 Station No.:165	#54651 RIO CH No. #165	#54652 RIO Sta. No. #165	#54653 DI dev name #165	#54654 DI dev No. #165	#54655 DO dev name #165	#54656 DO dev No. #165	#54657 DI Hi-Spd #165	#54658 DO Hi-Spd #165
#166 Station No.:166	#54661 RIO CH No. #166	#54662 RIO Sta. No. #166	#54663 DI dev name #166	#54664 DI dev No. #166	#54665 DO dev name #166	#54666 DO dev No. #166	#54667 DI Hi-Spd #166	#54668 DO Hi-Spd #166
#167 Station No.:167	#54671 RIO CH No. #167	#54672 RIO Sta. No. #167	#54673 DI dev name #167	#54674 DI dev No. #167	#54675 DO dev name #167	#54676 DO dev No. #167	#54677 DI Hi-Spd #167	#54678 DO Hi-Spd #167
#168 Station No.:168	#54681 RIO CH No. #168	#54682 RIO Sta. No. #168	#54683 DI dev name #168	#54684 DI dev No. #168	#54685 DO dev name #168	#54686 DO dev No. #168	#54687 DI Hi-Spd #168	#54688 DO Hi-Spd #168
#169 Station No.:169	#54691 RIO CH No. #169	#54692 RIO Sta. No. #169	#54693 DI dev name #169	#54694 DI dev No. #169	#54695 DO dev name #169	#54696 DO dev No. #169	#54697 DI Hi-Spd #169	#54698 DO Hi-Spd #169
#170 Station No.:170	#54701 RIO CH No. #170	#54702 RIO Sta. No. #170	#54703 DI dev name #170	#54704 DI dev No. #170	#54705 DO dev name #170	#54706 DO dev No. #170	#54707 DI Hi-Spd #170	#54708 DO Hi-Spd #170

	RIO CH No.	RIO Sta. No.	DI dev name	DI dev No.	DO dev name	DO dev No.	DI Hi-Spd	DO Hi-Spd
#171 Station No.:171	#54711 RIO CH No. #171	#54712 RIO Sta. No. #171	#54713 DI dev name #171	#54714 DI dev No. #171	#54715 DO dev name #171	#54716 DO dev No. #171	#54717 DI Hi-Spd #171	#54718 DO Hi-Spd #171
#172 Station No.:172	#54721 RIO CH No. #172	#54722 RIO Sta. No. #172	#54723 DI dev name #172	#54724 DI dev No. #172	#54725 DO dev name #172	#54726 DO dev No. #172	#54727 DI Hi-Spd #172	#54728 DO Hi-Spd #172
#173 Station No.:173	#54731 RIO CH No. #173	#54732 RIO Sta. No. #173	#54733 DI dev name #173	#54734 DI dev No. #173	#54735 DO dev name #173	#54736 DO dev No. #173	#54737 DI Hi-Spd #173	#54738 DO Hi-Spd #173
#174 Station No.:174	#54741 RIO CH No. #174	#54742 RIO Sta. No. #174	#54743 DI dev name #174	#54744 DI dev No. #174	#54745 DO dev name #174	#54746 DO dev No. #174	#54747 DI Hi-Spd #174	#54748 DO Hi-Spd #174
#175 Station No.:175	#54751 RIO CH No. #175	#54752 RIO Sta. No. #175	#54753 DI dev name #175	#54754 DI dev No. #175	#54755 DO dev name #175	#54756 DO dev No. #175	#54757 DI Hi-Spd #175	#54758 DO Hi-Spd #175
#176 Station No.:176	#54761 RIO CH No. #176	#54762 RIO Sta. No. #176	#54763 DI dev name #176	#54764 DI dev No. #176	#54765 DO dev name #176	#54766 DO dev No. #176	#54767 DI Hi-Spd #176	#54768 DO Hi-Spd #176
#177 Station No.:177	#54771 RIO CH No. #177	#54772 RIO Sta. No. #177	#54773 DI dev name #177	#54774 DI dev No. #177	#54775 DO dev name #177	#54776 DO dev No. #177	#54777 DI Hi-Spd #177	#54778 DO Hi-Spd #177
#178 Station No.:178	#54781 RIO CH No. #178	#54782 RIO Sta. No. #178	#54783 DI dev name #178	#54784 DI dev No. #178	#54785 DO dev name #178	#54786 DO dev No. #178	#54787 DI Hi-Spd #178	#54788 DO Hi-Spd #178
#179 Station No.:179	#54791 RIO CH No. #179	#54792 RIO Sta. No. #179	#54793 DI dev name #179	#54794 DI dev No. #179	#54795 DO dev name #179	#54796 DO dev No. #179	#54797 DI Hi-Spd #179	#54798 DO Hi-Spd #179
#180 Station No.:180	#54801 RIO CH No. #180	#54802 RIO Sta. No. #180	#54803 DI dev name #180	#54804 DI dev No. #180	#54805 DO dev name #180	#54806 DO dev No. #180	#54807 DI Hi-Spd #180	#54808 DO Hi-Spd #180
#181 Station No.:181	#54811 RIO CH No. #181	#54812 RIO Sta. No. #181	#54813 DI dev name #181	#54814 DI dev No. #181	#54815 DO dev name #181	#54816 DO dev No. #181	#54817 DI Hi-Spd #181	#54818 DO Hi-Spd #181
#182 Station No.:182	#54821 RIO CH No. #182	#54822 RIO Sta. No. #182	#54823 DI dev name #182	#54824 DI dev No. #182	#54825 DO dev name #182	#54826 DO dev No. #182	#54827 DI Hi-Spd #182	#54828 DO Hi-Spd #182
#183 Station No.:183	#54831 RIO CH No. #183	#54832 RIO Sta. No. #183	#54833 DI dev name #183	#54834 DI dev No. #183	#54835 DO dev name #183	#54836 DO dev No. #183	#54837 DI Hi-Spd #183	#54838 DO Hi-Spd #183
#184 Station No.:184	#54841 RIO CH No. #184	#54842 RIO Sta. No. #184	#54843 DI dev name #184	#54844 DI dev No. #184	#54845 DO dev name #184	#54846 DO dev No. #184	#54847 DI Hi-Spd #184	#54848 DO Hi-Spd #184
#185 Station No.:185	#54851 RIO CH No. #185	#54852 RIO Sta. No. #185	#54853 DI dev name #185	#54854 DI dev No. #185	#54855 DO dev name #185	#54856 DO dev No. #185	#54857 DI Hi-Spd #185	#54858 DO Hi-Spd #185
#186 Station No.:186	#54861 RIO CH No. #186	#54862 RIO Sta. No. #186	#54863 DI dev name #186	#54864 DI dev No. #186	#54865 DO dev name #186	#54866 DO dev No. #186	#54867 DI Hi-Spd #186	#54868 DO Hi-Spd #186

2.21 Open Parameters

#29001-29896 Open param 1

Set LONG data.
#29001 to #29896 are used as parameter range where C language modules can be used arbitrarily.

#29901-29996 Open param 2

Set DOUBLE data.
#29901 to #29996 are used as parameter range where C language modules can be used arbitrarily.

2.22 Device Open Parameters

(Note) This parameter description is common for M800/M80 Series.
It is written on the assumption that all option functions are added.
Confirm with the specifications issued by the machine tool builder before starting use.

#40001-40100	Device Open Parameters

<Data typ>
Set the data format (BYTE, WORD, DWORD, WORD(BIT)) of the assignment area.
0:WORD
1:DWORD
2:BYTE
3:WORD(BIT)
<Data no>
Set the number of data in the assignment area. The number to be designated varies depending on the unit designated by the data format.
0 to 3000
(Depends on the device assignment and data format.)
<Disp typ>
Designate the status of data display format, display restrictions and input protection.
bit0: Cancellation of protection for input
Select whether to check the input protection for the data protection key 2 on the group details screen.
(Note) The name of data protection key differs between machine tool builders. Refer to manuals issued by each machine tool builder for details.
0: Check
1: Not check
bit1: Cancellation of restriction on display
Select whether to display the group details screen even when a machine tool builder password is not entered.
0: Not display
1: Display
bit4: BCD format
Display the data of the group details screen in BCD format.
0: Invalid
1: Valid
bit5: BIT format
Display the data of the group details screen in BIT format.
0: Invalid
1: Valid
bit6: HEX format (Hexadecimal format)
Display the data of the group details screen in HEX format.
0: Invalid
1: Valid
bit7: Sign (Decimal format only)
Select whether to display the data of the group details screen in a decimal format with/without a sign.
0: With sign
1: Without sign

2.23 SRAM Open Parameters

(Note) This parameter description is common for M800/M80 Series.
It is written on the assumption that all option functions are added.
Confirm with the specifications issued by the machine tool builder before starting use.

#41001- 41100 SRAM Open Parameters

<Data typ>
Set the data type (CHAR, SHORT, LONG, DOUBLE) of the assignment area.
1: CHAR
2: SHORT
3: LONG
4: DOUBLE

<Data no>
Set the number of data in the assignment area. The number to be designated varies depending on the unit and free area designated by the data format.
0 to 9999999
(Depends on the data format and free area)

<Disp typ>
Designate the status of data display format, display restrictions and input protection.

bit0: Cancellation of protection for input
Select whether to check the input protection on data protection key 2 on the group details screen.
(Note) The name of data protection key differs between machine tool builders. Refer to manuals issued by each machine tool builder for details.
0: Check
1: Not check

bit1: Cancellation of restriction on display
Select whether to display the group details screen even when a machine tool builder password is not entered.
0: Not display
1: Display

bit4: BCD format
Display the data of the group details screen in BCD format.
0: Invalid
1: Valid

bit5: BIT format
Display the data of the group details screen in BIT format.
0: Invalid
1: Valid

bit6: HEX format (Hexadecimal format)
Display the data of the group details screen in HEX format.
0: Invalid
1: Valid

bit7: Sign (Decimal format only)
Select whether to display the data of the group details screen in a decimal format with/without a sign.
0: With sign
1: Without sign

2.24 CC-Link Parameters [M8]

(PR) #24001+40(n-1) SLn station No. CC-Link station No.

[M8]
Set the station No. of the CC-Link I/F unit.
"n" represents the expansion slot No.(n=1 to 3)
-1: Invalid
0: Master station
1 to 64: Slave station
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
-1 to 64

(PR) #24002+40(n-1) SLn line-spd&Mode CC-Link transmission rate and mode

[M8]
Select the transmission rate and operation mode of the CC-Link I/F unit.
"n" represents the expansion slot No.(n=1 to 3)
<Online mode>
0 : 156Kbps
1 : 625Kbps
2 : 2.5Mbps
3 : 5Mbps
4 : 10M
<Circuit test mode>
5 : 156Kbps
6 : 625Kbps
7 : 2.5Mbps
8 : 5Mbps
9 : 10Mbps
<Hardware test mode>
10 : 156Kbps
11 : 625Kbps
12 : 2.5Mbps
13 : 5Mbps
14 : 10Mbps
(Note) Perform hardware test after removing the CC-Link cable.
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
0 to 14

(PR) #24003+40(n-1) SLn set fault sta Setting of data link faulty station

[M8]
Select whether to clear or hold the data input from the data link faulty station.
"n" represents the expansion slot No.(n=1 to 3)
0: Clear
1: Hold

(Note) Refer to "CC-Link System Master/Local Module User's Manual (SH(NA)-080394E)" for the details of the functions.
---Master station---
Set to "0" or "1".
---Local/standby master station---
Set to "0" or "1".

#24004+40(n-1) SLn PLC stop set Setting at PLC STOP

[M8]
Set whether to refresh or compulsorily clear the slave stations at PLC STOP.
"n" represents the expansion slot No.(n=1 to 3)
0: Refresh
1: Compulsorily clear

(Note) Refer to "CC-Link System Master/Local Module User's Manual (SH(NA)-080394E)" for the details of the functions.
---Master station---
Set to "0" or "1".
---Local/standby master station---
Set to "0" or "1".

(PR) #24005+40(n-1) SLn occ stations Number of occupied stations

[M8]
Set the number of occupied local and standby master stations.
"n" represents the expansion slot No.(n=1 to 3)
---Master station---
Set to "0".
---Local/standby master station---
Set to either of "1" to "4".

---Setting range---
0 to 4

(PR) #24006+40(n-1) SLn extended cyc Extended cyclic setting

[M8]
Set the magnification for the extended cyclic operation of the local station whose type corresponds to Ver.2.
"n" represents the expansion slot No.(n=1 to 3)
Set "1" for the local station whose type corresponds to Ver.1.
This function is out of specifications when the protocol version is Ver.1. The setting for the local station is fixed to "1".
---Master station---
Set to "0".
---Local/standby master station---
Set to either of "1", "2", "4" or "8".

---Setting range---
0,1,2,4,8 (fold)

#24007+40(n-1) SLn conn modules Number of connected modules

[M8]
Set the total number of remote stations, local stations, intelligent device stations, standby master station and reserved stations connected to the master station.
"n" represents the expansion slot No.(n=1 to 3)
---Master station---
Set to either of "1" to "64".
---Local/standby master station---
Set to "0".

---Setting range---
0 to 64 (modules)

#24008+40(n-1) SLn num of retries Number of retries

[M8]
Set the number of retries for when a communication error occurs.
"n" represents the expansion slot No.(n=1 to 3)
---Master station---
Set to either of "1" or "7".
---Local/standby master station---
Set to "0".

---Setting range---
0 to 7 (times)

#24009+40(n-1) SLn auto ret mdls Number of automatic return modules

[M8]
Set the total number of remote stations, local stations, intelligent device stations and standby master station that can be returned to system operation by a single link scan.
"n" represents the expansion slot No.(n=1 to 3)

(Note) Refer to "CC-Link System Master/Local Module User's Manual (SH(NA)-080394E)" for the details of the functions.
---Master station---
Set to either of "1" or "10".
---Local/standby master station---
Set to "0".

---Setting range---
0 to 10 (modules)

(PR) #24010+40(n-1) SLn STBY master st Standby master station

[M8]
Set the station No. of the standby master station.
"n" represents the expansion slot No.(n=1 to 3)
Set "0" when no standby master station is provided.
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set "0" (fixed) for the local station.
Set "1" (fixed) for the standby station.

---Setting range---
0 to 64

#24011+40(n-1) SLn ope at NC down Operation at NC down

[M8]
Set the data link status for when the master station failure occurs.
"n" represents the expansion slot No.(n=1 to 3)
0: Fixed to stop

(Note) Refer to "CC-Link System Master/Local Module User's Manual (SH(NA)-080394E)" for the details of the functions.
---Master station---
Set to "0" (fixed).
---Local/standby master station---
Set to "0".

#24012+40(n-1) SLn scan mode Scan mode

[M8]
Select whether to synchronize the link scan with one ladder scan.
"n" represents the expansion slot No.(n=1 to 3)
0: Fixed to synchronize
---Master station---
Set to "0" (fixed).
---Local/standby master station---
Set to "0".

#24013+40(n-1) SLn delay time **Delay time**

[M8]
Set the delay time.
"n" represents the expansion slot No.(n=1 to 3)
0: (Fixed value)
---Master station---
Set to "0" (fixed).
---Local/standby master station---
Set to "0".

#24014+40(n-1) SLn RX dev name **Remote input (RX) refresh device name**

[M8]
Set the refresh device name of the remote input (RX) to be automatically refreshed.
(Example) X
"n" represents the expansion slot No.(n=1 to 3)
Set "0" when no setting is required.
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
0,X,M,L,B,D,W,R

#24015+40(n-1) SLn RX dev No. **Remote input (RX) refresh device No.**

[M8]
Set the refresh device No. of the remote input (RX) to be automatically refreshed.
"n" represents the expansion slot No.(n=1 to 3)

(Note 1) When setting parameters in ALL.PRM with using the parameter input/output function, input the device No. of decimal digit.
(Example) When setting "X400" for the remote input (RX) refresh device No., input as follows;
#24014+40(n-1): "X"
#24015+40(n-1): "1024"

(Note 2) When the refresh device name has been set, the refresh device No. will be "0".Confirm the refresh device No. after changing the refresh device name.

When specifying a bit device, set the address in increments of 16 points.
The operation will not be guaranteed unless the address is set in increments of 16 points.
(Example) 1000
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
X: 0 to 5FF
M: 0 to 10239
L: 0 to 511
B: 0 to 1FFF
D: 0 to 2047
W: 0 to 1FFF
R: 8300 to 9799, 9800 to 9899

#24016+40(n-1) SLn RY dev name **Remote output (RY) refresh device name**

[M8]
Set the refresh device name of the remote output (RY) to be automatically refreshed.
(Example) Y
"n" represents the expansion slot No.(n=1 to 3)
Set "0" when no setting is required.
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
0,Y,M,L,B,D,W,R

#24017+40(n-1) SLn RY dev No. Remote output (RY) refresh device No.

[M8]
Set the refresh device No. of the remote output (RY) to be automatically refreshed.
"n" represents the expansion slot No.(n=1 to 3)

(Note 1) When setting parameters in ALL.PRM with using the parameter input/output function, input the device No. of decimal digit.
(Example) When setting "X400" for the remote input (RX) refresh device No., input as follows;
#24014+40(n-1): "X" #24015+40(n-1): "1024"

(Note 2) When the refresh device name has been set, the refresh device No. will be "0".Confirm the refresh device No. after changing the refresh device name.

When specifying a bit device, set the address in increments of 16 points.
The operation will not be guaranteed unless the address is set in increments of 16 points.
(Example) 1000
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
Y: 0 to 5FF
M: 0 to 10239
L: 0 to 511
B: 0 to 1FFF
D: 0 to 2047
W: 0 to 1FFF
R: 8300 to 9799, 9800 to 9899

#24018+40(n-1) SLn RWr dev name Remote register (RWr) refresh device name

[M8]
Set the refresh device name of the remote register (RWr) to be automatically refreshed.
(Example) W
"n" represents the expansion slot No.(n=1 to 3)
Set "0" when no setting is required.
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
0,M,L,B,D,W,R

#24019+40(n-1) SLn RWr dev No. Remote register (RWr) refresh device No.

[M8]
Set the refresh device No. of the remote register (RWr) to be automatically refreshed.
"n" represents the expansion slot No.(n=1 to 3)

(Note 1) When setting parameters in ALL.PRM with using the parameter input/output function, input the device No. of decimal digit.
(Example) When setting "X400" for the remote input (RX) refresh device No., input as follows;
#24014+40(n-1): "X" #24015+40(n-1): "1024"

(Note 2) When the refresh device name has been set, the refresh device No. will be "0".Confirm the refresh device No. after changing the refresh device name.

When specifying a bit device, set the address in increments of 16 points.
The operation will not be guaranteed unless the address is set in increments of 16 points.
(Example) 1FF0
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
M: 0 to 10239
L: 0 to 511
B: 0 to 1FFF
D: 0 to 2047
W: 0 to 1FFF
R: 8300 to 9799, 9800 to 9899

#24020+40(n-1) SLn RWw dev name Remote register (RWw) refresh device name

[M8]
Set the refresh device name of the remote register (RWw) to be automatically refreshed.
(Example) W
"n" represents the expansion slot No.(n=1 to 3)
Set "0" when no setting is required.
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
0,M,L,B,D,W,R

#24021+40(n-1) SLn RWw dev No. Remote register (RWw) refresh device No.

[M8]
Set the refresh device No. of the remote register (RWw) to be automatically refreshed.
"n" represents the expansion slot No.(n=1 to 3)

(Note 1) When setting parameters in ALL.PRM with using the parameter input/output function, input the device No. of decimal digit.
(Example) When setting "X400" for the remote input (RX) refresh device No., input as follows;
#24014+40(n-1): "X" #24015+40(n-1): "1024"

(Note 2) When the refresh device name has been set, the refresh device No. will be "0".Confirm the refresh device No. after changing the refresh device name.

When specifying a bit device, set the address in increments of 16 points.
The operation will not be guaranteed unless the address is set in increments of 16 points.
(Example) 1FF0
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
M: 0 to 10239
L: 0 to 511
B: 0 to 1FFF
D: 0 to 2047
W: 0 to 1FFF
R: 8300 to 9799, 9800 to 9899

#24022+40(n-1) SLn SB dev name Special relay (SB) refresh device name

[M8]
Set the refresh device name of the special relay (SB) to be automatically refreshed.
(Example) SB
"n" represents the expansion slot No.(n=1 to 3)
Set "0" when no setting is required.
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
0,M,L,B,D,W,R,SB

#24023+40(n-1) SLn SB dev No. Special relay (SB) refresh device No.

[M8]
Set the refresh device No. of the special relay (SB) to be automatically refreshed.
"n" represents the expansion slot No.(n=1 to 3)

(Note 1) When setting parameters in ALL.PRM with using the parameter input/output function, input the device No. of decimal digit.
(Example) When setting "X400" for the remote input (RX) refresh device No., input as follows;
#24014+40(n-1): "X" #24015+40(n-1): "1024"

(Note 2) When the refresh device name has been set, the refresh device No. will be "0".Confirm the refresh device No. after changing the refresh device name.

When specifying a bit device, set the address in increments of 16 points.
The operation will not be guaranteed unless the address is set in increments of 16 points.
(Example) 1F0
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
M: 0 to 10239
L: 0 to 511
B: 0 to 1FFF
D: 0 to 2047
W: 0 to 1FFF
SB: 0 to 1FF
R: 8300 to 9799, 9800 to 9899

#24024+40(n-1) SLn SW dev name Special relay (SW) refresh device name

[M8]
Set the refresh device name of the special relay (SW) to be automatically refreshed.
"n" represents the expansion slot No.(n=1 to 3)
(Example) SW
Set "0" when no setting is required.
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
0,M,L,B,D,W,R,SW

#24025+40(n-1) SLn SW dev No. Special relay (SW) refresh device No.

[M8]
Set the refresh device No. of the special relay (SW) to be automatically refreshed.
"n" represents the expansion slot No.(n=1 to 3)

(Note 1) When setting parameters in ALL.PRM with using the parameter input/output function, input the device No. of decimal digit.
(Example) When setting "X400" for the remote input (RX) refresh device No., input as follows;
#24014+40(n-1): "X"
#24015+40(n-1): "1024"
(Note 2) When the refresh device name has been set, the refresh device No. will be "0".Confirm the refresh device No. after changing the refresh device name.

When specifying a bit device, set the address in increments of 16 points.
(Example) 1F0
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set a value within the setting range.

---Setting range---
M: 0 to 10239
L: 0 to 511
B: 0 to 1FFF
D: 0 to 2047
W: 0 to 1FFF
SW: 0 to 1FF
R: 8300 to 9799, 9800 to 9899

(PR) #24026+40(n-1) SLn Protocol Ver Protocol version

[M8]
Select the CC-Link version mode that has been set to the slide switch SW1-2 on the CC-Link unit (HN566/HN567).
"n" represents the expansion slot No.(n=1 to 3)
0: Ver.2
1: Ver.1
Ver.2 mode has been set to SW1-2 as default.
---Master station---
Set to "0" or "1".
---Local/standby master station---
Set to "0" or "1".

#24121+15(m-1) CNm station type Station type

[M8]
Set the type of the connected remote station, local station, intelligent device station and standby master station.
0: No setting
1: Ver.1 remote I/O station
2: Ver.1 remote device station
3: Ver.1 intelligent device station
4: Ver.2 remote device station
5: Ver.2 intelligent device station

"m" means the m-th connected station in ascending order of station No. (m= 1 to 64)
---Master station---
Set to either of "0" to "5".
---Local/standby master station---
Set to "0".

#24122+15(m-1) CNm extended cyc Extended cyclic setting

[M8]
Select the magnification for the extended cycling operation of the connected remote, local and intelligent stations.
Set "1" when the protocol version is Ver.1.
Set "0" when no setting is required.
"m" means the m-th connected station in ascending order of station No. (m=1 to 64)
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set to "0".

---Setting range---
0,1,2,4,8 (times)

#24123+15(m-1) CNm occ stations Number of occupied stations

[M8]
Set the number of the occupied stations by the connected remote, local and intelligent stations.
Set 1 for 8 points I/O and 16 points I/O.
Set "0" when no setting is required.
"m" means the m-th connected station in ascending order of station No. (m= 1 to 64)
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set to "0".

---Setting range---
0 to 4 (stations occupied)

#24124+15(m-1) CNm station No. Station No.

[M8]
Set the station No. of the connected remote, local and intelligent stations.
Set "0" when no setting is required.
"m" means the m-th connected station in ascending order of station No. (m= 1 to 64)
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set to "0".

---Setting range---
0 to 64

#24125+15(m-1) CNm remote sta pt Remote station points

[M8]
Select the number of points of the connected remote station.
"m" means the m-th connected station in ascending order of station No. (m= 1 to 64)
The details of setting values differ with each protocol version and station type.

Protocol: Ver.2 (station type: Ver.1, remote I/O station)
0: 0 point (reserved station)
1: 8 points
2: 8 points + 8 points reserved
3: 16 points
4: 32 points
- Setting 0 is valid only for the reserved station. When 0 is set for the other stations, the number of points will be 32.
- Set the value so that the total number of points of remote I/O stations connected in series will be multiple of 16.

(Example 1) 2 units of 8 points I/O: Set "1" for each
(Example 2) 3 units of 8 points I/O: Set "1" for the first and the second I/O, "2" for the third.

Protocol: Ver.2 (station type: Ver.1 except remote I/O station)
0: 0 point (reserved station)
1 to 4: Automatically calculated
- 0 point is valid only for the reserved station. When 0 is set for the other stations, the number of points will be automatically calculated.
- Unless 0 is set, the number of points will be automatically calculated with the number of occupied stations and the setting value of the extended cycling.

Protocol: Ver.1 (for all station types)
0 to 4: Automatically calculated
- 0 cannot be set even for the reserved station.
- Automatically calculated with the setting value of the number of occupied stations.

---Master station---
Set a value corresponding to the protocol version and the station type.
---Local/standby master station---
Set to "0".

#24126+15(m-1) CNm set rsvd sta Reserved station

[M8]
Set the reserved/error invalid station.
"m" means the m-th connected station in ascending order of station No. (m= 1 to 64)
0: No setting
1: Reserved station
2: Error invalid station

(Note) Refer to "CC-Link System Master/Local Module User's Manual (SH(NA)-080394E)" for the details of the functions.
---Master station---
Set either of "0" to "2".
---Local/standby master station---
Set to "0".

#24131+15(m-1) CNm send size Send buffer size

[M8]
Set the allocation of the buffer memory size to the local station, standby master station and intelligent device station when in transient transmission.
"m" means the m-th connected station in ascending order of station No. (m= 1 to 64)
Set "0" when no setting is required.

(Note) The total size of the send/receive buffers must be 4096 (words) or less.
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set to "0".

---Setting range---
0, 64 to 4096 (words)

#24132+15(m-1) CNm receive size Receive buffer size

[M8]
Set the allocation of the buffer memory size to the local station, standby master station and intelligent device station when in transient transmission.
"m" means the m-th connected station in ascending order of station No. (m= 1 to 64)
Set "0" when no setting is required.

(Note) The total size of the send/receive buffers must be 4096 (words) or less.
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set to "0".

---Setting range---
0, 64 to 4096 (words)

#24133+15(m-1) CNm auto bfr size Automatic update buffer size

[M8]
Set the allocation of the buffer memory size to the local station, standby master station and intelligent device station when in transient transmission.
"m" means the m-th connected station in ascending order of station No. (m= 1 to 64)
Set "0" when no setting is required.
---Master station---
Set a value within the setting range.
---Local/standby master station---
Set to "0".

---Setting range---
0, 128 to 4096 (words)

2.25 PLC Axis Indexing Parameters

(PR) #12800 chgauxno Auxiliary axis number

Set the axis No. to be controlled as auxiliary axis using auxiliary axis interface.
When "0" is set, the axis will not operate as auxiliary axis.

---Setting range---

[M8]
0 to 8: (M800W/M800S Series)
0 to 4: (M80/M80W Series)
0 to 1: (E80)

[C80]
0 to 8

(PR) #12801 aux_station Number of indexing stations

Set the number of stations.
For linear axis, this value is expressed by: number of divisions = number of stations -1.
Setting "0" or "1" sets the number of stations to 2.

---Setting range---

0 to 360

(PR) #12802 aux_Cont1 Control parameter 1

The bits that are not explained here must be set to "0".

Bit3:
0: Automatic reach signal isn't interlocked with the start signal.
1: Automatic reach signal is interlocked with the start signal.

Bit4:
0: Automatic reach signal is turned ON again.
1: Automatic reach signal isn't turned ON again.

Bit5:
0: Station No. Output within fixed position.
1: Station No. Constantly output.

bit9:
0: Rotation direction determined by operation control signal (DIR)
1: Rotation direction in the shortcut direction

bitE:
0: Rotation direction in operation control signal (DIR) or in the shortcut direction
1: Rotation direction in the arbitrary position command sign direction

bitF:
0: Stopper direction is in the positioning direction.
1: Stopper direction is in the sign direction of the stopper amount.

(PR) #12803 aux_Cont2 Control parameter 2

The bits that are not explained here must be set to "0".

bit4:
0: Uniform assignment
1: Arbitrary coordinate assignment

(PR) #12804 aux_tleng Linear axis stroke length

Set the movement stroke length for linear axes.
(Note 1) Setting "0.000" causes an MCP alarm at the power ON.
(Note 2) This parameter is meaningless at the non-uniform index or random position command.

---Setting range---

0.000 to 99999.999 (mm)

#12805 aux_ST.offset Station offset

Set the distance (offset) from the reference position to station 1.

---Setting range---

-99999.999 to 99999.999 (° or mm)

#12810+10(n-1) aux_Aspeedn Operation parameter group n Automatic operation speed

Set the feedrate during automatic operation when "operation parameter group n" is selected.
"#12810 aux_Aspeed1" is regarded as the clamp value for the automatic operation speeds and manual operation speeds of all operation groups.
A speed exceeding "aux_Aspeed1" cannot be commanded, even if it is set in a parameter.
(Note) Setting "0" causes an operation error at the "Operation start" signal's ON.

---Setting range---

0 to 100000 (°/min or mm/min)

#12811+10(n-1) aux_Mspeedn Operation parameter group n Manual operation speed

Set the feedrate during manual operation or JOG operation when "operation parameter group n" is selected.
(Note) Setting "0" causes an operation error at the "Operation start" signal's ON.

---Setting range---

0 to 100000 (°/min or mm/min)

#12812+10(n-1) aux_timen.1 Operation parameter group n Acceleration/deceleration time constant 1

Set the linear acceleration/deceleration time for "Operation parameter group 1 automatic operation speed" (clamp speed) when "operation parameter group n" is selected.
When "#12818+10(n-1) aux_smgstn" is "F", S-shape acceleration/deceleration is carried out.
When operating at a speed less than the clamp speed, if "#1361 aux_acc" is set to "0", the axis will accelerate/decelerate with the time constant set in this parameter. If "#1361 aux_acc" is set to "1", the axis will accelerate/decelerate at the constant inclination determined by this parameter and "aux_Aspeed1".
Setting "0" cancels acceleration/deceleration: The axis will move with the time constant "0".

---Setting range---

0 to 4000 (ms)

#12813+10(n-1) aux_timen.2 Operation parameter group n Acceleration/deceleration time constant 2

Set the total time of the non-linear parts in the S-pattern acceleration/deceleration.
In the handle feed operation mode, this setting value is regarded as time constant for the linear acceleration/deceleration.
(Note) If this parameter is set to "0" while "#12818 aux_smgst1"is set to "F", an MCP alarm will occur.

---Setting range---

0 to 4000 (ms)

#12814+10(n-1) aux_TLn Operation parameter group n Torque limit value

Set the motor output torque limit value when "operation parameter group n" is selected.
When setting 500%, the torque is limited at the maximum torque of the motor specifications. Set 500%, when torque is not particularly needed to be limited.
In the stopper positioning operation mode, this will be regarded as torque limit value when positioning to the stopper starting coordinates.

---Setting range---

0 to 500 (%)

#12815+10(n-1) aux_ODn Operation parameter group n Excessive error detection width

Set the excessive error detection width when "operation parameter group n" is selected.
The excessive error alarm (S03 0052) will be detected when the position droop becomes larger than this setting value.
In the stopper positioning operation mode, this will be regarded as excessive error detection width when positioning to the stopper starting coordinates. .

---Setting range---

0 to 32767(° or mm)

#12816+10(n-1) aux_justn Operation parameter group n Set position output width

Set the tolerable value at which "set position reached" (JST) or "automatic set position reached" (JSTA) signal is output when "operation parameter group n" is selected.
"Set position reached" (JST) indicates that the machine position is at any station.
During automatic operation, "automatic set position reached" (JSTA) is also output under the same condition.
These signals will turn OFF when the machine position moves away from the station over this value.

---Setting range---

0.000 to 99999.999(° or mm)

#12817+10(n-1) aux_nearn Operation parameter group n Near set position output width

Set the tolerable value at which "near set position" (NEAR) signal is output when "operation parameter group n" is selected.
"Near set position" (NEAR) indicates that the machine position is near any station position.
This value is generally set wider than the set position output width. During operations, this is related to the special commands when the station selection is set to "0".

---Setting range---

0.000 to 99999.999(° or mm)

(PR) #12818+10(n-1) aux_smgstn Operation parameter group n Acceleration/Deceleration type

Select the acceleration/deceleration type when "operation parameter group n" is selected.
0, 1: Linear acceleration/deceleration
F: S-pattern acceleration/deceleration

#12850 aux_stpos2 Station 2 coordinate

Set the station 2 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12851 aux_stpos3 Station 3 coordinate

Set the station 3 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12852 aux_stpos4 Station 4 coordinate

Set the station 4 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12853 aux_stpos5 Station 5 coordinate

Set the station 5 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12854 aux_stpos6 Station 6 coordinate

Set the station 6 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12855 aux_stpos7 Station 7 coordinate

Set the station 7 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12856 aux_stpos8 Station 8 coordinate

Set the station 8 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12857 aux_stpos9 Station 9 coordinate

Set the station 9 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12858 aux_stpos10 Station 10 coordinate

Set the station 10 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12859 aux_stpos11 Station 11 coordinate

Set the station 11 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12860 aux_stpos12 Station 12 coordinate

Set the station 12 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12861 aux_stpos13 Station 13 coordinate

Set the station 13 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12862 aux_stpos14 Station 14 coordinate

Set the station 14 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12863 aux_stpos15 Station 15 coordinate

Set the station 15 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12864 aux_stpos16 Station 16 coordinate

Set the station 16 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12865 aux_stpos17 Station 17 coordinate

Set the station 17 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12866 aux_stpos18 Station 18 coordinate

Set the station 18 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12867 aux_stpos19 Station 19 coordinate

Set the station 19 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12868 aux_stpos20 Station 20 coordinate

Set the station 20 coordinate value when arbitrary coordinate assignment is selected.
The station 1 coordinate value is fixed at "0.000" (machine coordinate zero point).

---Setting range---

-99999.999 to 99999.999(° or mm)

#12870 aux_PSWcheck PSW detection method

Select the criterion for the output of position switches 1 to 15.
bit0 to E correspond to position switches 1 to 15.

0: Judged by the machine position of the command system.
1: Judged by the machine FB position (actual position).

(Note) The bits that are not explained here must be set to "0".

#12871 aux_PSW1dog1 PSW1 area setting 1

Set "PSW1 area setting" 1 and 2 to specify the area where the position switch 1 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12872 aux_PSW1dog2 PSW1 area setting 2

Set "PSW1 area setting" 1 and 2 to specify the area where the position switch 1 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12873 aux_PSW2dog1 PSW2 area setting 1

Set "PSW2 area setting" 1 and 2 to specify the area where the position switch 2 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12874 aux_PSW2dog2 PSW2 area setting 2

Set "PSW2 area setting" 1 and 2 to specify the area where the position switch 2 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12875 aux_PSW3dog1 PSW3 area setting 1

Set "PSW3 area setting" 1 and 2 to specify the area where the position switch 3 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12876 aux_PSW3dog2 PSW3 area setting 2

Set "PSW3 area setting" 1 and 2 to specify the area where the position switch 3 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12877 aux_PSW4dog1 PSW4 area setting 1

Set "PSW4 area setting" 1 and 2 to specify the area where the position switch 4 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12878 aux_PSW4dog2 PSW4 area setting 2

Set "PSW4 area setting" 1 and 2 to specify the area where the position switch 4 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12879 aux_PSW5dog1 PSW5 area setting 1

Set "PSW5 area setting" 1 and 2 to specify the area where the position switch 5 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12880 aux_PSW5dog2 PSW5 area setting 2

Set "PSW5 area setting" 1 and 2 to specify the area where the position switch 5 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12881 aux_PSW6dog1 PSW6 area setting 1

Set "PSW6 area setting" 1 and 2 to specify the area where the position switch 6 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12882 aux_PSW6dog2 PSW6 area setting 2

Set "PSW6 area setting" 1 and 2 to specify the area where the position switch 6 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12883 aux_PSW7dog1 PSW7 area setting 1

Set "PSW7 area setting" 1 and 2 to specify the area where the position switch 7 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12884 aux_PSW7dog2 PSW7 area setting 2

Set "PSW7 area setting" 1 and 2 to specify the area where the position switch 7 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12885 aux_PSW8dog1 PSW8 area setting 1

Set "PSW8 area setting" 1 and 2 to specify the area where the position switch 8 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12886 aux_PSW8dog2 PSW8 area setting 2

Set "PSW8 area setting" 1 and 2 to specify the area where the position switch 8 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12887 aux_PSW9dog1 PSW9 area setting 1

Set "PSW9 area setting" 1 and 2 to specify the area where the position switch 9 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12888 aux_PSW9dog2 PSW9 area setting 2

Set "PSW9 area setting" 1 and 2 to specify the area where the position switch 9 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12889 aux_PSW10dog1 PSW10 area setting 1

Set "PSW10 area setting" 1 and 2 to specify the area where the position switch 10 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12890 aux_PSW10dog2 PSW10 area setting 2

Set "PSW10 area setting" 1 and 2 to specify the area where the position switch 10 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12891 aux_PSW11dog1 PSW11 area setting 1

Set "PSW11 area setting" 1 and 2 to specify the area where the position switch 11 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12892 aux_PSW11dog2 PSW11 area setting 2

Set "PSW11 area setting" 1 and 2 to specify the area where the position switch 11 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12893 aux_PSW12dog1 PSW12 area setting 1

Set "PSW12 area setting" 1 and 2 to specify the area where the position switch 12 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12894 aux_PSW12dog2 PSW12 area setting 2

Set "PSW12 area setting" 1 and 2 to specify the area where the position switch 12 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12895 aux_PSW13dog1 PSW13 area setting 1

Set "PSW13 area setting" 1 and 2 to specify the area where the position switch 13 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12896 aux_PSW13dog2 PSW13 area setting 2

Set "PSW13 area setting" 1 and 2 to specify the area where the position switch 13 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12897 aux_PSW14dog1 PSW14 area setting 1

Set "PSW14 area setting" 1 and 2 to specify the area where the position switch 14 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12898 aux_PSW14dog2 PSW14 area setting 2

Set "PSW14 area setting" 1 and 2 to specify the area where the position switch 14 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12899 aux_PSW15dog1 PSW15 area setting 1

Set "PSW15 area setting" 1 and 2 to specify the area where the position switch 15 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12900 aux_PSW15dog2 PSW15 area setting 2

Set "PSW15 area setting" 1 and 2 to specify the area where the position switch 15 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---

-99999.999 to 99999.999(° or mm)

#12910 aux_push Stopper amount

Set the command stroke of the stopper operation in the stopper positioning.

---Setting range---

0.000 to 359.999(° or mm)

#12911 aux_pusht1 Stopper standby time

Set the standby time from the stopper starting coordinate positioning to the stopper operation start in the stopper positioning.

---Setting range---

0 to 9999(ms)

#12912	aux_pusht2	Stopper torque release time

Set the time from the completion of the stopper operation to the changeover of the stopper torque in the stopper positioning.

---Setting range---

0 to 9999(ms)

#12913	aux_pusht3	Set position signal output delay time

Set the time from the completion of the stopper operation to the output of the "automatic set position reached" (JSTA), "set position reached" (JST) or "near set position" (NEAR) signal in the stopper positioning.

---Setting range---

0 to 9999(ms)

2.26 Machine Type Parameters [M8]

(PR) #12621 machine type — Select machine type (For L system only)

[M8]
Select the type of lathe: horizontal or vertical.
0: Horizontal-type lathe
1: Vertical-type lathe

(PR) #12622 turret move dir — Select turret move direction (For L system only)

[M8]
Select the linear axis direction to move the turret along for each part system.
•Horizontal-type lathe (right-handed)
1: Front upper position
2: Front lower position
3: Rear upper position
4: Rear lower position
•Horizontal-type lathe (left-handed)
11: Front upper position
12: Front lower position
13: Rear upper position
14: Rear lower position
•Vertical-type lathe (right-handed)
21: Front left position
22: Front right position
•Vertical-type lathe (left-handed)
31: Front left position
32: Front right position

(Note) Upper/lower position of horizontal-type lathe and right/left position of vertical-type lathe are the names indicating the turret position with general machine configuration.
Select a number corresponding to the actual machine configuration and the axis direction to this parameter.
Axis configuration follows the base axis I, J, K (parameters #1026 to #1028).

(PR) #12623 tool rot ax para — Select tool rotation axis parameters (For L system only)

[M8]
Select which of the following parameters to use as tool rotation axis-related parameters: Rotary axis configuration parameters or 3D check parameters.
0: Rotary axis configuration parameters
1: 3D check parameters

(PR) #12624 tool rot ax name — Tool rotation axis name (For L system only)

[M8]
Specify the name of tool rotation axis using the 2nd axis name.
---Setting range---
Two alphanumeric characters (A to Z and 1 to 9)

(PR) #12625 tool rot ax type — Select tool rotation axis (For L system only)

[M8]
Select about which axis the tool rotation axis rotates.
(Note) When "#12624 tool rot ax name" is not set, this parameter is disabled.
If "0: Disable" is selected when "#12624 tool rot ax name" is set, this parameter is treated as "2: J axis".
0: Disable
1: I axis
2: J axis
3: K axis

(PR) #12626 tool rot dir — Tool rotation axis direction (For L system only)

[M8]
Select the tool rotation axis direction.
(Note) When "#12624 tool rot ax name" is not set, this parameter is disabled.
0: Right-handed system
1: Left-handed system

(PR) #12627 main sp no — Front spindle No. (For L system only)

[M8]
Specify the spindle No. of the front side work spindle.
When this parameter is set to 0, the spindle No. is treated as 1.
---Setting range---
0 to the number of spindles

(PR) #12628 sub sp no — Rear spindle No. (For L system only)

[M8]
Specify the spindle No. of the rear side work spindle.
If there is no rear-side work spindle, set this parameter to 0.
---Setting range---
0 to the number of spindles

(PR) #12629 main sp rot dir — Front spindle rotation direction (For L system only)

[M8]
Specify the rotation direction of the front side work spindle.
0: Right-handed system
1: Left-handed system

(PR) #12630 sub sp rot dir — Rear spindle rotation direction (For L system only)

[M8]
Specify the rotation direction of the rear side work spindle.
0: Right-handed system
1: Left-handed system

(PR) #12631 main chuck close M Front chuck close M code (For L system only)

[M8]

Specify the M code allocated to the front chuck closing.

---Setting range---

0 to 99999999

(PR) #12632 sub chuck close M Back chuck close M code(For L system only)

[M8]

Specify the M code allocated to the back chuck closing.

---Setting range---

0 to 99999999

(PR) #12633 main chuck pos X Front chuck position X (For L system only)

[M8]

Specify the position from the machine zero point in the X axis direction of front chuck.

---Setting range---

-99999.999 to 99999.999 (mm)

(PR) #12634 main chuck pos Y Front chuck position Y (For L system only)

[M8]

Specify the position from the machine zero point in the Y axis direction of front chuck.

---Setting range---

-99999.999 to 99999.999 (mm)

(PR) #12635 main chuck pos Z Front chuck position Z (For L system only)

[M8]

Specify the position from the machine zero point in the Z axis direction of front chuck.

---Setting range---

-99999.999 to 99999.999 (mm)

(PR) #12636 sub chuck pos X Back chuck position X (For L system only)

[M8]

Specify the position from the machine zero point in the X axis direction of back chuck.

---Setting range---

-99999.999 to 99999.999 (mm)

(PR) #12637 sub chuck pos Y Back chuck position Y (For L system only)

[M8]

Specify the position from the machine zero point in the Y axis direction of back chuck.

---Setting range---

-99999.999 to 99999.999 (mm)

(PR) #12638 sub chuck pos Z Back chuck position Z (For L system only)

[M8]

Specify the position from the machine zero point in the Z axis direction of back chuck.

---Setting range---

-99999.999 to 99999.999 (mm)

(PR) #12639 main chuck ax name Front chuck moving axis name (For L system only)

[M8]

Specify the name of the axis to move the front chuck with 2nd axis name.

---Setting range---

Two digits between A to Z and 1 to 9

(PR) #12640 sub chuck ax name Back chuck moving axis name (For L system only)

[M8]

Specify the name of the axis to move the back chuck with 2nd axis name.

---Setting range---

Two digits between A to Z and 1 to 9

(PR) #12650 table center posH Horizontal axis table center position (For M system only)

[M8]

Set the center position of the table in the horizontal axis direction using the machine position.

---Setting range---

-99999.999 to 99999.999 (mm)

(PR) #12651 table center posV Vertical axis table center position (For M system only)

[M8]

Set the center position of the table in the vertical axis direction using the machine position.

---Setting range---

-99999.999 to 99999.999 (mm)

(PR) #12652 table center posT Height axis table center position (For M system only)

[M8]

Set the center position of the table in the height axis direction using the machine position.

---Setting range---

-99999.999 to 99999.999 (mm)

2.27 Machining Time Parameters[M8]

#42801+2(n-1) M[n] Code — **M code for calculating machining time**

[M8]
Specify the M code for calculating the machining time. (n=1 to 50)
---Setting range---
0 to 99999999

#42802+2(n-1) M[n] ExeTime — **Execution time of M code for calculating machining time**

[M8]
Specify the execution time of the M code. (n=1 to 50)
---Setting range---
0 to 60000 (ms)

#42901+2(n-1) M[50+n] Code — **M code for calculating machining time (for each part system)**

[M8]
Specify the M code for calculating the machining time.
Set the M code that takes different time for each part system. (n=1 to 10)
---Setting range---
0 to 99999999

#42902+2(n-1) M[50+n] ExeTime — **Execution time of M code for calculating machine time (for each part system)**

[M8]
Specify the execution time of the M code.
Different values can be set for each part system. (n=1 to 10)
---Setting range---
0 to 60000 (ms)

#42931+2(n-1) M2[n] Code — **2nd miscellaneous function code for calculating machining time**

[M8]
Specify the 2nd miscellaneous function code for calculating the machining time. (n=1 to 10)
---Setting range---
0 to 99999999

#42932+2(n-1) M2[n] ExeTime — **Execution time of 2nd m. function code for calculating machining time**

[M8]
Specify the execution time of the 2nd miscellaneous function code. (n=1 to 10)
---Setting range---
0 to 60000 (ms)

#42951 T Code ExeTime — **Execution time of T code for calculating machining time**

[M8]
Specify the execution time of the T code for each part system.
---Setting range---
0 to 60000 (ms)

#42952 M Code StdExeTime — **Standard execution time of M code for calculating machining time**

[M8]
Specify the average execution time of the M code for which individual setting is not performed.
---Setting range---
0 to 60000 (ms)

#42953 M2 Code StdExeTime — **Standard execution time of 2nd m. function code for calculating machine time**

[M8]
Specify the average execution time of the 2nd miscellaneous function code for which individual setting is not performed.
---Setting range---
0 to 60000 (ms)

#42961 S Code ExeTime 1 — **S code execution time for machining time calculation (1st spindle)**

[M8]
Specify the S code execution time of the 1st spindle.
---Setting range---
0 to 60000 (ms)

#42962 S Code ExeTime 2 — **S code execution time for machining time calculation (2nd spindle)**

[M8]
Specify the S code execution time of the 2nd spindle.
---Setting range---
0 to 60000 (ms)

#42963 S Code ExeTime 3 — **S code execution time for machining time calculation (3rd spindle)**

[M8]
Specify the S code execution time of the 3rd spindle.
---Setting range---
0 to 60000 (ms)

#42964 S Code ExeTime 4 — **S code execution time for machining time calculation (4th spindle)**

[M8]
Specify the S code execution time of the 4th spindle.
---Setting range---
0 to 60000 (ms)

#42965	S Code ExeTime 5	S code execution time for machining time calculation (5th spindle)

[M8]
Specify the S code execution time of the 5th spindle.
---Setting range---
0 to 60000 (ms)

#42966	S Code ExeTime 6	S code execution time for machining time calculation (6th spindle)

[M8]
Specify the S code execution time of the 6th spindle.
---Setting range---
0 to 60000 (ms)

#42967	S Code ExeTime 7	S code execution time for machining time calculation (7th spindle)

[M8]
Specify the S code execution time of the 7th spindle.
---Setting range---
0 to 60000 (ms)

#42968	S Code ExeTime 8	S code execution time for machining time calculation (8th spindle)

[M8]
Specify the S code execution time of the 8th spindle.
---Setting range---
0 to 60000 (ms)

2.28 Safety Common Parameters

(PR) #51001 SIO_Enable — Enable safety related I/O observation

0: Disable
1: Enable

(PR) #51002 SLS_Enable — Enable SLS observation

0: Disable
1: Enable

(PR) #51003 SLP_Enable — Enable SLP observation

0: Disable
1: Enable

(PR) #51004 SSM_Enable — Enable Safe speed monitor

0: Disable
1: Enable

(PR) #51005 SCA_Enable — Enable safe cam

0: Disable
1: Enable

(PR) #51006 SOS_Enable — Enable Safe operating stop

0: Disable
1: Enable

*When SS2 is executed, SOS is activated irrespective of this parameter.

(PR) #51007 SS1_Enable — Enable Safe stop 1

0: Disable
1: Enable

*Irrespective of this parameter, when a smart safety observation error is detected, SS1 may be activated depending on the setting of SF_Stoptype.

(PR) #51008 SS2_Enable — Enable Safe stop 2

0: Disable
1: Enable

(PR) #51009 STO_Enable — Enable Safe torque off

0: Disable
1: Enable

*Irrespective of this parameter, when a smart safety observation error is detected, STO may be activated depending on the setting of SF_Stoptype.

(PR) #51010 SBC_Enable — Safe brake control enabled

0: Disable
1: Enable

(PR) #51011 SBT_INT — SBT interval

Set the time that elapses before the next SBT incomplete signal (SBTNFEXm / SBTNFMOm) turns ON after completing the brake test.
When set "0", the interval will be 8 hours.

---Setting range---

0 to 255 hours

(PR) #51012 CRSCHK_TOL — Cross-check status inconsistency tolerable time

Set the tolerable time for inconsistency between CPUs status. (When the status is inconsistent for more than tolerable time, the alarm occurs and the motor power shuts OFF.)
When set "0", the inconsistency tolerable time is 100ms.

---Setting range---

0 to 5000 (ms)

#51013 SF_PSWD — Safe password

Set the safety password.
Setting: 7 or 8 uppercase alphanumeric characters
If no password is set, turn ON the machine parameter setup mode to set the safety parameters.

---Setting range---

7 or 8 uppercase alphanumeric characters

(PR) #51015 safe_drv_test — Drive safety function easy test mode

Select whether to enable the simple test mode in which the drive safety function operation can be checked without connecting any smart safety observation-capable drive unit.
0: Disable the drive safety function simple test mode
1: Enable the drive safety function simple test mode

2.29 Safety Axis Parameters

(PR) #51101 SF_Disable Disable smart safety observation

Set the axis to be outside the scope of smart safety observation.
0 : Enable smart safety observation
1 : Disable smart safety observation
(Note) The settings of "#51101 SF_Disable" and "#51301 SF_SDisable" must be the same within a multi-hybrid drive unit.

(PR) #51102 SF_Stoptype Stop method at error

Select which of the safe stop methods to use when an error is detected in the smart safety observation.
0 : STO
1 : SS1

(PR) #51103-51106 SLS_Speed1-4 SLS speed tolerance1-4

Specify the upper limits of machine-end speed determined as safe for each of SLS speed tolerances 1 to 4. If the SLS detection delay time has elapsed with the command/FB speed exceeding the safely-limited speed while SLS is ON, a safe stop (SS1 or STO) is executed. The safely-limited speed to be applied to SLS is calculated using the following equation.
Safely-limited speed = SLS speed tolerance x SLS speed override / 100
---Setting range---
0 to 999999 (mm/min or °/min)

(PR) #51107-51122 SLS_Override1-16 SLS speed overrid 1-16

Specify the speed overrides 1 to 16 with respect to SLS speed tolerances 1 to 4.
For details refer to SLS speed tolerances 1 to 4.
---Setting range---
0 to 100 (%)

(PR) #51123 SLS_Clamp SLS speed clamp ratio

Specify the speed clamp ratio that is applied while SLS is ON.
Set the ratio to about 80 to 90%. While SLS is ON, the command speed is clamped at the following speed:
Clamp speed = Safely-limited speed x SLS speed clamp ratio / 100
(Safely-limited speed = SLS speed tolerance x SLS speed override / 100)
---Setting range---
0 to 100 (%)

#51124 SLS_T1 SLS detection delay time

Specify a period of time to detect a speed error while SLS is ON. A safe stop (SS1 or STO) is executed if the period of time set in this parameter has elapsed with the command/FB speed exceeding the safely-limited speed.
---Setting range---
0 to 9999 (ms)

#51125 SLS_T2 SLS deceleration observation time

Specify a period of time to detect a deceleration error that is caused due to change of the safely-limited speed at the start of or during SLS. If you have changed the safely-limited speed at the start of or during SLS, and the time set in this parameter has elapsed with the command/FB speed exceeding the safely-limited speed, a safe stop (SS1 or STO) is executed. When set to 0, the detection time is treated as 200(ms).
---Setting range---
0 to 99999 (ms)

(PR) #51126+2(n-1) SLP_PositionPn SLP position tolerance n(+)

"n" represents the SLP position tolerance No. (n = 1 to 4)
Specify the upper and lower limits of machine position, which is determined as safe, for each of SLP position tolerances 1(+) to 4(+). If the SLP detection delay time has elapsed while SLP is ON with the command/FB position outside the SLP position tolerance range, a safe stop (SS1 or STO) is executed.
*SLP is not available for a rotation-type rotary axis.
---Setting range---
-99999.999 to +99999.999 (mm)

(PR) #51127+2(n-1) SLP_PositionMn SLP position tolerance n(-)

"n" represents the SLP position tolerance No. (n = 1 to 4)
Specify the upper and lower limits of machine position, which is determined as safe, for each of SLP position tolerances 1(-) to 4(-). If the SLP detection delay time has elapsed while SLP is ON with the command/FB position outside the SLP position tolerance range, a safe stop (SS1 or STO) is executed.
*SLP is not available for a rotation-type rotary axis.
---Setting range---
-99999.999 to +99999.999 (mm)

#51134 SLP_T1 SLP detection delay time

Specify a period of time to detect a machine position error while SLP is ON. If the time set in this parameter has elapsed with the command/FB position outside the SLP position tolerance range, a safe stop (SS1 or STO) is executed.
---Setting range---
0 to 9999 (ms)

(PR) #51135-51138 SSM_Speed1-4 SSM speed 1-4

Specify the upper limits of machine-end speed determined as safe for each of SSM speeds 1 to 4. If the command/FB speed is at the safe speed or lower while SSM is ON, the Under SSM safe speed signal turns ON. If the command/FB speed exceeds the safe speed, the Under SSM safe speed signal turns OFF. The safe speed to be applied to SSM is calculated using the following equation.
(When the Under SSM safe speed signal is ON)
Safe speed = SSM speed
(When the Under SSM safe speed signal is OFF)
Safe speed = SSM speed - SSM hysteresis width

---Setting range---

0 to 999999 (mm/min or °/min)

#51139-51142 SSM_Hysteresis1-4 SSM hysteresis width 1-4

Specify the hysteresis widths that correspond to SSM speeds 1 to 4. For details refer to SSM speeds 1 to 4.

---Setting range---

0 to 999999 (mm/min or °/min)

(PR) #51143+2(n-1) SCA_PositionPn SCA position n(+)

"n" represents the SCA position No. (n = 1 to 16)
Specify the upper and lower limits of machine position determined as safe for each of SCA positions 1(+) to 16(+). If the command/FB position is in the SCA safe position or smaller while SCA is ON, the Safe cam position signal turns OFF. If the position has exceeded the SCA safe position, the Safe cam position signal turns ON. The SCA safe position is calculated using the following equation.
(When the Safe cam position signal is ON)
SCA safe position = SCA position (+) – SCA hysteresis width
(When the Safe cam position signal is OFF)
SCA safe position = SCA position (+)

---Setting range---

-99999.999 to +99999.999 (mm)

(PR) #51144+2(n-1) SCA_PositionMn SCA position n(-)

"n" represents the SCA position No. (n = 1 to 16)
Specify the upper and lower limits of machine position determined as safe for each of SCA positions 1(-) to 16(-). If the command/FB position is in the SCA safe position or smaller while SCA is ON, the Safe cam position signal turns OFF. If the position has exceeded the SCA safe position, the Safe cam position signal turns ON. The SCA safe position is calculated using the following equation.
(When the Safe cam position signal is ON)
SCA safe position = SCA position (-) – SCA hysteresis width
(When the Safe cam position signal is OFF)
SCA safe position = SCA position (-)

---Setting range---

-99999.999 to +99999.999 (mm)

#51175 SCA_Hysteresis SCA hysteresis width

Specify the hysteresis widths that correspond to SCA positions 1 to 16. For details refer to SCA positions 1(+/-) to 16(+/-).

---Setting range---

0 to 99999.999 (mm)

(PR) #51176 SOS_Speed SOS stop speed

Specify the upper limit of machine-end speed determined as a safe operating stop.
- If the SOS_V detection delay time has elapsed with the command/FB speed exceeding the speed of this parameter while SOS is ON, a safe stop (SS1 or STO) is executed.
- The point of time at which the command/FB speed drops to that of this parameter or lower while SS1/SS2 is ON is treated as a standstill.

*When this parameter is set to 0, "SOS speed error" may occur even though the axis is at a standstill.

---Setting range---

0 to 9999 (mm/min or °/min)

#51177 SOS_T1 SOS_V detection delay time

Specify a period of time to detect a speed error while SOS is ON. If the period of time set in this parameter has elapsed with the command/FB speed exceeding the SOS stop speed while SOS is ON, a safe stop (SS1 or STO) is executed.

---Setting range---

0 to 9999 (ms)

(PR) #51178 SOS_Droop SOS position deviation tolerance

Specify the upper limit of machine-end position deviation determined as a safe operating stop. If the SOS_PD detection delay time has elapsed with the position deviation (difference between the command and FB positions) exceeding that of this parameter while SOS is ON, a safe stop (SS1 or STO) is executed.

*When this parameter is set to 0, "SOS position deviation error" may occur even though the axis is at a standstill.

---Setting range---

0 to 9999.999 (mm or °)

#51179 SOS_T2 SOS_PD detection delay time

Specify a period of time to detect a position deviation error while SOS is ON. If a period of time set by this parameter has elapsed with the position deviation (difference between the command and FB positions) exceeding the SOS position deviation tolerance while SOS is ON, a safe stop (SS1 or STO) is executed.

---Setting range---

0 to 9999 (ms)

(PR) #51180 SOS_PositionM SOS travel distance tolerance (-)

Specify the upper limit of machine-end travel distance (minus side) determined as a safe operating stop. If the SOS_P detection delay time has elapsed with the command/FB travel distance in the minus direction exceeding that of this parameter while SOS is ON, a safe stop (SS1 or STO) is executed.

*When this parameter is set to 0, "SOS travel distance error" may occur even though the axis is at a standstill.

---Setting range---

0 to 9999.999 (mm or °)

(PR) #51181 SOS_PositionP SOS travel distance tolerance (+)

Specify the upper limit of machine-end travel distance (plus side) determined as a safe operating stop. If the SOS_P detection delay time has elapsed with the command/FB travel distance in the plus direction exceeding that of this parameter while SOS is ON, a safe stop (SS1 or STO) is executed.
*When this parameter is set to 0, "SOS travel distance error" may occur even though the axis is at a standstill.

---Setting range---

0 to 9999.999 (mm or °)

#51182 SOS_T3 SOS_P detection delay time

Specify a period of time to detect a travel distance error while SOS is ON. If the period of time set in this parameter has elapsed with the command/FB travel distance exceeding the SOS travel distance tolerance (+/-) while SOS is ON, a safe stop (SS1 or STO) is executed.

---Setting range---

0 to 9999 (ms)

#51183 SS1_T1 SS1 deceleration observation time

Specify a period of time to detect a deceleration error while SS1 is ON. If the time set in this parameter has elapsed with the command/FB speed exceeding the SOS stop speed, STO is activated.

---Setting range---

0 to 99999 (ms)

#51184 SS2_T1 SS2 deceleration observation time

Specify a period of time to detect a deceleration error while SS2 is ON. If the time set in this parameter has elapsed with the command/FB speed exceeding the SOS stop speed, STO is activated.

---Setting range---

0 to 99999 (ms)

(PR) #51185 STO_EXEWT Waiting time before STO execution

Specify a period of time to wait from when the drive unit receives an STO request from the NC until when STO is actually executed. Set this time so that the brake is activated within this period of time. When set to 0, the STO execution standby time is treated as 200ms.

---Setting range---

0 to 20000 (ms)

(PR) #51186 SBTEX_Enable External brake SBT enabled

0 : Disable
1 : Enable

(PR) #51187 SBTMO_Enable Motor brake SBT enabled

0 : Disable
1 : Enable

#51191 SBT_ILIM SBT current limit value

Set the current limit value in the brake test in proportion to the stall current. When set "0", the alarm occurs at the start of the brake test. (The test does not start.)

---Setting range---

0 to 100 (%)

(PR) #51192 SBT_CMDWT SBT command wait time

Set the wait time of output of movement command for brake test from NC since receiving SBT starting signal (SBTSTEXm / SBTSTMOm). When set "0", the commanded wait time is 400ms.

---Setting range---

0 to 30000 (ms)

(PR) #51193 SBT_FD SBT command movement amount

Set the movement amount to command to the test target axis at the time of brake test. When set "0", the alarm occurs at the start of the brake test. (The test does not start.)

---Setting range---

-99999.999 to 99999.999 (mm or °)

(PR) #51194 SBT_FDRATE SBT command speed

Set the command speed to command to the test target axis at the time of brake test. When set "0", the alarm occurs at the start of the brake test. (The test does not start.)

---Setting rang---

0 to 1000000 (mm/min or °/min)

(PR) #51195 SBT_OBTIM SBT observation time

Set the time to continue the observation of axis movement amount after the output of movement command for test at the time of brake test. When set "0", the observation time is 1000ms.

---Setting range---

0 to 30000 (ms)

(PR) #51196 SBT_TOL SBT tolerable movement amount

Set the tolerable movement amount of the test target axis at the time of brake test. (The alarm occurs if the movement amount during the test exceeds this parameter value.)
When set "0", the tolerable movement amount is 100mm (or °).

---Setting range---

0 to 99999.999 (mm or °)

(PR) #51197 SLP/SCA_FDTOL SLP/SCA tolerable movement amount during power OFF

Sets the tolerable value of the difference (error amount) between [saved position at power shut OFF] and [restored position at power ON] in SLP/SCA encoder diagnosis during power OFF. When this above difference exceeds the tolerable value, the system starts in STO status. When set "0", the tolerable value is as in below formula.
Tolerable movement amount = SV018(PIT) * 0.9

---Setting range---

0 to 99999.999 (mm)

(PR) #51198 MlRtAbsSEnc_FDChk SLP/SCA encoder diagnosis during power OFF applica- tion for Multi revolution safety encoder

Enables the encoder diagnosis during power OFF to use SLP/SCA for the axes connected with Multi revolution safety encoder.

0 : Disable the encoder diagnosis during power OFF to use SLP/SCA for the axes connected with Multi revolution safety encoder

1 : Enable the encoder diagnosis during power OFF to use SLP/SCA for the axes connected with Multi revolution safety encoder

* As for the axes not connected with Multi revolution safety encoder, the above diagnosis will be enabled regardless of the setting value of this parameter.
* The above diagnosis will not be executed when SLP/SCA are disabled. (Both SLP_Enable and SCA_Enable are 0.)

#51199 SF_PDCHK_TOL Servo axis position deviation diagnosis tolerable value

Sets the tolerable value of the position deviation (the difference between the commanded position generated inside NC and the feedback position received from drive unit) in the position deviation diagnosis. When the position deviation exceeds the tolerable value, the Safe stop (SS1/STO) will be carried out. When set "0", the tolerable value is below.

Tolerable value = SV018(PIT) * 2.0

---Setting range---

0 to 32767 (mm or °)

(PR) #51200 SFSPEC1 Safety specification 1

Specify the Safety axis's specification by turning ON the corresponding BIT. Input the hexadecimal value for this parameter.

BIT0-2 : Not used

BIT3 : Motor brake connection status

0 : Motor brake connected

1 : Motor brake not connected

BIT4-F : Not used

* If the settings of encoder type (BIT0, BIT1) are different from the actually connected ones, the servo alarm 4D is output.

---Setting range---

0x0000 to 0xFFFF

(PR) #51201 SENCTYP Safety encoder type

For a safety encoder-connected axis, set the safety encoder type.

When the Multi revolution part is connected to the safety encoder that is outside the certification of safety standards, and in SLP/SCA enabled, SLP/SCA encorder diagnosis during power OFF will be carried out regardless of the setting value of #51198 MlRtAbsSEnc_FDChk.

0: Safety encoder that is outside the safety certification for Multi revolution

1: Safety encoder that is certified with safety standards for Multi revolution

(PR) #51202 SEMG_STO_WT STO delay time for safety external emergency stop

[M8]

Specify a length of time it takes to complete deceleration stop when safety external emergency stop is implemented.

When not executing deceleration stop, set the parameter to 0.

When not executing deceleration stop, set the parameter to 0.When executing deceleration stop, subtract "#51185 STO_EXEWT" from "#2256 SV056" and set the difference in the parameter.

---Setting range---

0 to 20000 (ms)

2.30 Safety Spindle Parameters

(PR) #51301 SF_SDisable Disable smart safety observation

Set the spindle to be outside the scope of smart safety observation.
0 : Enable smart safety observation
1 : Disable smart safety observation
(Note) The settings of "#51101 SF_Disable" and "#51301 SF_SDisable" must be the same within a multi-hybrid drive unit.

(PR) #51302 SF_SStoptype Stop method at error

Select which of the safe stop methods to use when an error is detected in the smart safety observation.
0 : STO
1 : SS1

(PR) #51303-51306 SLS_SSpeed1-4 SLS speed tolerance 1-4

Specify the upper limits of machine-end speed determined as safe for each of SLS speed tolerances 1 to 4. If the SLS detection delay time has elapsed with the command/FB speed exceeding the safely-limited speed while SLS is ON, a safe stop (SS1 or STO) is executed. The safely-limited speed to be applied to SLS is calculated using the following equation.
Safely-limited speed = SLS speed tolerance x SLS speed override / 100
---Setting range---
0 to 999999.9 (r/min)

(PR) #51307-51322 SLS_SOverride1-16 SLS speed override 1-16

Specify the speed overrides 1 to 16 with respect to SLS speed tolerances 1 to 4. For details refer to SLS speed tolerances 1 to 4.
---Setting range---
0 to 100 (%)

(PR) #51323 SLS_Sclamp SLS speed clamp ratio

Specify the speed clamp ratio that is applied while SLS is ON.
Set the ratio to about 80 to 90%. While SLS is ON, the command speed is clamped at the following speed:
Clamp speed = Safely-limited speed x SLS speed clamp ratio / 100
(Safely-limited speed = SLS speed tolerance x SLS speed override / 100)
---Setting range---
0 to 100 (%)

#51324 SLS_ST1 SLS detection delay time

Specify a period of time to detect a speed error while SLS is ON. A safe stop (SS1 or STO) is executed if the period of time set in this parameter has elapsed with the command/FB speed exceeding the safely-limited speed.
---Setting range---
0 to 9999 (ms)

#51325 SLS_ST2 SLS deceleration observation time

Specify a period of time to detect a deceleration error that is caused due to change of the safely-limited speed at the start of or during SLS. If you have changed the safely-limited speed at the start of or during SLS, and the time set in this parameter has elapsed with the command/FB speed exceeding the safely-limited speed, a safe stop (SS1 or STO) is executed. When set to 0, the detection time is treated as 200(ms).
---Setting range--
0 to 99999 (ms)

(PR) #51326-51329 SSM_SSpeed1-4 SSM speed 1-4

Specify the upper limits of machine-end speed determined as safe for each of SSM speeds 1 to 4. If the command/FB speed is at the safe speed or lower while SSM is ON, the Under SSM safe speed signal turns ON. If the command/FB speed exceeds the safe speed, the Under SSM safe speed signal turns OFF. The safe speed to be applied to SSM is calculated using the following equation.
(When the Under SSM safe speed signal is ON)
Safe speed = SSM speed
(When the Under SSM safe speed signal is OFF)
Safe speed = SSM speed - SSM hysteresis width
---Setting range---
0 to 999999.9 (r/min)

#51330-51333 SSM_SHysteresis1-4 SM hysteresis width 1-4

Specify the hysteresis widths that correspond to SSM speeds 1 to 4. For details refer to SSM speeds 1 to 4.
---Setting range---
0 to 999999.9 (r/min)

(PR) #51334 SOS_SSpeed SOS stop speed

Specify the upper limit of machine-end speed determined as a safe operating stop.
- If the SOS_V detection delay time has elapsed with the command/FB speed exceeding that of this parameter while SOS is ON, a safe stop (SS1 or STO) is executed.
- The point of time at which the command/FB speed drops to that of this parameter or lower while SS1/SS2 is ON is treated as a standstill.

*When this parameter is set to 0, "SOS speed error" may occur even though the spindle is at a standstill.
---Setting range---
0 to 9999.9 (r/min)

#51335 SOS_ST1 SOS_V detection delay time

Specify a period of time to detect a speed error while SOS is ON. If the period of time set in this parameter has elapsed with the command/FB speed exceeding the SOS stop speed while SOS is ON, a safe stop (SS1 or STO) is executed.
---Setting range---
0 to 9999 (ms)

(PR) #51336 SOS_SDroop SOS position deviation tolerance

Specify the upper limit of machine-end position deviation determined as a safe operating stop. If the SOS_PD detection delay time has elapsed with the position deviation (difference between the command and FB positions) exceeding that of this parameter while SOS is ON, a safe stop (SS1 or STO) is executed.

* When this parameter is set to 0, "SOS position deviation error" may occur even though the spindle is at a standstill.

---Setting range---

0 to 9999 (°)

#51337 SOS_ST2 SOS_PD detection delay time

Specify a period of time to detect a position deviation error while SOS is ON. If the time set in this parameter has elapsed with the position deviation (difference between the command and FB positions) exceeding the SOS position deviation tolerance while SOS is ON, a safe stop (SS1 or STO) is executed.

---Setting range---

0 to 9999 (ms)

(PR) #51338 SOS_SPositionM SOS travel distance tolerance (-)

Specify the upper limit of machine-end travel distance (minus side) determined as a safe operating stop. If the SOS_P detection delay time has elapsed with the command/FB travel distance in the minus direction exceeding that of this parameter while SOS is ON, a safe stop (SS1 or STO) is executed.

*When this parameter is set to 0, "SOS travel distance error" may occur even though the spindle is at a standstill.

---Setting range---

0 to 9999 (°)

(PR) #51339 SOS_SPositionP SOS travel distance tolerance (+)

Specify the upper limit of machine-end travel distance (plus side) determined as a safe operating stop. If the SOS_P detection delay time has elapsed with the command/FB travel distance in the plus direction exceeding that of this parameter while SOS is ON, a safe stop (SS1 or STO) is executed.

* When this parameter is set to 0, "SOS travel distance error" may occur even though the spindle is at a standstill.

---Setting range---

0 to 9999 (°)

#51340 SOS_ST3 SOS_P detection delay time

Specify a period of time to detect a travel distance error while SOS is ON. If the time set in this parameter has elapsed with the command/FB travel distance exceeding the SOS travel distance tolerance (+/-) while SOS is ON, a safe stop (SS1 or STO) is executed.

---Setting range---

0 to 9999 (ms)

#51341 SS1_ST1 SS1 deceleration observation time

Specify a period of time to detect a deceleration error while SS1 is ON. If the time set in this parameter has elapsed with the command/FB speed exceeding the SOS stop speed, STO is activated.

---Setting range---

0 to 99999 (ms)

#51342 SS2_ST1 SS2 deceleration observation time

Specify a period of time to detect a deceleration error while SS2 is ON. If the time set in this parameter has elapsed with the command/FB speed exceeding the SOS stop speed, STO is activated.

---Setting range---

0 to 99999 (ms)

(PR) #51343 STO_SEXEWT Waiting time before STO execution

Specify a period of time to wait from when the drive unit receives an STO request from the NC until when STO is actually executed. Set this time so that the brake is activated within this period of time. When set to 0, the STO execution standby time is treated as 200ms.

---Setting range---

0 to 20000 (ms)

#51344 SF_PDCHK_ST1 Spindle position deviation diagnosis waiting time

Set the waiting time for starting the position deviation diagnosis at Spindle non-interpolation mode. The diagnosis of the position deviation at Spindle non-interpolation mode starts after the commanded speed becomes consistent and after the time set by this parameter passes. It stops while the command speed is changing. When set "0", the Spindle position deviation diagnosis waiting time is 20000ms.

---Setting range---

0 to 30000 (ms)

#51345 SF_PDCHK_STOL Spindle position deviation diagnosis tolerable value

Sets the tolerable value of the position deviation (the difference between the commanded position generated inside NC and the feedback position received from drive unit) in the position deviation diagnosis. When the position deviation exceeds the tolerable value, the Safe stop (SS1/STO) will be carried out. When set "0", the tolerable value is 1080°.

---Setting range---

0 to 32767 (°)

(PR) #51347 SEMG_STO_SWT STO delay time for safety external emergency stop

[M8]

Specify a length of time it takes to complete deceleration stop when safety external emergency stop is implemented.

When not executing deceleration stop, set the parameter to 0.

When executing deceleration stop, subtract "#51343 STO_SEXEWT" from "#13056 SP056" and set the difference in the parameter.

---Setting range--

0 to 29900 (ms)

2.31 Safety I/O Assignment Parameters

(PR) #51501+10(n-1) RIO CH No. #n Target channel number #n

[M8]
Specify the channel No. to which the nth safety I/O unit is connected. (n=1 to 8)
* When set to "0", the RIO assignment parameters of the nth station are all disabled.

---Setting range---
0, 1 to 3

[C80]
Specify the channel No. to which the nth safety I/O unit is connected. (n=1 to 3)
* When set to "0", the RIO assignment parameters of the nth station are all disabled.

---Setting range---
0,1

(PR) #51502+10(n-1) RIO Station No. #n Target station number #n

[M8]
Specify the station No. of the nth safety I/O unit. (n=1 to 8)
* Set this parameter to the same value as of the rotary switch on the safety I/O unit to which the device is assigned.

---Setting range---
0 to 63

[C80]
Specify the station No. of the nth safety I/O unit. (n=1 to 3)
* Set this parameter to the same value as of the rotary switch on the safety I/O unit to which the device is assigned.

---Setting range---
0 to 3

(PR) #51503+10(n-1) DI dev name #n DI device name #n

[M8]
Specify the name of the DI assignment devices of the nth safety I/O unit. (n=1 to 8)
* When set to "0", the name is left blank.

---Setting range---
0, X, ZR

[C80]
Specify the name of the DI assignment devices of the nth safety I/O unit. (n=1 to 3)
* When set to "0", the name is left blank.

---Setting range---
0, X

(PR) #51504+10(n-1) DI dev No. #n DI device number #n

[M8]
Specify the head device No. of DI assignment devices of the nth safety I/O unit. (n=1 to 8)
Device X: hexadecimal and on a 32-point basis (a multiple of 32)
Device ZR: decimal and on a 2-point basis (an even number)
* The setting of this parameter changes to "0" if you change the device name of "DI dev name #n".
* Set the name of "DI dev name #n" first.

---Setting range---
X: 0 to 1E0 (hexadecimal)
ZR: 0 to 62 (decimal)

[C80]
Specify the head device No. of DI assignment devices of the nth safety I/O unit. (n=1 to 3)
* The setting of this parameter changes to "0" if you change the device name of "DI dev name #n".
* Set the name of "DI dev name #n" first.

---Setting range---
X: 0 to 1FF (hexadecimal)

(PR) #51505+10(n-1) DO dev name #n DO device name #n

[M8]
Specify the name of the DO assignment devices of the nth safety I/O unit. (n=1 to 8)
* When set to "0", the name is left blank.

---Setting range---
0, Y, ZR

[C80]
Specify the name of the DO assignment devices of the nth safety I/O unit. (n=1 to 3)
* When set to "0", the name is left blank.

---Setting range---
0,Y

(PR) #51506+10(n-1) DO dev No. #n DO device number #n

[M8]
Specify the head device No. of the DO assignment devices of the nth safety I/O unit. (n=1 to 8)
Device Y: hexadecimal and on a 32-point basis (a multiple of 32)
Device ZR: decimal and on a 2-point basis (an even number)
* The setting of this parameter changes to "0" if you change the device name of "DO dev name #n".
* Set the name of "DO dev name #n" first.

---Setting range---
Y: 0 to 1E0 (hexadecimal)
ZR: 64 to 126 (decimal)

[C80]
Specify the head device No. of the DO assignment devices of the nth safety I/O unit. (n=1 to 3)
* The setting of this parameter changes to "0" if you change the device name of "DO dev name #n".
* Set the name of "DO dev name #n" first.
* Set the same value as DI device No.

---Setting range---
Y: 0 to 1FF (hexadecimal)

(PR) #51582 EMG_Dev1_ch Emergency stop signal 1 channel No.

Specify the No. of I/O channel to connect the safety I/O unit that receives the emergency stop signal. When specifying the channel No. and station No. of the emergency stop signal, set any of the safety I/O units specified by the parameters RIO CH No. and RIO Station No. When set to 0, the designation of emergency stop signal device by EMG_Dev1 is disabled, irrespective of the settings of EMG_Dev1_stn and EMG_Dev1_bit.

---Setting range---

[M8]
0 to 3
[C80]
0,1

(PR) #51583 EMG_Dev1_stn Emergency stop signal 1 station No.

Specify the No. of station to connect the safety I/O unit that receives the emergency stop signal.

---Setting range---

[M8]
0 to 63
[C80]
0 to 3

(PR) #51584 EMG_Dev1_bit Emergency stop signal 1 bit No.

Specify the bit No. of the safety I/O unit that receives the emergency stop signal.

---Setting range---

[M8]
0 to 7
[C80]
0 to 31

(PR) #51585 EMG_Dev2_ch Emergency stop signal 2 channel No.

Specify the No. of I/O channel to connect the safety I/O unit that receives the emergency stop signal. When specifying the channel No. and station No of the emergency stop signal, set any of the safety I/O units specified by the parameters RIO CH No. and RIO Station No. When set to 0, the designation of emergency stop signal device by EMG_Dev2 is disabled, irrespective of the settings of EMG_Dev2_stn and EMG_Dev2_bit.

---Setting range---

[M8]
0 to 3
[C80]
0,1

(PR) #51586 EMG_Dev2_stn Emergency stop signal 2 station No.

Specify the No. of station to connect the safety I/O unit that receives the emergency stop signal.

---Setting range---

[M8]
0 to 63
[C80]
0 to 3

(PR) #51587 EMG_Dev2_bit Emergency stop signal 2 bit No.

Specify the bit No. of the safety I/O unit that receives the emergency stop signal.

---Setting range---

[M8]
0 to 7
[C80]
0 to 31

(PR) #51591 SIO_DIDelay Allowed input signal compare time

Specify the allowed time of inconsistency between the PLC1 and PLC2 side input signals. Specify this in increments of 10msec. When set to "0", the allowed safety signal compare time is 300ms.

---Setting range---

0 to 500 (10msec)

(PR) #51592 SIO_DODelay Allowed output signal compare time

Specify the allowed time of inconsistency between the PLC1 and PLC2 side loop-back signals. Specify this in increments of 10msec. When set to "0", the allowed safety signal compare time is 300ms.

---Setting range---

0 to 50 (10msec)

(PR) #51593 SIO_DOErrtype DO control method at diagnostic error

Select the DO control method and PLC status of when a safety signal observation error occurs.
0 : PLC is set in RUN state and DO is controlled through user safety sequence
1 : PLC is set in STOP state and all DOs are OFF.

(PR) #51594 SIO_DODelay2 Allowed output signal compare time 2

Specify the allowed time of inconsistency between the PLC1 and PLC2 side output signals. Specify this in increments of 10msec. When set to "0", the allowed safety signal compare time is 300ms. Set tolerable time more than 300ms, when an output signal is controlled with 100ms timer.

---Setting range---

0 to 500 (10msec)

(PR) #51595 SIO_StartCond Safety related I/O observation start condition

[C80]
Specify the start condition of safety related I/O observation.
0: The observation is automatically started when the power is turned ON.
1: The observation is started at the rising edge of safety related I/O observation start request signal.(ZR416Bit1)
(Note) Set to "1"only when the power cannot be supplied to the safety I/O device when the controller power is turned ON.

2.32 EtherNet/IP Parameters [M8]

2.32.1 EtherNet/IP Parameters Scanner 1

#80000+20(n-1) N001 Device Number — **Scanner function Implicit Message: device No.**

Specify the No. of the device that is assigned to node. (n=1 to 64)

---Setting range---

1 to 128

#80001+20(n-1) N001 Position No. — **Scanner function Implicit Message: position No.**

Specify the position No. that is assigned to node. (n=1 to 64)

---Setting range---

0 to 63

#80002+20(n-1) N001 Project No. — **Scanner function Implicit Message: PLC project No.**

Specify the PLC project No. that is assigned to node. (n=1 to 64)
This number is set as the project No. of PLC device to which the node input/output/connection status is assigned.

---Setting range---

1 to 6

#80003+20(n-1) N001 in dev name — **Scanner function Implicit Message: PLC device name (IN (T->O))**

Specify the name of PLC device to which Implicit Message input data is transferred. (n=1 to 64)
Example) X

---Setting range---

X, M, L, SB, B, SW, D, R, W

#80004+20(n-1) N001 in dev No. — **Scanner function Implicit Message: PLC device top No. (IN (T->O))**

Specify the top No. of PLC device to which Implicit Message input data is transferred. (n=1 to 64)
If you specify bit device, set it in increments of 16 points.
Example) 100

---Setting range---

X: 0 to 5F0
M: 0 to 61424
L: 0 to 32752
SB: 0 to 7FF0
B: 0 to EFF0
SW: 0 to 7FFF
D: 0 to 32767
W: 0 to 7FFF
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

#80005+20(n-1) N001 in dev size — **Scanner function Implicit Message: PLC device size (IN (T->O))**

Specify the size (bytes) of Implicit Message input data that is transferred to PLC device. (n=1 to 64)
Example) 1

---Setting range---

0 to 509 (bytes)
* Up to 5000 bytes in total for all nodes

#80006+20(n-1) N001 out dev name — **Scanner function Implicit Message: PLC device name (OUT (O->T))**

Specify the name of PLC device to which Implicit Message output data is transferred. (n=1 to 64)
Example) Y

---Setting range---

Y, M, L, SB, B, SW, D, R, W

#80007+20(n-1) N001 out dev No. — **Scanner function Implicit Message: PLC device top No. (OUT (O->T))**

Specify the top No. of PLC device to which Implicit Message output data is transferred. (n=1 to 64)
If you specify bit device, set it in increments of 16 points.
Example) 100

---Setting range---

Y: 0 to 5F0
M: 0 to 61424
L: 0 to 32752
SB: 0 to 7FF0
B: 0 to EFF0
SW: 0 to 7FFF
D: 0 to 32767
W: 0 to 7FFF
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

#80008+20(n-1) N001 out dev size — **Scanner function Implicit Message: PLC device size (OUT (O->T))**

Specify the size (bytes) of Implicit Message output data that is transferred to PLC device. (n=1 to 64)
Example) 1

---Setting range---

0 to 505 (bytes)
* Up to 5000 bytes in total for all nodes

#80009+20(n-1) N001 sts dev name — **Scanner function Implicit Message: connection status assign PLC device name**

Specify the name of PLC device to which connection status of the device assigned to node is transferred. (n=1 to 64)
Example) M

---Setting range---

M, L, SB, B, SW, D, R, W

#80010+20(n-1) N001 sts dev No. **Scanner function Implicit Message: connection status assign PLC device No.**

Specify the top No. of PLC device to which connection status of the device assigned to node is transferred. (n=1 to 64)
6 bytes of data starting from the specified device No. are occupied.
Example) 1024

---Setting range---

M: 0 to 61424
L: 0 to 32752
SB: 0 to 7FF0
B: 0 to EFF0
SW: 0 to 7FFF
D: 0 to 32767
W: 0 to 7FFF
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

2.32.2 EtherNet/IP Parameters Scanner 2

#81280+10(c-1)	CH01 Project No.	Scanner function Explicit Message: PLC project No.

Specify the PLC project No. that is assigned to node. (c=1 to 16)
This number is set as the project No. of PLC device to which the node input/output/control structure is assigned.

---Setting range---

1 to 6

#81281+10(c-1)	CH01 ctrl dev name	Scanner function Explicit Message: control structure assign PLC device name

Specify the name of PLC device to which "Explicit Message control structure" is assigned. (c=1 to 16)
Example) M

---Setting range---

M, L, SB, B, SW, D, R, W

#81282+10(c-1)	CH01 ctrl dev No.	Scanner function Explicit Message: ctrl structure assign PLC device top No.

Specify the top No. of PLC device to which "Explicit Message control structure" is assigned. (c=1 to 16)
If you specify bit device, set it in increments of 16 points.
Example) 2048

---Setting range---

M: 0 to 61424
L: 0 to 32752
SB:0 to 7FF0
B: 0 to EFF0
SW: 0 to 7FFF
D:0 to 32767
W: 0 to 7FFF
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

2.32.3 EtherNet/IP Parameters Adapter 1

#81440+20(a-1) Imp A1 Proj No. Adapter function Implicit Message: PLC project No.

Specify the PLC project No. that is assigned to Adapter Implicit (IN/OUT) area. (a=1 to 6)
This number is set as the project No. of PLC device for input/output to/from Adapter Implicit (IN/OUT) area.

---Setting range---

1 to 6

#81441+20(a-1) Imp A1in offset Adapter function Implicit Message: IN area top offset

Specify the offset (bytes) from the head of Adapter Implicit (IN) area. (a=1 to 6)
The data starting from the specified offset is sent from Adapter Implicit (IN) area to PLC device.
Example) 100

---Setting range---

0 to 499 (bytes)

#81442+20(a-1) Imp A1in dev name Adapter function Implicit Message: PLC device name (IN)

Specify the name of PLC device to which Adapter Implicit (IN) area data is transferred. (a=1 to 6)
Example) X

---Setting range---

X, M, L, SB, B, SW, D, R, W

#81443+20(a-1) Imp A1in dev No. Adapter function Implicit Message: PLC device top No. (IN)

Specify the top No. of PLC device to which Adapter Implicit (IN) area data is transferred. (a=1 to 6)
If you specify bit device, set it in increments of 16 points.
Example) 200

---Setting range---

X: 0 to 5F0
M: 0 to 61424
L: 0 to 32752
SB: 0 to 7FF0
B: 0 to EFF0
SW: 0 to 7FFF
D: 0 to 32767
W: 0 to 7FFF
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

#81444+20(a-1) Imp A1in dev size Adapter function Implicit Message: PLC device size (IN)

Specify the size (bytes) of Adapter Implicit (IN) area data that is transferred to PLC device. (a=1 to 6)
Example) 1

---Setting range---

0 to 500 (bytes)
* Up to 500 bytes in total for all areas

#81445+20(a-1) Imp A1out offset Adapter function Implicit Message: OUT area top offset

Specify the offset (bytes) from the head of Adapter Implicit (OUT) area. (a=1 to 6)
The PLC device data starting from the specified offset is sent to Adapter Implicit (OUT) area.
Example) 100

---Setting range---

0 to 499 (bytes)

#81446+20(a-1) Imp A1out dev name Adapter function Implicit Message: PLC device name (OUT)

Specify the name of PLC device that is sent to Adapter Implicit (OUT) area. (a=1 to 6)
Example) Y

---Setting range---

Y, M, L, SB, B, SW, D, R, W

#81447+20(a-1) Imp A1out dev No. Adapter function Implicit Message: PLC device top No. (OUT)

Specify the top No. of PLC device that is sent to Adapter Implicit (OUT) area. (a=1 to 6)
If you specify bit device, set it in increments of 16 points.
Example) 200

---Setting range---

Y: 0 to 5F0
M: 0 to 61424
L: 0 to 32752
SB: 0 to 7FF0
B: 0 to EFF0
SW: 0 to 7FFF
D: 0 to 32767
W: 0 to 7FFF
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

#81448+20(a-1) Imp A1out dev size Adapter function Implicit Message: PLC device size (OUT)

Specify the size (bytes) of PLC device that is sent to Adapter Implicit (OUT) area. (a=1 to 6)
Example) 1

---Setting range---

0 to 500 (bytes)
* Up to 500 bytes in total for all areas

#81560 Imp sts Proj No. Connection status assigned PLC project No.

Specify the No. of PLC project to which connection status is transferred.

---Setting range---

1 to 6

#81561	Impsts dev name	Connection status assigned PLC device name

Specify the name of PLC device to which connection status is transferred.
Example) M

---Setting range---

M, L, SB, B, SW, D, R, W

#81562	Imp sts dev No.	Connection status assigned PLC device top No.

Specify the top No. of PLC device to which connection status is transferred.
6 bytes of data starting from the specified device No. are occupied.

---Setting range---

M: 0 to 61424
L: 0 to 32752
SB: 0 to 7FF0
B: 0 to EFF0
SW: 0 to 7FFF
D: 0 to 32767
W: 0 to 7FFF
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

2.32.4 EtherNet/IP Parameters Adapter 2

#81570+20(a-1) Exp A1 Proj No. Adapter function Explicit Message: PLC project No.

Specify the PLC project No. that is assigned to Adapter Explicit (IN/OUT) area. (a=1 to 6)
This number is set as the project No. of PLC device for input/output to/from Adapter Explicit (IN/OUT) area.

---Setting range---

1 to 6

#81571+20(a-1) Exp A1in offset Adapter function Explicit Message: IN area top offset

Specify the offset (bytes) from the head of Adapter Explicit (IN) area. (a=1 to 6)
The data starting from the specified offset is sent from Adapter Explicit (IN) area to PLC device.
Example) 100

---Setting range---

0 to 1388

#81572+20(a-1) Exp A1in dev name Adapter function Explicit Message: PLC device name (IN)

Specify the name of PLC device to which Adapter Explicit (IN) area data is transferred. (a=1 to 6)
Example) M

---Setting range---

M, L, SB, B, SW, D, R, W

#81573+20(a-1) Exp A1in dev No. Adapter function Explicit Message: PLC device top No. (IN)

Specify the top No. of PLC device to which Adapter Explicit (IN) area data is transferred. (a=1 to 6)
If you specify bit device, set it in increments of 16 points.
Example) 512

---Setting range---

M: 0 to 61424
L: 0 to 32752
SB: 0 to 7FF0
B: 0 to EFF0
SW: 0 to 7FFF
D: 0 to 32767
W: 0 to 7FFF
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

#81574+20(a-1) Exp A1in dev size Adapter function Explicit Message: PLC device size (IN)

Specify the size (bytes) of Adapter Explicit (IN) area data that is transferred to PLC device. (a=1 to 6)
Example) 1

---Setting range---

0 to 1389 (bytes)
* Up to 1389 bytes in total for all areas

#81575+20(a-1) Exp A1out offset Adapter function Explicit Message: OUT area top offset

Specify the offset (bytes) from the head of Adapter Explicit (OUT) area. (a=1 to 6)
The PLC device data starting from the specified offset is sent to Adapter Explicit (OUT) area.
Example) 100

---Setting range---

0 to 1388

#81576+20(a-1) Exp A1out dev name Adapter function Explicit Message: PLC device name (OUT)

Specify the name of PLC device that is sent to Adapter Explicit (OUT) area. (a=1 to 6)
Example) B

---Setting range---

M, L, SB, B, SW, D, R, W

#81577+20(a-1) Exp A1out dev No. Adapter function Explicit Message: PLC device top No. (OUT)

Specify the top No. of PLC device that is sent to Adapter Explicit (OUT) area. (a=1 to 6)
Example) 200

---Setting range---

M: 0 to 61424
L: 0 to 32752
SB: 0 to 7FF0
B: 0 to EFF0
SW: 0 to 7FFF
D: 0 to 32767
W: 0 to 7FFF
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

#81578+20(a-1) Exp A1out dev size Adapter function Explicit Message: PLC device size (OUT)

Specify the size (bytes) of PLC device that is sent to Adapter Explicit (OUT) area. (a=1 to 6)
Example) 1

---Setting range---

0 to 1389 (bytes)
* Up to 1389 bytes in total for all areas

2.33 CC Link IE Field Parameters [M8]

2.33.1 CC Link IE Field Network 1

(PR) #82000 #1 Slot No. Selection of parameter application slot

Select the slot of the CC-Link IE field network expansion unit to which you apply the CCIEF common parameters #82000 to #82695.

* If you select the same slot as of "#82700 #2 Slot No.", the parameters #82000 to #82695 are applied to the slot with higher priority.

---Setting range---

0: No setting (Disable)
1: EXT3
2: EXT4

* For M80/M800S/E80

1: EXT1
2: EXT2

(PR) #82001 #1 Network Type Network type

Specify the station type of the CC-Link IE field network expansion unit.

0: Master station
1: Local station

(PR) #82002 #1 Network No. Network No.

Specify the network No. of the CC-Link IE field network expansion unit.

---Setting range---

0 to 239
0: No setting

#82003 #1 Total Stations Total number of slave stations

Specify the number of stations other than master stations.
If the NC acts as a local station, set 0 in the parameter.
•If you set a reserved station, include it in the count.

---Setting range---

0 to 64
0: No setting

(PR) #82004 #1 Station No. Station No. (local station)

Specify the station No. of the CC-Link IE field network expansion unit.
For a master station, the station No. is 0, irrespective of the parameter.

* If the NC acts as a master station, the maximum value of the station No. which can be set to the slave station is "64". If the NC acts as a master station and also the NC is connected as a local station, set "64" or less to the station No.

---Setting range---

0 to 120

(PR) #82005 #1 Mode Communication mode

Specify the communication mode.

0: Online mode
1: Offline mode
2: H/W test mode

#82006 #1 DLink Fault St. Data link error station setting

Select whether to hold or clear the input data from the slave station where a data link error occurred.

0: Clear
1: Hold

#82007 #1 PLC Stop Output Output setting at PLC STOP

Select whether to hold or clear the cyclic data output when the PLC is put in STOP status.

0: Output
1: Clear

#82008 #1 Loopback Func Loopback function setting

Select whether or not to use the loopback function.
When ring topology is selected as the method of connecting with other stations, select "1" (Use).
For the other connection methods, select "0" (Not use).
If the NC acts as a local station, set "0" in the parameter.
If the NC acts as a local station, it operates according to the loopback function setting of master station.

0: Not use
1: Use

#82040 #1 SB Link-d size Number of SB link devices

Specify the number of SB link devices for link refresh.
Set this in increments of 16.

---Setting range---

0 to 512

#82041 #1 SB Link-d DNo. Start device No. of SB link devices

Specify the start device No. of SB link devices that perform link refresh.
Set the number in increments of 16.

---Setting range---

0 to 1F0 (hexadecimal)

#82042 #1 Refr-d PNo.(SB) Refresh device project No. for SB link device

Specify the project No. of PLC devices that perform link refresh with the SB link devices.

---Setting range---

0 to 6
0: No setting

#82043 #1 Refr-d name(SB) Refresh device name for SB link device

Specify the name of PLC devices that perform link refresh with the SB link devices.

---Setting range---

0, M, L, B, D, W, R, SB
0: No setting

#82044 #1 Refr-d DNo.(SB) Refresh device start device No. for SB link device

Specify the start device No. of PLC devices that perform link refresh with the SB link devices.
If you designate bit devices, set the number in increments of 16.

---Setting range---

M: 0 to 61424
L: 0 to 32752
B: 0 to EFF0
D: 0 to 32767
W: 0 to 7FFF
SB: 0 to 7FF0
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

#82050 #1 SW Link-d size Number of SW link devices

Specify the number of SW link devices for link refresh.
Set this in increments of 4.

---Setting range---

0 to 512

#82051 #1 SW Link-d DNo. Start device No. of SW link devices

Specify the start device No. of SW link devices that perform link refresh.
Set the number in increments of 4.

---Setting range---

0 to 1FC (hexadecimal)

#82052 #1 Refr-d PNo.(SW) Refresh device project No. for SW link device

Specify the project No. of PLC devices that perform link refresh with the SW link devices.

---Setting range---

0 to 6
0: No setting

#82053 #1 Refr-d name(SW) Refresh device name for SW link device

Specify the name of PLC devices that perform link refresh with the SW link devices.

---Setting range---

0, M, L, B, D, W, R, SW
0: No setting

#82054 #1 Refr-d DNo.(SW) Refresh device start device No. for SW link device

Specify the start device No. of PLC devices that perform link refresh with the SW link devices.
If you designate bit devices, set the number in increments of 16.

---Setting range---

M: 0 to 61424
L: 0 to 32752
B: 0 to EFF0
D: 0 to 32767
W: 0 to 7FFF
SW: 0 to 7FF0
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

#82060+10(k-1) #1 N01 Link-d name Link device name

Specify the link device name. (k=1 to 64)

---Setting range---

0, RX, RY, RWr, RWw
0: No setting

#82061+10(k-1) #1 N01 Link-d size Number of link devices

Specify the number of link devices. (k=1 to 64)
If you designate RX/RY, set the number in increments of 16.
If you designate RWr/RWw, set the number in increments of 4.

---Setting range---

RX, RY: 0 to 16384
RWr, RWw: 0 to 8192

#82062+10(k-1) #1 N01 Link-d DNo. Link device start device No.

Specify the start device number of the link devices. (k=1 to 64)
If you designate RX/RY, set the number in increments of 16.
If you designate RWr/RWw, set the number in increments of 4.

---Setting range---

RX, RY: 0 to 3FF0
RWr, RWw: 0 to 1FFC (hexadecimal)

#82063+10(k-1) #1 N01 Refr-d PNo. Refresh device project No.

Specify the project No. of PLC devices that perform link refresh with the link devices. (k=1 to 64)

---Setting range---

0 to 6
0: No setting

#82064+10(k-1) #1 N01 Refr-d name Refresh device name

Specify the name of PLC devices that perform link refresh with the link devices. (k=1 to 64)

---Setting range---

RX: 0, X, M, L, B, D, W, R
RY: 0, Y, M, L, B, D, W, R
RWr, RWw: 0, M, L, B, D, W, R
0: No setting

#82065+10(k-1) #1 N01 Refr-d DNo. Refresh device start device No.

Specify the start device No. of PLC devices that perform link refresh with the link devices. (k=1 to 64)
If you designate bit devices, set the number in increments of 16.

---Setting range---

X: 0 to 5F0
Y: 0 to 5F0
M: 0 to 61424
L: 0 to 32752
B: 0 to EFF0
D: 0 to 32767
W: 0 to 7FFF
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

2.33.2 CC Link IE Field Network 2

(PR) #82700 #2 Slot No. Selection of parameter application slot

Select the slot of the CC-Link IE field network expansion unit to which you apply the CCIEF common parameters #82700 to #83395.

* If you select the same slot as of "#82000 #1 Slot No.", the parameters #82000 to #82695 are applied to the slot with higher priority.

---Setting range---

0: No setting (Disable)
1: EXT3
2: EXT4

* For M80/M800S/E80

1: EXT1
2: EXT2

(PR) #82701 #2 Network Type Network type

Specify the station type of the CC-Link IE field network expansion unit.

---Setting range---

0: Master station
1: Local station

(PR) #82702 #2 Network No. Network No.

Specify the network No. of the CC-Link IE field network expansion unit.

---Setting range---

0 to 239
0: No setting

#82703 #2 Total Stations Total number of slave stations

Specify the number of stations other than master stations.
If the NC acts as a local station, set 0 in the parameter.
•If you set a reserved station, include it in the count.

---Setting range---

0 to 64
0: No setting

(PR) #82704 #2 Station No. Station No. (local station)

Specify the station No. of the CC-Link IE field network expansion unit.
For a master station, the station No. is 0, irrespective of the parameter.

* If the NC acts as a master station, the maximum value of the station No. which can be set to the slave station is "64". If the NC acts as a master station and also the NC is connected as a local station, set "64" or less to the station No.

---Setting range---

0 to 120

(PR) #82705 #2 Mode Communication mode

Specify the communication mode.

0: Online mode
1: Offline mode
2: H/W test mode

#82706 #2 DLink Fault St. Data link error station setting

Select whether to hold or clear the input data from the station where a data link error occurred.

0: Clear
1: Hold

#82707 #2 PLC Stop Output Output setting at PLC STOP

Select whether to hold or clear the cyclic data output when the PLC is put in STOP status.

0: Clear
1: Hold

#82708 #2 Loopback Func Loopback function setting

Select whether or not to use the loopback function.
When ring topology is selected as the method of connecting with other stations, select "1" (Use).
For the other connection methods, select 0 (Not use).
If the NC acts as a local station, set "0" in the parameter.
If the NC acts as a local station, it operates according to the loopback function setting of master station.

0: Not use
1: Use

#82740 #2 SB Link-d size Number of SB link devices

Specify the number of SB link devices for link refresh.
Set this in increments of 16.

---Setting range---

0 to 512

#82741 #2 SB Link-d DNo. Start device No. of SB link devices

Specify the start device No. of SB link devices that perform link refresh.
Set the number in increments of 16.

---Setting range---

0 to 1F0 (hexadecimal)

#82742 #2 Refr-d PNo.(SB) Refresh device project No. for SB link device

Specify the project No. of PLC devices that perform link refresh with the SB link devices.

---Setting range---

0 to 6
0: No setting

#82743 #2 Refr-d name(SB) Refresh device name for SB link device

Specify the name of PLC devices that perform link refresh with the SB link devices.

---Setting range---

0, M, L, B, D, W, R, SB
0: No setting

#82744 #2 Refr-d DNo.(SB) Refresh device start device No. for SB link device

Specify the start device No. of PLC devices that perform link refresh with the SB link devices.
If you designate bit devices, set the number in increments of 16.

---Setting range---

M: 0 to 61424
L: 0 to 32752
B: 0 to EFF0
D: 0 to 32767
W: 0 to 7FFF
SB: 0 to 7FF0
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

#82750 #2 SW Link-d size Number of SW link devices

Specify the number of SW link devices for link refresh.
Set this in increments of 4.

---Setting range---

0 to 512

#82751 #2 SW Link-d DNo. Start device No. of SW link devices

Specify the start device No. of SW link devices that perform link refresh.
Set the number in increments of 4.

---Setting range---

0 to 1FC (hexadecimal)

#82752 #2 Refr-d PNo.(SW) Refresh device project No. for SW link device

Specify the project No. of PLC devices that perform link refresh with the SW link devices.

---Setting range---

0 to 6
0: No setting

#82753 #2 Refr-d name(SW) Refresh device name for SW link device

Specify the name of PLC devices that perform link refresh with the SW link devices.

---Setting range---

0, M, L, B, D, W, R, SW
0: No setting

#82754 #2 Refr-d DNo.(SW) Refresh device start device No. for SW link device

Specify the start device No. of PLC devices that perform link refresh with the SW link devices.
If you designate bit devices, set the number in increments of 16.

---Setting range---

M: 0 to 61424
L: 0 to 32752
B: 0 to EFF0
D: 0 to 32767
W: 0 to 7FFF
SW: 0 to 7FF0
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

#82760+10(k-1) #2 N01 Link-d name Link device name

Specify the link device name. (k=1 to 64)

---Setting range---

0, RX, RY, RWr, RWw
0: No setting

#82761+10(k-1) #2 N01 Link-d size Number of link devices

Specify the number of link devices. (k=1 to 64)
If you designate RX/RY, set the number in increments of 16.
If you designate RWr/RWw, set the number in increments of 4.

---Setting range---

RX, RY: 0 to 16384
RWr, RWw: 0 to 8192

#82762+10(k-1) #2 N01 Link-d DNo. Link device start device No.

Specify the start device number of the link devices. (k=1 to 64)
If you designate RX/RY, set the number in increments of 16.
If you designate RWr/RWw, set the number in increments of 4.

---Setting range---

RX, RY: 0 to 3FF0
RWr, RWw: 0 to 1FFC (hexadecimal)

#82763+10(k-1) #2 N01 Refr-d PNo. Refresh device project No.

Specify the project No. of PLC devices that perform link refresh with the link devices. (k=1 to 64)

---Setting range---

0 to 6
0: No setting

#82764+10(k-1) #2 N01 Refr-d name Refresh device name

Specify the name of PLC devices that perform link refresh with the link devices. (k=1 to 64)

---Setting range---

RX: 0, X, M, L, B, D, W, R
RY: 0, Y, M, L, B, D, W, R
RWr, RWw: 0, M, L, B, D, W, R
0: No setting

#82765+10(k-1) #2 N01 Refr-d DNo. Refresh device start device No.

Specify the start device No. of PLC devices that perform link refresh with the link devices. (k=1 to 64)
If you designate bit devices, set the number in increments of 16.

---Setting range---

X: 0 to 5F0
Y: 0 to 5F0
M: 0 to 61424
L: 0 to 32752
B: 0 to EFF0
D: 0 to 32767
W: 0 to 7FFF
R: 8300 to 9799, 9800 to 9899, 18300 to 19799, 19800 to 19899, 28300 to 29799, 29800 to 29899

2.33.3 CC Link IE Field Master Parameters

#83400+10(n-1) CN01 Station No. Station No. (slave station)

Specify the station No. of slave station connected to the network. (n=1 to 64)
There is no need to number the stations sequentially. (duplication is not acceptable)

---Setting range---

0 to 64
0: No setting

#83401+10(n-1) CN01 Station Type Station type (slave station)

Specify the station type for slave stations. (n=1 to 64)
Set the same station type as that of the units that are actually connected to the network.

---Setting range---

0: No setting
1: Remote I/O station
2: Remote device station
3: Intelligent device station
4: Local station

#83402+10(n-1) CN01 RX/RY size Number of RX/RY link devices

Specify the number of RX/RY link devices that perform link refresh with slave stations. (n=1 to 64)
Set the number in increments of 16.

---Setting range---

Local or intelligent device station: 0 to 2048
Remote device station: 0 to 128
Remote I/O station: 0 to 64

#83403+10(n-1) CN01 RX/RY DNo. Start device No. of RX/RY link devices

Specify the start device No. of RX/RY link devices that perform link refresh with slave stations. (n=1 to 64)
Set the number in increments of 16.

---Setting range---

0 to 3FF0 (hexadecimal)

#83404+10(n-1) CN01 RWr/RWw size Number of RWr/RWw link devices

Specify the number of RWr/RWw link devices that perform link refresh with slave stations. (n=1 to 64)
Set the number in increments of 4.

---Setting range---

Local or intelligent device station: 0 to 1024
Remote device station: 0 to 64
Remote I/O station: Setting is disabled (fixed to 0)

#83405+10(n-1) CN01 RWr/RWw DNo. Start device No. of RWr/RWw link devices

Specify the start device No. of RWr/RWw link devices that perform link refresh with slave stations. (n=1 to 64)
Set the number in increments of 4.

---Setting range---

0 to 1FFC (hexadecimal)

#83406+10(n-1) CN01 Set rsvd sts Reserved/Error invalid station setting

Designate the station as reserved station or error invalid station. (n=1 to 64)

---Setting range---

0: No setting
1: Reserved station
2: Error invalid station

2.34 PROFIBUS-DP Parameters[M8]

(PR) #57000+4(n-1) #n I/O reg PROFIBUS I/O area

[M8]

Select whether to allocate the devices to PX or PY of PROFIBUS-DP.

(Note) If 0 is set, the PROFIBUS allocation parameters of the n-th set are all disabled.

0: Disable
1: PX
2: PY

(PR) #57001+4(n-1) #n sect No. PROFIBUS section number

[M8]

Select the section of PROFIBUS-DP I/O data (PX/PY) to which the devices are allocated.

---Setting range---

0 to 31

(PR) #57002+4(n-1) #n dev name PROFIBUS device name

[M8]

Select the device that is allocated to the section of PROFIBUS-DP I/O data(PX/PY).

(Note) The setting range varies according to the value of "#n I/O reg".

---Setting range---

X, Y, M, L, B, D, R or W
When "#n I/O reg" is "1", "Y" is out of the setting range.
When "#n I/O reg" is "2", "X" is out of the setting range.

(PR) #57003+4(n-1) #n dev No. PROFIBUS device number

[M8]

Select the 32 bytes of devices to which PROFIBUS-DP I/O data is allocated.

Specify the starting device number. (n=1 to 64)

* If the set value is out of the following ranges, an alarm occurs at the start of NC.

Hexadecimal setting:
X: 0 to 1C0, 300 to 500
Y: 0 to 1C0, 300 to 500
B: 0 to DF00
W: 0 to 2FF0

Decimal setting:
M: 0 to 61184
L: 0 to 768
D: 0 to 4080
R: 8300 to 9884, 18300 to 19884, 28300 to 29884

(Note) Due to the multi-project function, if the number of the first project points is smaller than the default value, the range becomes narrower corresponding to the number of the first project points.

---Setting range---

The setting range varies according to the value of "#n dev name".
X, Y, B, W: 0 to FFFF
M, L, D, R: 0 to 65535

2.35 Multi CPU Parameters [C80]

(PR)	#26801-26832	EndRefDev1-32	END refresh device 1-32

[C80]
Specify the head device No. of devices that are refreshed at the END process of ladder.
For the range not refreshed by host CPU due to another CPU's setting (reception), the setting can be omitted.
Device "RC" can be set when "#26751 DevCondecseRef" is set to "1".

---Setting range---

Device: X, Y, M, L, B, D, W, R, ZR, RC
Device number: 0 to 99999

III PLC Devices

The parameter "#1603 PLCdev_no" should be set when your system includes 5 or more part systems, or when 9 or more axes exist in a part system.

1 PLC Input Signals (Bit type: X***)

(Note) Signals marked with " ▲ " are prepared for a specific machine tool builder.

Device	Abbrev.	Signal name
X2F0	BRST	Board reset
X700	IPCEI1	Power consumption computation: Consumption accumulation ON 1
X701	IPCEI2	Power consumption computation: Consumption accumulation ON 2
X702	IPCEI3	Power consumption computation: Consumption accumulation ON 3
X703	IPCEI4	Power consumption computation: Consumption accumulation ON 4
X707		Power OFF processing
X708	IPCCC1	Power consumption computation: Clearing consumption accumulation 1 complete
X709	IPCCC2	Power consumption computation: Clearing consumption accumulation 2 complete
X70A	IPCCC3	Power consumption computation: Clearing consumption accumulation 3 complete
X70B	IPCCC4	Power consumption computation: Clearing consumption accumulation 4 complete
X70E	BATWR	Battery warning
X70F	BATAL	Battery alarm
X710	MSON	In macro single valid [C80]
X711		Optimum acceleration/deceleration switching parameter completion [spindle] ▲
X712	SMLKO	High-speed simple program check mode ON
X713	SPSCO	High-speed simple program check: Coordinate position check ON
X714	PNCMDO	Manual arbitrary reverse run: Actual cutting mode ON [M8]
X715	PCHKO	Manual arbitrary reverse run mode ON
X716	MOREV	Manual arbitrary reverse run: Reverse run ON
X720		In sampling trace ▲
X721		Sampling trace complete ▲
X722		Diagnosis data output completion
X723		Collecting diagnosis data
X724		In remote program input ▲
X725		Remote program input completion ▲
X726		Remote program input error ▲
X727		In tool ID communication ▲
X728	MDBUSIF	Modbus/TCP communicating ▲
X729	MDBUSER1	Modbus time-out 1 ▲
X72A	MDBUSER2	Modbus time-out 2 ▲
X72B	FLNETO	FL-net : Online ▲
X72F		Power OFF required after parameter change
X74D	MBSTP	Thread, tap block stopping in manual arbitrary reverse run
X74E	MRVNG	Thread, tap reverse run prohibition alarm in manual arbitrary reverse run
X74F		MES interface library: Operation trigger status [M8]
X752	CNOP	24 hours continuous operation
X753	MSOE	In multi-step speed monitor [M8]
X758		Pallet program registration Ext. workpiece coordinate transfer completion
X759		Graphic check (check method II) in progress [M8]
X760		$1 Display
X761		$2 Display
X762		$3 Display
X763		$4 Display
X764		$5 Display
X765		$6 Display
X766		$7 Display
X767		$8 Display
X771	ITF3DTF	Interference check III: Interfering object selection data setting completed
X772	ITF3MD	Interference check III: In interference check III mode
X773		Interference check between part systems: Mode is active [M8]
X778	GBMOD	G/B spindle synchronizing mode
X779	GBSYN	G/B spindle synchronization: position control synchronizing
X77A	GBPHF	G/B spindle synchronization: phase alignment complete
X77B	GBPCM	G/B spindle synchronization: position error compensating
X780	RDY11	Servo ready 1st axis $1
X781	RDY21	Servo ready 2nd axis $1
X782	RDY31	Servo ready 3rd axis $1
X783	RDY41	Servo ready 4th axis $1
X784	RDY51	Servo ready 5th axis $1
X785	RDY61	Servo ready 6th axis $1
X786	RDY71	Servo ready 7th axis $1
X787	RDY81	Servo ready 8th axis $1
X788	RDY12	Servo ready 1st axis $2
X789	RDY22	Servo ready 2nd axis $2
X78A	RDY32	Servo ready 3rd axis $2
X78B	RDY42	Servo ready 4th axis $2
X78C	RDY52	Servo ready 5th axis $2
X78D	RDY62	Servo ready 6th axis $2
X78E	RDY72	Servo ready 7th axis $2
X78F	RDY82	Servo ready 8th axis $2
X790	RDY13	Servo ready 1st axis $3
X791	RDY23	Servo ready 2nd axis $3
X792	RDY33	Servo ready 3rd axis $3

Device	Abbrev.	Signal name
X793	RDY43	Servo ready 4th axis $3
X794	RDY53	Servo ready 5th axis $3
X795	RDY63	Servo ready 6th axis $3
X796	RDY73	Servo ready 7th axis $3
X797	RDY83	Servo ready 8th axis $3
X798	RDY14	Servo ready 1st axis $4
X799	RDY24	Servo ready 2nd axis $4
X79A	RDY34	Servo ready 3rd axis $4
X79B	RDY44	Servo ready 4th axis $4
X79C	RDY54	Servo ready 5th axis $4
X79D	RDY64	Servo ready 6th axis $4
X79E	RDY74	Servo ready 7th axis $4
X79F	RDY84	Servo ready 8th axis $4
X7A0	AX11	Axis selection 1st axis $1
X7A1	AX21	Axis selection 2nd axis $1
X7A2	AX31	Axis selection 3rd axis $1
X7A3	AX41	Axis selection 4th axis $1
X7A4	AX51	Axis selection 5th axis $1
X7A5	AX61	Axis selection 6th axis $1
X7A6	AX71	Axis selection 7th axis $1
X7A7	AX81	Axis selection 8th axis $1
X7A8	AX12	Axis selection 1st axis $2
X7A9	AX22	Axis selection 2nd axis $2
X7AA	AX32	Axis selection 3rd axis $2
X7AB	AX42	Axis selection 4th axis $2
X7AC	AX52	Axis selection 5th axis $2
X7AD	AX62	Axis selection 6th axis $2
X7AE	AX72	Axis selection 7th axis $2
X7AF	AX82	Axis selection 8th axis $2
X7B0	AX13	Axis selection 1st axis $3
X7B1	AX23	Axis selection 2nd axis $3
X7B2	AX33	Axis selection 3rd axis $3
X7B3	AX43	Axis selection 4th axis $3
X7B4	AX53	Axis selection 5th axis $3
X7B5	AX63	Axis selection 6th axis $3
X7B6	AX73	Axis selection 7th axis $3
X7B7	AX83	Axis selection 8th axis $3
X7B8	AX14	Axis selection 1st axis $4
X7B9	AX24	Axis selection 2nd axis $4
X7BA	AX34	Axis selection 3rd axis $4
X7BB	AX44	Axis selection 4th axis $4
X7BC	AX54	Axis selection 5th axis $4
X7BD	AX64	Axis selection 6th axis $4
X7BE	AX74	Axis selection 7th axis $4
X7BF	AX84	Axis selection 8th axis $4
X7C0	MVP11	In axis plus motion 1st axis $1
X7C1	MVP21	In axis plus motion 2nd axis $1
X7C2	MVP31	In axis plus motion 3rd axis $1
X7C3	MVP41	In axis plus motion 4th axis $1
X7C4	MVP51	In axis plus motion 5th axis $1
X7C5	MVP61	In axis plus motion 6th axis $1
X7C6	MVP71	In axis plus motion 7th axis $1
X7C7	MVP81	In axis plus motion 8th axis $1
X7C8	MVP12	In axis plus motion 1st axis $2
X7C9	MVP22	In axis plus motion 2nd axis $2
X7CA	MVP32	In axis plus motion 3rd axis $2
X7CB	MVP42	In axis plus motion 4th axis $2
X7CC	MVP52	In axis plus motion 5th axis $2
X7CD	MVP62	In axis plus motion 6th axis $2
X7CE	MVP72	In axis plus motion 7th axis $2
X7CF	MVP82	In axis plus motion 8th axis $2
X7D0	MVP13	In axis plus motion 1st axis $3
X7D1	MVP23	In axis plus motion 2nd axis $3
X7D2	MVP33	In axis plus motion 3rd axis $3
X7D3	MVP43	In axis plus motion 4th axis $3
X7D4	MVP53	In axis plus motion 5th axis $3
X7D5	MVP63	In axis plus motion 6th axis $3
X7D6	MVP73	In axis plus motion 7th axis $3
X7D7	MVP83	In axis plus motion 8th axis $3
X7D8	MVP14	In axis plus motion 1st axis $4
X7D9	MVP24	In axis plus motion 2nd axis $4
X7DA	MVP34	In axis plus motion 3rd axis $4
X7DB	MVP44	In axis plus motion 4th axis $4
X7DC	MVP54	In axis plus motion 5th axis $4
X7DD	MVP64	In axis plus motion 6th axis $4
X7DE	MVP74	In axis plus motion 7th axis $4
X7DF	MVP84	In axis plus motion 8th axis $4
X7E0	MVM11	In axis minus motion 1st axis $1
X7E1	MVM21	In axis minus motion 2nd axis $1
X7E2	MVM31	In axis minus motion 3rd axis $1
X7E3	MVM41	In axis minus motion 4th axis $1
X7E4	MVM51	In axis minus motion 5th axis $1

Device	Abbrev.	Signal name
X7E5	MVM61	In axis minus motion 6th axis $1
X7E6	MVM71	In axis minus motion 7th axis $1
X7E7	MVM81	In axis minus motion 8th axis $1
X7E8	MVM12	In axis minus motion 1st axis $2
X7E9	MVM22	In axis minus motion 2nd axis $2
X7EA	MVM32	In axis minus motion 3rd axis $2
X7EB	MVM42	In axis minus motion 4th axis $2
X7EC	MVM52	In axis minus motion 5th axis $2
X7ED	MVM62	In axis minus motion 6th axis $2
X7EE	MVM72	In axis minus motion 7th axis $2
X7EF	MVM82	In axis minus motion 8th axis $2
X7F0	MVM13	In axis minus motion 1st axis $3
X7F1	MVM23	In axis minus motion 2nd axis $3
X7F2	MVM33	In axis minus motion 3rd axis $3
X7F3	MVM43	In axis minus motion 4th axis $3
X7F4	MVM53	In axis minus motion 5th axis $3
X7F5	MVM63	In axis minus motion 6th axis $3
X7F6	MVM73	In axis minus motion 7th axis $3
X7F7	MVM83	In axis minus motion 8th axis $3
X7F8	MVM14	In axis minus motion 1st axis $4
X7F9	MVM24	In axis minus motion 2nd axis $4
X7FA	MVM34	In axis minus motion 3rd axis $4
X7FB	MVM44	In axis minus motion 4th axis $4
X7FC	MVM54	In axis minus motion 5th axis $4
X7FD	MVM64	In axis minus motion 6th axis $4
X7FE	MVM74	In axis minus motion 7th axis $4
X7FF	MVM84	In axis minus motion 8th axis $4
X800	ZP111	1st reference position reached 1st axis $1
X801	ZP121	1st reference position reached 2nd axis $1
X802	ZP131	1st reference position reached 3rd axis $1
X803	ZP141	1st reference position reached 4th axis $1
X804	ZP151	1st reference position reached 5th axis $1
X805	ZP161	1st reference position reached 6th axis $1
X806	ZP171	1st reference position reached 7th axis $1
X807	ZP181	1st reference position reached 8th axis $1
X808	ZP112	1st reference position reached 1st axis $2
X809	ZP122	1st reference position reached 2nd axis $2
X80A	ZP132	1st reference position reached 3rd axis $2
X80B	ZP142	1st reference position reached 4th axis $2
X80C	ZP152	1st reference position reached 5th axis $2
X80D	ZP162	1st reference position reached 6th axis $2
X80E	ZP172	1st reference position reached 7th axis $2
X80F	ZP182	1st reference position reached 8th axis $2
X810	ZP113	1st reference position reached 1st axis $3
X811	ZP123	1st reference position reached 2nd axis $3
X812	ZP133	1st reference position reached 3rd axis $3
X813	ZP143	1st reference position reached 4th axis $3
X814	ZP153	1st reference position reached 5th axis $3
X815	ZP163	1st reference position reached 6th axis $3
X816	ZP173	1st reference position reached 7th axis $3
X817	ZP183	1st reference position reached 8th axis $3
X818	ZP114	1st reference position reached 1st axis $4
X819	ZP124	1st reference position reached 2nd axis $4
X81A	ZP134	1st reference position reached 3rd axis $4
X81B	ZP144	1st reference position reached 4th axis $4
X81C	ZP154	1st reference position reached 5th axis $4
X81D	ZP164	1st reference position reached 6th axis $4
X81E	ZP174	1st reference position reached 7th axis $4
X81F	ZP184	1st reference position reached 8th axis $4
X820	ZP211	2nd reference position reached 1st axis $1
X821	ZP221	2nd reference position reached 2nd axis $1
X822	ZP231	2nd reference position reached 3rd axis $1
X823	ZP241	2nd reference position reached 4th axis $1
X824	ZP251	2nd reference position reached 5th axis $1
X825	ZP261	2nd reference position reached 6th axis $1
X826	ZP271	2nd reference position reached 7th axis $1
X827	ZP281	2nd reference position reached 8th axis $1
X828	ZP212	2nd reference position reached 1st axis $2
X829	ZP222	2nd reference position reached 2nd axis $2
X82A	ZP232	2nd reference position reached 3rd axis $2
X82B	ZP242	2nd reference position reached 4th axis $2
X82C	ZP252	2nd reference position reached 5th axis $2
X82D	ZP262	2nd reference position reached 6th axis $2
X82E	ZP272	2nd reference position reached 7th axis $2
X82F	ZP282	2nd reference position reached 8th axis $2
X830	ZP213	2nd reference position reached 1st axis $3
X831	ZP223	2nd reference position reached 2nd axis $3
X832	ZP233	2nd reference position reached 3rd axis $3
X833	ZP243	2nd reference position reached 4th axis $3
X834	ZP253	2nd reference position reached 5th axis $3
X835	ZP263	2nd reference position reached 6th axis $3
X836	ZP273	2nd reference position reached 7th axis $3

Device	Abbrev.	Signal name
X837	ZP283	2nd reference position reached 8th axis $3
X838	ZP214	2nd reference position reached 1st axis $4
X839	ZP224	2nd reference position reached 2nd axis $4
X83A	ZP234	2nd reference position reached 3rd axis $4
X83B	ZP244	2nd reference position reached 4th axis $4
X83C	ZP254	2nd reference position reached 5th axis $4
X83D	ZP264	2nd reference position reached 6th axis $4
X83E	ZP274	2nd reference position reached 7th axis $4
X83F	ZP284	2nd reference position reached 8th axis $4
X840	ZP311	3rd reference position reached 1st axis $1
X841	ZP321	3rd reference position reached 2nd axis $1
X842	ZP331	3rd reference position reached 3rd axis $1
X843	ZP341	3rd reference position reached 4th axis $1
X844	ZP351	3rd reference position reached 5th axis $1
X845	ZP361	3rd reference position reached 6th axis $1
X846	ZP371	3rd reference position reached 7th axis $1
X847	ZP381	3rd reference position reached 8th axis $1
X848	ZP312	3rd reference position reached 1st axis $2
X849	ZP322	3rd reference position reached 2nd axis $2
X84A	ZP332	3rd reference position reached 3rd axis $2
X84B	ZP342	3rd reference position reached 4th axis $2
X84C	ZP352	3rd reference position reached 5th axis $2
X84D	ZP362	3rd reference position reached 6th axis $2
X84E	ZP372	3rd reference position reached 7th axis $2
X84F	ZP382	3rd reference position reached 8th axis $2
X850	ZP313	3rd reference position reached 1st axis $3
X851	ZP323	3rd reference position reached 2nd axis $3
X852	ZP333	3rd reference position reached 3rd axis $3
X853	ZP343	3rd reference position reached 4th axis $3
X854	ZP353	3rd reference position reached 5th axis $3
X855	ZP363	3rd reference position reached 6th axis $3
X856	ZP373	3rd reference position reached 7th axis $3
X857	ZP383	3rd reference position reached 8th axis $3
X858	ZP314	3rd reference position reached 1st axis $4
X859	ZP324	3rd reference position reached 2nd axis $4
X85A	ZP334	3rd reference position reached 3rd axis $4
X85B	ZP344	3rd reference position reached 4th axis $4
X85C	ZP354	3rd reference position reached 5th axis $4
X85D	ZP364	3rd reference position reached 6th axis $4
X85E	ZP374	3rd reference position reached 7th axis $4
X85F	ZP384	3rd reference position reached 8th axis $4
X860	ZP411	4th reference position reached 1st axis $1
X861	ZP421	4th reference position reached 2nd axis $1
X862	ZP431	4th reference position reached 3rd axis $1
X863	ZP441	4th reference position reached 4th axis $1
X864	ZP451	4th reference position reached 5th axis $1
X865	ZP461	4th reference position reached 6th axis $1
X866	ZP471	4th reference position reached 7th axis $1
X867	ZP481	4th reference position reached 8th axis $1
X868	ZP412	4th reference position reached 1st axis $2
X869	ZP422	4th reference position reached 2nd axis $2
X86A	ZP432	4th reference position reached 3rd axis $2
X86B	ZP442	4th reference position reached 4th axis $2
X86C	ZP452	4th reference position reached 5th axis $2
X86D	ZP462	4th reference position reached 6th axis $2
X86E	ZP472	4th reference position reached 7th axis $2
X86F	ZP482	4th reference position reached 8th axis $2
X870	ZP413	4th reference position reached 1st axis $3
X871	ZP423	4th reference position reached 2nd axis $3
X872	ZP433	4th reference position reached 3rd axis $3
X873	ZP443	4th reference position reached 4th axis $3
X874	ZP453	4th reference position reached 5th axis $3
X875	ZP463	4th reference position reached 6th axis $3
X876	ZP473	4th reference position reached 7th axis $3
X877	ZP483	4th reference position reached 8th axis $3
X878	ZP414	4th reference position reached 1st axis $4
X879	ZP424	4th reference position reached 2nd axis $4
X87A	ZP434	4th reference position reached 3rd axis $4
X87B	ZP444	4th reference position reached 4th axis $4
X87C	ZP454	4th reference position reached 5th axis $4
X87D	ZP464	4th reference position reached 6th axis $4
X87E	ZP474	4th reference position reached 7th axis $4
X87F	ZP484	4th reference position reached 8th axis $4
X880	NRF11	Near reference position 1st axis $1
X881	NRF21	Near reference position 2nd axis $1
X882	NRF31	Near reference position 3rd axis $1
X883	NRF41	Near reference position 4th axis $1
X884	NRF51	Near reference position 5th axis $1
X885	NRF61	Near reference position 6th axis $1
X886	NRF71	Near reference position 7th axis $1
X887	NRF81	Near reference position 8th axis $1
X888	NRF12	Near reference position 1st axis $2

Device	Abbrev.	Signal name
X889	NRF22	Near reference position 2nd axis $2
X88A	NRF32	Near reference position 3rd axis $2
X88B	NRF42	Near reference position 4th axis $2
X88C	NRF52	Near reference position 5th axis $2
X88D	NRF62	Near reference position 6th axis $2
X88E	NRF72	Near reference position 7th axis $2
X88F	NRF82	Near reference position 8th axis $2
X890	NRF13	Near reference position 1st axis $3
X891	NRF23	Near reference position 2nd axis $3
X892	NRF33	Near reference position 3rd axis $3
X893	NRF43	Near reference position 4th axis $3
X894	NRF53	Near reference position 5th axis $3
X895	NRF63	Near reference position 6th axis $3
X896	NRF73	Near reference position 7th axis $3
X897	NRF83	Near reference position 8th axis $3
X898	NRF14	Near reference position 1st axis $4
X899	NRF24	Near reference position 2nd axis $4
X89A	NRF34	Near reference position 3rd axis $4
X89B	NRF44	Near reference position 4th axis $4
X89C	NRF54	Near reference position 5th axis $4
X89D	NRF64	Near reference position 6th axis $4
X89E	NRF74	Near reference position 7th axis $4
X89F	NRF84	Near reference position 8th axis $4
X8A0	PLFN11	Arbitrary axis superimposition complete 1st axis $1
X8A1	PLFN21	Arbitrary axis superimposition complete 2nd axis $1
X8A2	PLFN31	Arbitrary axis superimposition complete 3rd axis $1
X8A3	PLFN41	Arbitrary axis superimposition complete 4th axis $1
X8A4	PLFN51	Arbitrary axis superimposition complete 5th axis $1
X8A5	PLFN61	Arbitrary axis superimposition complete 6th axis $1
X8A6	PLFN71	Arbitrary axis superimposition complete 7th axis $1
X8A7	PLFN81	Arbitrary axis superimposition complete 8th axis $1
X8A8	PLFN12	Arbitrary axis superimposition complete 1st axis $2
X8A9	PLFN22	Arbitrary axis superimposition complete 2nd axis $2
X8AA	PLFN32	Arbitrary axis superimposition complete 3rd axis $2
X8AB	PLFN42	Arbitrary axis superimposition complete 4th axis $2
X8AC	PLFN52	Arbitrary axis superimposition complete 5th axis $2
X8AD	PLFN62	Arbitrary axis superimposition complete 6th axis $2
X8AE	PLFN72	Arbitrary axis superimposition complete 7th axis $2
X8AF	PLFN82	Arbitrary axis superimposition complete 8th axis $2
X8B0	PLFN13	Arbitrary axis superimposition complete 1st axis $3
X8B1	PLFN23	Arbitrary axis superimposition complete 2nd axis $3
X8B2	PLFN33	Arbitrary axis superimposition complete 3rd axis $3
X8B3	PLFN43	Arbitrary axis superimposition complete 4th axis $3
X8B4	PLFN53	Arbitrary axis superimposition complete 5th axis $3
X8B5	PLFN63	Arbitrary axis superimposition complete 6th axis $3
X8B6	PLFN73	Arbitrary axis superimposition complete 7th axis $3
X8B7	PLFN83	Arbitrary axis superimposition complete 8th axis $3
X8B8	PLFN14	Arbitrary axis superimposition complete 1st axis $4
X8B9	PLFN24	Arbitrary axis superimposition complete 2nd axis $4
X8BA	PLFN34	Arbitrary axis superimposition complete 3rd axis $4
X8BB	PLFN44	Arbitrary axis superimposition complete 4th axis $4
X8BC	PLFN54	Arbitrary axis superimposition complete 5th axis $4
X8BD	PLFN64	Arbitrary axis superimposition complete 6th axis $4
X8BE	PLFN74	Arbitrary axis superimposition complete 7th axis $4
X8BF	PLFN84	Arbitrary axis superimposition complete 8th axis $4
X8C0	ZSF11	Zero point initialization set completed 1st axis $1
X8C1	ZSF21	Zero point initialization set completed 2nd axis $1
X8C2	ZSF31	Zero point initialization set completed 3rd axis $1
X8C3	ZSF41	Zero point initialization set completed 4th axis $1
X8C4	ZSF51	Zero point initialization set completed 5th axis $1
X8C5	ZSF61	Zero point initialization set completed 6th axis $1
X8C6	ZSF71	Zero point initialization set completed 7th axis $1
X8C7	ZSF81	Zero point initialization set completed 8th axis $1
X8C8	ZSF12	Zero point initialization set completed 1st axis $2
X8C9	ZSF22	Zero point initialization set completed 2nd axis $2
X8CA	ZSF32	Zero point initialization set completed 3rd axis $2
X8CB	ZSF42	Zero point initialization set completed 4th axis $2
X8CC	ZSF52	Zero point initialization set completed 5th axis $2
X8CD	ZSF62	Zero point initialization set completed 6th axis $2
X8CE	ZSF72	Zero point initialization set completed 7th axis $2
X8CF	ZSF82	Zero point initialization set completed 8th axis $2
X8D0	ZSF13	Zero point initialization set completed 1st axis $3
X8D1	ZSF23	Zero point initialization set completed 2nd axis $3
X8D2	ZSF33	Zero point initialization set completed 3rd axis $3
X8D3	ZSF43	Zero point initialization set completed 4th axis $3
X8D4	ZSF53	Zero point initialization set completed 5th axis $3
X8D5	ZSF63	Zero point initialization set completed 6th axis $3
X8D6	ZSF73	Zero point initialization set completed 7th axis $3
X8D7	ZSF83	Zero point initialization set completed 8th axis $3
X8D8	ZSF14	Zero point initialization set completed 1st axis $4
X8D9	ZSF24	Zero point initialization set completed 2nd axis $4
X8DA	ZSF34	Zero point initialization set completed 3rd axis $4

Device	Abbrev.	Signal name
X8DB	ZSF44	Zero point initialization set completed 4th axis $4
X8DC	ZSF54	Zero point initialization set completed 5th axis $4
X8DD	ZSF64	Zero point initialization set completed 6th axis $4
X8DE	ZSF74	Zero point initialization set completed 7th axis $4
X8DF	ZSF84	Zero point initialization set completed 8th axis $4
X8E0	ZSE11	Zero point initialization set error completed 1st axis $1
X8E1	ZSE21	Zero point initialization set error completed 2nd axis $1
X8E2	ZSE31	Zero point initialization set error completed 3rd axis $1
X8E3	ZSE41	Zero point initialization set error completed 4th axis $1
X8E4	ZSE51	Zero point initialization set error completed 5th axis $1
X8E5	ZSE61	Zero point initialization set error completed 6th axis $1
X8E6	ZSE71	Zero point initialization set error completed 7th axis $1
X8E7	ZSE81	Zero point initialization set error completed 8th axis $1
X8E8	ZSE12	Zero point initialization set error completed 1st axis $2
X8E9	ZSE22	Zero point initialization set error completed 2nd axis $2
X8EA	ZSE32	Zero point initialization set error completed 3rd axis $2
X8EB	ZSE42	Zero point initialization set error completed 4th axis $2
X8EC	ZSE52	Zero point initialization set error completed 5th axis $2
X8ED	ZSE62	Zero point initialization set error completed 6th axis $2
X8EE	ZSE72	Zero point initialization set error completed 7th axis $2
X8EF	ZSE82	Zero point initialization set error completed 8th axis $2
X8F0	ZSE13	Zero point initialization set error completed 1st axis $3
X8F1	ZSE23	Zero point initialization set error completed 2nd axis $3
X8F2	ZSE33	Zero point initialization set error completed 3rd axis $3
X8F3	ZSE43	Zero point initialization set error completed 4th axis $3
X8F4	ZSE53	Zero point initialization set error completed 5th axis $3
X8F5	ZSE63	Zero point initialization set error completed 6th axis $3
X8F6	ZSE73	Zero point initialization set error completed 7th axis $3
X8F7	ZSE83	Zero point initialization set error completed 8th axis $3
X8F8	ZSE14	Zero point initialization set error completed 1st axis $4
X8F9	ZSE24	Zero point initialization set error completed 2nd axis $4
X8FA	ZSE34	Zero point initialization set error completed 3rd axis $4
X8FB	ZSE44	Zero point initialization set error completed 4th axis $4
X8FC	ZSE54	Zero point initialization set error completed 5th axis $4
X8FD	ZSE64	Zero point initialization set error completed 6th axis $4
X8FE	ZSE74	Zero point initialization set error completed 7th axis $4
X8FF	ZSE84	Zero point initialization set error completed 8th axis $4
X900	ILI11	In current limit 1st axis $1
X901	ILI21	In current limit 2nd axis $1
X902	ILI31	In current limit 3rd axis $1
X903	ILI41	In current limit 4th axis $1
X904	ILI51	In current limit 5th axis $1
X905	ILI61	In current limit 6th axis $1
X906	ILI71	In current limit 7th axis $1
X907	ILI81	In current limit 8th axis $1
X908	ILI12	In current limit 1st axis $2
X909	ILI22	In current limit 2nd axis $2
X90A	ILI32	In current limit 3rd axis $2
X90B	ILI42	In current limit 4th axis $2
X90C	ILI52	In current limit 5th axis $2
X90D	ILI62	In current limit 6th axis $2
X90E	ILI72	In current limit 7th axis $2
X90F	ILI82	In current limit 8th axis $2
X910	ILI13	In current limit 1st axis $3
X911	ILI23	In current limit 2nd axis $3
X912	ILI33	In current limit 3rd axis $3
X913	ILI43	In current limit 4th axis $3
X914	ILI53	In current limit 5th axis $3
X915	ILI63	In current limit 6th axis $3
X916	ILI73	In current limit 7th axis $3
X917	ILI83	In current limit 8th axis $3
X918	ILI14	In current limit 1st axis $4
X919	ILI24	In current limit 2nd axis $4
X91A	ILI34	In current limit 3rd axis $4
X91B	ILI44	In current limit 4th axis $4
X91C	ILI54	In current limit 5th axis $4
X91D	ILI64	In current limit 6th axis $4
X91E	ILI74	In current limit 7th axis $4
X91F	ILI84	In current limit 8th axis $4
X920	ILA11	Current limit reached 1st axis $1
X921	ILA21	Current limit reached 2nd axis $1
X922	ILA31	Current limit reached 3rd axis $1
X923	ILA41	Current limit reached 4th axis $1
X924	ILA51	Current limit reached 5th axis $1
X925	ILA61	Current limit reached 6th axis $1
X926	ILA71	Current limit reached 7th axis $1
X927	ILA81	Current limit reached 8th axis $1
X928	ILA12	Current limit reached 1st axis $2
X929	ILA22	Current limit reached 2nd axis $2
X92A	ILA32	Current limit reached 3rd axis $2
X92B	ILA42	Current limit reached 4th axis $2
X92C	ILA52	Current limit reached 5th axis $2

Device	Abbrev.	Signal name
X92D	ILA62	Current limit reached 6th axis $2
X92E	ILA72	Current limit reached 7th axis $2
X92F	ILA82	Current limit reached 8th axis $2
X930	ILA13	Current limit reached 1st axis $3
X931	ILA23	Current limit reached 2nd axis $3
X932	ILA33	Current limit reached 3rd axis $3
X933	ILA43	Current limit reached 4th axis $3
X934	ILA53	Current limit reached 5th axis $3
X935	ILA63	Current limit reached 6th axis $3
X936	ILA73	Current limit reached 7th axis $3
X937	ILA83	Current limit reached 8th axis $3
X938	ILA14	Current limit reached 1st axis $4
X939	ILA24	Current limit reached 2nd axis $4
X93A	ILA34	Current limit reached 3rd axis $4
X93B	ILA44	Current limit reached 4th axis $4
X93C	ILA54	Current limit reached 5th axis $4
X93D	ILA64	Current limit reached 6th axis $4
X93E	ILA74	Current limit reached 7th axis $4
X93F	ILA84	Current limit reached 8th axis $4
X940	ARRF11	NC axis up-to-speed 1st axis $1
X941	ARRF21	NC axis up-to-speed 2nd axis $1
X942	ARRF31	NC axis up-to-speed 3rd axis $1
X943	ARRF41	NC axis up-to-speed 4th axis $1
X944	ARRF51	NC axis up-to-speed 5th axis $1
X945	ARRF61	NC axis up-to-speed 6th axis $1
X946	ARRF71	NC axis up-to-speed 7th axis $1
X947	ARRF81	NC axis up-to-speed 8th axis $1
X948	ARRF12	NC axis up-to-speed 1st axis $2
X949	ARRF22	NC axis up-to-speed 2nd axis $2
X94A	ARRF32	NC axis up-to-speed 3rd axis $2
X94B	ARRF42	NC axis up-to-speed 4th axis $2
X94C	ARRF52	NC axis up-to-speed 5th axis $2
X94D	ARRF62	NC axis up-to-speed 6th axis $2
X94E	ARRF72	NC axis up-to-speed 7th axis $2
X94F	ARRF82	NC axis up-to-speed 8th axis $2
X950	ARRF13	NC axis up-to-speed 1st axis $3
X951	ARRF23	NC axis up-to-speed 2nd axis $3
X952	ARRF33	NC axis up-to-speed 3rd axis $3
X953	ARRF43	NC axis up-to-speed 4th axis $3
X954	ARRF53	NC axis up-to-speed 5th axis $3
X955	ARRF63	NC axis up-to-speed 6th axis $3
X956	ARRF73	NC axis up-to-speed 7th axis $3
X957	ARRF83	NC axis up-to-speed 8th axis $3
X958	ARRF14	NC axis up-to-speed 1st axis $4
X959	ARRF24	NC axis up-to-speed 2nd axis $4
X95A	ARRF34	NC axis up-to-speed 3rd axis $4
X95B	ARRF44	NC axis up-to-speed 4th axis $4
X95C	ARRF54	NC axis up-to-speed 5th axis $4
X95D	ARRF64	NC axis up-to-speed 6th axis $4
X95E	ARRF74	NC axis up-to-speed 7th axis $4
X95F	ARRF84	NC axis up-to-speed 8th axis $4
X960	UCLP11	Unclamp command 1st axis $1
X961	UCLP21	Unclamp command 2nd axis $1
X962	UCLP31	Unclamp command 3rd axis $1
X963	UCLP41	Unclamp command 4th axis $1
X964	UCLP51	Unclamp command 5th axis $1
X965	UCLP61	Unclamp command 6th axis $1
X966	UCLP71	Unclamp command 7th axis $1
X967	UCLP81	Unclamp command 8th axis $1
X968	UCLP12	Unclamp command 1st axis $2
X969	UCLP22	Unclamp command 2nd axis $2
X96A	UCLP32	Unclamp command 3rd axis $2
X96B	UCLP42	Unclamp command 4th axis $2
X96C	UCLP52	Unclamp command 5th axis $2
X96D	UCLP62	Unclamp command 6th axis $2
X96E	UCLP72	Unclamp command 7th axis $2
X96F	UCLP82	Unclamp command 8th axis $2
X970	UCLP13	Unclamp command 1st axis $3
X971	UCLP23	Unclamp command 2nd axis $3
X972	UCLP33	Unclamp command 3rd axis $3
X973	UCLP43	Unclamp command 4th axis $3
X974	UCLP53	Unclamp command 5th axis $3
X975	UCLP63	Unclamp command 6th axis $3
X976	UCLP73	Unclamp command 7th axis $3
X977	UCLP83	Unclamp command 8th axis $3
X978	UCLP14	Unclamp command 1st axis $4
X979	UCLP24	Unclamp command 2nd axis $4
X97A	UCLP34	Unclamp command 3rd axis $4
X97B	UCLP44	Unclamp command 4th axis $4
X97C	UCLP54	Unclamp command 5th axis $4
X97D	UCLP64	Unclamp command 6th axis $4
X97E	UCLP74	Unclamp command 7th axis $4

Device	Abbrev.	Signal name
X97F	UCLP84	Unclamp command 8th axis $4
X980		In mixed control (cross axis control) 1st axis $1
X981		In mixed control (cross axis control) 2nd axis $1
X982		In mixed control (cross axis control) 3rd axis $1
X983		In mixed control (cross axis control) 4th axis $1
X984		In mixed control (cross axis control) 5th axis $1
X985		In mixed control (cross axis control) 6th axis $1
X986		In mixed control (cross axis control) 7th axis $1
X987		In mixed control (cross axis control) 8th axis $1
X988		In mixed control (cross axis control) 1st axis $2
X989		In mixed control (cross axis control) 2nd axis $2
X98A		In mixed control (cross axis control) 3rd axis $2
X98B		In mixed control (cross axis control) 4th axis $2
X98C		In mixed control (cross axis control) 5th axis $2
X98D		In mixed control (cross axis control) 6th axis $2
X98E		In mixed control (cross axis control) 7th axis $2
X98F		In mixed control (cross axis control) 8th axis $2
X990		In mixed control (cross axis control) 1st axis $3
X991		In mixed control (cross axis control) 2nd axis $3
X992		In mixed control (cross axis control) 3rd axis $3
X993		In mixed control (cross axis control) 4th axis $3
X994		In mixed control (cross axis control) 5th axis $3
X995		In mixed control (cross axis control) 6th axis $3
X996		In mixed control (cross axis control) 7th axis $3
X997		In mixed control (cross axis control) 8th axis $3
X998		In mixed control (cross axis control) 1st axis $4
X999		In mixed control (cross axis control) 2nd axis $4
X99A		In mixed control (cross axis control) 3rd axis $4
X99B		In mixed control (cross axis control) 4th axis $4
X99C		In mixed control (cross axis control) 5th axis $4
X99D		In mixed control (cross axis control) 6th axis $4
X99E		In mixed control (cross axis control) 7th axis $4
X99F		In mixed control (cross axis control) 8th axis $4
X9A0		In synchronous/superimposition control 1st axis $1
X9A1		In synchronous/superimposition control 2nd axis $1
X9A2		In synchronous/superimposition control 3rd axis $1
X9A3		In synchronous/superimposition control 4th axis $1
X9A4		In synchronous/superimposition control 5th axis $1
X9A5		In synchronous/superimposition control 6th axis $1
X9A6		In synchronous/superimposition control 7th axis $1
X9A7		In synchronous/superimposition control 8th axis $1
X9A8		In synchronous/superimposition control 1st axis $2
X9A9		In synchronous/superimposition control 2nd axis $2
X9AA		In synchronous/superimposition control 3rd axis $2
X9AB		In synchronous/superimposition control 4th axis $2
X9AC		In synchronous/superimposition control 5th axis $2
X9AD		In synchronous/superimposition control 6th axis $2
X9AE		In synchronous/superimposition control 7th axis $2
X9AF		In synchronous/superimposition control 8th axis $2
X9B0		In synchronous/superimposition control 1st axis $3
X9B1		In synchronous/superimposition control 2nd axis $3
X9B2		In synchronous/superimposition control 3rd axis $3
X9B3		In synchronous/superimposition control 4th axis $3
X9B4		In synchronous/superimposition control 5th axis $3
X9B5		In synchronous/superimposition control 6th axis $3
X9B6		In synchronous/superimposition control 7th axis $3
X9B7		In synchronous/superimposition control 8th axis $3
X9B8		In synchronous/superimposition control 1st axis $4
X9B9		In synchronous/superimposition control 2nd axis $4
X9BA		In synchronous/superimposition control 3rd axis $4
X9BB		In synchronous/superimposition control 4th axis $4
X9BC		In synchronous/superimposition control 5th axis $4
X9BD		In synchronous/superimposition control 6th axis $4
X9BE		In synchronous/superimposition control 7th axis $4
X9BF		In synchronous/superimposition control 8th axis $4
X9C0	MIR11	In mirror image 1st axis $1
X9C1	MIR21	In mirror image 2nd axis $1
X9C2	MIR31	In mirror image 3rd axis $1
X9C3	MIR41	In mirror image 4th axis $1
X9C4	MIR51	In mirror image 5th axis $1
X9C5	MIR61	In mirror image 6th axis $1
X9C6	MIR71	In mirror image 7th axis $1
X9C7	MIR81	In mirror image 8th axis $1
X9C8	MIR12	In mirror image 1st axis $2
X9C9	MIR22	In mirror image 2nd axis $2
X9CA	MIR32	In mirror image 3rd axis $2
X9CB	MIR42	In mirror image 4th axis $2
X9CC	MIR52	In mirror image 5th axis $2
X9CD	MIR62	In mirror image 6th axis $2
X9CE	MIR72	In mirror image 7th axis $2
X9CF	MIR82	In mirror image 8th axis $2
X9D0	MIR13	In mirror image 1st axis $3

Device	Abbrev.	Signal name
X9D1	MIR23	In mirror image 2nd axis $3
X9D2	MIR33	In mirror image 3rd axis $3
X9D3	MIR43	In mirror image 4th axis $3
X9D4	MIR53	In mirror image 5th axis $3
X9D5	MIR63	In mirror image 6th axis $3
X9D6	MIR73	In mirror image 7th axis $3
X9D7	MIR83	In mirror image 8th axis $3
X9D8	MIR14	In mirror image 1st axis $4
X9D9	MIR24	In mirror image 2nd axis $4
X9DA	MIR34	In mirror image 3rd axis $4
X9DB	MIR44	In mirror image 4th axis $4
X9DC	MIR54	In mirror image 5th axis $4
X9DD	MIR64	In mirror image 6th axis $4
X9DE	MIR74	In mirror image 7th axis $4
X9DF	MIR84	In mirror image 8th axis $4
X9E0		Reference position establishment 1st axis $1
X9E1		Reference position establishment 2nd axis $1
X9E2		Reference position establishment 3rd axis $1
X9E3		Reference position establishment 4th axis $1
X9E4		Reference position establishment 5th axis $1
X9E5		Reference position establishment 6th axis $1
X9E6		Reference position establishment 7th axis $1
X9E7		Reference position establishment 8th axis $1
X9E8		Reference position establishment 1st axis $2
X9E9		Reference position establishment 2nd axis $2
X9EA		Reference position establishment 3rd axis $2
X9EB		Reference position establishment 4th axis $2
X9EC		Reference position establishment 5th axis $2
X9ED		Reference position establishment 6th axis $2
X9EE		Reference position establishment 7th axis $2
X9EF		Reference position establishment 8th axis $2
X9F0		Reference position establishment 1st axis $3
X9F1		Reference position establishment 2nd axis $3
X9F2		Reference position establishment 3rd axis $3
X9F3		Reference position establishment 4th axis $3
X9F4		Reference position establishment 5th axis $3
X9F5		Reference position establishment 6th axis $3
X9F6		Reference position establishment 7th axis $3
X9F7		Reference position establishment 8th axis $3
X9F8		Reference position establishment 1st axis $4
X9F9		Reference position establishment 2nd axis $4
X9FA		Reference position establishment 3rd axis $4
X9FB		Reference position establishment 4th axis $4
X9FC		Reference position establishment 5th axis $4
X9FD		Reference position establishment 6th axis $4
X9FE		Reference position establishment 7th axis $4
X9FF		Reference position establishment 8th axis $4
XA00		Reference position return direction 1st axis $1
XA01		Reference position return direction 2nd axis $1
XA02		Reference position return direction 3rd axis $1
XA03		Reference position return direction 4th axis $1
XA04		Reference position return direction 5th axis $1
XA05		Reference position return direction 6th axis $1
XA06		Reference position return direction 7th axis $1
XA07		Reference position return direction 8th axis $1
XA08		Reference position return direction 1st axis $2
XA09		Reference position return direction 2nd axis $2
XA0A		Reference position return direction 3rd axis $2
XA0B		Reference position return direction 4th axis $2
XA0C		Reference position return direction 5th axis $2
XA0D		Reference position return direction 6th axis $2
XA0E		Reference position return direction 7th axis $2
XA0F		Reference position return direction 8th axis $2
XA10		Reference position return direction 1st axis $3
XA11		Reference position return direction 2nd axis $3
XA12		Reference position return direction 3rd axis $3
XA13		Reference position return direction 4th axis $3
XA14		Reference position return direction 5th axis $3
XA15		Reference position return direction 6th axis $3
XA16		Reference position return direction 7th axis $3
XA17		Reference position return direction 8th axis $3
XA18		Reference position return direction 1st axis $4
XA19		Reference position return direction 2nd axis $4
XA1A		Reference position return direction 3rd axis $4
XA1B		Reference position return direction 4th axis $4
XA1C		Reference position return direction 5th axis $4
XA1D		Reference position return direction 6th axis $4
XA1E		Reference position return direction 7th axis $4
XA1F		Reference position return direction 8th axis $4
XA20		In NC axis control 1st axis $1
XA21		In NC axis control 2nd axis $1
XA22		In NC axis control 3rd axis $1

Device	Abbrev.	Signal name
XA23		In NC axis control 4th axis $1
XA24		In NC axis control 5th axis $1
XA25		In NC axis control 6th axis $1
XA26		In NC axis control 7th axis $1
XA27		In NC axis control 8th axis $1
XA28		In NC axis control 1st axis $2
XA29		In NC axis control 2nd axis $2
XA2A		In NC axis control 3rd axis $2
XA2B		In NC axis control 4th axis $2
XA2C		In NC axis control 5th axis $2
XA2D		In NC axis control 6th axis $2
XA2E		In NC axis control 7th axis $2
XA2F		In NC axis control 8th axis $2
XA30		In NC axis control 1st axis $3
XA31		In NC axis control 2nd axis $3
XA32		In NC axis control 3rd axis $3
XA33		In NC axis control 4th axis $3
XA34		In NC axis control 5th axis $3
XA35		In NC axis control 6th axis $3
XA36		In NC axis control 7th axis $3
XA37		In NC axis control 8th axis $3
XA38		In NC axis control 1st axis $4
XA39		In NC axis control 2nd axis $4
XA3A		In NC axis control 3rd axis $4
XA3B		In NC axis control 4th axis $4
XA3C		In NC axis control 5th axis $4
XA3D		In NC axis control 6th axis $4
XA3E		In NC axis control 7th axis $4
XA3F		In NC axis control 8th axis $4
XA40	ECIL11	Ext. machine coordinate system offset data illegal 1st axis $1
XA41	ECIL21	Ext. machine coordinate system offset data illegal 2nd axis $1
XA42	ECIL31	Ext. machine coordinate system offset data illegal 3rd axis $1
XA43	ECIL41	Ext. machine coordinate system offset data illegal 4th axis $1
XA44	ECIL51	Ext. machine coordinate system offset data illegal 5th axis $1
XA45	ECIL61	Ext. machine coordinate system offset data illegal 6th axis $1
XA46	ECIL71	Ext. machine coordinate system offset data illegal 7th axis $1
XA47	ECIL81	Ext. machine coordinate system offset data illegal 8th axis $1
XA48	ECIL12	Ext. machine coordinate system offset data illegal 1st axis $2
XA49	ECIL22	Ext. machine coordinate system offset data illegal 2nd axis $2
XA4A	ECIL32	Ext. machine coordinate system offset data illegal 3rd axis $2
XA4B	ECIL42	Ext. machine coordinate system offset data illegal 4th axis $2
XA4C	ECIL52	Ext. machine coordinate system offset data illegal 5th axis $2
XA4D	ECIL62	Ext. machine coordinate system offset data illegal 6th axis $2
XA4E	ECIL72	Ext. machine coordinate system offset data illegal 7th axis $2
XA4F	ECIL82	Ext. machine coordinate system offset data illegal 8th axis $2
XA50	ECIL13	Ext. machine coordinate system offset data illegal 1st axis $3
XA51	ECIL23	Ext. machine coordinate system offset data illegal 2nd axis $3
XA52	ECIL33	Ext. machine coordinate system offset data illegal 3rd axis $3
XA53	ECIL43	Ext. machine coordinate system offset data illegal 4th axis $3
XA54	ECIL53	Ext. machine coordinate system offset data illegal 5th axis $3
XA55	ECIL63	Ext. machine coordinate system offset data illegal 6th axis $3
XA56	ECIL73	Ext. machine coordinate system offset data illegal 7th axis $3
XA57	ECIL83	Ext. machine coordinate system offset data illegal 8th axis $3
XA58	ECIL14	Ext. machine coordinate system offset data illegal 1st axis $4
XA59	ECIL24	Ext. machine coordinate system offset data illegal 2nd axis $4
XA5A	ECIL34	Ext. machine coordinate system offset data illegal 3rd axis $4
XA5B	ECIL44	Ext. machine coordinate system offset data illegal 4th axis $4
XA5C	ECIL54	Ext. machine coordinate system offset data illegal 5th axis $4
XA5D	ECIL64	Ext. machine coordinate system offset data illegal 6th axis $4
XA5E	ECIL74	Ext. machine coordinate system offset data illegal 7th axis $4
XA5F	ECIL84	Ext. machine coordinate system offset data illegal 8th axis $4
XA60		Vertical axis pull-up prevented 1st axis $1
XA61		Vertical axis pull-up prevented 2nd axis $1
XA62		Vertical axis pull-up prevented 3rd axis $1
XA63		Vertical axis pull-up prevented 4th axis $1
XA64		Vertical axis pull-up prevented 5th axis $1
XA65		Vertical axis pull-up prevented 6th axis $1
XA66		Vertical axis pull-up prevented 7th axis $1
XA67		Vertical axis pull-up prevented 8th axis $1
XA68		Vertical axis pull-up prevented 1st axis $2
XA69		Vertical axis pull-up prevented 2nd axis $2
XA6A		Vertical axis pull-up prevented 3rd axis $2
XA6B		Vertical axis pull-up prevented 4th axis $2
XA6C		Vertical axis pull-up prevented 5th axis $2
XA6D		Vertical axis pull-up prevented 6th axis $2
XA6E		Vertical axis pull-up prevented 7th axis $2
XA6F		Vertical axis pull-up prevented 8th axis $2
XA70		Vertical axis pull-up prevented 1st axis $3
XA71		Vertical axis pull-up prevented 2nd axis $3
XA72		Vertical axis pull-up prevented 3rd axis $3
XA73		Vertical axis pull-up prevented 4th axis $3
XA74		Vertical axis pull-up prevented 5th axis $3

Device	Abbrev.	Signal name
XA75		Vertical axis pull-up prevented 6th axis $3
XA76		Vertical axis pull-up prevented 7th axis $3
XA77		Vertical axis pull-up prevented 8th axis $3
XA78		Vertical axis pull-up prevented 1st axis $4
XA79		Vertical axis pull-up prevented 2nd axis $4
XA7A		Vertical axis pull-up prevented 3rd axis $4
XA7B		Vertical axis pull-up prevented 4th axis $4
XA7C		Vertical axis pull-up prevented 5th axis $4
XA7D		Vertical axis pull-up prevented 6th axis $4
XA7E		Vertical axis pull-up prevented 7th axis $4
XA7F		Vertical axis pull-up prevented 8th axis $4
XA80		Mirror image status 1st axis $1 ▲
XA81		Mirror image status 2nd axis $1 ▲
XA82		Mirror image status 3rd axis $1 ▲
XA83		Mirror image status 4th axis $1 ▲
XA84		Mirror image status 5th axis $1 ▲
XA85		Mirror image status 6th axis $1 ▲
XA86		Mirror image status 7th axis $1 ▲
XA87		Mirror image status 8th axis $1 ▲
XA88		Mirror image status 1st axis $2 ▲
XA89		Mirror image status 2nd axis $2 ▲
XA8A		Mirror image status 3rd axis $2 ▲
XA8B		Mirror image status 4th axis $2 ▲
XA8C		Mirror image status 5th axis $2 ▲
XA8D		Mirror image status 6th axis $2 ▲
XA8E		Mirror image status 7th axis $2 ▲
XA8F		Mirror image status 8th axis $2 ▲
XA90		Mirror image status 1st axis $3 ▲
XA91		Mirror image status 2nd axis $3 ▲
XA92		Mirror image status 3rd axis $3 ▲
XA93		Mirror image status 4th axis $3 ▲
XA94		Mirror image status 5th axis $3 ▲
XA95		Mirror image status 6th axis $3 ▲
XA96		Mirror image status 7th axis $3 ▲
XA97		Mirror image status 8th axis $3 ▲
XA98		Mirror image status 1st axis $4 ▲
XA99		Mirror image status 2nd axis $4 ▲
XA9A		Mirror image status 3rd axis $4 ▲
XA9B		Mirror image status 4th axis $4 ▲
XA9C		Mirror image status 5th axis $4 ▲
XA9D		Mirror image status 6th axis $4 ▲
XA9E		Mirror image status 7th axis $4 ▲
XA9F		Mirror image status 8th axis $4 ▲
XB00	CLP11	Clamp command 1st axis $1
XB01	CLP21	Clamp command 2nd axis $1
XB02	CLP31	Clamp command 3rd axis $1
XB03	CLP41	Clamp command 4th axis $1
XB04	CLP51	Clamp command 5th axis $1
XB05	CLP61	Clamp command 6th axis $1
XB06	CLP71	Clamp command 7th axis $1
XB07	CLP81	Clamp command 8th axis $1
XB08	CLP12	Clamp command 1st axis $2
XB09	CLP22	Clamp command 2nd axis $2
XB0A	CLP32	Clamp command 3rd axis $2
XB0B	CLP42	Clamp command 4th axis $2
XB0C	CLP52	Clamp command 5th axis $2
XB0D	CLP62	Clamp command 6th axis $2
XB0E	CLP72	Clamp command 7th axis $2
XB0F	CLP82	Clamp command 8th axis $2
XB10	CLP13	Clamp command 1st axis $3
XB11	CLP23	Clamp command 2nd axis $3
XB12	CLP33	Clamp command 3rd axis $3
XB13	CLP43	Clamp command 4th axis $3
XB14	CLP53	Clamp command 5th axis $3
XB15	CLP63	Clamp command 6th axis $3
XB16	CLP73	Clamp command 7th axis $3
XB17	CLP83	Clamp command 8th axis $3
XB18	CLP14	Clamp command 1st axis $4
XB19	CLP24	Clamp command 2nd axis $4
XB1A	CLP34	Clamp command 3rd axis $4
XB1B	CLP44	Clamp command 4th axis $4
XB1C	CLP54	Clamp command 5th axis $4
XB1D	CLP64	Clamp command 6th axis $4
XB1E	CLP74	Clamp command 7th axis $4
XB1F	CLP84	Clamp command 8th axis $4
XB40	ROTSPM11	Spindle-mode rotary axis control mode 1st axis $1
XB41	ROTSPM21	Spindle-mode rotary axis control mode 2nd axis $1
XB42	ROTSPM31	Spindle-mode rotary axis control mode 3rd axis $1
XB43	ROTSPM41	Spindle-mode rotary axis control mode 4th axis $1
XB44	ROTSPM51	Spindle-mode rotary axis control mode 5th axis $1
XB45	ROTSPM61	Spindle-mode rotary axis control mode 6th axis $1
XB46	ROTSPM71	Spindle-mode rotary axis control mode 7th axis $1

Device	Abbrev.	Signal name
XB47	ROTSPM81	Spindle-mode rotary axis control mode 8th axis $1
XB48	ROTSPM12	Spindle-mode rotary axis control mode 1st axis $2
XB49	ROTSPM22	Spindle-mode rotary axis control mode 2nd axis $2
XB4A	ROTSPM32	Spindle-mode rotary axis control mode 3rd axis $2
XB4B	ROTSPM42	Spindle-mode rotary axis control mode 4th axis $2
XB4C	ROTSPM52	Spindle-mode rotary axis control mode 5th axis $2
XB4D	ROTSPM62	Spindle-mode rotary axis control mode 6th axis $2
XB4E	ROTSPM72	Spindle-mode rotary axis control mode 7th axis $2
XB4F	ROTSPM82	Spindle-mode rotary axis control mode 8th axis $2
XB50	ROTSPM13	Spindle-mode rotary axis control mode 1st axis $3
XB51	ROTSPM23	Spindle-mode rotary axis control mode 2nd axis $3
XB52	ROTSPM33	Spindle-mode rotary axis control mode 3rd axis $3
XB53	ROTSPM43	Spindle-mode rotary axis control mode 4th axis $3
XB54	ROTSPM53	Spindle-mode rotary axis control mode 5th axis $3
XB55	ROTSPM63	Spindle-mode rotary axis control mode 6th axis $3
XB56	ROTSPM73	Spindle-mode rotary axis control mode 7th axis $3
XB57	ROTSPM83	Spindle-mode rotary axis control mode 8th axis $3
XB58	ROTSPM14	Spindle-mode rotary axis control mode 1st axis $4
XB59	ROTSPM24	Spindle-mode rotary axis control mode 2nd axis $4
XB5A	ROTSPM34	Spindle-mode rotary axis control mode 3rd axis $4
XB5B	ROTSPM44	Spindle-mode rotary axis control mode 4th axis $4
XB5C	ROTSPM54	Spindle-mode rotary axis control mode 5th axis $4
XB5D	ROTSPM64	Spindle-mode rotary axis control mode 6th axis $4
XB5E	ROTSPM74	Spindle-mode rotary axis control mode 7th axis $4
XB5F	ROTSPM84	Spindle-mode rotary axis control mode 8th axis $4
XB60	AXINP11	Each axis in-position 1st axis $1
XB61	AXINP21	Each axis in-position 2nd axis $1
XB62	AXINP31	Each axis in-position 3rd axis $1
XB63	AXINP41	Each axis in-position 4th axis $1
XB64	AXINP51	Each axis in-position 5th axis $1
XB65	AXINP61	Each axis in-position 6th axis $1
XB66	AXINP71	Each axis in-position 7th axis $1
XB67	AXINP81	Each axis in-position 8th axis $1
XB68	AXINP12	Each axis in-position 1st axis $2
XB69	AXINP22	Each axis in-position 2nd axis $2
XB6A	AXINP32	Each axis in-position 3rd axis $2
XB6B	AXINP42	Each axis in-position 4th axis $2
XB6C	AXINP52	Each axis in-position 5th axis $2
XB6D	AXINP62	Each axis in-position 6th axis $2
XB6E	AXINP72	Each axis in-position 7th axis $2
XB6F	AXINP82	Each axis in-position 8th axis $2
XB70	AXINP13	Each axis in-position 1st axis $3
XB71	AXINP23	Each axis in-position 2nd axis $3
XB72	AXINP33	Each axis in-position 3rd axis $3
XB73	AXINP43	Each axis in-position 4th axis $3
XB74	AXINP53	Each axis in-position 5th axis $3
XB75	AXINP63	Each axis in-position 6th axis $3
XB76	AXINP73	Each axis in-position 7th axis $3
XB77	AXINP83	Each axis in-position 8th axis $3
XB78	AXINP14	Each axis in-position 1st axis $4
XB79	AXINP24	Each axis in-position 2nd axis $4
XB7A	AXINP34	Each axis in-position 3rd axis $4
XB7B	AXINP44	Each axis in-position 4th axis $4
XB7C	AXINP54	Each axis in-position 5th axis $4
XB7D	AXINP64	Each axis in-position 6th axis $4
XB7E	AXINP74	Each axis in-position 7th axis $4
XB7F	AXINP84	Each axis in-position 8th axis $4
XB80	VGHLD11	Real-time tuning 1: Speed control gain changeover hold-down ON 1st axis $1
XB81	VGHLD21	Real-time tuning 1: Speed control gain changeover hold-down ON 2nd axis $1
XB82	VGHLD31	Real-time tuning 1: Speed control gain changeover hold-down ON 3rd axis $1
XB83	VGHLD41	Real-time tuning 1: Speed control gain changeover hold-down ON 4th axis $1
XB84	VGHLD51	Real-time tuning 1: Speed control gain changeover hold-down ON 5th axis $1
XB85	VGHLD61	Real-time tuning 1: Speed control gain changeover hold-down ON 6th axis $1
XB86	VGHLD71	Real-time tuning 1: Speed control gain changeover hold-down ON 7th axis $1
XB87	VGHLD81	Real-time tuning 1: Speed control gain changeover hold-down ON 8th axis $1
XB88	VGHLD12	Real-time tuning 1: Speed control gain changeover hold-down ON 1st axis $2
XB89	VGHLD22	Real-time tuning 1: Speed control gain changeover hold-down ON 2nd axis $2
XB8A	VGHLD32	Real-time tuning 1: Speed control gain changeover hold-down ON 3rd axis $2
XB8B	VGHLD42	Real-time tuning 1: Speed control gain changeover hold-down ON 4th axis $2
XB8C	VGHLD52	Real-time tuning 1: Speed control gain changeover hold-down ON 5th axis $2
XB8D	VGHLD62	Real-time tuning 1: Speed control gain changeover hold-down ON 6th axis $2
XB8E	VGHLD72	Real-time tuning 1: Speed control gain changeover hold-down ON 7th axis $2
XB8F	VGHLD82	Real-time tuning 1: Speed control gain changeover hold-down ON 8th axis $2
XB90	VGHLD13	Real-time tuning 1: Speed control gain changeover hold-down ON 1st axis $3
XB91	VGHLD23	Real-time tuning 1: Speed control gain changeover hold-down ON 2nd axis $3
XB92	VGHLD33	Real-time tuning 1: Speed control gain changeover hold-down ON 3rd axis $3
XB93	VGHLD43	Real-time tuning 1: Speed control gain changeover hold-down ON 4th axis $3
XB94	VGHLD53	Real-time tuning 1: Speed control gain changeover hold-down ON 5th axis $3
XB95	VGHLD63	Real-time tuning 1: Speed control gain changeover hold-down ON 6th axis $3
XB96	VGHLD73	Real-time tuning 1: Speed control gain changeover hold-down ON 7th axis $3
XB97	VGHLD83	Real-time tuning 1: Speed control gain changeover hold-down ON 8th axis $3
XB98	VGHLD14	Real-time tuning 1: Speed control gain changeover hold-down ON 1st axis $4

Device	Abbrev.	Signal name
XB99	VGHLD24	Real-time tuning 1: Speed control gain changeover hold-down ON 2nd axis $4
XB9A	VGHLD34	Real-time tuning 1: Speed control gain changeover hold-down ON 3rd axis $4
XB9B	VGHLD44	Real-time tuning 1: Speed control gain changeover hold-down ON 4th axis $4
XB9C	VGHLD54	Real-time tuning 1: Speed control gain changeover hold-down ON 5th axis $4
XB9D	VGHLD64	Real-time tuning 1: Speed control gain changeover hold-down ON 6th axis $4
XB9E	VGHLD74	Real-time tuning 1: Speed control gain changeover hold-down ON 7th axis $4
XB9F	VGHLD84	Real-time tuning 1: Speed control gain changeover hold-down ON 8th axis $4
XBA0	NPCHGIS11	NC axis/PLC axis switchover invalid status 1st axis $1
XBA1	NPCHGIS21	NC axis/PLC axis switchover invalid status 2nd axis $1
XBA2	NPCHGIS31	NC axis/PLC axis switchover invalid status 3rd axis $1
XBA3	NPCHGIS41	NC axis/PLC axis switchover invalid status 4th axis $1
XBA4	NPCHGIS51	NC axis/PLC axis switchover invalid status 5th axis $1
XBA5	NPCHGIS61	NC axis/PLC axis switchover invalid status 6th axis $1
XBA6	NPCHGIS71	NC axis/PLC axis switchover invalid status 7th axis $1
XBA7	NPCHGIS81	NC axis/PLC axis switchover invalid status 8th axis $1
XBA8	NPCHGIS12	NC axis/PLC axis switchover invalid status 1st axis $2
XBA9	NPCHGIS22	NC axis/PLC axis switchover invalid status 2nd axis $2
XBAA	NPCHGIS32	NC axis/PLC axis switchover invalid status 3rd axis $2
XBAB	NPCHGIS42	NC axis/PLC axis switchover invalid status 4th axis $2
XBAC	NPCHGIS52	NC axis/PLC axis switchover invalid status 5th axis $2
XBAD	NPCHGIS62	NC axis/PLC axis switchover invalid status 6th axis $2
XBAE	NPCHGIS72	NC axis/PLC axis switchover invalid status 7th axis $2
XBAF	NPCHGIS82	NC axis/PLC axis switchover invalid status 8th axis $2
XBB0	NPCHGIS13	NC axis/PLC axis switchover invalid status 1st axis $3
XBB1	NPCHGIS23	NC axis/PLC axis switchover invalid status 2nd axis $3
XBB2	NPCHGIS33	NC axis/PLC axis switchover invalid status 3rd axis $3
XBB3	NPCHGIS43	NC axis/PLC axis switchover invalid status 4th axis $3
XBB4	NPCHGIS53	NC axis/PLC axis switchover invalid status 5th axis $3
XBB5	NPCHGIS63	NC axis/PLC axis switchover invalid status 6th axis $3
XBB6	NPCHGIS73	NC axis/PLC axis switchover invalid status 7th axis $3
XBB7	NPCHGIS83	NC axis/PLC axis switchover invalid status 8th axis $3
XBB8	NPCHGIS14	NC axis/PLC axis switchover invalid status 1st axis $4
XBB9	NPCHGIS24	NC axis/PLC axis switchover invalid status 2nd axis $4
XBBA	NPCHGIS34	NC axis/PLC axis switchover invalid status 3rd axis $4
XBBB	NPCHGIS44	NC axis/PLC axis switchover invalid status 4th axis $4
XBBC	NPCHGIS54	NC axis/PLC axis switchover invalid status 5th axis $4
XBBD	NPCHGIS64	NC axis/PLC axis switchover invalid status 6th axis $4
XBBE	NPCHGIS74	NC axis/PLC axis switchover invalid status 7th axis $4
XBBF	NPCHGIS84	NC axis/PLC axis switchover invalid status 8th axis $4
XBC0	NPCHGMOD11	NC axis/PLC axis switchover 1st axis in process $1
XBC1	NPCHGMOD21	NC axis/PLC axis switchover 2nd axis in process $1
XBC2	NPCHGMOD31	NC axis/PLC axis switchover 3rd axis in process $1
XBC3	NPCHGMOD41	NC axis/PLC axis switchover 4th axis in process $1
XBC4	NPCHGMOD51	NC axis/PLC axis switchover 5th axis in process $1
XBC5	NPCHGMOD61	NC axis/PLC axis switchover 6th axis in process $1
XBC6	NPCHGMOD71	NC axis/PLC axis switchover 7th axis in process $1
XBC7	NPCHGMOD81	NC axis/PLC axis switchover 8th axis in process $1
XBC8	NPCHGMOD12	NC axis/PLC axis switchover 1st axis in process $2
XBC9	NPCHGMOD22	NC axis/PLC axis switchover 2nd axis in process $2
XBCA	NPCHGMOD32	NC axis/PLC axis switchover 3rd axis in process $2
XBCB	NPCHGMOD42	NC axis/PLC axis switchover 4th axis in process $2
XBCC	NPCHGMOD52	NC axis/PLC axis switchover 5th axis in process $2
XBCD	NPCHGMOD62	NC axis/PLC axis switchover 6th axis in process $2
XBCE	NPCHGMOD72	NC axis/PLC axis switchover 7th axis in process $2
XBCF	NPCHGMOD82	NC axis/PLC axis switchover 8th axis in process $2
XBD0	NPCHGMOD13	NC axis/PLC axis switchover 1st axis in process $3
XBD1	NPCHGMOD23	NC axis/PLC axis switchover 2nd axis in process $3
XBD2	NPCHGMOD33	NC axis/PLC axis switchover 3rd axis in process $3
XBD3	NPCHGMOD43	NC axis/PLC axis switchover 4th axis in process $3
XBD4	NPCHGMOD53	NC axis/PLC axis switchover 5th axis in process $3
XBD5	NPCHGMOD63	NC axis/PLC axis switchover 6th axis in process $3
XBD6	NPCHGMOD73	NC axis/PLC axis switchover 7th axis in process $3
XBD7	NPCHGMOD83	NC axis/PLC axis switchover 8th axis in process $3
XBD8	NPCHGMOD14	NC axis/PLC axis switchover 1st axis in process $4
XBD9	NPCHGMOD24	NC axis/PLC axis switchover 2nd axis in process $4
XBDA	NPCHGMOD34	NC axis/PLC axis switchover 3rd axis in process $4
XBDB	NPCHGMOD44	NC axis/PLC axis switchover 4th axis in process $4
XBDC	NPCHGMOD54	NC axis/PLC axis switchover 5th axis in process $4
XBDD	NPCHGMOD64	NC axis/PLC axis switchover 6th axis in process $4
XBDE	NPCHGMOD74	NC axis/PLC axis switchover 7th axis in process $4
XBDF	NPCHGMOD84	NC axis/PLC axis switchover 8th axis in process $4
XBE0	GQEMGO11	Machine group-based alarm stop: Machine group-based PLC interlock ON 1st axis $1
XBE1	GQEMGO21	Machine group-based alarm stop: Machine group-based PLC interlock ON 2nd axis $1
XBE2	GQEMGO31	Machine group-based alarm stop: Machine group-based PLC interlock ON 3rd axis $1
XBE3	GQEMGO41	Machine group-based alarm stop: Machine group-based PLC interlock ON 4th axis $1
XBE4	GQEMGO51	Machine group-based alarm stop: Machine group-based PLC interlock ON 5th axis $1
XBE5	GQEMGO61	Machine group-based alarm stop: Machine group-based PLC interlock ON 6th axis $1

Device	Abbrev.	Signal name
XBE6	GQEMGO71	Machine group-based alarm stop: Machine group-based PLC interlock ON 7th axis $1
XBE7	GQEMGO81	Machine group-based alarm stop: Machine group-based PLC interlock ON 8th axis $1
XBE8	GQEMGO12	Machine group-based alarm stop: Machine group-based PLC interlock ON 1st axis $2
XBE9	GQEMGO22	Machine group-based alarm stop: Machine group-based PLC interlock ON 2nd axis $2
XBEA	GQEMGO32	Machine group-based alarm stop: Machine group-based PLC interlock ON 3rd axis $2
XBEB	GQEMGO42	Machine group-based alarm stop: Machine group-based PLC interlock ON 4th axis $2
XBEC	GQEMGO52	Machine group-based alarm stop: Machine group-based PLC interlock ON 5th axis $2
XBED	GQEMGO62	Machine group-based alarm stop: Machine group-based PLC interlock ON 6th axis $2
XBEE	GQEMGO72	Machine group-based alarm stop: Machine group-based PLC interlock ON 7th axis $2
XBEF	GQEMGO82	Machine group-based alarm stop: Machine group-based PLC interlock ON 8th axis $2
XBF0	GQEMGO13	Machine group-based alarm stop: Machine group-based PLC interlock ON 1st axis $3
XBF1	GQEMGO23	Machine group-based alarm stop: Machine group-based PLC interlock ON 2nd axis $3
XBF2	GQEMGO33	Machine group-based alarm stop: Machine group-based PLC interlock ON 3rd axis $3
XBF3	GQEMGO43	Machine group-based alarm stop: Machine group-based PLC interlock ON 4th axis $3
XBF4	GQEMGO53	Machine group-based alarm stop: Machine group-based PLC interlock ON 5th axis $3
XBF5	GQEMGO63	Machine group-based alarm stop: Machine group-based PLC interlock ON 6th axis $3
XBF6	GQEMGO73	Machine group-based alarm stop: Machine group-based PLC interlock ON 7th axis $3
XBF7	GQEMGO83	Machine group-based alarm stop: Machine group-based PLC interlock ON 8th axis $3
XBF8	GQEMGO14	Machine group-based alarm stop: Machine group-based PLC interlock ON 1st axis $4
XBF9	GQEMGO24	Machine group-based alarm stop: Machine group-based PLC interlock ON 2nd axis $4
XBFA	GQEMGO34	Machine group-based alarm stop: Machine group-based PLC interlock ON 3rd axis $4
XBFB	GQEMGO44	Machine group-based alarm stop: Machine group-based PLC interlock ON 4th axis $4
XBFC	GQEMGO54	Machine group-based alarm stop: Machine group-based PLC interlock ON 5th axis $4
XBFD	GQEMGO64	Machine group-based alarm stop: Machine group-based PLC interlock ON 6th axis $4
XBFE	GQEMGO74	Machine group-based alarm stop: Machine group-based PLC interlock ON 7th axis $4
XBFF	GQEMGO84	Machine group-based alarm stop: Machine group-based PLC interlock ON 8th axis $4
XC00	JO1	In jog mode $1
XC01	HO1	In handle mode $1
XC02	SO1	In incremental mode $1
XC03	PTPO1	In manual arbitrary feed mode $1
XC04	ZRNO1	In reference position return mode $1
XC05	ASTO1	In automatic initial set mode $1
XC06		In JOG-handle simultaneous mode $1
XC08	MEMO1	In memory mode $1
XC09	TO1	In tape mode $1
XC0A		In online operation mode $1
XC0B	DO1	In MDI mode $1
XC0E	SBSMO1	Sub part system control: Sub part system control I mode ON $1
XC10	MA1	Controller ready completion $1
XC11	SA1	Servo ready completion $1
XC12	OP1	In automatic operation "run" $1
XC13	STL1	In automatic operation "start" $1
XC14	SPL1	In automatic operation "pause" $1
XC15	RST1	In "reset" $1
XC16	CXN1	In manual arbitrary feed $1
XC17	RWD1	In rewind $1
XC18	DEN1	Motion command completion $1
XC19	TIMP1	All axes in-position $1
XC1A	TSMZ1	All axes smoothing zero $1
XC1C	CXFIN1	Manual arbitrary feed completion $1
XC1D		External search finished $1
XC1F		In high-speed machining mode (G05) $1
XC20	RPN1	In rapid traverse $1
XC21	CUT1	In cutting feed $1
XC22	TAP1	In tapping $1
XC23	THRD1	In thread cutting $1
XC24	SYN1	In synchronous feed $1
XC25	CSS1	In constant surface speed $1
XC26	SKIP1	In skip $1
XC27	ZRNN1	In reference position return $1
XC28	INCH1	In inch unit selection $1
XC29	DLKN1	In display lock $1

Device	Abbrev.	Signal name
XC2A	F1DN1	F 1-digit commanded $1
XC2B	TLFO1	In tool life management $1
XC2C		Tool life management: Temporary cancel of tool life expiration ON $1
XC2D		Tool life management: Temporary cancel of tool group life expiration ON $1
XC2E	TLOV1	Tool life over $1
XC2F		Tool group life over $1
XC30	F111	F1-digit No. code 1 $1
XC31	F121	F1-digit No. code 2 $1
XC32	F141	F1-digit No. code 4 $1
XC33	F181	F1-digit No. code 8 $1
XC34		Timing synchronization between part systems $1
XC35	PCINO1	In PLC interrupt $1
XC37	ASLE1	Illegal axis selected $1
XC40	DM001	M code independent output M00 $1
XC41	DM011	M code independent output M01 $1
XC42	DM021	M code independent output M02 $1
XC43	DM301	M code independent output M30 $1
XC48		In manual speed command valid $1
XC49	MMS1	Manual numerical command $1
XC4A		In tool escape and return mode $1
XC4E	SBS1	Sub part system control: Sub part system processing $1
XC4F		In circular feed in manual mode $1
XC53	TRTN21	In tool retract and return 2 mode $1 ▲
XC5F		Coordinate rotation by parameter: Manual feed coordinate system $1
XC60	MF11	M function strobe 1 $1
XC61	MF21	M function strobe 2 $1
XC62	MF31	M function strobe 3 $1
XC63	MF41	M function strobe 4 $1
XC64	SF11	S function strobe 1 $1
XC65	SF21	S function strobe 2 $1
XC66	SF31	S function strobe 3 $1
XC67	SF41	S function strobe 4 $1
XC68	TF11	T function strobe 1 $1
XC69	TF21	T function strobe 2 $1
XC6A	TF31	T function strobe 3 $1
XC6B	TF41	T function strobe 4 $1
XC6C	BF11	2nd M function strobe 1 $1
XC6D	BF21	2nd M function strobe 2 $1
XC6E	BF31	2nd M function strobe 3 $1
XC6F	BF41	2nd M function strobe 4 $1
XC70	SF51	S function strobe 5 $1
XC71	SF61	S function strobe 6 $1
XC72	SF71	S function strobe 7 $1
XC73	SF81	S function strobe 8 $1
XC7F	CHPRCC1	Chopping compensation update prevented $1
XC80	CHOP1	In chopping start $1
XC81	CHP11	Basic position -> upper dead point path flag $1
XC82	CHP21	Upper dead point -> bottom dead point path flag $1
XC83	CHP31	Bottom dead point -> upper dead point path flag $1
XC84	CHP41	Upper dead point -> basic position path flag $1
XC85	CHPMD1	In chopping mode $1
XC86		Stroke compensation completion $1
XC87		Tool escape and return transit point recognition completed $1
XC8A	SSE1	Search & start Error $1
XC8B	SSG1	Search & start Search $1
XC93	TCP1	Tool change position return completion $1
XC94	TCRQ1	New tool change $1
XC95		All spindles simultaneous control (G47.1) $1
XC96		Life prediction $1
XC98	AL11	NC alarm 1 $1
XC99	AL21	NC alarm 2 (Servo alarm) $1
XC9A	AL31	NC alarm 3 (Program error) $1
XC9B	AL41	NC alarm 4 (Operation error) $1
XC9C	WR11	NC warning (Servo warning) $1
XCA0		Load monitor I : Teaching/Monitor mode in execution $1 ▲
XCA1		Load monitor I : Teaching mode valid $1 ▲
XCA2		Load monitor I : Monitor mode valid $1 ▲
XCA3		Load monitor I : Adaptive control in execution $1 ▲
XCA4	FFCO1	Thread cutting: Feed-forward control ON $1
XCA5	TRVE1	Tap retract possible $1
XCA6	PCNT1	No. of work machining over $1
XCA7	ABSW1	Absolute position warning $1
XCA9		In axis name switch $1
XCAA		Optimum acceleration/deceleration parameter switch completion [axis] $1 ▲
XCAB	ESTSVIN1	Optimum acceleration/deceleration selection : NC axis inertia estimation in progress $1 ▲
XCAC	GETSVAF1	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency acquisition in progress $1 ▲
XCAD	VFTCIS1	Variable feed thread cutting invalid state $1 ▲
XCAE	HOBRTM1	Hob machining: retracting $1
XCAF	HOBRTF1	Hob machining: retract complete $1
XCB0		In spindle-NC axis polygon mode $1
XCB1	AL51	NC alarm 5 $1

Device	Abbrev.	Signal name
XCB2		In spindle-spindle polygon mode $1
XCB3		Spindle-spindle polygon synchronization completion $1
XCB9		In 3-dimensional coordinate conversion $1
XCC0	RTAP1	In synchronized tapping selection (M command) $1
XCC1		In small diameter deep hole cycle $1
XCC2		High-speed retract function valid state $1 ▲
XCC3		In high-speed retract function operation $1 ▲
XCC8		In barrier valid (left) $1
XCC9		In barrier valid (right) $1
XCCA	TLMSFIN1	Tool length measurement completion $1 ▲
XCCB	TLMSERR1	Tool length measurement error $1 ▲
XCCE	TLMSSELO1	Tool length measurement sub-side selected $1 ▲
XCCF		Tool retract position reached $1 ▲
XCD0	TRME1	With tool retract amount command $1 ▲
XCD1	TRRP1	In tool repositioning $1 ▲
XCD8		Door open enable $1
XCE8		Door open enable (2 channels per 1 part system) $1
XCEA		External search: Program return completed $1
XCED		Optimum machining diagnosis in progress $1 ▲
XCEE		Load monitor I : Cutting torque estimation in progress $1 ▲
XCEF		Load monitor I : Cutting torque estimation completed $1 ▲
XCF0	PFCHS1	Program format switch in progress $1 [M8]
XCF9	GLMT1	Torque limitation skip: G160 torque limit ON $1
XD0B	G0AC1	Rapid traverse time constant: In switchover $1
XD0C	RT2CHG1	Real-time tuning 2: Acceleration/deceleration time constant in switchover $1
XD14		3D coordinate conversion : Manual feed valid $1 [M8]
XD15	RCEI1	Rotation center error compensation in progress $1
XD17	SECI1	Spatial error compensation in progress $1 [M8]
XD18	MJST1	Tool axis coordinate system in 3D manual feed (JOG, INC) $1
XD19	MJSB1	Table coordinate system in 3D manual feed (JOG, INC) $1
XD1A	MJSF1	Feature coordinate system in 3D manual feed (JOG, INC) $1
XD1B	MH1ST1	Tool axis coordinate system in 3D manual feed (1st handle) $1
XD1C	MH1SB1	Table coordinate system in 3D manual feed (1st handle) $1
XD1D	MH1SF1	Feature coordinate system in 3D manual feed (1st handle) $1
XD1E	MH2ST1	Tool axis coordinate system in 3D manual feed (2nd handle) $1
XD1F	MH2SB1	Table coordinate system in 3D manual feed (2nd handle) $1
XD20	MH2SF1	Feature coordinate system in 3D manual feed (2nd handle) $1
XD21	MH3ST1	Tool axis coordinate system in 3D manual feed (3rd handle) $1
XD22	MH3SB1	Table coordinate system in 3D manual feed (3rd handle) $1
XD23	MH3SF1	Feature coordinate system in 3D manual feed (3rd handle) $1
XD27	TCPRS1	In tool center point rotation $1
XD28	RSSCT1	R-Navi: selecting machine surface $1
XD29	RSIND1	R-Navi: machine surface indexing $1
XD2A	RSIDF1	R-Navi: machine surface index complete $1
XD2F	SLOP1	Simple inclined surface machining/Inclined surface control command ON $1 [M8]
XD30		MES interface library: Sending user arbitrary information $1 [M8]
XD31		Manual arbitrary reverse run: Reverse run invalid status $1 [M8]
XD40	JO2	In jog mode $2
XD41	HO2	In handle mode $2
XD42	SO2	In incremental mode $2
XD43	PTPO2	In manual arbitrary feed mode $2
XD44	ZRNO2	In reference position return mode $2
XD45	ASTO2	In automatic initial set mode $2
XD46		In JOG-handle simultaneous mode $2
XD48	MEMO2	In memory mode $2
XD49	TO2	In tape mode $2
XD4A		In online operation mode $2
XD4B	DO2	In MDI mode $2
XD4E	SBSMO2	Sub part system control: Sub part system control I mode ON $2
XD50	MA2	Controller ready completion $2
XD51	SA2	Servo ready completion $2
XD52	OP2	In automatic operation "run" $2
XD53	STL2	In automatic operation "start" $2
XD54	SPL2	In automatic operation "pause" $2
XD55	RST2	In "reset" $2
XD56	CXN2	In manual arbitrary feed $2
XD57	RWD2	In rewind $2
XD58	DEN2	Motion command completion $2
XD59	TIMP2	All axes in-position $2
XD5A	TSMZ2	All axes smoothing zero $2
XD5C	CXFIN2	Manual arbitrary feed completion $2
XD5D		External search finished $2
XD5F		In high-speed machining mode (G05) $2
XD60	RPN2	In rapid traverse $2
XD61	CUT2	In cutting feed $2
XD62	TAP2	In tapping $2
XD63	THRD2	In thread cutting $2
XD64	SYN2	In synchronous feed $2
XD65	CSS2	In constant surface speed $2
XD66	SKIP2	In skip $2
XD67	ZRNN2	In reference position return $2
XD68	INCH2	In inch unit selection $2

Device	Abbrev.	Signal name
XD69	DLKN2	In display lock $2
XD6A	F1DN2	F 1-digit commanded $2
XD6B	TLFO2	In tool life management $2
XD6C		Tool life management: Temporary cancel of tool life expiration ON $2
XD6D		Tool life management: Temporary cancel of tool group life expiration ON $2
XD6E	TLOV2	Tool life over $2
XD6F		Tool group life over $2
XD70	F112	F1-digit No. code 1 $2
XD71	F122	F1-digit No. code 2 $2
XD72	F142	F1-digit No. code 4 $2
XD73	F182	F1-digit No. code 8 $2
XD74		Timing synchronization between part systems $2
XD75	PCINO2	In PLC interrupt $2
XD77	ASLE2	Illegal axis selected $2
XD80	DM002	M code independent output M00 $2
XD81	DM012	M code independent output M01 $2
XD82	DM022	M code independent output M02 $2
XD83	DM302	M code independent output M30 $2
XD88		In manual speed command valid $2
XD89	MMS2	Manual numerical command $2
XD8A		In tool escape and return mode $2
XD8E	SBS2	Sub part system control: Sub part system processing $2
XD8F		In circular feed in manual mode $2
XD93	TRTN22	In tool retract and return 2 mode $2 ▲
XD9F		Coordinate rotation by parameter: Manual feed coordinate system $2
XDA0	MF12	M function strobe 1 $2
XDA1	MF22	M function strobe 2 $2
XDA2	MF32	M function strobe 3 $2
XDA3	MF42	M function strobe 4 $2
XDA4	SF12	S function strobe 1 $2
XDA5	SF22	S function strobe 2 $2
XDA6	SF32	S function strobe 3 $2
XDA7	SF42	S function strobe 4 $2
XDA8	TF12	T function strobe 1 $2
XDA9	TF22	T function strobe 2 $2
XDAA	TF32	T function strobe 3 $2
XDAB	TF42	T function strobe 4 $2
XDAC	BF12	2nd M function strobe 1 $2
XDAD	BF22	2nd M function strobe 2 $2
XDAE	BF32	2nd M function strobe 3 $2
XDAF	BF42	2nd M function strobe 4 $2
XDB0	SF52	S function strobe 5 $2
XDB1	SF62	S function strobe 6 $2
XDB2	SF72	S function strobe 7 $2
XDB3	SF82	S function strobe 8 $2
XDBF	CHPRCC2	Chopping compensation update prevented $2
XDC0	CHOP2	In chopping start $2
XDC1	CHP12	Basic position -> upper dead point path flag $2
XDC2	CHP22	Upper dead point -> bottom dead point path flag $2
XDC3	CHP32	Bottom dead point -> upper dead point path flag $2
XDC4	CHP42	Upper dead point -> basic position path flag $2
XDC5	CHPMD2	In chopping mode $2
XDC6		Stroke compensation completion $2
XDC7		Tool escape and return transit point recognition completed $2
XDCA	SSE2	Search & start Error $2
XDCB	SSG2	Search & start Search $2
XDD3	TCP2	Tool change position return completion $2
XDD4	TCRQ2	New tool change $2
XDD5		All spindles simultaneous control (G47.1) $2
XDD6		Life prediction $2
XDD8	AL12	NC alarm 1 $2
XDD9	AL22	NC alarm 2 (Servo alarm) $2
XDDA	AL32	NC alarm 3 (Program error) $2
XDDB	AL42	NC alarm 4 (Operation error) $2
XDDC	WR12	NC warning (Servo warning) $2
XDE0		Load monitor I : Teaching/Monitor mode in execution $2 ▲
XDE1		Load monitor I : Teaching mode valid $2 ▲
XDE2		Load monitor I : Monitor mode valid $2 ▲
XDE3		Load monitor I : Adaptive control in execution $2 ▲
XDE4	FFCO2	Thread cutting: Feed-forward control ON $2
XDE5	TRVE2	Tap retract possible $2
XDE6	PCNT2	No. of work machining over $2
XDE7	ABSW2	Absolute position warning $2
XDE9		In axis name switch $2
XDEA		Optimum acceleration/deceleration parameter switch completion [axis] $2 ▲
XDEB	ESTSVIN2	Optimum acceleration/deceleration selection : NC axis inertia estimation in progress $2 ▲
XDEC	GETSVAF2	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency acquisition in progress $2 ▲
XDED	VFTCIS2	Variable feed thread cutting invalid state $2 ▲
XDEE	HOBRTM2	Hob machining: retracting $2
XDEF	HOBRTF2	Hob machining: retract complete $2
XDF0		In spindle-NC axis polygon mode $2

Device	Abbrev.	Signal name
XDF1	AL52	NC alarm 5 $2
XDF2		In spindle-spindle polygon mode $2
XDF3		Spindle-spindle polygon synchronization completion $2
XDF9		In 3-dimensional coordinate conversion $2
XE00	RTAP2	In synchronized tapping selection (M command) $2
XE01		In small diameter deep hole cycle $2
XE02		High-speed retract function valid state $2 ▲
XE03		In high-speed retract function operation $2 ▲
XE08		In barrier valid (left) $2
XE09		In barrier valid (right) $2
XE0A	TLMSFIN2	Tool length measurement completion $2 ▲
XE0B	TLMSERR2	Tool length measurement error $2 ▲
XE0E	TLMSSELO2	Tool length measurement sub-side selected $2 ▲
XE0F		Tool retract position reached $2 ▲
XE10	TRME2	With tool retract amount command $2 ▲
XE11	TRRP2	In tool repositioning $2 ▲
XE18		Door open enable $2
XE28		Door open enable (2 channels per 1 part system) $2
XE2A		External search: Program return completed $2
XE2D		Optimum machining diagnosis in progress $2 ▲
XE2E		Load monitor I : Cutting torque estimation in progress $2 ▲
XE2F		Load monitor I : Cutting torque estimation completed $2 ▲
XE30	PFCHS2	Program format switch in progress $2 [M8]
XE39	GLMT2	Torque limitation skip: G160 torque limit ON $2
XE4B	G0AC2	Rapid traverse time constant: In switchover $2
XE4C	RT2CHG2	Real-time tuning 2: Acceleration/deceleration time constant in switchover $2
XE54		3D coordinate conversion : Manual feed valid $2 [M8]
XE55	RCEI2	Rotation center error compensation in progress $2
XE57	SECI2	Spatial error compensation in progress $2 [M8]
XE58	MJST2	Tool axis coordinate system in 3D manual feed (JOG, INC) $2
XE59	MJSB2	Table coordinate system in 3D manual feed (JOG, INC) $2
XE5A	MJSF2	Feature coordinate system in 3D manual feed (JOG, INC) $2
XE5B	MH1ST2	Tool axis coordinate system in 3D manual feed (1st handle) $2
XE5C	MH1SB2	Table coordinate system in 3D manual feed (1st handle) $2
XE5D	MH1SF2	Feature coordinate system in 3D manual feed (1st handle) $2
XE5E	MH2ST2	Tool axis coordinate system in 3D manual feed (2nd handle) $2
XE5F	MH2SB2	Table coordinate system in 3D manual feed (2nd handle) $2
XE60	MH2SF2	Feature coordinate system in 3D manual feed (2nd handle) $2
XE61	MH3ST2	Tool axis coordinate system in 3D manual feed (3rd handle) $2
XE62	MH3SB2	Table coordinate system in 3D manual feed (3rd handle) $2
XE63	MH3SF2	Feature coordinate system in 3D manual feed (3rd handle) $2
XE67	TCPRS2	In tool center point rotation $2
XE68	RSSCT2	R-Navi: selecting machine surface $2
XE69	RSIND2	R-Navi: machine surface indexing $2
XE6A	RSIDF2	R-Navi: machine surface index complete $2
XE6F	SLOP2	Simple inclined surface machining/Inclined surface control command ON $2 [M8]
XE70		MES interface library: Sending user arbitrary information $2 [M8]
XE71		Manual arbitrary reverse run: Reverse run invalid status $2 [M8]
XE80	JO3	In jog mode $3
XE81	HO3	In handle mode $3
XE82	SO3	In incremental mode $3
XE83	PTPO3	In manual arbitrary feed mode $3
XE84	ZRNO3	In reference position return mode $3
XE85	ASTO3	In automatic initial set mode $3
XE86		In JOG-handle simultaneous mode $3
XE88	MEMO3	In memory mode $3
XE89	TO3	In tape mode $3
XE8A		In online operation mode $3
XE8B	DO3	In MDI mode $3
XE8E	SBSMO3	Sub part system control: Sub part system control I mode ON $3
XE90	MA3	Controller ready completion $3
XE91	SA3	Servo ready completion $3
XE92	OP3	In automatic operation "run" $3
XE93	STL3	In automatic operation "start" $3
XE94	SPL3	In automatic operation "pause" $3
XE95	RST3	In "reset" $3
XE96	CXN3	In manual arbitrary feed $3
XE97	RWD3	In rewind $3
XE98	DEN3	Motion command completion $3
XE99	TIMP3	All axes in-position $3
XE9A	TSMZ3	All axes smoothing zero $3
XE9C	CXFIN3	Manual arbitrary feed completion $3
XE9D		External search finished $3
XE9F		In high-speed machining mode (G05) $3
XEA0	RPN3	In rapid traverse $3
XEA1	CUT3	In cutting feed $3
XEA2	TAP3	In tapping $3
XEA3	THRD3	In thread cutting $3
XEA4	SYN3	In synchronous feed $3
XEA5	CSS3	In constant surface speed $3
XEA6	SKIP3	In skip $3
XEA7	ZRNN3	In reference position return $3

Device	Abbrev.	Signal name
XEA8	INCH3	In inch unit selection $3
XEA9	DLKN3	In display lock $3
XEAA	F1DN3	F 1-digit commanded $3
XEAB	TLFO3	In tool life management $3
XEAC		Tool life management: Temporary cancel of tool life expiration ON $3
XEAD		Tool life management: Temporary cancel of tool group life expiration ON $3
XEAE	TLOV3	Tool life over $3
XEAF		Tool group life over $3
XEB0	F113	F1-digit No. code 1 $3
XEB1	F123	F1-digit No. code 2 $3
XEB2	F143	F1-digit No. code 4 $3
XEB3	F183	F1-digit No. code 8 $3
XEB4		Timing synchronization between part systems $3
XEB5	PCINO3	In PLC interrupt $3
XEB7	ASLE3	Illegal axis selected $3
XEC0	DM003	M code independent output M00 $3
XEC1	DM013	M code independent output M01 $3
XEC2	DM023	M code independent output M02 $3
XEC3	DM303	M code independent output M30 $3
XEC8		In manual speed command valid $3
XEC9	MMS3	Manual numerical command $3
XECA		In tool escape and return mode $3
XECE	SBS3	Sub part system control: Sub part system processing $3
XECF		In circular feed in manual mode $3
XED3	TRTN23	In tool retract and return 2 mode $3 ▲
XEDF		Coordinate rotation by parameter: Manual feed coordinate system $3
XEE0	MF13	M function strobe 1 $3
XEE1	MF23	M function strobe 2 $3
XEE2	MF33	M function strobe 3 $3
XEE3	MF43	M function strobe 4 $3
XEE4	SF13	S function strobe 1 $3
XEE5	SF23	S function strobe 2 $3
XEE6	SF33	S function strobe 3 $3
XEE7	SF43	S function strobe 4 $3
XEE8	TF13	T function strobe 1 $3
XEE9	TF23	T function strobe 2 $3
XEEA	TF33	T function strobe 3 $3
XEEB	TF43	T function strobe 4 $3
XEEC	BF13	2nd M function strobe 1 $3
XEED	BF23	2nd M function strobe 2 $3
XEEE	BF33	2nd M function strobe 3 $3
XEEF	BF43	2nd M function strobe 4 $3
XEF0	SF53	S function strobe 5 $3
XEF1	SF63	S function strobe 6 $3
XEF2	SF73	S function strobe 7 $3
XEF3	SF83	S function strobe 8 $3
XEFF	CHPRCC3	Chopping compensation update prevented $3
XF00	CHOP3	In chopping start $3
XF01	CHP13	Basic position -> upper dead point path flag $3
XF02	CHP23	Upper dead point -> bottom dead point path flag $3
XF03	CHP33	Bottom dead point -> upper dead point path flag $3
XF04	CHP43	Upper dead point -> basic position path flag $3
XF05	CHPMD3	In chopping mode $3
XF06		Stroke compensation completion $3
XF07		Tool escape and return transit point recognition completed $3
XF0A	SSE3	Search & start Error $3
XF0B	SSG3	Search & start Search $3
XF13	TCP3	Tool change position return completion $3
XF14	TCRQ3	New tool change $3
XF15		All spindles simultaneous control (G47.1) $3
XF16		Life prediction $3
XF18	AL13	NC alarm 1 $3
XF19	AL23	NC alarm 2 (Servo alarm) $3
XF1A	AL33	NC alarm 3 (Program error) $3
XF1B	AL43	NC alarm 4 (Operation error) $3
XF1C	WR13	NC warning (Servo warning) $3
XF20		Load monitor I : Teaching/Monitor mode in execution $3 ▲
XF21		Load monitor I : Teaching mode valid $3 ▲
XF22		Load monitor I : Monitor mode valid $3 ▲
XF23		Load monitor I : Adaptive control in execution $3 ▲
XF24	FFCO3	Thread cutting: Feed-forward control ON $3
XF25	TRVE3	Tap retract possible $3
XF26	PCNT3	No. of work machining over $3
XF27	ABSW3	Absolute position warning $3
XF29		In axis name switch $3
XF2A		Optimum acceleration/deceleration parameter switch completion [axis] $3 ▲
XF2B	ESTSVIN3	Optimum acceleration/deceleration selection : NC axis inertia estimation in progress $3 ▲
XF2C	GETSVAF3	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency acquisition in progress $3 ▲
XF2D	VFTCIS3	Variable feed thread cutting invalid state $3 ▲
XF2E	HOBRTM3	Hob machining: retracting $3
XF2F	HOBRTF3	Hob machining: retract complete $3

Device	Abbrev.	Signal name
XF30		In spindle-NC axis polygon mode $3
XF31	AL53	NC alarm 5 $3
XF32		In spindle-spindle polygon mode $3
XF33		Spindle-spindle polygon synchronization completion $3
XF39		In 3-dimensional coordinate conversion $3
XF40	RTAP3	In synchronized tapping selection (M command) $3
XF41		In small diameter deep hole cycle $3
XF42		High-speed retract function valid state $3 ▲
XF43		In high-speed retract function operation $3 ▲
XF48		In barrier valid (left) $3
XF49		In barrier valid (right) $3
XF4A	TLMSFIN3	Tool length measurement completion $3 ▲
XF4B	TLMSERR3	Tool length measurement error $3 ▲
XF4E	TLMSSELO3	Tool length measurement sub-side selected $3 ▲
XF4F		Tool retract position reached $3 ▲
XF50	TRME3	With tool retract amount command $3 ▲
XF51	TRRP3	In tool repositioning $3 ▲
XF58		Door open enable $3
XF68		Door open enable (2 channels per 1 part system) $3
XF6A		External search: Program return completed $3
XF6D		Optimum machining diagnosis in progress $3 ▲
XF6E		Load monitor I : Cutting torque estimation in progress $3 ▲
XF6F		Load monitor I : Cutting torque estimation completed $3 ▲
XF70	PFCHS3	Program format switch in progress $3 [M8]
XF79	GLMT3	Torque limitation skip: G160 torque limit ON $3
XF8B	G0AC3	Rapid traverse time constant: In switchover $3
XF8C	RT2CHG3	Real-time tuning 2: Acceleration/deceleration time constant in switchover $3
XF94		3D coordinate conversion : Manual feed valid $3 [M8]
XF95	RCEI3	Rotation center error compensation in progress $3
XF97	SECI3	Spatial error compensation in progress $3 [M8]
XF98	MJST3	Tool axis coordinate system in 3D manual feed (JOG, INC) $3
XF99	MJSB3	Table coordinate system in 3D manual feed (JOG, INC) $3
XF9A	MJSF3	Feature coordinate system in 3D manual feed (JOG, INC) $3
XF9B	MH1ST3	Tool axis coordinate system in 3D manual feed (1st handle) $3
XF9C	MH1SB3	Table coordinate system in 3D manual feed (1st handle) $3
XF9D	MH1SF3	Feature coordinate system in 3D manual feed (1st handle) $3
XF9E	MH2ST3	Tool axis coordinate system in 3D manual feed (2nd handle) $3
XF9F	MH2SB3	Table coordinate system in 3D manual feed (2nd handle) $3
XFA0	MH2SF3	Feature coordinate system in 3D manual feed (2nd handle) $3
XFA1	MH3ST3	Tool axis coordinate system in 3D manual feed (3rd handle) $3
XFA2	MH3SB3	Table coordinate system in 3D manual feed (3rd handle) $3
XFA3	MH3SF3	Feature coordinate system in 3D manual feed (3rd handle) $3
XFA7	TCPRS3	In tool center point rotation $3
XFA8	RSSCT3	R-Navi: selecting machine surface $3
XFA9	RSIND3	R-Navi: machine surface indexing $3
XFAA	RSIDF3	R-Navi: machine surface index complete $3
XFAF	SLOP3	Simple inclined surface machining/Inclined surface control command ON $3 [M8]
XFB0		MES interface library: Sending user arbitrary information $3 [M8]
XFB1		Manual arbitrary reverse run: Reverse run invalid status $3 [M8]
XFC0	JO4	In jog mode $4
XFC1	HO4	In handle mode $4
XFC2	SO4	In incremental mode $4
XFC3	PTPO4	In manual arbitrary feed mode $4
XFC4	ZRNO4	In reference position return mode $4
XFC5	ASTO4	In automatic initial set mode $4
XFC6		In JOG-handle simultaneous mode $4
XFC8	MEMO4	In memory mode $4
XFC9	TO4	In tape mode $4
XFCA		In online operation mode $4
XFCB	DO4	In MDI mode $4
XFCE	SBSMO4	Sub part system control: Sub part system control I mode ON $4
XFD0	MA4	Controller ready completion $4
XFD1	SA4	Servo ready completion $4
XFD2	OP4	In automatic operation "run" $4
XFD3	STL4	In automatic operation "start" $4
XFD4	SPL4	In automatic operation "pause" $4
XFD5	RST4	In "reset" $4
XFD6	CXN4	In manual arbitrary feed $4
XFD7	RWD4	In rewind $4
XFD8	DEN4	Motion command completion $4
XFD9	TIMP4	All axes in-position $4
XFDA	TSMZ4	All axes smoothing zero $4
XFDC	CXFIN4	Manual arbitrary feed completion $4
XFDD		External search finished $4
XFDF		In high-speed machining mode (G05) $4
XFE0	RPN4	In rapid traverse $4
XFE1	CUT4	In cutting feed $4
XFE2	TAP4	In tapping $4
XFE3	THRD4	In thread cutting $4
XFE4	SYN4	In synchronous feed $4
XFE5	CSS4	In constant surface speed $4
XFE6	SKIP4	In skip $4

Device	Abbrev.	Signal name
XFE7	ZRNN4	In reference position return $4
XFE8	INCH4	In inch unit selection $4
XFE9	DLKN4	In display lock $4
XFEA	F1DN4	F 1-digit commanded $4
XFEB	TLFO4	In tool life management $4
XFEC		Tool life management: Temporary cancel of tool life expiration ON $4
XFED		Tool life management: Temporary cancel of tool group life expiration ON $4
XFEE	TLOV4	Tool life over $4
XFEF		Tool group life over $4
XFF0	F114	F1-digit No. code 1 $4
XFF1	F124	F1-digit No. code 2 $4
XFF2	F144	F1-digit No. code 4 $4
XFF3	F184	F1-digit No. code 8 $4
XFF4		Timing synchronization between part systems $4
XFF5	PCINO4	In PLC interrupt $4
XFF7	ASLE4	Illegal axis selected $4
X1000	DM004	M code independent output M00 $4
X1001	DM014	M code independent output M01 $4
X1002	DM024	M code independent output M02 $4
X1003	DM304	M code independent output M30 $4
X1008		In manual speed command valid $4
X1009	MMS4	Manual numerical command $4
X100A		In tool escape and return mode $4
X100E	SBS4	Sub part system control: Sub part system processing $4
X100F		In circular feed in manual mode $4
X1013	TRTN24	In tool retract and return 2 mode $4 ▲
X101F		Coordinate rotation by parameter: Manual feed coordinate system $4
X1020	MF14	M function strobe 1 $4
X1021	MF24	M function strobe 2 $4
X1022	MF34	M function strobe 3 $4
X1023	MF44	M function strobe 4 $4
X1024	SF14	S function strobe 1 $4
X1025	SF24	S function strobe 2 $4
X1026	SF34	S function strobe 3 $4
X1027	SF44	S function strobe 4 $4
X1028	TF14	T function strobe 1 $4
X1029	TF24	T function strobe 2 $4
X102A	TF34	T function strobe 3 $4
X102B	TF44	T function strobe 4 $4
X102C	BF14	2nd M function strobe 1 $4
X102D	BF24	2nd M function strobe 2 $4
X102E	BF34	2nd M function strobe 3 $4
X102F	BF44	2nd M function strobe 4 $4
X1030	SF54	S function strobe 5 $4
X1031	SF64	S function strobe 6 $4
X1032	SF74	S function strobe 7 $4
X1033	SF84	S function strobe 8 $4
X103F	CHPRCC4	Chopping compensation update prevented $4
X1040	CHOP4	In chopping start $4
X1041	CHP14	Basic position -> upper dead point path flag $4
X1042	CHP24	Upper dead point -> bottom dead point path flag $4
X1043	CHP34	Bottom dead point -> upper dead point path flag $4
X1044	CHP44	Upper dead point -> basic position path flag $4
X1045	CHPMD4	In chopping mode $4
X1046		Stroke compensation completion $4
X1047		Tool escape and return transit point recognition completed $4
X104A	SSE4	Search & start Error $4
X104B	SSG4	Search & start Search $4
X1053	TCP4	Tool change position return completion $4
X1054	TCRQ4	New tool change $4
X1055		All spindles simultaneous control (G47.1) $4
X1056		Life prediction $4
X1058	AL14	NC alarm 1 $4
X1059	AL24	NC alarm 2 (Servo alarm) $4
X105A	AL34	NC alarm 3 (Program error) $4
X105B	AL44	NC alarm 4 (Operation error) $4
X105C	WR14	NC warning (Servo warning) $4
X1060		Load monitor I : Teaching/Monitor mode in execution $4 ▲
X1061		Load monitor I : Teaching mode valid $4 ▲
X1062		Load monitor I : Monitor mode valid $4 ▲
X1063		Load monitor I : Adaptive control in execution $4 ▲
X1064	FFCO4	Thread cutting: Feed-forward control ON $4
X1065	TRVE4	Tap retract possible $4
X1066	PCNT4	No. of work machining over $4
X1067	ABSW4	Absolute position warning $4
X1069		In axis name switch $4
X106A		Optimum acceleration/deceleration parameter switch completion [axis] $4 ▲
X106B	ESTSVIN4	Optimum acceleration/deceleration selection : NC axis inertia estimation in progress $4 ▲
X106C	GETSVAF4	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency acquisition in progress $4 ▲
X106D	VFTCIS4	Variable feed thread cutting invalid state $4 ▲
X106E	HOBRTM4	Hob machining: retracting $4

Device	Abbrev.	Signal name
X106F	HOBRTF4	Hob machining: retract complete $4
X1070		In spindle-NC axis polygon mode $4
X1071	AL54	NC alarm 5 $4
X1072		In spindle-spindle polygon mode $4
X1073		Spindle-spindle polygon synchronization completion $4
X1079		In 3-dimensional coordinate conversion $4
X1080	RTAP4	In synchronized tapping selection (M command) $4
X1081		In small diameter deep hole cycle $4
X1082		High-speed retract function valid state $4 ▲
X1083		In high-speed retract function operation $4 ▲
X1088		In barrier valid (left) $4
X1089		In barrier valid (right) $4
X108A	TLMSFIN4	Tool length measurement completion $4 ▲
X108B	TLMSERR4	Tool length measurement error $4 ▲
X108E	TLMSSELO4	Tool length measurement sub-side selected $4 ▲
X108F		Tool retract position reached $4 ▲
X1090	TRME4	With tool retract amount command $4 ▲
X1091	TRRP4	In tool repositioning $4 ▲
X1098		Door open enable $4
X10A8		Door open enable (2 channels per 1 part system) $4
X10AA		External search: Program return completed $4
X10AD		Optimum machining diagnosis in progress $4 ▲
X10AE		Load monitor I : Cutting torque estimation in progress $4 ▲
X10AF		Load monitor I : Cutting torque estimation completed $4 ▲
X10B0	PFCHS4	Program format switch in progress $4 [M8]
X10B9	GLMT4	Torque limitation skip: G160 torque limit ON $4
X10CB	G0AC4	Rapid traverse time constant: In switchover $4
X10CC	RT2CHG4	Real-time tuning 2: Acceleration/deceleration time constant in switchover $4
X10D4		3D coordinate conversion : Manual feed valid $4 [M8]
X10D5	RCEI4	Rotation center error compensation in progress $4
X10D7	SECI4	Spatial error compensation in progress $4 [M8]
X10D8	MJST4	Tool axis coordinate system in 3D manual feed (JOG, INC) $4
X10D9	MJSB4	Table coordinate system in 3D manual feed (JOG, INC) $4
X10DA	MJSF4	Feature coordinate system in 3D manual feed (JOG, INC) $4
X10DB	MH1ST4	Tool axis coordinate system in 3D manual feed (1st handle) $4
X10DC	MH1SB4	Table coordinate system in 3D manual feed (1st handle) $4
X10DD	MH1SF4	Feature coordinate system in 3D manual feed (1st handle) $4
X10DE	MH2ST4	Tool axis coordinate system in 3D manual feed (2nd handle) $4
X10DF	MH2SB4	Table coordinate system in 3D manual feed (2nd handle) $4
X10E0	MH2SF4	Feature coordinate system in 3D manual feed (2nd handle) $4
X10E1	MH3ST4	Tool axis coordinate system in 3D manual feed (3rd handle) $4
X10E2	MH3SB4	Table coordinate system in 3D manual feed (3rd handle) $4
X10E3	MH3SF4	Feature coordinate system in 3D manual feed (3rd handle) $4
X10E7	TCPRS4	In tool center point rotation $4
X10E8	RSSCT4	R-Navi: selecting machine surface $4
X10E9	RSIND4	R-Navi: machine surface indexing $4
X10EA	RSIDF4	R-Navi: machine surface index complete $4
X10EF	SLOP4	Simple inclined surface machining/Inclined surface control command ON $4 [M8]
X10F0		MES interface library: Sending user arbitrary information $4 [M8]
X10F1		Manual arbitrary reverse run: Reverse run invalid status $4 [M8]
X1100	JO5	In jog mode $5
X1101	HO5	In handle mode $5
X1102	SO5	In incremental mode $5
X1103	PTPO5	In manual arbitrary feed mode $5
X1104	ZRNO5	In reference position return mode $5
X1105	ASTO5	In automatic initial set mode $5
X1106		In JOG-handle simultaneous mode $5
X1108	MEMO5	In memory mode $5
X1109	TO5	In tape mode $5
X110A		In online operation mode $5
X110B	DO5	In MDI mode $5
X110E	SBSMO5	Sub part system control: Sub part system control I mode ON $5
X1110	MA5	Controller ready completion $5
X1111	SA5	Servo ready completion $5
X1112	OP5	In automatic operation "run" $5
X1113	STL5	In automatic operation "start" $5
X1114	SPL5	In automatic operation "pause" $5
X1115	RST5	In "reset" $5
X1116	CXN5	In manual arbitrary feed $5
X1117	RWD5	In rewind $5
X1118	DEN5	Motion command completion $5
X1119	TIMP5	All axes in-position $5
X111A	TSMZ5	All axes smoothing zero $5
X111C	CXFIN5	Manual arbitrary feed completion $5
X111D		External search finished $5
X111F		In high-speed machining mode (G05) $5
X1120	RPN5	In rapid traverse $5
X1121	CUT5	In cutting feed $5
X1122	TAP5	In tapping $5
X1123	THRD5	In thread cutting $5
X1124	SYN5	In synchronous feed $5
X1125	CSS5	In constant surface speed $5

Device	Abbrev.	Signal name
X1126	SKIP5	In skip $5
X1127	ZRNN5	In reference position return $5
X1128	INCH5	In inch unit selection $5
X1129	DLKN5	In display lock $5
X112A	F1DN5	F 1-digit commanded $5
X112B	TLFO5	In tool life management $5
X112C		Tool life management: Temporary cancel of tool life expiration ON $5
X112D		Tool life management: Temporary cancel of tool group life expiration ON $5
X112E	TLOV5	Tool life over $5
X112F		Tool group life over $5
X1130	F115	F1-digit No. code 1 $5
X1131	F125	F1-digit No. code 2 $5
X1132	F145	F1-digit No. code 4 $5
X1133	F185	F1-digit No. code 8 $5
X1134		Timing synchronization between part systems $5
X1135	PCINO5	In PLC interrupt $5
X1137	ASLE5	Illegal axis selected $5
X1140	DM005	M code independent output M00 $5
X1141	DM015	M code independent output M01 $5
X1142	DM025	M code independent output M02 $5
X1143	DM305	M code independent output M30 $5
X1148		In manual speed command valid $5
X1149	MMS5	Manual numerical command $5
X114A		In tool escape and return mode $5
X114E	SBS5	Sub part system control: Sub part system processing $5
X114F		In circular feed in manual mode $5
X1153	TRTN25	In tool retract and return 2 mode $5 ▲
X115F		Coordinate rotation by parameter: Manual feed coordinate system $5
X1160	MF15	M function strobe 1 $5
X1161	MF25	M function strobe 2 $5
X1162	MF35	M function strobe 3 $5
X1163	MF45	M function strobe 4 $5
X1164	SF15	S function strobe 1 $5
X1165	SF25	S function strobe 2 $5
X1166	SF35	S function strobe 3 $5
X1167	SF45	S function strobe 4 $5
X1168	TF15	T function strobe 1 $5
X1169	TF25	T function strobe 2 $5
X116A	TF35	T function strobe 3 $5
X116B	TF45	T function strobe 4 $5
X116C	BF15	2nd M function strobe 1 $5
X116D	BF25	2nd M function strobe 2 $5
X116E	BF35	2nd M function strobe 3 $5
X116F	BF45	2nd M function strobe 4 $5
X1170	SF55	S function strobe 5 $5
X1171	SF65	S function strobe 6 $5
X1172	SF75	S function strobe 7 $5
X1173	SF85	S function strobe 8 $5
X117F	CHPRCC5	Chopping compensation update prevented $5
X1180	CHOP5	In chopping start $5
X1181	CHP15	Basic position -> upper dead point path flag $5
X1182	CHP25	Upper dead point -> bottom dead point path flag $5
X1183	CHP35	Bottom dead point -> upper dead point path flag $5
X1184	CHP45	Upper dead point -> basic position path flag $5
X1185	CHPMD5	In chopping mode $5
X1186		Stroke compensation completion $5
X1187		Tool escape and return transit point recognition completed $5
X118A	SSE5	Search & start Error $5
X118B	SSG5	Search & start Search $5
X1193	TCP5	Tool change position return completion $5
X1194	TCRQ5	New tool change $5
X1195		All spindles simultaneous control (G47.1) $5
X1196		Life prediction $5
X1198	AL15	NC alarm 1 $5
X1199	AL25	NC alarm 2 (Servo alarm) $5
X119A	AL35	NC alarm 3 (Program error) $5
X119B	AL45	NC alarm 4 (Operation error) $5
X119C	WR15	NC warning (Servo warning) $5
X11A0		Load monitor I : Teaching/Monitor mode in execution $5 ▲
X11A1		Load monitor I : Teaching mode valid $5 ▲
X11A2		Load monitor I : Monitor mode valid $5 ▲
X11A3		Load monitor I : Adaptive control in execution $5 ▲
X11A4	FFCO5	Thread cutting: Feed-forward control ON $5
X11A5	TRVE5	Tap retract possible $5
X11A6	PCNT5	No. of work machining over $5
X11A7	ABSW5	Absolute position warning $5
X11A9		In axis name switch $5
X11AA		Optimum acceleration/deceleration parameter switch completion [axis] $5 ▲
X11AB	ESTSVIN5	Optimum acceleration/deceleration selection : NC axis inertia estimation in progress $5 ▲
X11AC	GETSVAF5	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency acquisition in progress $5 ▲
X11AD	VFTCIS5	Variable feed thread cutting invalid state $5 ▲

Device	Abbrev.	Signal name
X11AE	HOBRTM5	Hob machining: retracting $5
X11AF	HOBRTF5	Hob machining: retract complete $5
X11B0		In spindle-NC axis polygon mode $5
X11B1	AL55	NC alarm 5 $5
X11B2		In spindle-spindle polygon mode $5
X11B3		Spindle-spindle polygon synchronization completion $5
X11B9		In 3-dimensional coordinate conversion $5
X11C0	RTAP5	In synchronized tapping selection (M command) $5
X11C1		In small diameter deep hole cycle $5
X11C2		High-speed retract function valid state $5 ▲
X11C3		In high-speed retract function operation $5 ▲
X11C8		In barrier valid (left) $5
X11C9		In barrier valid (right) $5
X11CA	TLMSFIN5	Tool length measurement completion $5 ▲
X11CB	TLMSERR5	Tool length measurement error $5 ▲
X11CE	TLMSSELO5	Tool length measurement sub-side selected $5 ▲
X11CF		Tool retract position reached $5 ▲
X11D0	TRME5	With tool retract amount command $5 ▲
X11D1	TRRP5	In tool repositioning $5 ▲
X11D8		Door open enable $5
X11E8		Door open enable (2 channels per 1 part system) $5
X11EA		External search: Program return completed $5
X11ED		Optimum machining diagnosis in progress $5 ▲
X11EE		Load monitor I : Cutting torque estimation in progress $5 ▲
X11EF		Load monitor I : Cutting torque estimation completed $5 ▲
X11F0	PFCHS5	Program format switch in progress $5 [M8]
X11F9	GLMT5	Torque limitation skip: G160 torque limit ON $5
X120B	G0AC5	Rapid traverse time constant: In switchover $5
X120C	RT2CHG5	Real-time tuning 2: Acceleration/deceleration time constant in switchover $5
X1214		3D coordinate conversion : Manual feed valid $5 [M8]
X1215	RCEI5	Rotation center error compensation in progress $5
X1217	SECI5	Spatial error compensation in progress $5 [M8]
X1218	MJST5	Tool axis coordinate system in 3D manual feed (JOG, INC) $5
X1219	MJSB5	Table coordinate system in 3D manual feed (JOG, INC) $5
X121A	MJSF5	Feature coordinate system in 3D manual feed (JOG, INC) $5
X121B	MH1ST5	Tool axis coordinate system in 3D manual feed (1st handle) $5
X121C	MH1SB5	Table coordinate system in 3D manual feed (1st handle) $5
X121D	MH1SF5	Feature coordinate system in 3D manual feed (1st handle) $5
X121E	MH2ST5	Tool axis coordinate system in 3D manual feed (2nd handle) $5
X121F	MH2SB5	Table coordinate system in 3D manual feed (2nd handle) $5
X1220	MH2SF5	Feature coordinate system in 3D manual feed (2nd handle) $5
X1221	MH3ST5	Tool axis coordinate system in 3D manual feed (3rd handle) $5
X1222	MH3SB5	Table coordinate system in 3D manual feed (3rd handle) $5
X1223	MH3SF5	Feature coordinate system in 3D manual feed (3rd handle) $5
X1227	TCPRS5	In tool center point rotation $5
X1228	RSSCT5	R-Navi: selecting machine surface $5
X1229	RSIND5	R-Navi: machine surface indexing $5
X122A	RSIDF5	R-Navi: machine surface index complete $5
X122F	SLOP5	Simple inclined surface machining/Inclined surface control command ON $5 [M8]
X1230		MES interface library: Sending user arbitrary information $5 [M8]
X1231		Manual arbitrary reverse run: Reverse run invalid status $5 [M8]
X1240	JO6	In jog mode $6
X1241	HO6	In handle mode $6
X1242	SO6	In incremental mode $6
X1243	PTPO6	In manual arbitrary feed mode $6
X1244	ZRNO6	In reference position return mode $6
X1245	ASTO6	In automatic initial set mode $6
X1246		In JOG-handle simultaneous mode $6
X1248	MEMO6	In memory mode $6
X1249	TO6	In tape mode $6
X124A		In online operation mode $6
X124B	DO6	In MDI mode $6
X124E	SBSMO6	Sub part system control: Sub part system control I mode ON $6
X1250	MA6	Controller ready completion $6
X1251	SA6	Servo ready completion $6
X1252	OP6	In automatic operation "run" $6
X1253	STL6	In automatic operation "start" $6
X1254	SPL6	In automatic operation "pause" $6
X1255	RST6	In "reset" $6
X1256	CXN6	In manual arbitrary feed $6
X1257	RWD6	In rewind $6
X1258	DEN6	Motion command completion $6
X1259	TIMP6	All axes in-position $6
X125A	TSMZ6	All axes smoothing zero $6
X125C	CXFIN6	Manual arbitrary feed completion $6
X125D		External search finished $6
X125F		In high-speed machining mode (G05) $6
X1260	RPN6	In rapid traverse $6
X1261	CUT6	In cutting feed $6
X1262	TAP6	In tapping $6
X1263	THRD6	In thread cutting $6
X1264	SYN6	In synchronous feed $6

Device	Abbrev.	Signal name
X1265	CSS6	In constant surface speed $6
X1266	SKIP6	In skip $6
X1267	ZRNN6	In reference position return $6
X1268	INCH6	In inch unit selection $6
X1269	DLKN6	In display lock $6
X126A	F1DN6	F 1-digit commanded $6
X126B	TLFO6	In tool life management $6
X126C		Tool life management: Temporary cancel of tool life expiration ON $6
X126D		Tool life management: Temporary cancel of tool group life expiration ON $6
X126E	TLOV6	Tool life over $6
X126F		Tool group life over $6
X1270	F116	F1-digit No. code 1 $6
X1271	F126	F1-digit No. code 2 $6
X1272	F146	F1-digit No. code 4 $6
X1273	F186	F1-digit No. code 8 $6
X1274		Timing synchronization between part systems $6
X1275	PCINO6	In PLC interrupt $6
X1277	ASLE6	Illegal axis selected $6
X1280	DM006	M code independent output M00 $6
X1281	DM016	M code independent output M01 $6
X1282	DM026	M code independent output M02 $6
X1283	DM306	M code independent output M30 $6
X1288		In manual speed command valid $6
X1289	MMS6	Manual numerical command $6
X128A		In tool escape and return mode $6
X128E	SBS6	Sub part system control: Sub part system processing $6
X128F		In circular feed in manual mode $6
X1293	TRTN26	In tool retract and return 2 mode $6 ▲
X129F		Coordinate rotation by parameter: Manual feed coordinate system $6
X12A0	MF16	M function strobe 1 $6
X12A1	MF26	M function strobe 2 $6
X12A2	MF36	M function strobe 3 $6
X12A3	MF46	M function strobe 4 $6
X12A4	SF16	S function strobe 1 $6
X12A5	SF26	S function strobe 2 $6
X12A6	SF36	S function strobe 3 $6
X12A7	SF46	S function strobe 4 $6
X12A8	TF16	T function strobe 1 $6
X12A9	TF26	T function strobe 2 $6
X12AA	TF36	T function strobe 3 $6
X12AB	TF46	T function strobe 4 $6
X12AC	BF16	2nd M function strobe 1 $6
X12AD	BF26	2nd M function strobe 2 $6
X12AE	BF36	2nd M function strobe 3 $6
X12AF	BF46	2nd M function strobe 4 $6
X12B0	SF56	S function strobe 5 $6
X12B1	SF66	S function strobe 6 $6
X12B2	SF76	S function strobe 7 $6
X12B3	SF86	S function strobe 8 $6
X12BF	CHPRCC6	Chopping compensation update prevented $6
X12C0	CHOP6	In chopping start $6
X12C1	CHP16	Basic position -> upper dead point path flag $6
X12C2	CHP26	Upper dead point -> bottom dead point path flag $6
X12C3	CHP36	Bottom dead point -> upper dead point path flag $6
X12C4	CHP46	Upper dead point -> basic position path flag $6
X12C5	CHPMD6	In chopping mode $6
X12C6		Stroke compensation completion $6
X12C7		Tool escape and return transit point recognition completed $6
X12CA	SSE6	Search & start Error $6
X12CB	SSG6	Search & start Search $6
X12D3	TCP6	Tool change position return completion $6
X12D4	TCRQ6	New tool change $6
X12D5		All spindles simultaneous control (G47.1) $6
X12D6		Life prediction $6
X12D8	AL16	NC alarm 1 $6
X12D9	AL26	NC alarm 2 (Servo alarm) $6
X12DA	AL36	NC alarm 3 (Program error) $6
X12DB	AL46	NC alarm 4 (Operation error) $6
X12DC	WR16	NC warning (Servo warning) $6
X12E0		Load monitor I : Teaching/Monitor mode in execution $6 ▲
X12E1		Load monitor I : Teaching mode valid $6 ▲
X12E2		Load monitor I : Monitor mode valid $6 ▲
X12E3		Load monitor I : Adaptive control in execution $6 ▲
X12E4	FFCO6	Thread cutting: Feed-forward control ON $6
X12E5	TRVE6	Tap retract possible $6
X12E6	PCNT6	No. of work machining over $6
X12E7	ABSW6	Absolute position warning $6
X12E9		In axis name switch $6
X12EA		Optimum acceleration/deceleration parameter switch completion [axis] $6 ▲
X12EB	ESTSVIN6	Optimum acceleration/deceleration selection : NC axis inertia estimation in progress $6 ▲
X12EC	GETSVAF6	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency acquisition in progress $6 ▲

Device	Abbrev.	Signal name
X12ED	VFTCIS6	Variable feed thread cutting invalid state $6 ▲
X12EE	HOBRTM6	Hob machining: retracting $6
X12EF	HOBRTF6	Hob machining: retract complete $6
X12F0		In spindle-NC axis polygon mode $6
X12F1	AL56	NC alarm 5 $6
X12F2		In spindle-spindle polygon mode $6
X12F3		Spindle-spindle polygon synchronization completion $6
X12F9		In 3-dimensional coordinate conversion $6
X1300	RTAP6	In synchronized tapping selection (M command) $6
X1301		In small diameter deep hole cycle $6
X1302		High-speed retract function valid state $6 ▲
X1303		In high-speed retract function operation $6 ▲
X1308		In barrier valid (left) $6
X1309		In barrier valid (right) $6
X130A	TLMSFIN6	Tool length measurement completion $6 ▲
X130B	TLMSERR6	Tool length measurement error $6 ▲
X130E	TLMSSELO6	Tool length measurement sub-side selected $6 ▲
X130F		Tool retract position reached $6 ▲
X1310	TRME6	With tool retract amount command $6 ▲
X1311	TRRP6	In tool repositioning $6 ▲
X1318		Door open enable $6
X1328		Door open enable (2 channels per 1 part system) $6
X132A		External search: Program return completed $6
X132D		Optimum machining diagnosis in progress $6 ▲
X132E		Load monitor I : Cutting torque estimation in progress $6 ▲
X132F		Load monitor I : Cutting torque estimation completed $6 ▲
X1330	PFCHS6	Program format switch in progress $6 [M8]
X1339	GLMT6	Torque limitation skip: G160 torque limit ON $6
X134B	G0AC6	Rapid traverse time constant: In switchover $6
X134C	RT2CHG6	Real-time tuning 2: Acceleration/deceleration time constant in switchover $6
X1354		3D coordinate conversion : Manual feed valid $6 [M8]
X1355	RCEI6	Rotation center error compensation in progress $6
X1357	SECI6	Spatial error compensation in progress $6 [M8]
X1358	MJST6	Tool axis coordinate system in 3D manual feed (JOG, INC) $6
X1359	MJSB6	Table coordinate system in 3D manual feed (JOG, INC) $6
X135A	MJSF6	Feature coordinate system in 3D manual feed (JOG, INC) $6
X135B	MH1ST6	Tool axis coordinate system in 3D manual feed (1st handle) $6
X135C	MH1SB6	Table coordinate system in 3D manual feed (1st handle) $6
X135D	MH1SF6	Feature coordinate system in 3D manual feed (1st handle) $6
X135E	MH2ST6	Tool axis coordinate system in 3D manual feed (2nd handle) $6
X135F	MH2SB6	Table coordinate system in 3D manual feed (2nd handle) $6
X1360	MH2SF6	Feature coordinate system in 3D manual feed (2nd handle) $6
X1361	MH3ST6	Tool axis coordinate system in 3D manual feed (3rd handle) $6
X1362	MH3SB6	Table coordinate system in 3D manual feed (3rd handle) $6
X1363	MH3SF6	Feature coordinate system in 3D manual feed (3rd handle) $6
X1367	TCPRS6	In tool center point rotation $6
X1368	RSSCT6	R-Navi: selecting machine surface $6
X1369	RSIND6	R-Navi: machine surface indexing $6
X136A	RSIDF6	R-Navi: machine surface index complete $6
X136F	SLOP6	Simple inclined surface machining/Inclined surface control command ON $6 [M8]
X1370		MES interface library: Sending user arbitrary information $6 [M8]
X1371		Manual arbitrary reverse run: Reverse run invalid status $6 [M8]
X1380	JO7	In jog mode $7
X1381	HO7	In handle mode $7
X1382	SO7	In incremental mode $7
X1383	PTPO7	In manual arbitrary feed mode $7
X1384	ZRNO7	In reference position return mode $7
X1385	ASTO7	In automatic initial set mode $7
X1386		In JOG-handle simultaneous mode $7
X1388	MEMO7	In memory mode $7
X1389	TO7	In tape mode $7
X138A		In online operation mode $7
X138B	DO7	In MDI mode $7
X138E	SBSMO7	Sub part system control: Sub part system control I mode ON $7
X1390	MA7	Controller ready completion $7
X1391	SA7	Servo ready completion $7
X1392	OP7	In automatic operation "run" $7
X1393	STL7	In automatic operation "start" $7
X1394	SPL7	In automatic operation "pause" $7
X1395	RST7	In "reset" $7
X1396	CXN7	In manual arbitrary feed $7
X1397	RWD7	In rewind $7
X1398	DEN7	Motion command completion $7
X1399	TIMP7	All axes in-position $7
X139A	TSMZ7	All axes smoothing zero $7
X139C	CXFIN7	Manual arbitrary feed completion $7
X139D		External search finished $7
X139F		In high-speed machining mode (G05) $7
X13A0	RPN7	In rapid traverse $7
X13A1	CUT7	In cutting feed $7
X13A2	TAP7	In tapping $7
X13A3	THRD7	In thread cutting $7

Device	Abbrev.	Signal name
X13A4	SYN7	In synchronous feed $7
X13A5	CSS7	In constant surface speed $7
X13A6	SKIP7	In skip $7
X13A7	ZRNN7	In reference position return $7
X13A8	INCH7	In inch unit selection $7
X13A9	DLKN7	In display lock $7
X13AA	F1DN7	F 1-digit commanded $7
X13AB	TLFO7	In tool life management $7
X13AC		Tool life management: Temporary cancel of tool life expiration ON $7
X13AD		Tool life management: Temporary cancel of tool group life expiration ON $7
X13AE	TLOV7	Tool life over $7
X13AF		Tool group life over $7
X13B0	F117	F1-digit No. code 1 $7
X13B1	F127	F1-digit No. code 2 $7
X13B2	F147	F1-digit No. code 4 $7
X13B3	F187	F1-digit No. code 8 $7
X13B4		Timing synchronization between part systems $7
X13B5	PCINO7	In PLC interrupt $7
X13B7	ASLE7	Illegal axis selected $7
X13C0	DM007	M code independent output M00 $7
X13C1	DM017	M code independent output M01 $7
X13C2	DM027	M code independent output M02 $7
X13C3	DM307	M code independent output M30 $7
X13C8		In manual speed command valid $7
X13C9	MMS7	Manual numerical command $7
X13CA		In tool escape and return mode $7
X13CE	SBS7	Sub part system control: Sub part system processing $7
X13CF		In circular feed in manual mode $7
X13D3	TRTN27	In tool retract and return 2 mode $7 ▲
X13DF		Coordinate rotation by parameter: Manual feed coordinate system $7
X13E0	MF17	M function strobe 1 $7
X13E1	MF27	M function strobe 2 $7
X13E2	MF37	M function strobe 3 $7
X13E3	MF47	M function strobe 4 $7
X13E4	SF17	S function strobe 1 $7
X13E5	SF27	S function strobe 2 $7
X13E6	SF37	S function strobe 3 $7
X13E7	SF47	S function strobe 4 $7
X13E8	TF17	T function strobe 1 $7
X13E9	TF27	T function strobe 2 $7
X13EA	TF37	T function strobe 3 $7
X13EB	TF47	T function strobe 4 $7
X13EC	BF17	2nd M function strobe 1 $7
X13ED	BF27	2nd M function strobe 2 $7
X13EE	BF37	2nd M function strobe 3 $7
X13EF	BF47	2nd M function strobe 4 $7
X13F0	SF57	S function strobe 5 $7
X13F1	SF67	S function strobe 6 $7
X13F2	SF77	S function strobe 7 $7
X13F3	SF87	S function strobe 8 $7
X13FF	CHPRCC7	Chopping compensation update prevented $7
X1400	CHOP7	In chopping start $7
X1401	CHP17	Basic position -> upper dead point path flag $7
X1402	CHP27	Upper dead point -> bottom dead point path flag $7
X1403	CHP37	Bottom dead point -> upper dead point path flag $7
X1404	CHP47	Upper dead point -> basic position path flag $7
X1405	CHPMD7	In chopping mode $7
X1406		Stroke compensation completion $7
X1407		Tool escape and return transit point recognition completed $7
X140A	SSE7	Search & start Error $7
X140B	SSG7	Search & start Search $7
X1413	TCP7	Tool change position return completion $7
X1414	TCRQ7	New tool change $7
X1415		All spindles simultaneous control (G47.1) $7
X1416		Life prediction $7
X1418	AL17	NC alarm 1 $7
X1419	AL27	NC alarm 2 (Servo alarm) $7
X141A	AL37	NC alarm 3 (Program error) $7
X141B	AL47	NC alarm 4 (Operation error) $7
X141C	WR17	NC warning (Servo warning) $7
X1420		Load monitor I : Teaching/Monitor mode in execution $7 ▲
X1421		Load monitor I : Teaching mode valid $7 ▲
X1422		Load monitor I : Monitor mode valid $7 ▲
X1423		Load monitor I : Adaptive control in execution $7 ▲
X1424	FFCO7	Thread cutting: Feed-forward control ON $7
X1425	TRVE7	Tap retract possible $7
X1426	PCNT7	No. of work machining over $7
X1427	ABSW7	Absolute position warning $7
X1429		In axis name switch $7
X142A		Optimum acceleration/deceleration parameter switch completion [axis] $7 ▲
X142B	ESTSVIN7	Optimum acceleration/deceleration selection : NC axis inertia estimation in progress $7 ▲

Device	Abbrev.	Signal name
X142C	GETSVAF7	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency acquisition in progress $7 ▲
X142D	VFTCIS7	Variable feed thread cutting invalid state $7 ▲
X142E	HOBRTM7	Hob machining: retracting $7
X142F	HOBRTF7	Hob machining: retract complete $7
X1430		In spindle-NC axis polygon mode $7
X1431	AL57	NC alarm 5 $7
X1432		In spindle-spindle polygon mode $7
X1433		Spindle-spindle polygon synchronization completion $7
X1439		In 3-dimensional coordinate conversion $7
X1440	RTAP7	In synchronized tapping selection (M command) $7
X1441		In small diameter deep hole cycle $7
X1442		High-speed retract function valid state $7 ▲
X1443		In high-speed retract function operation $7 ▲
X1448		In barrier valid (left) $7
X1449		In barrier valid (right) $7
X144A	TLMSFIN7	Tool length measurement completion $7 ▲
X144B	TLMSERR7	Tool length measurement error $7 ▲
X144E	TLMSSELO7	Tool length measurement sub-side selected $7 ▲
X144F		Tool retract position reached $7 ▲
X1450	TRME7	With tool retract amount command $7 ▲
X1451	TRRP7	In tool repositioning $7 ▲
X1458		Door open enable $7
X1468		Door open enable (2 channels per 1 part system) $7
X146A		External search: Program return completed $7
X146D		Optimum machining diagnosis in progress $7 ▲
X146E		Load monitor I : Cutting torque estimation in progress $7 ▲
X146F		Load monitor I : Cutting torque estimation completed $7 ▲
X1470	PFCHS7	Program format switch in progress $7 [M8]
X1479	GLMT7	Torque limitation skip: G160 torque limit ON $7
X148B	G0AC7	Rapid traverse time constant: In switchover $7
X148C	RT2CHG7	Real-time tuning 2: Acceleration/deceleration time constant in switchover $7
X1494		3D coordinate conversion : Manual feed valid $7 [M8]
X1495	RCEI7	Rotation center error compensation in progress $7
X1497	SECI7	Spatial error compensation in progress $7 [M8]
X1498	MJST7	Tool axis coordinate system in 3D manual feed (JOG, INC) $7
X1499	MJSB7	Table coordinate system in 3D manual feed (JOG, INC) $7
X149A	MJSF7	Feature coordinate system in 3D manual feed (JOG, INC) $7
X149B	MH1ST7	Tool axis coordinate system in 3D manual feed (1st handle) $7
X149C	MH1SB7	Table coordinate system in 3D manual feed (1st handle) $7
X149D	MH1SF7	Feature coordinate system in 3D manual feed (1st handle) $7
X149E	MH2ST7	Tool axis coordinate system in 3D manual feed (2nd handle) $7
X149F	MH2SB7	Table coordinate system in 3D manual feed (2nd handle) $7
X14A0	MH2SF7	Feature coordinate system in 3D manual feed (2nd handle) $7
X14A1	MH3ST7	Tool axis coordinate system in 3D manual feed (3rd handle) $7
X14A2	MH3SB7	Table coordinate system in 3D manual feed (3rd handle) $7
X14A3	MH3SF7	Feature coordinate system in 3D manual feed (3rd handle) $7
X14A7	TCPRS7	In tool center point rotation $7
X14A8	RSSCT7	R-Navi: selecting machine surface $7
X14A9	RSIND7	R-Navi: machine surface indexing $7
X14AA	RSIDF7	R-Navi: machine surface index complete $7
X14AF	SLOP7	Simple inclined surface machining/Inclined surface control command ON $7 [M8]
X14B0		MES interface library: Sending user arbitrary information $7 [M8]
X14B1		Manual arbitrary reverse run: Reverse run invalid status $7 [M8]
X14C0	JO8	In jog mode $8
X14C1	HO8	In handle mode $8
X14C2	SO8	In incremental mode $8
X14C3	PTPO8	In manual arbitrary feed mode $8
X14C4	ZRNO8	In reference position return mode $8
X14C5	ASTO8	In automatic initial set mode $8
X14C6		In JOG-handle simultaneous mode $8
X14C8	MEMO8	In memory mode $8
X14C9	TO8	In tape mode $8
X14CA		In online operation mode $8
X14CB	DO8	In MDI mode $8
X14CE	SBSMO8	Sub part system control: Sub part system control I mode ON $8
X14D0	MA8	Controller ready completion $8
X14D1	SA8	Servo ready completion $8
X14D2	OP8	In automatic operation "run" $8
X14D3	STL8	In automatic operation "start" $8
X14D4	SPL8	In automatic operation "pause" $8
X14D5	RST8	In "reset" $8
X14D6	CXN8	In manual arbitrary feed $8
X14D7	RWD8	In rewind $8
X14D8	DEN8	Motion command completion $8
X14D9	TIMP8	All axes in-position $8
X14DA	TSMZ8	All axes smoothing zero $8
X14DC	CXFIN8	Manual arbitrary feed completion $8
X14DD		External search finished $8
X14DF		In high-speed machining mode (G05) $8
X14E0	RPN8	In rapid traverse $8
X14E1	CUT8	In cutting feed $8

Device	Abbrev.	Signal name
X14E2	TAP8	In tapping $8
X14E3	THRD8	In thread cutting $8
X14E4	SYN8	In synchronous feed $8
X14E5	CSS8	In constant surface speed $8
X14E6	SKIP8	In skip $8
X14E7	ZRNN8	In reference position return $8
X14E8	INCH8	In inch unit selection $8
X14E9	DLKN8	In display lock $8
X14EA	F1DN8	F 1-digit commanded $8
X14EB	TLFO8	In tool life management $8
X14EC		Tool life management: Temporary cancel of tool life expiration ON $8
X14ED		Tool life management: Temporary cancel of tool group life expiration ON $8
X14EE	TLOV8	Tool life over $8
X14EF		Tool group life over $8
X14F0	F118	F1-digit No. code 1 $8
X14F1	F128	F1-digit No. code 2 $8
X14F2	F148	F1-digit No. code 4 $8
X14F3	F188	F1-digit No. code 8 $8
X14F4		Timing synchronization between part systems $8
X14F5	PCINO8	In PLC interrupt $8
X14F7	ASLE8	Illegal axis selected $8
X1500	DM008	M code independent output M00 $8
X1501	DM018	M code independent output M01 $8
X1502	DM028	M code independent output M02 $8
X1503	DM308	M code independent output M30 $8
X1508		In manual speed command valid $8
X1509	MMS8	Manual numerical command $8
X150A		In tool escape and return mode $8
X150E	SBS8	Sub part system control: Sub part system processing $8
X150F		In circular feed in manual mode $8
X1513	TRTN28	In tool retract and return 2 mode $8 ▲
X151F		Coordinate rotation by parameter: Manual feed coordinate system $8
X1520	MF18	M function strobe 1 $8
X1521	MF28	M function strobe 2 $8
X1522	MF38	M function strobe 3 $8
X1523	MF48	M function strobe 4 $8
X1524	SF18	S function strobe 1 $8
X1525	SF28	S function strobe 2 $8
X1526	SF38	S function strobe 3 $8
X1527	SF48	S function strobe 4 $8
X1528	TF18	T function strobe 1 $8
X1529	TF28	T function strobe 2 $8
X152A	TF38	T function strobe 3 $8
X152B	TF48	T function strobe 4 $8
X152C	BF18	2nd M function strobe 1 $8
X152D	BF28	2nd M function strobe 2 $8
X152E	BF38	2nd M function strobe 3 $8
X152F	BF48	2nd M function strobe 4 $8
X1530	SF58	S function strobe 5 $8
X1531	SF68	S function strobe 6 $8
X1532	SF78	S function strobe 7 $8
X1533	SF88	S function strobe 8 $8
X153F	CHPRCC8	Chopping compensation update prevented $8
X1540	CHOP8	In chopping start $8
X1541	CHP18	Basic position -> upper dead point path flag $8
X1542	CHP28	Upper dead point -> bottom dead point path flag $8
X1543	CHP38	Bottom dead point -> upper dead point path flag $8
X1544	CHP48	Upper dead point -> basic position path flag $8
X1545	CHPMD8	In chopping mode $8
X1546		Stroke compensation completion $8
X1547		Tool escape and return transit point recognition completed $8
X154A	SSE8	Search & start Error $8
X154B	SSG8	Search & start Search $8
X1553	TCP8	Tool change position return completion $8
X1554	TCRQ8	New tool change $8
X1555		All spindles simultaneous control (G47.1) $8
X1556		Life prediction $8
X1558	AL18	NC alarm 1 $8
X1559	AL28	NC alarm 2 (Servo alarm) $8
X155A	AL38	NC alarm 3 (Program error) $8
X155B	AL48	NC alarm 4 (Operation error) $8
X155C	WR18	NC warning (Servo warning) $8
X1560		Load monitor I : Teaching/Monitor mode in execution $8 ▲
X1561		Load monitor I : Teaching mode valid $8 ▲
X1562		Load monitor I : Monitor mode valid $8 ▲
X1563		Load monitor I : Adaptive control in execution $8 ▲
X1564	FFCO8	Thread cutting: Feed-forward control ON $8
X1565	TRVE8	Tap retract possible $8
X1566	PCNT8	No. of work machining over $8
X1567	ABSW8	Absolute position warning $8
X1569		In axis name switch $8
X156A		Optimum acceleration/deceleration parameter switch completion [axis] $8 ▲

Device	Abbrev.	Signal name
X156B	ESTSVIN8	Optimum acceleration/deceleration selection : NC axis inertia estimation in progress $8 ▲
X156C	GETSVAF8	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency acquisition in progress $8 ▲
X156D	VFTCIS8	Variable feed thread cutting invalid state $8 ▲
X156E	HOBRTM8	Hob machining: retracting $8
X156F	HOBRTF8	Hob machining: retract complete $8
X1570		In spindle-NC axis polygon mode $8
X1571	AL58	NC alarm 5 $8
X1572		In spindle-spindle polygon mode $8
X1573		Spindle-spindle polygon synchronization completion $8
X1579		In 3-dimensional coordinate conversion $8
X1580	RTAP8	In synchronized tapping selection (M command) $8
X1581		In small diameter deep hole cycle $8
X1582		High-speed retract function valid state $8 ▲
X1583		In high-speed retract function operation $8 ▲
X1588		In barrier valid (left) $8
X1589		In barrier valid (right) $8
X158A	TLMSFIN8	Tool length measurement completion $8 ▲
X158B	TLMSERR8	Tool length measurement error $8 ▲
X158E	TLMSSELO8	Tool length measurement sub-side selected $8 ▲
X158F		Tool retract position reached $8 ▲
X1590	TRME8	With tool retract amount command $8 ▲
X1591	TRRP8	In tool repositioning $8 ▲
X1598		Door open enable $8
X15A8		Door open enable (2 channels per 1 part system) $8
X15AA		External search: Program return completed $8
X15AD		Optimum machining diagnosis in progress $8 ▲
X15AE		Load monitor I : Cutting torque estimation in progress $8 ▲
X15AF		Load monitor I : Cutting torque estimation completed $8 ▲
X15B0	PFCHS8	Program format switch in progress $8 [M8]
X15B9	GLMT8	Torque limitation skip: G160 torque limit ON $8
X15CB	G0AC8	Rapid traverse time constant: In switchover $8
X15CC	RT2CHG8	Real-time tuning 2: Acceleration/deceleration time constant in switchover $8
X15D4		3D coordinate conversion : Manual feed valid $8 [M8]
X15D5	RCEI8	Rotation center error compensation in progress $8
X15D7	SECI8	Spatial error compensation in progress $8 [M8]
X15D8	MJST8	Tool axis coordinate system in 3D manual feed (JOG, INC) $8
X15D9	MJSB8	Table coordinate system in 3D manual feed (JOG, INC) $8
X15DA	MJSF8	Feature coordinate system in 3D manual feed (JOG, INC) $8
X15DB	MH1ST8	Tool axis coordinate system in 3D manual feed (1st handle) $8
X15DC	MH1SB8	Table coordinate system in 3D manual feed (1st handle) $8
X15DD	MH1SF8	Feature coordinate system in 3D manual feed (1st handle) $8
X15DE	MH2ST8	Tool axis coordinate system in 3D manual feed (2nd handle) $8
X15DF	MH2SB8	Table coordinate system in 3D manual feed (2nd handle) $8
X15E0	MH2SF8	Feature coordinate system in 3D manual feed (2nd handle) $8
X15E1	MH3ST8	Tool axis coordinate system in 3D manual feed (3rd handle) $8
X15E2	MH3SB8	Table coordinate system in 3D manual feed (3rd handle) $8
X15E3	MH3SF8	Feature coordinate system in 3D manual feed (3rd handle) $8
X15E7	TCPRS8	In tool center point rotation $8
X15E8	RSSCT8	R-Navi: selecting machine surface $8
X15E9	RSIND8	R-Navi: machine surface indexing $8
X15EA	RSIDF8	R-Navi: machine surface index complete $8
X15EF	SLOP8	Simple inclined surface machining/Inclined surface control command ON $8 [M8]
X15F0		MES interface library: Sending user arbitrary information $8 [M8]
X15F1		Manual arbitrary reverse run: Reverse run invalid status $8 [M8]
X1878		Edit/search window displayed
X1882	SIGE1	S command gear No. illegal 1stSP
X1883	SOVE1	S command max./min. command value over 1stSP
X1884	SNGE1	S command no gear selected 1stSP
X1885	GR11	Spindle gear shift command 1 1stSP
X1886	GR21	Spindle gear shift command 2 1stSP
X1887	-	(Always "0") 1stSP
X1888	ORAO21	Spindle 2nd in-position 1stSP
X1889	CDO1	Current detection 1stSP
X188A	VRO1	Speed detection 1stSP
X188B	FLO1	In spindle alarm 1stSP
X188C	ZSO1	Zero speed 1stSP
X188D	USO1	Spindle up-to-speed 1stSP
X188E	ORAO1	Spindle in-position 1stSP
X188F	LCSA1	In L coil selection 1stSP
X1890	SMA1	Spindle ready-ON 1stSP
X1891	SSA1	Spindle servo-ON 1stSP
X1892	SEMG1	In spindle emergency stop 1stSP
X1893	SSRN1	In spindle forward run 1stSP
X1894	SSRI1	In spindle reverse run 1stSP
X1895		Z phase passed 1stSP
X1896	SIMP1	Position loop in-position 1stSP
X1897	STLQ1	In spindle torque limit 1stSP
X189A		Spindle torque limit reached 1stSP
X189D	SD21	Speed detection 2 1stSP
X189E	MCSA1	In M coil selection 1stSP

Device	Abbrev.	Signal name
X189F		Index positioning completion 1stSP
X18A0	ENB1	Spindle enable 1stSP
X18A1	LRUC1	In changeover to L coil 1stSP ▲
X18A2	HRUC1	In changeover to H coil 1stSP ▲
X18A7		Spindle synchronization speed detect 1stSP ▲
X18A8	SPSYN11	In spindle synchronization 1stSP
X18A9	FSPRV1	Spindle rotation speed synchronization completion 1stSP
X18AA	FSPPH1	Spindle phase synchronization completion 1stSP
X18AB	SPSYN21	In spindle synchronization 2 1stSP
X18AC	SPCMP1	Chuck close confirmation 1stSP
X18AD	TSS11	Tool spindle synchronization I (Polygon) ON 1stSP
X18AE	SPSYN31	In tool spindle synchronization II 1stSP
X18AF	SPNCH1	Spindle superimposition control: Speed change disabled 1stSP
X18B0	SPPHOV1	Spindle synchronization phase error over 1stSP
X18B1	SPILE1	Spindle superimposition control ON 1stSP
X18B2	SPLCR1	Spindle superimposition control: Spindle superimposition clamped 1stSP
X18B3	PHOVR1	Hob axis delay excess 1stSP
X18B5	EXOFN1	Holding power of spindle increased 1stSP
X18B6	SPOFFA1	In spindle off 1stSP
X18B7	SSRD1	Spindle speed fluctuation detection: Spindle speed out of setting range 1stSP [M8]
X18C1	SVMD1	Spindle position control (Spindle/C axis control): C axis mode ON 1stSP
X18C2	GO11	Spindle gear selection output 1 1stSP
X18C3	GO21	Spindle gear selection output 2 1stSP
X18C8		Spindle oscillation in progress 1stSP
X18CA	VGHLD1	Real-time tuning 1: Speed control gain changeover hold-down ON 1stSP
X18E2	SIGE2	S command gear No. illegal 2ndSP
X18E3	SOVE2	S command max./min. command value over 2ndSP
X18E4	SNGE2	S command no gear selected 2ndSP
X18E5	GR12	Spindle gear shift command 1 2ndSP
X18E6	GR22	Spindle gear shift command 2 2ndSP
X18E7	-	(Always "0") 2ndSP
X18E8	ORAO22	Spindle 2nd in-position 2ndSP
X18E9	CDO2	Current detection 2ndSP
X18EA	VRO2	Speed detection 2ndSP
X18EB	FLO2	In spindle alarm 2ndSP
X18EC	ZSO2	Zero speed 2ndSP
X18ED	USO2	Spindle up-to-speed 2ndSP
X18EE	ORAO2	Spindle in-position 2ndSP
X18EF	LCSA2	In L coil selection 2ndSP
X18F0	SMA2	Spindle ready-ON 2ndSP
X18F1	SSA2	Spindle servo-ON 2ndSP
X18F2	SEMG2	In spindle emergency stop 2ndSP
X18F3	SSRN2	In spindle forward run 2ndSP
X18F4	SSRI2	In spindle reverse run 2ndSP
X18F5		Z phase passed 2ndSP
X18F6	SIMP2	Position loop in-position 2ndSP
X18F7	STLQ2	In spindle torque limit 2ndSP
X18FA		Spindle torque limit reached 2ndSP
X18FD	SD22	Speed detection 2 2ndSP
X18FE	MCSA2	In M coil selection 2ndSP
X18FF		Index positioning completion 2ndSP
X1900	ENB2	Spindle enable 2ndSP
X1901	LRUC2	In changeover to L coil 2ndSP ▲
X1902	HRUC2	In changeover to H coil 2ndSP ▲
X1907		Spindle synchronization speed detect 2ndSP ▲
X1908	SPSYN12	In spindle synchronization 2ndSP
X1909	FSPRV2	Spindle rotation speed synchronization completion 2ndSP
X190A	FSPPH2	Spindle phase synchronization completion 2ndSP
X190B	SPSYN22	In spindle synchronization 2 2ndSP
X190C	SPCMP2	Chuck close confirmation 2ndSP
X190D	TSS12	Tool spindle synchronization I (Polygon) ON 2ndSP
X190E	SPSYN32	In tool spindle synchronization II 2ndSP
X190F	SPNCH2	Spindle superimposition control: Speed change disabled 2ndSP
X1910	SPPHOV2	Spindle synchronization phase error over 2ndSP
X1911	SPILE2	Spindle superimposition control ON 2ndSP
X1912	SPLCR2	Spindle superimposition control: Spindle superimposition clamped 2ndSP
X1913	PHOVR2	Hob axis delay excess 2ndSP
X1915	EXOFN2	Holding power of spindle increased 2ndSP
X1916	SPOFFA2	In spindle off 2ndSP
X1917	SSRD2	Spindle speed fluctuation detection: Spindle speed out of setting range 2ndSP [M8]
X1921	SVMD2	Spindle position control (Spindle/C axis control): C axis mode ON 2ndSP
X1922	GO12	Spindle gear selection output 1 2ndSP
X1923	GO22	Spindle gear selection output 2 2ndSP
X1928		Spindle oscillation in progress 2ndSP
X192A	VGHLD2	Real-time tuning 1: Speed control gain changeover hold-down ON 2ndSP
X1942	SIGE3	S command gear No. illegal 3rdSP
X1943	SOVE3	S command max./min. command value over 3rdSP
X1944	SNGE3	S command no gear selected 3rdSP
X1945	GR13	Spindle gear shift command 1 3rdSP
X1946	GR23	Spindle gear shift command 2 3rdSP
X1947	-	(Always "0") 3rdSP

Device	Abbrev.	Signal name
X1948	ORAO23	Spindle 2nd in-position 3rdSP
X1949	CDO3	Current detection 3rdSP
X194A	VRO3	Speed detection 3rdSP
X194B	FLO3	In spindle alarm 3rdSP
X194C	ZSO3	Zero speed 3rdSP
X194D	USO3	Spindle up-to-speed 3rdSP
X194E	ORAO3	Spindle in-position 3rdSP
X194F	LCSA3	In L coil selection 3rdSP
X1950	SMA3	Spindle ready-ON 3rdSP
X1951	SSA3	Spindle servo-ON 3rdSP
X1952	SEMG3	In spindle emergency stop 3rdSP
X1953	SSRN3	In spindle forward run 3rdSP
X1954	SSRI3	In spindle reverse run 3rdSP
X1955		Z phase passed 3rdSP
X1956	SIMP3	Position loop in-position 3rdSP
X1957	STLQ3	In spindle torque limit 3rdSP
X195A		Spindle torque limit reached 3rdSP
X195D	SD23	Speed detection 2 3rdSP
X195E	MCSA3	In M coil selection 3rdSP
X195F		Index positioning completion 3rdSP
X1960	ENB3	Spindle enable 3rdSP
X1961	LRUC3	In changeover to L coil 3rdSP ▲
X1962	HRUC3	In changeover to H coil 3rdSP ▲
X1967		Spindle synchronization speed detect 3rdSP ▲
X1968	SPSYN13	In spindle synchronization 3rdSP
X1969	FSPRV3	Spindle rotation speed synchronization completion 3rdSP
X196A	FSPPH3	Spindle phase synchronization completion 3rdSP
X196B	SPSYN23	In spindle synchronization 2 3rdSP
X196C	SPCMP3	Chuck close confirmation 3rdSP
X196D	TSS13	Tool spindle synchronization I (Polygon) ON 3rdSP
X196E	SPSYN33	In tool spindle synchronization II 3rdSP
X196F	SPNCH3	Spindle superimposition control: Speed change disabled 3rdSP
X1970	SPPHOV3	Spindle synchronization phase error over 3rdSP
X1971	SPILE3	Spindle superimposition control ON 3rdSP
X1972	SPLCR3	Spindle superimposition control: Spindle superimposition clamped 3rdSP
X1973	PHOVR3	Hob axis delay excess 3rdSP
X1975	EXOFN3	Holding power of spindle increased 3rdSP
X1976	SPOFFA3	In spindle off 3rdSP
X1977	SSRD3	Spindle speed fluctuation detection: Spindle speed out of setting range 3rdSP [M8]
X1981	SVMD3	Spindle position control (Spindle/C axis control): C axis mode ON 3rdSP
X1982	GO13	Spindle gear selection output 1 3rdSP
X1983	GO23	Spindle gear selection output 2 3rdSP
X1988		Spindle oscillation in progress 3rdSP
X198A	VGHLD3	Real-time tuning 1: Speed control gain changeover hold-down ON 3rdSP
X19A2	SIGE4	S command gear No. illegal 4thSP
X19A3	SOVE4	S command max./min. command value over 4thSP
X19A4	SNGE4	S command no gear selected 4thSP
X19A5	GR14	Spindle gear shift command 1 4thSP
X19A6	GR24	Spindle gear shift command 2 4thSP
X19A7	-	(Always "0") 4thSP
X19A8	ORAO24	Spindle 2nd in-position 4thSP
X19A9	CDO4	Current detection 4thSP
X19AA	VRO4	Speed detection 4thSP
X19AB	FLO4	In spindle alarm 4thSP
X19AC	ZSO4	Zero speed 4thSP
X19AD	USO4	Spindle up-to-speed 4thSP
X19AE	ORAO4	Spindle in-position 4thSP
X19AF	LCSA4	In L coil selection 4thSP
X19B0	SMA4	Spindle ready-ON 4thSP
X19B1	SSA4	Spindle servo-ON 4thSP
X19B2	SEMG4	In spindle emergency stop 4thSP
X19B3	SSRN4	In spindle forward run 4thSP
X19B4	SSRI4	In spindle reverse run 4thSP
X19B5		Z phase passed 4thSP
X19B6	SIMP4	Position loop in-position 4thSP
X19B7	STLQ4	In spindle torque limit 4thSP
X19BA		Spindle torque limit reached 4thSP
X19BD	SD24	Speed detection 2 4thSP
X19BE	MCSA4	In M coil selection 4thSP
X19BF		Index positioning completion 4thSP
X19C0	ENB4	Spindle enable 4thSP
X19C1	LRUC4	In changeover to L coil 4thSP ▲
X19C2	HRUC4	In changeover to H coil 4thSP ▲
X19C7		Spindle synchronization speed detect 4thSP ▲
X19C8	SPSYN14	In spindle synchronization 4thSP
X19C9	FSPRV4	Spindle rotation speed synchronization completion 4thSP
X19CA	FSPPH4	Spindle phase synchronization completion 4thSP
X19CB	SPSYN24	In spindle synchronization 2 4thSP
X19CC	SPCMP4	Chuck close confirmation 4thSP
X19CD	TSS14	Tool spindle synchronization I (Polygon) ON 4thSP
X19CE	SPSYN34	In tool spindle synchronization II 4thSP
X19CF	SPNCH4	Spindle superimposition control: Speed change disabled 4thSP

Device	Abbrev.	Signal name
X19D0	SPPHOV4	Spindle synchronization phase error over 4thSP
X19D1	SPILE4	Spindle superimposition control ON 4thSP
X19D2	SPLCR4	Spindle superimposition control: Spindle superimposition clamped 4thSP
X19D3	PHOVR4	Hob axis delay excess 4thSP
X19D5	EXOFN4	Holding power of spindle increased 4thSP
X19D6	SPOFFA4	In spindle off 4thSP
X19D7	SSRD4	Spindle speed fluctuation detection: Spindle speed out of setting range 4thSP [M8]
X19E1	SVMD4	Spindle position control (Spindle/C axis control): C axis mode ON 4thSP
X19E2	GO14	Spindle gear selection output 1 4thSP
X19E3	GO24	Spindle gear selection output 2 4thSP
X19E8		Spindle oscillation in progress 4thSP
X19EA	VGHLD4	Real-time tuning 1: Speed control gain changeover hold-down ON 4thSP
X1A02	SIGE5	S command gear No. illegal 5thSP
X1A03	SOVE5	S command max./min. command value over 5thSP
X1A04	SNGE5	S command no gear selected 5thSP
X1A05	GR15	Spindle gear shift command 1 5thSP
X1A06	GR25	Spindle gear shift command 2 5thSP
X1A07	-	(Always "0") 5thSP
X1A08	ORAO25	Spindle 2nd in-position 5thSP
X1A09	CDO5	Current detection 5thSP
X1A0A	VRO5	Speed detection 5thSP
X1A0B	FLO5	In spindle alarm 5thSP
X1A0C	ZSO5	Zero speed 5thSP
X1A0D	USO5	Spindle up-to-speed 5thSP
X1A0E	ORAO5	Spindle in-position 5thSP
X1A0F	LCSA5	In L coil selection 5thSP
X1A10	SMA5	Spindle ready-ON 5thSP
X1A11	SSA5	Spindle servo-ON 5thSP
X1A12	SEMG5	In spindle emergency stop 5thSP
X1A13	SSRN5	In spindle forward run 5thSP
X1A14	SSRI5	In spindle reverse run 5thSP
X1A15		Z phase passed 5thSP
X1A16	SIMP5	Position loop in-position 5thSP
X1A17	STLQ5	In spindle torque limit 5thSP
X1A1A		Spindle torque limit reached 5thSP
X1A1D	SD25	Speed detection 2 5thSP
X1A1E	MCSA5	In M coil selection 5thSP
X1A1F		Index positioning completion 5thSP
X1A20	ENB5	Spindle enable 5thSP
X1A21	LRUC5	In changeover to L coil 5thSP ▲
X1A22	HRUC5	In changeover to H coil 5thSP ▲
X1A27		Spindle synchronization speed detect 5thSP ▲
X1A28	SPSYN15	In spindle synchronization 5thSP
X1A29	FSPRV5	Spindle rotation speed synchronization completion 5thSP
X1A2A	FSPPH5	Spindle phase synchronization completion 5thSP
X1A2B	SPSYN25	In spindle synchronization 2 5thSP
X1A2C	SPCMP5	Chuck close confirmation 5thSP
X1A2D	TSS15	Tool spindle synchronization I (Polygon) ON 5thSP
X1A2E	SPSYN35	In tool spindle synchronization II 5thSP
X1A2F	SPNCH5	Spindle superimposition control: Speed change disabled 5thSP
X1A30	SPPHOV5	Spindle synchronization phase error over 5thSP
X1A31	SPILE5	Spindle superimposition control ON 5thSP
X1A32	SPLCR5	Spindle superimposition control: Spindle superimposition clamped 5thSP
X1A33	PHOVR5	Hob axis delay excess 5thSP
X1A35	EXOFN5	Holding power of spindle increased 5thSP
X1A36	SPOFFA5	In spindle off 5thSP
X1A37	SSRD5	Spindle speed fluctuation detection: Spindle speed out of setting range 5thSP [M8]
X1A41	SVMD5	Spindle position control (Spindle/C axis control): C axis mode ON 5thSP
X1A42	GO15	Spindle gear selection output 1 5thSP
X1A43	GO25	Spindle gear selection output 2 5thSP
X1A48		Spindle oscillation in progress 5thSP
X1A4A	VGHLD5	Real-time tuning 1: Speed control gain changeover hold-down ON 5thSP
X1A62	SIGE6	S command gear No. illegal 6thSP
X1A63	SOVE6	S command max./min. command value over 6thSP
X1A64	SNGE6	S command no gear selected 6thSP
X1A65	GR16	Spindle gear shift command 1 6thSP
X1A66	GR26	Spindle gear shift command 2 6thSP
X1A67	-	(Always "0") 6thSP
X1A68	ORAO26	Spindle 2nd in-position 6thSP
X1A69	CDO6	Current detection 6thSP
X1A6A	VRO6	Speed detection 6thSP
X1A6B	FLO6	In spindle alarm 6thSP
X1A6C	ZSO6	Zero speed 6thSP
X1A6D	USO6	Spindle up-to-speed 6thSP
X1A6E	ORAO6	Spindle in-position 6thSP
X1A6F	LCSA6	In L coil selection 6thSP
X1A70	SMA6	Spindle ready-ON 6thSP
X1A71	SSA6	Spindle servo-ON 6thSP
X1A72	SEMG6	In spindle emergency stop 6thSP
X1A73	SSRN6	In spindle forward run 6thSP
X1A74	SSRI6	In spindle reverse run 6thSP

Device	Abbrev.	Signal name
X1A75		Z phase passed 6thSP
X1A76	SIMP6	Position loop in-position 6thSP
X1A77	STLQ6	In spindle torque limit 6thSP
X1A7A		Spindle torque limit reached 6thSP
X1A7D	SD26	Speed detection 2 6thSP
X1A7E	MCSA6	In M coil selection 6thSP
X1A7F		Index positioning completion 6thSP
X1A80	ENB6	Spindle enable 6thSP
X1A81	LRUC6	In changeover to L coil 6thSP ▲
X1A82	HRUC6	In changeover to H coil 6thSP ▲
X1A87		Spindle synchronization speed detect 6thSP ▲
X1A88	SPSYN16	In spindle synchronization 6thSP
X1A89	FSPRV6	Spindle rotation speed synchronization completion 6thSP
X1A8A	FSPPH6	Spindle phase synchronization completion 6thSP
X1A8B	SPSYN26	In spindle synchronization 2 6thSP
X1A8C	SPCMP6	Chuck close confirmation 6thSP
X1A8D	TSS16	Tool spindle synchronization I (Polygon) ON 6thSP
X1A8E	SPSYN36	In tool spindle synchronization II 6thSP
X1A8F	SPNCH6	Spindle superimposition control: Speed change disabled 6thSP
X1A90	SPPHOV6	Spindle synchronization phase error over 6thSP
X1A91	SPILE6	Spindle superimposition control ON 6thSP
X1A92	SPLCR6	Spindle superimposition control: Spindle superimposition clamped 6thSP
X1A93	PHOVR6	Hob axis delay excess 6thSP
X1A95	EXOFN6	Holding power of spindle increased 6thSP
X1A96	SPOFFA6	In spindle off 6thSP
X1A97	SSRD6	Spindle speed fluctuation detection: Spindle speed out of setting range 6thSP [M8]
X1AA1	SVMD6	Spindle position control (Spindle/C axis control): C axis mode ON 6thSP
X1AA2	GO16	Spindle gear selection output 1 6thSP
X1AA3	GO26	Spindle gear selection output 2 6thSP
X1AA8		Spindle oscillation in progress 6thSP
X1AAA	VGHLD6	Real-time tuning 1: Speed control gain changeover hold-down ON 6thSP
X1AC2	SIGE7	S command gear No. illegal 7thSP
X1AC3	SOVE7	S command max./min. command value over 7thSP
X1AC4	SNGE7	S command no gear selected 7thSP
X1AC5	GR17	Spindle gear shift command 1 7thSP
X1AC6	GR27	Spindle gear shift command 2 7thSP
X1AC7	-	(Always "0") 7thSP
X1AC8	ORAO27	Spindle 2nd in-position 7thSP
X1AC9	CDO7	Current detection 7thSP
X1ACA	VRO7	Speed detection 7thSP
X1ACB	FLO7	In spindle alarm 7thSP
X1ACC	ZSO7	Zero speed 7thSP
X1ACD	USO7	Spindle up-to-speed 7thSP
X1ACE	ORAO7	Spindle in-position 7thSP
X1ACF	LCSA7	In L coil selection 7thSP
X1AD0	SMA7	Spindle ready-ON 7thSP
X1AD1	SSA7	Spindle servo-ON 7thSP
X1AD2	SEMG7	In spindle emergency stop 7thSP
X1AD3	SSRN7	In spindle forward run 7thSP
X1AD4	SSRI7	In spindle reverse run 7thSP
X1AD5		Z phase passed 7thSP
X1AD6	SIMP7	Position loop in-position 7thSP
X1AD7	STLQ7	In spindle torque limit 7thSP
X1ADA		Spindle torque limit reached 7thSP
X1ADD	SD27	Speed detection 2 7thSP
X1ADE	MCSA7	In M coil selection 7thSP
X1ADF		Index positioning completion 7thSP
X1AE0	ENB7	Spindle enable 7thSP
X1AE1	LRUC7	In changeover to L coil 7thSP ▲
X1AE2	HRUC7	In changeover to H coil 7thSP ▲
X1AE7		Spindle synchronization speed detect 7thSP ▲
X1AE8	SPSYN17	In spindle synchronization 7thSP
X1AE9	FSPRV7	Spindle rotation speed synchronization completion 7thSP
X1AEA	FSPPH7	Spindle phase synchronization completion 7thSP
X1AEB	SPSYN27	In spindle synchronization 2 7thSP
X1AEC	SPCMP7	Chuck close confirmation 7thSP
X1AED	TSS17	Tool spindle synchronization I (Polygon) ON 7thSP
X1AEE	SPSYN37	In tool spindle synchronization II 7thSP
X1AEF	SPNCH7	Spindle superimposition control: Speed change disabled 7thSP
X1AF0	SPPHOV7	Spindle synchronization phase error over 7thSP
X1AF1	SPILE7	Spindle superimposition control ON 7thSP
X1AF2	SPLCR7	Spindle superimposition control: Spindle superimposition clamped 7thSP
X1AF3	PHOVR7	Hob axis delay excess 7thSP
X1AF5	EXOFN7	Holding power of spindle increased 7thSP
X1AF6	SPOFFA7	In spindle off 7thSP
X1AF7	SSRD7	Spindle speed fluctuation detection: Spindle speed out of setting range 7thSP [M8]
X1B01	SVMD7	Spindle position control (Spindle/C axis control): C axis mode ON 7thSP
X1B02	GO17	Spindle gear selection output 1 7thSP
X1B03	GO27	Spindle gear selection output 2 7thSP
X1B08		Spindle oscillation in progress 7thSP
X1B0A	VGHLD7	Real-time tuning 1: Speed control gain changeover hold-down ON 7thSP

Device	Abbrev.	Signal name
X1B22	SIGE8	S command gear No. illegal 8thSP
X1B23	SOVE8	S command max./min. command value over 8thSP
X1B24	SNGE8	S command no gear selected 8thSP
X1B25	GR18	Spindle gear shift command 1 8thSP
X1B26	GR28	Spindle gear shift command 2 8thSP
X1B27	-	(Always "0") 8thSP
X1B28	ORAO28	Spindle 2nd in-position 8thSP
X1B29	CDO8	Current detection 8thSP
X1B2A	VRO8	Speed detection 8thSP
X1B2B	FLO8	In spindle alarm 8thSP
X1B2C	ZSO8	Zero speed 8thSP
X1B2D	USO8	Spindle up-to-speed 8thSP
X1B2E	ORAO8	Spindle in-position 8thSP
X1B2F	LCSA8	In L coil selection 8thSP
X1B30	SMA8	Spindle ready-ON 8thSP
X1B31	SSA8	Spindle servo-ON 8thSP
X1B32	SEMG8	In spindle emergency stop 8thSP
X1B33	SSRN8	In spindle forward run 8thSP
X1B34	SSRI8	In spindle reverse run 8thSP
X1B35		Z phase passed 8thSP
X1B36	SIMP8	Position loop in-position 8thSP
X1B37	STLQ8	In spindle torque limit 8thSP
X1B3A		Spindle torque limit reached 8thSP
X1B3D	SD28	Speed detection 2 8thSP
X1B3E	MCSA8	In M coil selection 8thSP
X1B3F		Index positioning completion 8thSP
X1B40	ENB8	Spindle enable 8thSP
X1B41	LRUC8	In changeover to L coil 8thSP ▲
X1B42	HRUC8	In changeover to H coil 8thSP ▲
X1B47		Spindle synchronization speed detect 8thSP ▲
X1B48	SPSYN18	In spindle synchronization 8thSP
X1B49	FSPRV8	Spindle rotation speed synchronization completion 8thSP
X1B4A	FSPPH8	Spindle phase synchronization completion 8thSP
X1B4B	SPSYN28	In spindle synchronization 2 8thSP
X1B4C	SPCMP8	Chuck close confirmation 8thSP
X1B4D	TSS18	Tool spindle synchronization I (Polygon) ON 8thSP
X1B4E	SPSYN38	In tool spindle synchronization II 8thSP
X1B4F	SPNCH8	Spindle superimposition control: Speed change disabled 8thSP
X1B50	SPPHOV8	Spindle synchronization phase error over 8thSP
X1B51	SPILE8	Spindle superimposition control ON 8thSP
X1B52	SPLCR8	Spindle superimposition control: Spindle superimposition clamped 8thSP
X1B53	PHOVR8	Hob axis delay excess 8thSP
X1B55	EXOFN8	Holding power of spindle increased 8thSP
X1B56	SPOFFA8	In spindle off 8thSP
X1B57	SSRD8	Spindle speed fluctuation detection: Spindle speed out of setting range 8thSP [M8]
X1B61	SVMD8	Spindle position control (Spindle/C axis control): C axis mode ON 8thSP
X1B62	GO18	Spindle gear selection output 1 8thSP
X1B63	GO28	Spindle gear selection output 2 8thSP
X1B68		Spindle oscillation in progress 8thSP
X1B6A	VGHLD8	Real-time tuning 1: Speed control gain changeover hold-down ON 8thSP
X1CD0		Handy terminal key 1 [M8]
X1CD1		Handy terminal key 2 [M8]
X1CD2		Handy terminal key 3 [M8]
X1CD3		Handy terminal key 4 [M8]
X1CD4		Handy terminal key 5 [M8]
X1CD5		Handy terminal key 6 [M8]
X1CD6		Handy terminal key 7 [M8]
X1CD7		Handy terminal key 8 [M8]
X1CD8		Handy terminal key 9 [M8]
X1CD9		Handy terminal key 10 [M8]
X1CDA		Handy terminal key 11 [M8]
X1CDB		Handy terminal key 12 [M8]
X1CDC		Handy terminal key 13 [M8]
X1CDD		Handy terminal key 14 [M8]
X1CDE		Handy terminal key 15 [M8]
X1CDF		Handy terminal key 16 [M8]
X1CE0		Handy terminal key 17 [M8]
X1CE1		Handy terminal key 18 [M8]
X1CE2		Handy terminal key 19 [M8]
X1CE3		Handy terminal key 20 [M8]
X1CE4		Handy terminal key 21 [M8]
X1CE5		Handy terminal key 22 [M8]
X1CE6		Handy terminal key 23 [M8]
X1CE7		Handy terminal key 24 [M8]
X1CE8		Handy terminal key 25 [M8]
X1CE9		Handy terminal key 26 [M8]
X1CEA		Handy terminal key 27 [M8]
X1CEB		Handy terminal key 28 [M8]
X1CEC		Handy terminal key 29 [M8]
X1CED		Handy terminal key 30 [M8]
X1CEE		Handy terminal key 31 [M8]
X1CEF		Handy terminal key 32 [M8]

Device	Abbrev.	Signal name
X1CF0		Handy terminal key 33 [M8]
X1CF1		Handy terminal key 34 [M8]
X1CF2		Handy terminal key 35 [M8]
X1CF3		Handy terminal key 36 [M8]
X1CF4		Handy terminal key 37 [M8]
X1CF5		Handy terminal key 38 [M8]
X1CF6		Handy terminal key 39 [M8]
X1CF7		Handy terminal key 40 [M8]
X1CF8		Handy terminal key 41 [M8]
X1CF9		Handy terminal key 42 [M8]
X1CFA		Handy terminal key 43 [M8]
X1CFB		Handy terminal key 44 [M8]
X1CFC		Handy terminal key 45 [M8]
X1D00	PSW11	Position switch 1 $1
X1D01	PSW21	Position switch 2 $1
X1D02	PSW31	Position switch 3 $1
X1D03	PSW41	Position switch 4 $1
X1D04	PSW51	Position switch 5 $1
X1D05	PSW61	Position switch 6 $1
X1D06	PSW71	Position switch 7 $1
X1D07	PSW81	Position switch 8 $1
X1D08	PSW91	Position switch 9 $1
X1D09	PSW101	Position switch 10 $1
X1D0A	PSW111	Position switch 11 $1
X1D0B	PSW121	Position switch 12 $1
X1D0C	PSW131	Position switch 13 $1
X1D0D	PSW141	Position switch 14 $1
X1D0E	PSW151	Position switch 15 $1
X1D0F	PSW161	Position switch 16 $1
X1D10	PSW171	Position switch 17 $1
X1D11	PSW181	Position switch 18 $1
X1D12	PSW191	Position switch 19 $1
X1D13	PSW201	Position switch 20 $1
X1D14	PSW211	Position switch 21 $1
X1D15	PSW221	Position switch 22 $1
X1D16	PSW231	Position switch 23 $1
X1D17	PSW241	Position switch 24 $1
X1D20	PSW12	Position switch 1 $2
X1D21	PSW22	Position switch 2 $2
X1D22	PSW32	Position switch 3 $2
X1D23	PSW42	Position switch 4 $2
X1D24	PSW52	Position switch 5 $2
X1D25	PSW62	Position switch 6 $2
X1D26	PSW72	Position switch 7 $2
X1D27	PSW82	Position switch 8 $2
X1D28	PSW92	Position switch 9 $2
X1D29	PSW102	Position switch 10 $2
X1D2A	PSW112	Position switch 11 $2
X1D2B	PSW122	Position switch 12 $2
X1D2C	PSW132	Position switch 13 $2
X1D2D	PSW142	Position switch 14 $2
X1D2E	PSW152	Position switch 15 $2
X1D2F	PSW162	Position switch 16 $2
X1D30	PSW172	Position switch 17 $2
X1D31	PSW182	Position switch 18 $2
X1D32	PSW192	Position switch 19 $2
X1D33	PSW202	Position switch 20 $2
X1D34	PSW212	Position switch 21 $2
X1D35	PSW222	Position switch 22 $2
X1D36	PSW232	Position switch 23 $2
X1D37	PSW242	Position switch 24 $2
X1D40	PSW13	Position switch 1 $3
X1D41	PSW23	Position switch 2 $3
X1D42	PSW33	Position switch 3 $3
X1D43	PSW43	Position switch 4 $3
X1D44	PSW53	Position switch 5 $3
X1D45	PSW63	Position switch 6 $3
X1D46	PSW73	Position switch 7 $3
X1D47	PSW83	Position switch 8 $3
X1D48	PSW93	Position switch 9 $3
X1D49	PSW103	Position switch 10 $3
X1D4A	PSW113	Position switch 11 $3
X1D4B	PSW123	Position switch 12 $3
X1D4C	PSW133	Position switch 13 $3
X1D4D	PSW143	Position switch 14 $3
X1D4E	PSW153	Position switch 15 $3
X1D4F	PSW163	Position switch 16 $3
X1D50	PSW173	Position switch 17 $3
X1D51	PSW183	Position switch 18 $3
X1D52	PSW193	Position switch 19 $3
X1D53	PSW203	Position switch 20 $3
X1D54	PSW213	Position switch 21 $3

Device	Abbrev.	Signal name
X1D55	PSW223	Position switch 22 $3
X1D56	PSW233	Position switch 23 $3
X1D57	PSW243	Position switch 24 $3
X1D60	PSW14	Position switch 1 $4
X1D61	PSW24	Position switch 2 $4
X1D62	PSW34	Position switch 3 $4
X1D63	PSW44	Position switch 4 $4
X1D64	PSW54	Position switch 5 $4
X1D65	PSW64	Position switch 6 $4
X1D66	PSW74	Position switch 7 $4
X1D67	PSW84	Position switch 8 $4
X1D68	PSW94	Position switch 9 $4
X1D69	PSW104	Position switch 10 $4
X1D6A	PSW114	Position switch 11 $4
X1D6B	PSW124	Position switch 12 $4
X1D6C	PSW134	Position switch 13 $4
X1D6D	PSW144	Position switch 14 $4
X1D6E	PSW154	Position switch 15 $4
X1D6F	PSW164	Position switch 16 $4
X1D70	PSW174	Position switch 17 $4
X1D71	PSW184	Position switch 18 $4
X1D72	PSW194	Position switch 19 $4
X1D73	PSW204	Position switch 20 $4
X1D74	PSW214	Position switch 21 $4
X1D75	PSW224	Position switch 22 $4
X1D76	PSW234	Position switch 23 $4
X1D77	PSW244	Position switch 24 $4
X1D80	PSW15	Position switch 1 $5
X1D81	PSW25	Position switch 2 $5
X1D82	PSW35	Position switch 3 $5
X1D83	PSW45	Position switch 4 $5
X1D84	PSW55	Position switch 5 $5
X1D85	PSW65	Position switch 6 $5
X1D86	PSW75	Position switch 7 $5
X1D87	PSW85	Position switch 8 $5
X1D88	PSW95	Position switch 9 $5
X1D89	PSW105	Position switch 10 $5
X1D8A	PSW115	Position switch 11 $5
X1D8B	PSW125	Position switch 12 $5
X1D8C	PSW135	Position switch 13 $5
X1D8D	PSW145	Position switch 14 $5
X1D8E	PSW155	Position switch 15 $5
X1D8F	PSW165	Position switch 16 $5
X1D90	PSW175	Position switch 17 $5
X1D91	PSW185	Position switch 18 $5
X1D92	PSW195	Position switch 19 $5
X1D93	PSW205	Position switch 20 $5
X1D94	PSW215	Position switch 21 $5
X1D95	PSW225	Position switch 22 $5
X1D96	PSW235	Position switch 23 $5
X1D97	PSW245	Position switch 24 $5
X1DA0	PSW16	Position switch 1 $6
X1DA1	PSW26	Position switch 2 $6
X1DA2	PSW36	Position switch 3 $6
X1DA3	PSW46	Position switch 4 $6
X1DA4	PSW56	Position switch 5 $6
X1DA5	PSW66	Position switch 6 $6
X1DA6	PSW76	Position switch 7 $6
X1DA7	PSW86	Position switch 8 $6
X1DA8	PSW96	Position switch 9 $6
X1DA9	PSW106	Position switch 10 $6
X1DAA	PSW116	Position switch 11 $6
X1DAB	PSW126	Position switch 12 $6
X1DAC	PSW136	Position switch 13 $6
X1DAD	PSW146	Position switch 14 $6
X1DAE	PSW156	Position switch 15 $6
X1DAF	PSW166	Position switch 16 $6
X1DB0	PSW176	Position switch 17 $6
X1DB1	PSW186	Position switch 18 $6
X1DB2	PSW196	Position switch 19 $6
X1DB3	PSW206	Position switch 20 $6
X1DB4	PSW216	Position switch 21 $6
X1DB5	PSW226	Position switch 22 $6
X1DB6	PSW236	Position switch 23 $6
X1DB7	PSW246	Position switch 24 $6
X1DC0	PSW17	Position switch 1 $7
X1DC1	PSW27	Position switch 2 $7
X1DC2	PSW37	Position switch 3 $7
X1DC3	PSW47	Position switch 4 $7
X1DC4	PSW57	Position switch 5 $7
X1DC5	PSW67	Position switch 6 $7
X1DC6	PSW77	Position switch 7 $7

Device	Abbrev.	Signal name
X1DC7	PSW87	Position switch 8 $7
X1DC8	PSW97	Position switch 9 $7
X1DC9	PSW107	Position switch 10 $7
X1DCA	PSW117	Position switch 11 $7
X1DCB	PSW127	Position switch 12 $7
X1DCC	PSW137	Position switch 13 $7
X1DCD	PSW147	Position switch 14 $7
X1DCE	PSW157	Position switch 15 $7
X1DCF	PSW167	Position switch 16 $7
X1DD0	PSW177	Position switch 17 $7
X1DD1	PSW187	Position switch 18 $7
X1DD2	PSW197	Position switch 19 $7
X1DD3	PSW207	Position switch 20 $7
X1DD4	PSW217	Position switch 21 $7
X1DD5	PSW227	Position switch 22 $7
X1DD6	PSW237	Position switch 23 $7
X1DD7	PSW247	Position switch 24 $7
X1DE0	PSW18	Position switch 1 $8
X1DE1	PSW28	Position switch 2 $8
X1DE2	PSW38	Position switch 3 $8
X1DE3	PSW48	Position switch 4 $8
X1DE4	PSW58	Position switch 5 $8
X1DE5	PSW68	Position switch 6 $8
X1DE6	PSW78	Position switch 7 $8
X1DE7	PSW88	Position switch 8 $8
X1DE8	PSW98	Position switch 9 $8
X1DE9	PSW108	Position switch 10 $8
X1DEA	PSW118	Position switch 11 $8
X1DEB	PSW128	Position switch 12 $8
X1DEC	PSW138	Position switch 13 $8
X1DED	PSW148	Position switch 14 $8
X1DEE	PSW158	Position switch 15 $8
X1DEF	PSW168	Position switch 16 $8
X1DF0	PSW178	Position switch 17 $8
X1DF1	PSW188	Position switch 18 $8
X1DF2	PSW198	Position switch 19 $8
X1DF3	PSW208	Position switch 20 $8
X1DF4	PSW218	Position switch 21 $8
X1DF5	PSW228	Position switch 22 $8
X1DF6	PSW238	Position switch 23 $8
X1DF7	PSW248	Position switch 24 $8

2 PLC Input Signals (Data type: R***)

(Note) Signals marked with " ▲ " are prepared for a specific machine tool builder.

Device	Abbrev.	Signal name
R0	AI1	Analog input 1
R1	AI2	Analog input 2
R2	AI3	Analog input 3
R3	AI4	Analog input 4
R4	AI5	Analog input 5
R5	AI6	Analog input 6
R6	AI7	Analog input 7
R7	AI8	Analog input 8
R8		KEY IN 1
R11		Clock data Year/Month
R12		Clock data Date/Hour
R13		Clock data Minute/Second
R16		CNC software version code A
R17		CNC software version code B
R18		CNC software version code C1
R19		CNC software version code C2
R25		PC high-speed process time
R26		Turret interference check status
R27		Interference object alarm information
R30		Remote program input error information ▲
R31		Diagnosis data output
R37		PLC window parameter status
R38		ASYNC error: exceptional occurrence step number ▲
R39		
R40		ASYNC error: exceptional occurrence R register number ▲
R56		Battery drop cause
R57		Temperature warning cause
R58		5V/24V error cause
R60		Control unit temperature
R62		Tool ID communication error information ▲
R68		PLC main scan time
R69		Emergency stop cause
R70		DIO card information
R72		Ball screw thermal displacement compensation Compensation amount 1st axis [M]
R73		Ball screw thermal displacement compensation Compensation amount 2nd axis [M]
R74		Ball screw thermal displacement compensation Compensation amount 3rd axis [M]
R75		Ball screw thermal displacement compensation Compensation amount 4th axis [M]
R83		Modbus/RTU received packet monitor ▲
R84		Modbus/RTU communication error monitor ▲
R85		Modal task data update cycle
R90		Modbus/TCP connection request monitor ▲
R91		Modbus/TCP number of connections monitor ▲
R92		Modbus/TCP received packet monitor ▲
R93		Modbus/TCP communication error monitor ▲
R94		Modbus/TCP protocol error packet monitor ▲
R96	SMDOEN	Speed monitor door open possible
R98	SOPFN	Multi-step speed monitor selected speed output [M8]
R100	SODIO2	Safety observation I/O signal state 2 ▲
R101		Interference check between part systems: Setting error alarm information [M8]
R102		Interference check between part systems: Alarm information [M8]
R113	SMPSTS	NC data sampling: Sampling state ▲
R114		PLC axis position switch 1 to 16 [C80]
R115		PLC axis position switch 17 to 32 [C80]
R116	HS1PCNT	Handle feed: 1st handle pulse counter
R117	HS2PCNT	Handle feed: 2nd handle pulse counter
R118	HS3PCNT	Handle feed: 3rd handle pulse counter
R120	DTPPC	Power consumption computation: Present consumption of entire drive system(L)
R121		Power consumption computation: Present consumption of entire drive system(H)
R122	DTIPC1	Power consumption computation: Accumulated consumption of entire drive system 1(L)
R123		Power consumption computation: Accumulated consumption of entire drive system 1(H)
R124	DTIPC2	Power consumption computation: Accumulated consumption of entire drive system 2(L)
R125		Power consumption computation: Accumulated consumption of entire drive system 2(H)
R126	DTIPC3	Power consumption computation: Accumulated consumption of entire drive system 3(L)
R127		Power consumption computation: Accumulated consumption of entire drive system 3(H)
R128	DTIPC4	Power consumption computation: Accumulated consumption of entire drive system 4(L)
R129		Power consumption computation: Accumulated consumption of entire drive system 4(H)
R130	NDIPC1	Power consumption computation: Accumulated consumption of devices other than drive system 1(L)

Device	Abbrev.	Signal name
R131		Power consumption computation: Accumulated consumption of devices other than drive system 1(H)
R132	NDIPC2	Power consumption computation: Accumulated consumption of devices other than drive system 2(L)
R133		Power consumption computation: Accumulated consumption of devices other than drive system 2(H)
R134	NDIPC3	Power consumption computation: Accumulated consumption of devices other than drive system 3(L)
R135		Power consumption computation: Accumulated consumption of devices other than drive system 3(H)
R136	NDIPC4	Power consumption computation: Accumulated consumption of devices other than drive system 4(L)
R137		Power consumption computation: Accumulated consumption of devices other than drive system 4(H)
R138	ITF3CHWGOBJ	Interference check III: Entry in interference warning area interfering object information
R139	ITF3CHALOBJ	Interference check III: Interference detection interfering object information
R140	ITF3TRALOBJ	Interference check III: Entry in interference alarm area interfering object information
R141	ITF3DTER1	Interference check III: Data setting error information 1
R142	ITF3DTER2	Interference check III: Data setting error information 2
R143		
R144		
R145		
R146		
R147		
R148		
R149		
R168		PLC axis alarm/warning No. 1st axis
R169		PLC axis alarm/warning No. 2nd axis
R170		PLC axis alarm/warning No. 3rd axis
R171		PLC axis alarm/warning No. 4th axis
R172		PLC axis alarm/warning No. 5th axis
R173		PLC axis alarm/warning No. 6th axis
R174		PLC axis alarm/warning No. 7th axis
R175		PLC axis alarm/warning No. 8th axis
R180		ZR device No. in which DDRD/DDWR command error has occurred (L) [C80]
R181		ZR device No. in which DDRD/DDWR command error has occurred (H) [C80]
R182		Common variable read/write error part [C80]
R183		Common variable read/write error code [C80]
R195		Direct screen selection completion notification [C80]
R196		Displayed screen No. [C80]
R197		Detailed screen No. [C80]
R198		High-speed simple program check:Time measurement output (L) [C80]
R199		High-speed simple program check:Time measurement output (M) [C80]
R500		External search status $1
R501		External search: Program return complete status $1
R504		M code data 1 (L) $1
R505		M code data 1 (H) $1
R506		M code data 2 (L) $1
R507		M code data 2 (H) $1
R508		M code data 3 (L) $1
R509		M code data 3 (H) $1
R510		M code data 4 (L) $1
R511		M code data 4 (H) $1
R512		S code data 1 (L) $1
R513		S code data 1 (H) $1
R514		S code data 2 (L) $1
R515		S code data 2 (H) $1
R516		S code data 3 (L) $1
R517		S code data 3 (H) $1
R518		S code data 4 (L) $1
R519		S code data 4 (H) $1
R520		S code data 5 (L) $1
R521		S code data 5 (H) $1
R522		S code data 6 (L) $1
R523		S code data 6 (H) $1
R524		S code data 7 (L) $1
R525		S code data 7 (H) $1
R526		S code data 8 (L) $1
R527		S code data 8 (H) $1
R536		T code data 1 (L) $1
R537		T code data 1 (H) $1
R538		T code data 2 (L) $1
R539		T code data 2 (H) $1
R540		T code data 3 (L) $1
R541		T code data 3 (H) $1
R542		T code data 4 (L) $1
R543		T code data 4 (H) $1
R544		2nd M function data 1 (L) $1
R545		2nd M function data 1 (H) $1
R546		2nd M function data 2 (L) $1
R547		2nd M function data 2 (H) $1
R548		2nd M function data 3 (L) $1

Device	Abbrev.	Signal name
R549		2nd M function data 3 (H) $1
R550		2nd M function data 4 (L) $1
R551		2nd M function data 4 (H) $1
R554		Chopping error No. $1
R555		Manual measurement status $1
R564		Load monitor I : Warning axis $1 ▲
R565		Load monitor I : Alarm axis $1 ▲
R566		Load monitor I : Data error information $1 ▲
R567		Group in tool life management $1
R571		Load monitor I : Adaptive control override $1 ▲
R572		CNC completion standby status $1
R573		Error code $1 [C80]
R574		In initialization $1
R575		Initialization incompletion $1
R576		Reference position adjustment value parameter setting completed $1
R577	APIER1	User macro section and sub-section designated execution result $1
R578		Measurement tool tip point No. $1 ▲
R580		Near reference position (per reference position) 1st to 4th axis $1
R581		Near reference position (per reference position) 5th to 8th axis $1
R582		Presetter contact $1
R583		Presetter interlock $1
R584		Area signal X axis ON/OFF $1 ▲
R585		Area signal Z axis ON/OFF $1 ▲
R586		Area signal X axis (-) ON/OFF $1 ▲
R587		Area signal Z axis (-) ON/OFF $1 ▲
R588		Takt time (ms) (L) $1
R589		Takt time (ms) (H) $1
R590		Takt time (min) (L) $1
R591		Takt time (min) (H) $1
R596		Load monitor I : Status output (1) $1 ▲
R597		Load monitor I : Status output (2) $1 ▲
R598		Load monitor I : Status output (3) $1 ▲
R599		Load monitor I : Status output (4) $1 ▲
R600		Load monitor I : Status output (5) $1 ▲
R601		Load monitor I : Status output (6) $1 ▲
R602		Load monitor I : Status output (7) $1 ▲
R603		Load monitor I : Status output (8) $1 ▲
R604		Load monitor I : Status output (9) $1 ▲
R605		Load monitor I : Status output (10) $1 ▲
R606		No. of work machining (current value) (L) $1
R607		No. of work machining (current value) (H) $1
R608		No. of work machining (maximum value) (L) $1
R609		No. of work machining (maximum value) (H) $1
R616	SBSID1	Sub part system control: Sub part system control II identification No. $1
R617	SBSCL1	Sub part system control: Calling sub part system $1
R618	SBSWT1	Sub part system control: Waiting for sub part system completion $1
R619	SBSSY1	Sub part system control: Caller of sub part system $1
R624		Constant torque control: Axis under constant torque/proportional torque stopper control $1
R625		Constant torque control: Constant torque droop cancel axis status $1
R628		Tool life usage data (L) $1
R629		Tool life usage data (H) $1
R630		Number of registered tool life control tools $1
R636		Circular feed in manual mode Current position X (L) $1 [M]
R637		Circular feed in manual mode Current position X (H) $1 [M]
R640		Circular feed in manual mode Current position Y (L) $1 [M]
R641		Circular feed in manual mode Current position Y (H) $1 [M]
R646		Machining mode state $1 ▲
R648		Thread recutting status $1
R649		Thread recutting execution status $1
R650		Thread recutting spindle No. $1
R651		Thread recutting lead axis No. $1
R652	TLMSLNO11	Censor ON Tool length compensation No. (BCD output) $1 ▲
R653	TLMSWNO11	Censor ON Tool wear compensation No. (BCD output) $1 ▲
R654	TLMSLNO21	Compensation data update Tool length compensation No. (BCD output) $1 ▲
R655	TLMSWNO21	Compensation data update Tool wear compensation No. (BCD output) $1 ▲
R656	RPAROUT1	Rotary axis configuration parameter output $1
R659		Ext. machine coordinate: number input compensation offset valid axis $1 ▲
R660	RSWRK1	R-Navi: selecting work number $1
R661	RSSRF1	R-Navi: selecting machine surface number $1
R662	CAXSVFO1	Spindle position control (spindle/C axis control): Servo OFF state during Spindle/C axis mode n-th axis $1 ▲
R663	SPGNCI1	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $1 ▲
R668	SVESTAF1	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency (in estimating inertia) $1 ▲
R669	SVESTST1	Optimum acceleration/deceleration selection : NC axis estimated inertia state $1 ▲
R670	ITF3CHWGSLD1	Interference check III: Entry in interference warn area solid information $1
R671		
R672	ITF3CHALSLD1	Interference check III: Interference detection solid information $1
R673		

Device	Abbrev.	Signal name
R674	ITF3TRALSLD1	Interference check III: Entry in interference alarm area solid information $1
R675		
R684		Specific user NC status 1 $1 ▲
R688		Specific user Manual skip Axis in skip motion $1 ▲
R689		Specific user Manual skip Skip motion direction $1 ▲
R690		Specific user Error/Warning detail $1 ▲
R700		External search status $2
R701		External search: Program return complete status $2
R704		M code data 1 (L) $2
R705		M code data 1 (H) $2
R706		M code data 2 (L) $2
R707		M code data 2 (H) $2
R708		M code data 3 (L) $2
R709		M code data 3 (H) $2
R710		M code data 4 (L) $2
R711		M code data 4 (H) $2
R712		S code data 1 (L) $2
R713		S code data 1 (H) $2
R714		S code data 2 (L) $2
R715		S code data 2 (H) $2
R716		S code data 3 (L) $2
R717		S code data 3 (H) $2
R718		S code data 4 (L) $2
R719		S code data 4 (H) $2
R720		S code data 5 (L) $2
R721		S code data 5 (H) $2
R722		S code data 6 (L) $2
R723		S code data 6 (H) $2
R724		S code data 7 (L) $2
R725		S code data 7 (H) $2
R726		S code data 8 (L) $2
R727		S code data 8 (H) $2
R736		T code data 1 (L) $2
R737		T code data 1 (H) $2
R738		T code data 2 (L) $2
R739		T code data 2 (H) $2
R740		T code data 3 (L) $2
R741		T code data 3 (H) $2
R742		T code data 4 (L) $2
R743		T code data 4 (H) $2
R744		2nd M function data 1 (L) $2
R745		2nd M function data 1 (H) $2
R746		2nd M function data 2 (L) $2
R747		2nd M function data 2 (H) $2
R748		2nd M function data 3 (L) $2
R749		2nd M function data 3 (H) $2
R750		2nd M function data 4 (L) $2
R751		2nd M function data 4 (H) $2
R754		Chopping error No. $2
R755		Manual measurement status $2
R764		Load monitor I : Warning axis $2 ▲
R765		Load monitor I : Alarm axis $2 ▲
R766		Load monitor I : Data error information $2 ▲
R767		Group in tool life management $2
R771		Load monitor I : Adaptive control override $2 ▲
R772		CNC completion standby status $2
R773		Error code $2 [C80]
R774		In initialization $2
R775		Initialization incompletion $2
R776		Reference position adjustment value parameter setting completed $2
R777	APIER2	User macro section and sub-section designated execution result $2
R778		Measurement tool tip point No. $2 ▲
R780		Near reference position (per reference position) 1st to 4th axis $2
R781		Near reference position (per reference position) 5th to 8th axis $2
R782		Presetter contact $2
R783		Presetter interlock $2
R784		Area signal X axis ON/OFF $2 ▲
R785		Area signal Z axis ON/OFF $2 ▲
R786		Area signal X axis (-) ON/OFF $2 ▲
R787		Area signal Z axis (-) ON/OFF $2 ▲
R788		Takt time (ms) (L) $2
R789		Takt time (ms) (H) $2
R790		Takt time (min) (L) $2
R791		Takt time (min) (H) $2
R796		Load monitor I : Status output (1) $2 ▲
R797		Load monitor I : Status output (2) $2 ▲
R798		Load monitor I : Status output (3) $2 ▲
R799		Load monitor I : Status output (4) $2 ▲
R800		Load monitor I : Status output (5) $2 ▲
R801		Load monitor I : Status output (6) $2 ▲
R802		Load monitor I : Status output (7) $2 ▲
R803		Load monitor I : Status output (8) $2 ▲

Device	Abbrev.	Signal name
R804		Load monitor I : Status output (9) $2 ▲
R805		Load monitor I : Status output (10) $2 ▲
R806		No. of work machining (current value) (L) $2
R807		No. of work machining (current value) (H) $2
R808		No. of work machining (maximum value) (L) $2
R809		No. of work machining (maximum value) (H) $2
R816	SBSID2	Sub part system control: Sub part system control II identification No. $2
R817	SBSCL2	Sub part system control: Calling sub part system $2
R818	SBSWT2	Sub part system control: Waiting for sub part system completion $2
R819	SBSSY2	Sub part system control: Caller of sub part system $2
R824		Constant torque control: Axis under constant torque/proportional torque stopper control $2
R825		Constant torque control: Constant torque droop cancel axis status $2
R828		Tool life usage data (L) $2
R829		Tool life usage data (H) $2
R830		Number of registered tool life control tools $2
R836		Circular feed in manual mode Current position X (L) $2 [M]
R837		Circular feed in manual mode Current position X (H) $2 [M]
R840		Circular feed in manual mode Current position Y (L) $2 [M]
R841		Circular feed in manual mode Current position Y (H) $2 [M]
R846		Machining mode state $2 ▲
R848		Thread recutting status $2
R849		Thread recutting execution status $2
R850		Thread recutting spindle No. $2
R851		Thread recutting lead axis No. $2
R852	TLMSLNO12	Censor ON Tool length compensation No. (BCD output) $2 ▲
R853	TLMSWNO12	Censor ON Tool wear compensation No. (BCD output) $2 ▲
R854	TLMSLNO22	Compensation data update Tool length compensation No. (BCD output) $2 ▲
R855	TLMSWNO22	Compensation data update Tool wear compensation No. (BCD output) $2 ▲
R856	RPAROUT2	Rotary axis configuration parameter output $2
R859		Ext. machine coordinate: number input compensation offset valid axis $2 ▲
R860	RSWRK2	R-Navi: selecting work number $2
R861	RSSRF2	R-Navi: selecting machine surface number $2
R862	CAXSVFO2	Spindle position control (spindle/C axis control): Servo OFF state during Spindle/C axis mode n-th axis $2 ▲
R863	SPGNCI2	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $2 ▲
R868	SVESTAF2	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency (in estimating inertia) $2 ▲
R869	SVESTST2	Optimum acceleration/deceleration selection : NC axis estimated inertia state $2 ▲
R870	ITF3CHWGSLD2	Interference check III: Entry in interference warn area solid information $2
R871		
R872	ITF3CHALSLD2	Interference check III: Interference detection solid information $2
R873		
R874	ITF3TRALSLD2	Interference check III: Entry in interference alarm area solid information $2
R875		
R884		Specific user NC status 1 $2 ▲
R888		Specific user Manual skip Axis in skip motion $2 ▲
R889		Specific user Manual skip Skip motion direction $2 ▲
R890		Specific user Error/Warning detail $2 ▲
R900		External search status $3
R901		External search: Program return complete status $3
R904		M code data 1 (L) $3
R905		M code data 1 (H) $3
R906		M code data 2 (L) $3
R907		M code data 2 (H) $3
R908		M code data 3 (L) $3
R909		M code data 3 (H) $3
R910		M code data 4 (L) $3
R911		M code data 4 (H) $3
R912		S code data 1 (L) $3
R913		S code data 1 (H) $3
R914		S code data 2 (L) $3
R915		S code data 2 (H) $3
R916		S code data 3 (L) $3
R917		S code data 3 (H) $3
R918		S code data 4 (L) $3
R919		S code data 4 (H) $3
R920		S code data 5 (L) $3
R921		S code data 5 (H) $3
R922		S code data 6 (L) $3
R923		S code data 6 (H) $3
R924		S code data 7 (L) $3
R925		S code data 7 (H) $3
R926		S code data 8 (L) $3
R927		S code data 8 (H) $3
R936		T code data 1 (L) $3
R937		T code data 1 (H) $3
R938		T code data 2 (L) $3
R939		T code data 2 (H) $3
R940		T code data 3 (L) $3
R941		T code data 3 (H) $3

Device	Abbrev.	Signal name
R942		T code data 4 (L) $3
R943		T code data 4 (H) $3
R944		2nd M function data 1 (L) $3
R945		2nd M function data 1 (H) $3
R946		2nd M function data 2 (L) $3
R947		2nd M function data 2 (H) $3
R948		2nd M function data 3 (L) $3
R949		2nd M function data 3 (H) $3
R950		2nd M function data 4 (L) $3
R951		2nd M function data 4 (H) $3
R954		Chopping error No. $3
R955		Manual measurement status $3
R964		Load monitor I : Warning axis $3 ▲
R965		Load monitor I : Alarm axis $3 ▲
R966		Load monitor I : Data error information $3 ▲
R967		Group in tool life management $3
R971		Load monitor I : Adaptive control override $3 ▲
R972		CNC completion standby status $3
R973		Error code $3 [C80]
R974		In initialization $3
R975		Initialization incompletion $3
R976		Reference position adjustment value parameter setting completed $3
R977	APIER3	User macro section and sub-section designated execution result $3
R978		Measurement tool tip point No. $3 ▲
R980		Near reference position (per reference position) 1st to 4th axis $3
R981		Near reference position (per reference position) 5th to 8th axis $3
R982		Presetter contact $3
R983		Presetter interlock $3
R984		Area signal X axis ON/OFF $3 ▲
R985		Area signal Z axis ON/OFF $3 ▲
R986		Area signal X axis (-) ON/OFF $3 ▲
R987		Area signal Z axis (-) ON/OFF $3 ▲
R988		Takt time (ms) (L) $3
R989		Takt time (ms) (H) $3
R990		Takt time (min) (L) $3
R991		Takt time (min) (H) $3
R996		Load monitor I : Status output (1) $3 ▲
R997		Load monitor I : Status output (2) $3 ▲
R998		Load monitor I : Status output (3) $3 ▲
R999		Load monitor I : Status output (4) $3 ▲
R1000		Load monitor I : Status output (5) $3 ▲
R1001		Load monitor I : Status output (6) $3 ▲
R1002		Load monitor I : Status output (7) $3 ▲
R1003		Load monitor I : Status output (8) $3 ▲
R1004		Load monitor I : Status output (9) $3 ▲
R1005		Load monitor I : Status output (10) $3 ▲
R1006		No. of work machining (current value) (L) $3
R1007		No. of work machining (current value) (H) $3
R1008		No. of work machining (maximum value) (L) $3
R1009		No. of work machining (maximum value) (H) $3
R1016	SBSID3	Sub part system control: Sub part system control II identification No. $3
R1017	SBSCL3	Sub part system control: Calling sub part system $3
R1018	SBSWT3	Sub part system control: Waiting for sub part system completion $3
R1019	SBSSY3	Sub part system control: Caller of sub part system $3
R1024		Constant torque control: Axis under constant torque/proportional torque stopper control $3
R1025		Constant torque control: Constant torque droop cancel axis status $3
R1028		Tool life usage data (L) $3
R1029		Tool life usage data (H) $3
R1030		Number of registered tool life control tools $3
R1036		Circular feed in manual mode Current position X (L) $3 [M]
R1037		Circular feed in manual mode Current position X (H) $3 [M]
R1040		Circular feed in manual mode Current position Y (L) $3 [M]
R1041		Circular feed in manual mode Current position Y (H) $3 [M]
R1046		Machining mode state $3 ▲
R1048		Thread recutting status $3
R1049		Thread recutting execution status $3
R1050		Thread recutting spindle No. $3
R1051		Thread recutting lead axis No. $3
R1052	TLMSLNO13	Censor ON Tool length compensation No. (BCD output) $3 ▲
R1053	TLMSWNO13	Censor ON Tool wear compensation No. (BCD output) $3 ▲
R1054	TLMSLNO23	Compensation data update Tool length compensation No. (BCD output) $3 ▲
R1055	TLMSWNO23	Compensation data update Tool wear compensation No. (BCD output) $3 ▲
R1056	RPAROUT3	Rotary axis configuration parameter output $3
R1059		Ext. machine coordinate: number input compensation offset valid axis $3 ▲
R1060	RSWRK3	R-Navi: selecting work number $3
R1061	RSSRF3	R-Navi: selecting machine surface number $3
R1062	CAXSVFO3	Spindle position control (spindle/C axis control): Servo OFF state during Spindle/C axis mode n-th axis $3 ▲
R1063	SPGNCI3	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $3 ▲
R1068	SVESTAF3	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency (in estimating inertia) $3 ▲

Device	Abbrev.	Signal name
R1069	SVESTST3	Optimum acceleration/deceleration selection : NC axis estimated inertia state $3 ▲
R1070	ITF3CHWGSLD3	Interference check III: Entry in interference warn area solid information $3
R1071		
R1072	ITF3CHALSLD3	Interference check III: Interference detection solid information $3
R1073		
R1074	ITF3TRALSLD3	Interference check III: Entry in interference alarm area solid information $3
R1075		
R1084		Specific user NC status 1 $3 ▲
R1088		Specific user Manual skip Axis in skip motion $3 ▲
R1089		Specific user Manual skip Skip motion direction $3 ▲
R1090		Specific user Error/Warning detail $3 ▲
R1100		External search status $4
R1101		External search: Program return complete status $4
R1104		M code data 1 (L) $4
R1105		M code data 1 (H) $4
R1106		M code data 2 (L) $4
R1107		M code data 2 (H) $4
R1108		M code data 3 (L) $4
R1109		M code data 3 (H) $4
R1110		M code data 4 (L) $4
R1111		M code data 4 (H) $4
R1112		S code data 1 (L) $4
R1113		S code data 1 (H) $4
R1114		S code data 2 (L) $4
R1115		S code data 2 (H) $4
R1116		S code data 3 (L) $4
R1117		S code data 3 (H) $4
R1118		S code data 4 (L) $4
R1119		S code data 4 (H) $4
R1120		S code data 5 (L) $4
R1121		S code data 5 (H) $4
R1122		S code data 6 (L) $4
R1123		S code data 6 (H) $4
R1124		S code data 7 (L) $4
R1125		S code data 7 (H) $4
R1126		S code data 8 (L) $4
R1127		S code data 8 (H) $4
R1136		T code data 1 (L) $4
R1137		T code data 1 (H) $4
R1138		T code data 2 (L) $4
R1139		T code data 2 (H) $4
R1140		T code data 3 (L) $4
R1141		T code data 3 (H) $4
R1142		T code data 4 (L) $4
R1143		T code data 4 (H) $4
R1144		2nd M function data 1 (L) $4
R1145		2nd M function data 1 (H) $4
R1146		2nd M function data 2 (L) $4
R1147		2nd M function data 2 (H) $4
R1148		2nd M function data 3 (L) $4
R1149		2nd M function data 3 (H) $4
R1150		2nd M function data 4 (L) $4
R1151		2nd M function data 4 (H) $4
R1154		Chopping error No. $4
R1155		Manual measurement status $4
R1164		Load monitor I : Warning axis $4 ▲
R1165		Load monitor I : Alarm axis $4 ▲
R1166		Load monitor I : Data error information $4 ▲
R1167		Group in tool life management $4
R1171		Load monitor I : Adaptive control override $4 ▲
R1172		CNC completion standby status $4
R1173		Error code $4 [C80]
R1174		In initialization $4
R1175		Initialization incompletion $4
R1176		Reference position adjustment value parameter setting completed $4
R1177	APIER4	User macro section and sub-section designated execution result $4
R1178		Measurement tool tip point No. $4 ▲
R1180		Near reference position (per reference position) 1st to 4th axis $4
R1181		Near reference position (per reference position) 5th to 8th axis $4
R1182		Presetter contact $4
R1183		Presetter interlock $4
R1184		Area signal X axis ON/OFF $4 ▲
R1185		Area signal Z axis ON/OFF $4 ▲
R1186		Area signal X axis (-) ON/OFF $4 ▲
R1187		Area signal Z axis (-) ON/OFF $4 ▲
R1188		Takt time (ms) (L) $4
R1189		Takt time (ms) (H) $4
R1190		Takt time (min) (L) $4
R1191		Takt time (min) (H) $4
R1196		Load monitor I : Status output (1) $4 ▲
R1197		Load monitor I : Status output (2) $4 ▲
R1198		Load monitor I : Status output (3) $4 ▲

Device	Abbrev.	Signal name
R1199		Load monitor I : Status output (4) $4 ▲
R1200		Load monitor I : Status output (5) $4 ▲
R1201		Load monitor I : Status output (6) $4 ▲
R1202		Load monitor I : Status output (7) $4 ▲
R1203		Load monitor I : Status output (8) $4 ▲
R1204		Load monitor I : Status output (9) $4 ▲
R1205		Load monitor I : Status output (10) $4 ▲
R1206		No. of work machining (current value) (L) $4
R1207		No. of work machining (current value) (H) $4
R1208		No. of work machining (maximum value) (L) $4
R1209		No. of work machining (maximum value) (H) $4
R1216	SBSID4	Sub part system control: Sub part system control II identification No. $4
R1217	SBSCL4	Sub part system control: Calling sub part system $4
R1218	SBSWT4	Sub part system control: Waiting for sub part system completion $4
R1219	SBSSY4	Sub part system control: Caller of sub part system $4
R1224		Constant torque control: Axis under constant torque/proportional torque stopper control $4
R1225		Constant torque control: Constant torque droop cancel axis status $4
R1228		Tool life usage data (L) $4
R1229		Tool life usage data (H) $4
R1230		Number of registered tool life control tools $4
R1236		Circular feed in manual mode Current position X (L) $4 [M]
R1237		Circular feed in manual mode Current position X (H) $4 [M]
R1240		Circular feed in manual mode Current position Y (L) $4 [M]
R1241		Circular feed in manual mode Current position Y (H) $4 [M]
R1246		Machining mode state $4 ▲
R1248		Thread recutting status $4
R1249		Thread recutting execution status $4
R1250		Thread recutting spindle No. $4
R1251		Thread recutting lead axis No. $4
R1252	TLMSLNO14	Censor ON Tool length compensation No. (BCD output) $4 ▲
R1253	TLMSWNO14	Censor ON Tool wear compensation No. (BCD output) $4 ▲
R1254	TLMSLNO24	Compensation data update Tool length compensation No. (BCD output) $4 ▲
R1255	TLMSWNO24	Compensation data update Tool wear compensation No. (BCD output) $4 ▲
R1256	RPAROUT4	Rotary axis configuration parameter output $4
R1259		Ext. machine coordinate: number input compensation offset valid axis $4 ▲
R1260	RSWRK4	R-Navi: selecting work number $4
R1261	RSSRF4	R-Navi: selecting machine surface number $4
R1262	CAXSVFO4	Spindle position control (spindle/C axis control): Servo OFF state during Spindle/C axis mode n-th axis $4 ▲
R1263	SPGNCl4	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $4 ▲
R1268	SVESTAF4	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency (in estimating inertia) $4 ▲
R1269	SVESTST4	Optimum acceleration/deceleration selection : NC axis estimated inertia state $4 ▲
R1270	ITF3CHWGSLD4	Interference check III: Entry in interference warn area solid information $4
R1271		
R1272	ITF3CHALSLD4	Interference check III: Interference detection solid information $4
R1273		
R1274	ITF3TRALSLD4	Interference check III: Entry in interference alarm area solid information $4
R1275		
R1284		Specific user NC status 1 $4 ▲
R1288		Specific user Manual skip Axis in skip motion $4 ▲
R1289		Specific user Manual skip Skip motion direction $4 ▲
R1290		Specific user Error/Warning detail $4 ▲
R1300		External search status $5
R1301		External search: Program return complete status $5
R1304		M code data 1 (L) $5
R1305		M code data 1 (H) $5
R1306		M code data 2 (L) $5
R1307		M code data 2 (H) $5
R1308		M code data 3 (L) $5
R1309		M code data 3 (H) $5
R1310		M code data 4 (L) $5
R1311		M code data 4 (H) $5
R1312		S code data 1 (L) $5
R1313		S code data 1 (H) $5
R1314		S code data 2 (L) $5
R1315		S code data 2 (H) $5
R1316		S code data 3 (L) $5
R1317		S code data 3 (H) $5
R1318		S code data 4 (L) $5
R1319		S code data 4 (H) $5
R1320		S code data 5 (L) $5
R1321		S code data 5 (H) $5
R1322		S code data 6 (L) $5
R1323		S code data 6 (H) $5
R1324		S code data 7 (L) $5
R1325		S code data 7 (H) $5
R1326		S code data 8 (L) $5
R1327		S code data 8 (H) $5
R1336		T code data 1 (L) $5

Device	Abbrev.	Signal name
R1337		T code data 1 (H) $5
R1338		T code data 2 (L) $5
R1339		T code data 2 (H) $5
R1340		T code data 3 (L) $5
R1341		T code data 3 (H) $5
R1342		T code data 4 (L) $5
R1343		T code data 4 (H) $5
R1344		2nd M function data 1 (L) $5
R1345		2nd M function data 1 (H) $5
R1346		2nd M function data 2 (L) $5
R1347		2nd M function data 2 (H) $5
R1348		2nd M function data 3 (L) $5
R1349		2nd M function data 3 (H) $5
R1350		2nd M function data 4 (L) $5
R1351		2nd M function data 4 (H) $5
R1354		Chopping error No. $5
R1355		Manual measurement status $5
R1364		Load monitor I : Warning axis $5 ▲
R1365		Load monitor I : Alarm axis $5 ▲
R1366		Load monitor I : Data error information $5 ▲
R1367		Group in tool life management $5
R1371		Load monitor I : Adaptive control override $5 ▲
R1372		CNC completion standby status $5
R1373		Error code $5 [C80]
R1374		In initialization $5
R1375		Initialization incompletion $5
R1376		Reference position adjustment value parameter setting completed $5
R1377	APIER5	User macro section and sub-section designated execution result $5
R1378		Measurement tool tip point No. $5 ▲
R1380		Near reference position (per reference position) 1st to 4th axis $5
R1381		Near reference position (per reference position) 5th to 8th axis $5
R1382		Presetter contact $5
R1383		Presetter interlock $5
R1384		Area signal X axis ON/OFF $5 ▲
R1385		Area signal Z axis ON/OFF $5 ▲
R1386		Area signal X axis (-) ON/OFF $5 ▲
R1387		Area signal Z axis (-) ON/OFF $5 ▲
R1388		Takt time (ms) (L) $5
R1389		Takt time (ms) (H) $5
R1390		Takt time (min) (L) $5
R1391		Takt time (min) (H) $5
R1396		Load monitor I : Status output (1) $5 ▲
R1397		Load monitor I : Status output (2) $5 ▲
R1398		Load monitor I : Status output (3) $5 ▲
R1399		Load monitor I : Status output (4) $5 ▲
R1400		Load monitor I : Status output (5) $5 ▲
R1401		Load monitor I : Status output (6) $5 ▲
R1402		Load monitor I : Status output (7) $5 ▲
R1403		Load monitor I : Status output (8) $5 ▲
R1404		Load monitor I : Status output (9) $5 ▲
R1405		Load monitor I : Status output (10) $5 ▲
R1406		No. of work machining (current value) (L) $5
R1407		No. of work machining (current value) (H) $5
R1408		No. of work machining (maximum value) (L) $5
R1409		No. of work machining (maximum value) (H) $5
R1416	SBSID5	Sub part system control: Sub part system control II identification No. $5
R1417	SBSCL5	Sub part system control: Calling sub part system $5
R1418	SBSWT5	Sub part system control: Waiting for sub part system completion $5
R1419	SBSSY5	Sub part system control: Caller of sub part system $5
R1424		Constant torque control: Axis under constant torque/proportional torque stopper control $5
R1425		Constant torque control: Constant torque droop cancel axis status $5
R1428		Tool life usage data (L) $5
R1429		Tool life usage data (H) $5
R1430		Number of registered tool life control tools $5
R1436		Circular feed in manual mode Current position X (L) $5 [M]
R1437		Circular feed in manual mode Current position X (H) $5 [M]
R1440		Circular feed in manual mode Current position Y (L) $5 [M]
R1441		Circular feed in manual mode Current position Y (H) $5 [M]
R1446		Machining mode state $5 ▲
R1448		Thread recutting status $5
R1449		Thread recutting execution status $5
R1450		Thread recutting spindle No. $5
R1451		Thread recutting lead axis No. $5
R1452	TLMSLNO15	Censor ON Tool length compensation No. (BCD output) $5 ▲
R1453	TLMSWNO15	Censor ON Tool wear compensation No. (BCD output) $5 ▲
R1454	TLMSLNO25	Compensation data update Tool length compensation No. (BCD output) $5 ▲
R1455	TLMSWNO25	Compensation data update Tool wear compensation No. (BCD output) $5 ▲
R1456	RPAROUT5	Rotary axis configuration parameter output $5
R1459		Ext. machine coordinate: number input compensation offset valid axis $5 ▲
R1460	RSWRK5	R-Navi: selecting work number $5
R1461	RSSRF5	R-Navi: selecting machine surface number $5

Device	Abbrev.	Signal name
R1462	CAXSVFO5	Spindle position control (spindle/C axis control): Servo OFF state during Spindle/C axis mode n-th axis $5 ▲
R1463	SPGNCI5	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $5 ▲
R1468	SVESTAF5	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency (in estimating inertia) $5 ▲
R1469	SVESTST5	Optimum acceleration/deceleration selection : NC axis estimated inertia state $5 ▲
R1470	ITF3CHWGSLD5	Interference check III: Entry in interference warn area solid information $5
R1471		
R1472	ITF3CHALSLD5	Interference check III: Interference detection solid information $5
R1473		
R1474	ITF3TRALSLD5	Interference check III: Entry in interference alarm area solid information $5
R1475		
R1484		Specific user NC status 1 $5 ▲
R1488		Specific user Manual skip Axis in skip motion $5 ▲
R1489		Specific user Manual skip Skip motion direction $5 ▲
R1490		Specific user Error/Warning detail $5 ▲
R1500		External search status $6
R1501		External search: Program return complete status $6
R1504		M code data 1 (L) $6
R1505		M code data 1 (H) $6
R1506		M code data 2 (L) $6
R1507		M code data 2 (H) $6
R1508		M code data 3 (L) $6
R1509		M code data 3 (H) $6
R1510		M code data 4 (L) $6
R1511		M code data 4 (H) $6
R1512		S code data 1 (L) $6
R1513		S code data 1 (H) $6
R1514		S code data 2 (L) $6
R1515		S code data 2 (H) $6
R1516		S code data 3 (L) $6
R1517		S code data 3 (H) $6
R1518		S code data 4 (L) $6
R1519		S code data 4 (H) $6
R1520		S code data 5 (L) $6
R1521		S code data 5 (H) $6
R1522		S code data 6 (L) $6
R1523		S code data 6 (H) $6
R1524		S code data 7 (L) $6
R1525		S code data 7 (H) $6
R1526		S code data 8 (L) $6
R1527		S code data 8 (H) $6
R1536		T code data 1 (L) $6
R1537		T code data 1 (H) $6
R1538		T code data 2 (L) $6
R1539		T code data 2 (H) $6
R1540		T code data 3 (L) $6
R1541		T code data 3 (H) $6
R1542		T code data 4 (L) $6
R1543		T code data 4 (H) $6
R1544		2nd M function data 1 (L) $6
R1545		2nd M function data 1 (H) $6
R1546		2nd M function data 2 (L) $6
R1547		2nd M function data 2 (H) $6
R1548		2nd M function data 3 (L) $6
R1549		2nd M function data 3 (H) $6
R1550		2nd M function data 4 (L) $6
R1551		2nd M function data 4 (H) $6
R1554		Chopping error No. $6
R1555		Manual measurement status $6
R1564		Load monitor I : Warning axis $6 ▲
R1565		Load monitor I : Alarm axis $6 ▲
R1566		Load monitor I : Data error information $6 ▲
R1567		Group in tool life management $6
R1571		Load monitor I : Adaptive control override $6 ▲
R1572		CNC completion standby status $6
R1573		Error code $6 [C80]
R1574		In initialization $6
R1575		Initialization incompletion $6
R1576		Reference position adjustment value parameter setting completed $6
R1577	APIER6	User macro section and sub-section designated execution result $6
R1578		Measurement tool tip point No. $6 ▲
R1580		Near reference position (per reference position) 1st to 4th axis $6
R1581		Near reference position (per reference position) 5th to 8th axis $6
R1582		Presetter contact $6
R1583		Presetter interlock $6
R1584		Area signal X axis ON/OFF $6 ▲
R1585		Area signal Z axis ON/OFF $6 ▲
R1586		Area signal X axis (-) ON/OFF $6 ▲
R1587		Area signal Z axis (-) ON/OFF $6 ▲
R1588		Takt time (ms) (L) $6

Device	Abbrev.	Signal name
R1589		Takt time (ms) (H) $6
R1590		Takt time (min) (L) $6
R1591		Takt time (min) (H) $6
R1596		Load monitor I : Status output (1) $6 ▲
R1597		Load monitor I : Status output (2) $6 ▲
R1598		Load monitor I : Status output (3) $6 ▲
R1599		Load monitor I : Status output (4) $6 ▲
R1600		Load monitor I : Status output (5) $6 ▲
R1601		Load monitor I : Status output (6) $6 ▲
R1602		Load monitor I : Status output (7) $6 ▲
R1603		Load monitor I : Status output (8) $6 ▲
R1604		Load monitor I : Status output (9) $6 ▲
R1605		Load monitor I : Status output (10) $6 ▲
R1606		No. of work machining (current value) (L) $6
R1607		No. of work machining (current value) (H) $6
R1608		No. of work machining (maximum value) (L) $6
R1609		No. of work machining (maximum value) (H) $6
R1616	SBSID6	Sub part system control: Sub part system control II identification No. $6
R1617	SBSCL6	Sub part system control: Calling sub part system $6
R1618	SBSWT6	Sub part system control: Waiting for sub part system completion $6
R1619	SBSSY6	Sub part system control: Caller of sub part system $6
R1624		Constant torque control: Axis under constant torque/proportional torque stopper control $6
R1625		Constant torque control: Constant torque droop cancel axis status $6
R1628		Tool life usage data (L) $6
R1629		Tool life usage data (H) $6
R1630		Number of registered tool life control tools $6
R1636		Circular feed in manual mode Current position X (L) $6 [M]
R1637		Circular feed in manual mode Current position X (H) $6 [M]
R1640		Circular feed in manual mode Current position Y (L) $6 [M]
R1641		Circular feed in manual mode Current position Y (H) $6 [M]
R1646		Machining mode state $6 ▲
R1648		Thread recutting status $6
R1649		Thread recutting execution status $6
R1650		Thread recutting spindle No. $6
R1651		Thread recutting lead axis No. $6
R1652	TLMSLNO16	Censor ON Tool length compensation No. (BCD output) $6 ▲
R1653	TLMSWNO16	Censor ON Tool wear compensation No. (BCD output) $6 ▲
R1654	TLMSLNO26	Compensation data update Tool length compensation No. (BCD output) $6 ▲
R1655	TLMSWNO26	Compensation data update Tool wear compensation No. (BCD output) $6 ▲
R1656	RPAROUT6	Rotary axis configuration parameter output $6
R1659		Ext. machine coordinate: number input compensation offset valid axis $6 ▲
R1660	RSWRK6	R-Navi: selecting work number $6
R1661	RSSRF6	R-Navi: selecting machine surface number $6
R1662	CAXSVFO6	Spindle position control (spindle/C axis control): Servo OFF state during Spindle/C axis mode n-th axis $6 ▲
R1663	SPGNCI6	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $6 ▲
R1668	SVESTAF6	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency (in estimating inertia) $6 ▲
R1669	SVESTST6	Optimum acceleration/deceleration selection : NC axis estimated inertia state $6 ▲
R1670	ITF3CHWGSLD6	Interference check III: Entry in interference warn area solid information $6
R1671		
R1672	ITF3CHALSLD6	Interference check III: Interference detection solid information $6
R1673		
R1674	ITF3TRALSLD6	Interference check III: Entry in interference alarm area solid information $6
R1675		
R1684		Specific user NC status 1 $6 ▲
R1688		Specific user Manual skip Axis in skip motion $6 ▲
R1689		Specific user Manual skip Skip motion direction $6 ▲
R1690		Specific user Error/Warning detail $6 ▲
R1700		External search status $7
R1701		External search: Program return complete status $7
R1704		M code data 1 (L) $7
R1705		M code data 1 (H) $7
R1706		M code data 2 (L) $7
R1707		M code data 2 (H) $7
R1708		M code data 3 (L) $7
R1709		M code data 3 (H) $7
R1710		M code data 4 (L) $7
R1711		M code data 4 (H) $7
R1712		S code data 1 (L) $7
R1713		S code data 1 (H) $7
R1714		S code data 2 (L) $7
R1715		S code data 2 (H) $7
R1716		S code data 3 (L) $7
R1717		S code data 3 (H) $7
R1718		S code data 4 (L) $7
R1719		S code data 4 (H) $7
R1720		S code data 5 (L) $7
R1721		S code data 5 (H) $7
R1722		S code data 6 (L) $7

Device	Abbrev.	Signal name
R1723		S code data 6 (H) $7
R1724		S code data 7 (L) $7
R1725		S code data 7 (H) $7
R1726		S code data 8 (L) $7
R1727		S code data 8 (H) $7
R1736		T code data 1 (L) $7
R1737		T code data 1 (H) $7
R1738		T code data 2 (L) $7
R1739		T code data 2 (H) $7
R1740		T code data 3 (L) $7
R1741		T code data 3 (H) $7
R1742		T code data 4 (L) $7
R1743		T code data 4 (H) $7
R1744		2nd M function data 1 (L) $7
R1745		2nd M function data 1 (H) $7
R1746		2nd M function data 2 (L) $7
R1747		2nd M function data 2 (H) $7
R1748		2nd M function data 3 (L) $7
R1749		2nd M function data 3 (H) $7
R1750		2nd M function data 4 (L) $7
R1751		2nd M function data 4 (H) $7
R1754		Chopping error No. $7
R1755		Manual measurement status $7
R1764		Load monitor I : Warning axis $7 ▲
R1765		Load monitor I : Alarm axis $7 ▲
R1766		Load monitor I : Data error information $7 ▲
R1767		Group in tool life management $7
R1771		Load monitor I : Adaptive control override $7 ▲
R1772		CNC completion standby status $7
R1773		Error code $7 [C80]
R1774		In initialization $7
R1775		Initialization incompletion $7
R1776		Reference position adjustment value parameter setting completed $7
R1777	APIER7	User macro section and sub-section designated execution result $7
R1778		Measurement tool tip point No. $7 ▲
R1780		Near reference position (per reference position) 1st to 4th axis $7
R1781		Near reference position (per reference position) 5th to 8th axis $7
R1782		Presetter contact $7
R1783		Presetter interlock $7
R1784		Area signal X axis ON/OFF $7 ▲
R1785		Area signal Z axis ON/OFF $7 ▲
R1786		Area signal X axis (-) ON/OFF $7 ▲
R1787		Area signal Z axis (-) ON/OFF $7 ▲
R1788		Takt time (ms) (L) $7
R1789		Takt time (ms) (H) $7
R1790		Takt time (min) (L) $7
R1791		Takt time (min) (H) $7
R1796		Load monitor I : Status output (1) $7 ▲
R1797		Load monitor I : Status output (2) $7 ▲
R1798		Load monitor I : Status output (3) $7 ▲
R1799		Load monitor I : Status output (4) $7 ▲
R1800		Load monitor I : Status output (5) $7 ▲
R1801		Load monitor I : Status output (6) $7 ▲
R1802		Load monitor I : Status output (7) $7 ▲
R1803		Load monitor I : Status output (8) $7 ▲
R1804		Load monitor I : Status output (9) $7 ▲
R1805		Load monitor I : Status output (10) $7 ▲
R1806		No. of work machining (current value) (L) $7
R1807		No. of work machining (current value) (H) $7
R1808		No. of work machining (maximum value) (L) $7
R1809		No. of work machining (maximum value) (H) $7
R1816	SBSID7	Sub part system control: Sub part system control II identification No. $7
R1817	SBSCL7	Sub part system control: Calling sub part system $7
R1818	SBSWT7	Sub part system control: Waiting for sub part system completion $7
R1819	SBSSY7	Sub part system control: Caller of sub part system $7
R1824		Constant torque control: Axis under constant torque/proportional torque stopper control $7
R1825		Constant torque control: Constant torque droop cancel axis status $7
R1828		Tool life usage data (L) $7
R1829		Tool life usage data (H) $7
R1830		Number of registered tool life control tools $7
R1836		Circular feed in manual mode Current position X (L) $7 [M]
R1837		Circular feed in manual mode Current position X (H) $7 [M]
R1840		Circular feed in manual mode Current position Y (L) $7 [M]
R1841		Circular feed in manual mode Current position Y (H) $7 [M]
R1846		Machining mode state $7 ▲
R1848		Thread recutting status $7
R1849		Thread recutting execution status $7
R1850		Thread recutting spindle No. $7
R1851		Thread recutting lead axis No. $7
R1852	TLMSLNO17	Censor ON Tool length compensation No. (BCD output) $7 ▲
R1853	TLMSWNO17	Censor ON Tool wear compensation No. (BCD output) $7 ▲
R1854	TLMSLNO27	Compensation data update Tool length compensation No. (BCD output) $7 ▲

Device	Abbrev.	Signal name
R1855	TLMSWNO27	Compensation data update Tool wear compensation No. (BCD output) $7 ▲
R1856	RPAROUT7	Rotary axis configuration parameter output $7
R1859		Ext. machine coordinate: number input compensation offset valid axis $7 ▲
R1860	RSWRK7	R-Navi: selecting work number $7
R1861	RSSRF7	R-Navi: selecting machine surface number $7
R1862	CAXSVFO7	Spindle position control (spindle/C axis control): Servo OFF state during Spindle/C axis mode n-th axis $7 ▲
R1863	SPGNCI7	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $7 ▲
R1868	SVESTAF7	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency (in estimating inertia) $7 ▲
R1869	SVESTST7	Optimum acceleration/deceleration selection : NC axis estimated inertia state $7 ▲
R1870	ITF3CHWGSLD7	Interference check III: Entry in interference warn area solid information $7
R1871		
R1872	ITF3CHALSLD7	Interference check III: Interference detection solid information $7
R1873		
R1874	ITF3TRALSLD7	Interference check III: Entry in interference alarm area solid information $7
R1875		
R1884		Specific user NC status 1 $7 ▲
R1888		Specific user Manual skip Axis in skip motion $7 ▲
R1889		Specific user Manual skip Skip motion direction $7 ▲
R1890		Specific user Error/Warning detail $7 ▲
R1900		External search status $8
R1901		External search: Program return complete status $8
R1904		M code data 1 (L) $8
R1905		M code data 1 (H) $8
R1906		M code data 2 (L) $8
R1907		M code data 2 (H) $8
R1908		M code data 3 (L) $8
R1909		M code data 3 (H) $8
R1910		M code data 4 (L) $8
R1911		M code data 4 (H) $8
R1912		S code data 1 (L) $8
R1913		S code data 1 (H) $8
R1914		S code data 2 (L) $8
R1915		S code data 2 (H) $8
R1916		S code data 3 (L) $8
R1917		S code data 3 (H) $8
R1918		S code data 4 (L) $8
R1919		S code data 4 (H) $8
R1920		S code data 5 (L) $8
R1921		S code data 5 (H) $8
R1922		S code data 6 (L) $8
R1923		S code data 6 (H) $8
R1924		S code data 7 (L) $8
R1925		S code data 7 (H) $8
R1926		S code data 8 (L) $8
R1927		S code data 8 (H) $8
R1936		T code data 1 (L) $8
R1937		T code data 1 (H) $8
R1938		T code data 2 (L) $8
R1939		T code data 2 (H) $8
R1940		T code data 3 (L) $8
R1941		T code data 3 (H) $8
R1942		T code data 4 (L) $8
R1943		T code data 4 (H) $8
R1944		2nd M function data 1 (L) $8
R1945		2nd M function data 1 (H) $8
R1946		2nd M function data 2 (L) $8
R1947		2nd M function data 2 (H) $8
R1948		2nd M function data 3 (L) $8
R1949		2nd M function data 3 (H) $8
R1950		2nd M function data 4 (L) $8
R1951		2nd M function data 4 (H) $8
R1954		Chopping error No. $8
R1955		Manual measurement status $8
R1964		Load monitor I : Warning axis $8 ▲
R1965		Load monitor I : Alarm axis $8 ▲
R1966		Load monitor I : Data error information $8 ▲
R1967		Group in tool life management $8
R1971		Load monitor I : Adaptive control override $8 ▲
R1972		CNC completion standby status $8
R1973		Error code $8 [C80]
R1974		In initialization $8
R1975		Initialization incompletion $8
R1976		Reference position adjustment value parameter setting completed $8
R1977	APIER8	User macro section and sub-section designated execution result $8
R1978		Measurement tool tip point No. $8 ▲
R1980		Near reference position (per reference position) 1st to 4th axis $8
R1981		Near reference position (per reference position) 5th to 8th axis $8
R1982		Presetter contact $8
R1983		Presetter interlock $8

Device	Abbrev.	Signal name
R1984		Area signal X axis ON/OFF $8 ▲
R1985		Area signal Z axis ON/OFF $8 ▲
R1986		Area signal X axis (-) ON/OFF $8 ▲
R1987		Area signal Z axis (-) ON/OFF $8 ▲
R1988		Takt time (ms) (L) $8
R1989		Takt time (ms) (H) $8
R1990		Takt time (min) (L) $8
R1991		Takt time (min) (H) $8
R1996		Load monitor I : Status output (1) $8 ▲
R1997		Load monitor I : Status output (2) $8 ▲
R1998		Load monitor I : Status output (3) $8 ▲
R1999		Load monitor I : Status output (4) $8 ▲
R2000		Load monitor I : Status output (5) $8 ▲
R2001		Load monitor I : Status output (6) $8 ▲
R2002		Load monitor I : Status output (7) $8 ▲
R2003		Load monitor I : Status output (8) $8 ▲
R2004		Load monitor I : Status output (9) $8 ▲
R2005		Load monitor I : Status output (10) $8 ▲
R2006		No. of work machining (current value) (L) $8
R2007		No. of work machining (current value) (H) $8
R2008		No. of work machining (maximum value) (L) $8
R2009		No. of work machining (maximum value) (H) $8
R2016	SBSID8	Sub part system control: Sub part system control II identification No. $8
R2017	SBSCL8	Sub part system control: Calling sub part system $8
R2018	SBSWT8	Sub part system control: Waiting for sub part system completion $8
R2019	SBSSY8	Sub part system control: Caller of sub part system $8
R2024		Constant torque control: Axis under constant torque/proportional torque stopper control $8
R2025		Constant torque control: Constant torque droop cancel axis status $8
R2028		Tool life usage data (L) $8
R2029		Tool life usage data (H) $8
R2030		Number of registered tool life control tools $8
R2036		Circular feed in manual mode Current position X (L) $8 [M]
R2037		Circular feed in manual mode Current position X (H) $8 [M]
R2040		Circular feed in manual mode Current position Y (L) $8 [M]
R2041		Circular feed in manual mode Current position Y (H) $8 [M]
R2046		Machining mode state $8 ▲
R2048		Thread recutting status $8
R2049		Thread recutting execution status $8
R2050		Thread recutting spindle No. $8
R2051		Thread recutting lead axis No. $8
R2052	TLMSLNO18	Censor ON Tool length compensation No. (BCD output) $8 ▲
R2053	TLMSWNO18	Censor ON Tool wear compensation No. (BCD output) $8 ▲
R2054	TLMSLNO28	Compensation data update Tool length compensation No. (BCD output) $8 ▲
R2055	TLMSWNO28	Compensation data update Tool wear compensation No. (BCD output) $8 ▲
R2056	RPAROUT8	Rotary axis configuration parameter output $8
R2059		Ext. machine coordinate: number input compensation offset valid axis $8 ▲
R2060	RSWRK8	R-Navi: selecting work number $8
R2061	RSSRF8	R-Navi: selecting machine surface number $8
R2062	CAXSVFO8	Spindle position control (spindle/C axis control): Servo OFF state during Spindle/C axis mode n-th axis $8 ▲
R2063	SPGNCI8	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $8 ▲
R2068	SVESTAF8	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency (in estimating inertia) $8 ▲
R2069	SVESTST8	Optimum acceleration/deceleration selection : NC axis estimated inertia state $8 ▲
R2070	ITF3CHWGSLD8	Interference check III: Entry in interference warn area solid information $8
R2071		
R2072	ITF3CHALSLD8	Interference check III: Interference detection solid information $8
R2073		
R2074	ITF3TRALSLD8	Interference check III: Entry in interference alarm area solid information $8
R2075		
R2084		Specific user NC status 1 $8 ▲
R2088		Specific user Manual skip Axis in skip motion $8 ▲
R2089		Specific user Manual skip Skip motion direction $8 ▲
R2090		Specific user Error/Warning detail $8 ▲
R2400		3D Machine Interference Check : Requested shape group No.1
R2401		3D Machine Interference Check : Requested shape group No.2
R2402		3D Machine Interference Check : Requested shape group No.3
R2403		3D Machine Interference Check : Requested shape group No.4
R4500		Machine position 1st axis (L) $1 [M]
R4501		Machine position 1st axis (H) $1 [M]
R4504		Machine position 2nd axis (L) $1 [M]
R4505		Machine position 2nd axis (H) $1 [M]
R4508		Machine position 3rd axis (L) $1 [M]
R4509		Machine position 3rd axis (H) $1 [M]
R4512		Machine position 4th axis (L) $1 [M]
R4513		Machine position 4th axis (H) $1 [M]
R4516		Machine position 5th axis (L) $1 [M]
R4517		Machine position 5th axis (H) $1 [M]
R4520		Machine position 6th axis (L) $1 [M]
R4521		Machine position 6th axis (H) $1 [M]

Device	Abbrev.	Signal name
R4524		Machine position 7th axis (L) $1 [M]
R4525		Machine position 7th axis (H) $1 [M]
R4528		Machine position 8th axis (L) $1 [M]
R4529		Machine position 8th axis (H) $1 [M]
R4532		Machine position 1st axis (L) $2 [M]
R4533		Machine position 1st axis (H) $2 [M]
R4536		Machine position 2nd axis (L) $2 [M]
R4537		Machine position 2nd axis (H) $2 [M]
R4540		Machine position 3rd axis (L) $2 [M]
R4541		Machine position 3rd axis (H) $2 [M]
R4544		Machine position 4th axis (L) $2 [M]
R4545		Machine position 4th axis (H) $2 [M]
R4548		Machine position 5th axis (L) $2 [M]
R4549		Machine position 5th axis (H) $2 [M]
R4552		Machine position 6th axis (L) $2 [M]
R4553		Machine position 6th axis (H) $2 [M]
R4556		Machine position 7th axis (L) $2 [M]
R4557		Machine position 7th axis (H) $2 [M]
R4560		Machine position 8th axis (L) $2 [M]
R4561		Machine position 8th axis (H) $2 [M]
R4564		Machine position 1st axis (L) $3 [M]
R4565		Machine position 1st axis (H) $3 [M]
R4568		Machine position 2nd axis (L) $3 [M]
R4569		Machine position 2nd axis (H) $3 [M]
R4572		Machine position 3rd axis (L) $3 [M]
R4573		Machine position 3rd axis (H) $3 [M]
R4576		Machine position 4th axis (L) $3 [M]
R4577		Machine position 4th axis (H) $3 [M]
R4580		Machine position 5th axis (L) $3 [M]
R4581		Machine position 5th axis (H) $3 [M]
R4584		Machine position 6th axis (L) $3 [M]
R4585		Machine position 6th axis (H) $3 [M]
R4588		Machine position 7th axis (L) $3 [M]
R4589		Machine position 7th axis (H) $3 [M]
R4592		Machine position 8th axis (L) $3 [M]
R4593		Machine position 8th axis (H) $3 [M]
R4596		Machine position 1st axis (L) $4 [M]
R4597		Machine position 1st axis (H) $4 [M]
R4600		Machine position 2nd axis (L) $4 [M]
R4601		Machine position 2nd axis (H) $4 [M]
R4604		Machine position 3rd axis (L) $4 [M]
R4605		Machine position 3rd axis (H) $4 [M]
R4608		Machine position 4th axis (L) $4 [M]
R4609		Machine position 4th axis (H) $4 [M]
R4612		Machine position 5th axis (L) $4 [M]
R4613		Machine position 5th axis (H) $4 [M]
R4616		Machine position 6th axis (L) $4 [M]
R4617		Machine position 6th axis (H) $4 [M]
R4620		Machine position 7th axis (L) $4 [M]
R4621		Machine position 7th axis (H) $4 [M]
R4624		Machine position 8th axis (L) $4 [M]
R4625		Machine position 8th axis (H) $4 [M]
R4628		Feedback machine position 1st axis (L) $1 [M]
R4629		Feedback machine position 1st axis (H) $1 [M]
R4632		Feedback machine position 2nd axis (L) $1 [M]
R4633		Feedback machine position 2nd axis (H) $1 [M]
R4636		Feedback machine position 3rd axis (L) $1 [M]
R4637		Feedback machine position 3rd axis (H) $1 [M]
R4640		Feedback machine position 4th axis (L) $1 [M]
R4641		Feedback machine position 4th axis (H) $1 [M]
R4644		Feedback machine position 5th axis (L) $1 [M]
R4645		Feedback machine position 5th axis (H) $1 [M]
R4648		Feedback machine position 6th axis (L) $1 [M]
R4649		Feedback machine position 6th axis (H) $1 [M]
R4652		Feedback machine position 7th axis (L) $1 [M]
R4653		Feedback machine position 7th axis (H) $1 [M]
R4656		Feedback machine position 8th axis (L) $1 [M]
R4657		Feedback machine position 8th axis (H) $1 [M]
R4660		Feedback machine position 1st axis (L) $2 [M]
R4661		Feedback machine position 1st axis (H) $2 [M]
R4664		Feedback machine position 2nd axis (L) $2 [M]
R4665		Feedback machine position 2nd axis (H) $2 [M]
R4668		Feedback machine position 3rd axis (L) $2 [M]
R4669		Feedback machine position 3rd axis (H) $2 [M]
R4672		Feedback machine position 4th axis (L) $2 [M]
R4673		Feedback machine position 4th axis (H) $2 [M]
R4676		Feedback machine position 5th axis (L) $2 [M]
R4677		Feedback machine position 5th axis (H) $2 [M]
R4680		Feedback machine position 6th axis (L) $2 [M]
R4681		Feedback machine position 6th axis (H) $2 [M]
R4684		Feedback machine position 7th axis (L) $2 [M]
R4685		Feedback machine position 7th axis (H) $2 [M]

Device	Abbrev.	Signal name
R4688		Feedback machine position 8th axis (L) $2 [M]
R4689		Feedback machine position 8th axis (H) $2 [M]
R4692		Feedback machine position 1st axis (L) $3 [M]
R4693		Feedback machine position 1st axis (H) $3 [M]
R4696		Feedback machine position 2nd axis (L) $3 [M]
R4697		Feedback machine position 2nd axis (H) $3 [M]
R4700		Feedback machine position 3rd axis (L) $3 [M]
R4701		Feedback machine position 3rd axis (H) $3 [M]
R4704		Feedback machine position 4th axis (L) $3 [M]
R4705		Feedback machine position 4th axis (H) $3 [M]
R4708		Feedback machine position 5th axis (L) $3 [M]
R4709		Feedback machine position 5th axis (H) $3 [M]
R4712		Feedback machine position 6th axis (L) $3 [M]
R4713		Feedback machine position 6th axis (H) $3 [M]
R4716		Feedback machine position 7th axis (L) $3 [M]
R4717		Feedback machine position 7th axis (H) $3 [M]
R4720		Feedback machine position 8th axis (L) $3 [M]
R4721		Feedback machine position 8th axis (H) $3 [M]
R4724		Feedback machine position 1st axis (L) $4 [M]
R4725		Feedback machine position 1st axis (H) $4 [M]
R4728		Feedback machine position 2nd axis (L) $4 [M]
R4729		Feedback machine position 2nd axis (H) $4 [M]
R4732		Feedback machine position 3rd axis (L) $4 [M]
R4733		Feedback machine position 3rd axis (H) $4 [M]
R4736		Feedback machine position 4th axis (L) $4 [M]
R4737		Feedback machine position 4th axis (H) $4 [M]
R4740		Feedback machine position 5th axis (L) $4 [M]
R4741		Feedback machine position 5th axis (H) $4 [M]
R4744		Feedback machine position 6th axis (L) $4 [M]
R4745		Feedback machine position 6th axis (H) $4 [M]
R4748		Feedback machine position 7th axis (L) $4 [M]
R4749		Feedback machine position 7th axis (H) $4 [M]
R4752		Feedback machine position 8th axis (L) $4 [M]
R4753		Feedback machine position 8th axis (H) $4 [M]
R4756		Servo deflection amount 1st axis (L) $1 [M]
R4757		Servo deflection amount 1st axis (H) $1 [M]
R4758		Servo deflection amount 2nd axis (L) $1 [M]
R4759		Servo deflection amount 2nd axis (H) $1 [M]
R4760		Servo deflection amount 3rd axis (L) $1 [M]
R4761		Servo deflection amount 3rd axis (H) $1 [M]
R4762		Servo deflection amount 4th axis (L) $1 [M]
R4763		Servo deflection amount 4th axis (H) $1 [M]
R4764		Servo deflection amount 5th axis (L) $1 [M]
R4765		Servo deflection amount 5th axis (H) $1 [M]
R4766		Servo deflection amount 6th axis (L) $1 [M]
R4767		Servo deflection amount 6th axis (H) $1 [M]
R4768		Servo deflection amount 7th axis (L) $1 [M]
R4769		Servo deflection amount 7th axis (H) $1 [M]
R4770		Servo deflection amount 8th axis (L) $1 [M]
R4771		Servo deflection amount 8th axis (H) $1 [M]
R4772		Servo deflection amount 1st axis (L) $2 [M]
R4773		Servo deflection amount 1st axis (H) $2 [M]
R4774		Servo deflection amount 2nd axis (L) $2 [M]
R4775		Servo deflection amount 2nd axis (H) $2 [M]
R4776		Servo deflection amount 3rd axis (L) $2 [M]
R4777		Servo deflection amount 3rd axis (H) $2 [M]
R4778		Servo deflection amount 4th axis (L) $2 [M]
R4779		Servo deflection amount 4th axis (H) $2 [M]
R4780		Servo deflection amount 5th axis (L) $2 [M]
R4781		Servo deflection amount 5th axis (H) $2 [M]
R4782		Servo deflection amount 6th axis (L) $2 [M]
R4783		Servo deflection amount 6th axis (H) $2 [M]
R4784		Servo deflection amount 7th axis (L) $2 [M]
R4785		Servo deflection amount 7th axis (H) $2 [M]
R4786		Servo deflection amount 8th axis (L) $2 [M]
R4787		Servo deflection amount 8th axis (H) $2 [M]
R4788		Servo deflection amount 1st axis (L) $3 [M]
R4789		Servo deflection amount 1st axis (H) $3 [M]
R4790		Servo deflection amount 2nd axis (L) $3 [M]
R4791		Servo deflection amount 2nd axis (H) $3 [M]
R4792		Servo deflection amount 3rd axis (L) $3 [M]
R4793		Servo deflection amount 3rd axis (H) $3 [M]
R4794		Servo deflection amount 4th axis (L) $3 [M]
R4795		Servo deflection amount 4th axis (H) $3 [M]
R4796		Servo deflection amount 5th axis (L) $3 [M]
R4797		Servo deflection amount 5th axis (H) $3 [M]
R4798		Servo deflection amount 6th axis (L) $3 [M]
R4799		Servo deflection amount 6th axis (H) $3 [M]
R4800		Servo deflection amount 7th axis (L) $3 [M]
R4801		Servo deflection amount 7th axis (H) $3 [M]
R4802		Servo deflection amount 8th axis (L) $3 [M]
R4803		Servo deflection amount 8th axis (H) $3 [M]

Device	Abbrev.	Signal name
R4804		Servo deflection amount 1st axis (L) $4 [M]
R4805		Servo deflection amount 1st axis (H) $4 [M]
R4806		Servo deflection amount 2nd axis (L) $4 [M]
R4807		Servo deflection amount 2nd axis (H) $4 [M]
R4808		Servo deflection amount 3rd axis (L) $4 [M]
R4809		Servo deflection amount 3rd axis (H) $4 [M]
R4810		Servo deflection amount 4th axis (L) $4 [M]
R4811		Servo deflection amount 4th axis (H) $4 [M]
R4812		Servo deflection amount 5th axis (L) $4 [M]
R4813		Servo deflection amount 5th axis (H) $4 [M]
R4814		Servo deflection amount 6th axis (L) $4 [M]
R4815		Servo deflection amount 6th axis (H) $4 [M]
R4816		Servo deflection amount 7th axis (L) $4 [M]
R4817		Servo deflection amount 7th axis (H) $4 [M]
R4818		Servo deflection amount 8th axis (L) $4 [M]
R4819		Servo deflection amount 8th axis (H) $4 [M]
R4820		Motor rotation speed 1st axis (L) $1
R4821		Motor rotation speed 1st axis (H) $1
R4822		Motor rotation speed 2nd axis (L) $1
R4823		Motor rotation speed 2nd axis (H) $1
R4824		Motor rotation speed 3rd axis (L) $1
R4825		Motor rotation speed 3rd axis (H) $1
R4826		Motor rotation speed 4th axis (L) $1
R4827		Motor rotation speed 4th axis (H) $1
R4828		Motor rotation speed 5th axis (L) $1
R4829		Motor rotation speed 5th axis (H) $1
R4830		Motor rotation speed 6th axis (L) $1
R4831		Motor rotation speed 6th axis (H) $1
R4832		Motor rotation speed 7th axis (L) $1
R4833		Motor rotation speed 7th axis (H) $1
R4834		Motor rotation speed 8th axis (L) $1
R4835		Motor rotation speed 8th axis (H) $1
R4836		Motor rotation speed 1st axis (L) $2
R4837		Motor rotation speed 1st axis (H) $2
R4838		Motor rotation speed 2nd axis (L) $2
R4839		Motor rotation speed 2nd axis (H) $2
R4840		Motor rotation speed 3rd axis (L) $2
R4841		Motor rotation speed 3rd axis (H) $2
R4842		Motor rotation speed 4th axis (L) $2
R4843		Motor rotation speed 4th axis (H) $2
R4844		Motor rotation speed 5th axis (L) $2
R4845		Motor rotation speed 5th axis (H) $2
R4846		Motor rotation speed 6th axis (L) $2
R4847		Motor rotation speed 6th axis (H) $2
R4848		Motor rotation speed 7th axis (L) $2
R4849		Motor rotation speed 7th axis (H) $2
R4850		Motor rotation speed 8th axis (L) $2
R4851		Motor rotation speed 8th axis (H) $2
R4852		Motor rotation speed 1st axis (L) $3
R4853		Motor rotation speed 1st axis (H) $3
R4854		Motor rotation speed 2nd axis (L) $3
R4855		Motor rotation speed 2nd axis (H) $3
R4856		Motor rotation speed 3rd axis (L) $3
R4857		Motor rotation speed 3rd axis (H) $3
R4858		Motor rotation speed 4th axis (L) $3
R4859		Motor rotation speed 4th axis (H) $3
R4860		Motor rotation speed 5th axis (L) $3
R4861		Motor rotation speed 5th axis (H) $3
R4862		Motor rotation speed 6th axis (L) $3
R4863		Motor rotation speed 6th axis (H) $3
R4864		Motor rotation speed 7th axis (L) $3
R4865		Motor rotation speed 7th axis (H) $3
R4866		Motor rotation speed 8th axis (L) $3
R4867		Motor rotation speed 8th axis (H) $3
R4868		Motor rotation speed 1st axis (L) $4
R4869		Motor rotation speed 1st axis (H) $4
R4870		Motor rotation speed 2nd axis (L) $4
R4871		Motor rotation speed 2nd axis (H) $4
R4872		Motor rotation speed 3rd axis (L) $4
R4873		Motor rotation speed 3rd axis (H) $4
R4874		Motor rotation speed 4th axis (L) $4
R4875		Motor rotation speed 4th axis (H) $4
R4876		Motor rotation speed 5th axis (L) $4
R4877		Motor rotation speed 5th axis (H) $4
R4878		Motor rotation speed 6th axis (L) $4
R4879		Motor rotation speed 6th axis (H) $4
R4880		Motor rotation speed 7th axis (L) $4
R4881		Motor rotation speed 7th axis (H) $4
R4882		Motor rotation speed 8th axis (L) $4
R4883		Motor rotation speed 8th axis (H) $4
R4884		Motor load current 1st axis (L) $1
R4885		Motor load current 1st axis (H) $1

Device	Abbrev.	Signal name
R4886		Motor load current 2nd axis (L) $1
R4887		Motor load current 2nd axis (H) $1
R4888		Motor load current 3rd axis (L) $1
R4889		Motor load current 3rd axis (H) $1
R4890		Motor load current 4th axis (L) $1
R4891		Motor load current 4th axis (H) $1
R4892		Motor load current 5th axis (L) $1
R4893		Motor load current 5th axis (H) $1
R4894		Motor load current 6th axis (L) $1
R4895		Motor load current 6th axis (H) $1
R4896		Motor load current 7th axis (L) $1
R4897		Motor load current 7th axis (H) $1
R4898		Motor load current 8th axis (L) $1
R4899		Motor load current 8th axis (H) $1
R4900		Motor load current 1st axis (L) $2
R4901		Motor load current 1st axis (H) $2
R4902		Motor load current 2nd axis (L) $2
R4903		Motor load current 2nd axis (H) $2
R4904		Motor load current 3rd axis (L) $2
R4905		Motor load current 3rd axis (H) $2
R4906		Motor load current 4th axis (L) $2
R4907		Motor load current 4th axis (H) $2
R4908		Motor load current 5th axis (L) $2
R4909		Motor load current 5th axis (H) $2
R4910		Motor load current 6th axis (L) $2
R4911		Motor load current 6th axis (H) $2
R4912		Motor load current 7th axis (L) $2
R4913		Motor load current 7th axis (H) $2
R4914		Motor load current 8th axis (L) $2
R4915		Motor load current 8th axis (H) $2
R4916		Motor load current 1st axis (L) $3
R4917		Motor load current 1st axis (H) $3
R4918		Motor load current 2nd axis (L) $3
R4919		Motor load current 2nd axis (H) $3
R4920		Motor load current 3rd axis (L) $3
R4921		Motor load current 3rd axis (H) $3
R4922		Motor load current 4th axis (L) $3
R4923		Motor load current 4th axis (H) $3
R4924		Motor load current 5th axis (L) $3
R4925		Motor load current 5th axis (H) $3
R4926		Motor load current 6th axis (L) $3
R4927		Motor load current 6th axis (H) $3
R4928		Motor load current 7th axis (L) $3
R4929		Motor load current 7th axis (H) $3
R4930		Motor load current 8th axis (L) $3
R4931		Motor load current 8th axis (H) $3
R4932		Motor load current 1st axis (L) $4
R4933		Motor load current 1st axis (H) $4
R4934		Motor load current 2nd axis (L) $4
R4935		Motor load current 2nd axis (H) $4
R4936		Motor load current 3rd axis (L) $4
R4937		Motor load current 3rd axis (H) $4
R4938		Motor load current 4th axis (L) $4
R4939		Motor load current 4th axis (H) $4
R4940		Motor load current 5th axis (L) $4
R4941		Motor load current 5th axis (H) $4
R4942		Motor load current 6th axis (L) $4
R4943		Motor load current 6th axis (H) $4
R4944		Motor load current 7th axis (L) $4
R4945		Motor load current 7th axis (H) $4
R4946		Motor load current 8th axis (L) $4
R4947		Motor load current 8th axis (H) $4
R4948		Skip coordinate position 1st axis (L) $1 [M]
R4949		Skip coordinate position 1st axis (H) $1 [M]
R4952		Skip coordinate position 2nd axis (L) $1 [M]
R4953		Skip coordinate position 2nd axis (H) $1 [M]
R4956		Skip coordinate position 3rd axis (L) $1 [M]
R4957		Skip coordinate position 3rd axis (H) $1 [M]
R4960		Skip coordinate position 4th axis (L) $1 [M]
R4961		Skip coordinate position 4th axis (H) $1 [M]
R4964		Skip coordinate position 5th axis (L) $1 [M]
R4965		Skip coordinate position 5th axis (H) $1 [M]
R4968		Skip coordinate position 6th axis (L) $1 [M]
R4969		Skip coordinate position 6th axis (H) $1 [M]
R4972		Skip coordinate position 7th axis (L) $1 [M]
R4973		Skip coordinate position 7th axis (H) $1 [M]
R4976		Skip coordinate position 8th axis (L) $1 [M]
R4977		Skip coordinate position 8th axis (H) $1 [M]
R4980		Skip coordinate position 1st axis (L) $2 [M]
R4981		Skip coordinate position 1st axis (H) $2 [M]
R4984		Skip coordinate position 2nd axis (L) $2 [M]
R4985		Skip coordinate position 2nd axis (H) $2 [M]

Device	Abbrev.	Signal name
R4988		Skip coordinate position 3rd axis (L) $2 [M]
R4989		Skip coordinate position 3rd axis (H) $2 [M]
R4992		Skip coordinate position 4th axis (L) $2 [M]
R4993		Skip coordinate position 4th axis (H) $2 [M]
R4996		Skip coordinate position 5th axis (L) $2 [M]
R4997		Skip coordinate position 5th axis (H) $2 [M]
R5000		Skip coordinate position 6th axis (L) $2 [M]
R5001		Skip coordinate position 6th axis (H) $2 [M]
R5004		Skip coordinate position 7th axis (L) $2 [M]
R5005		Skip coordinate position 7th axis (H) $2 [M]
R5008		Skip coordinate position 8th axis (L) $2 [M]
R5009		Skip coordinate position 8th axis (H) $2 [M]
R5012		Skip coordinate position 1st axis (L) $3 [M]
R5013		Skip coordinate position 1st axis (H) $3 [M]
R5016		Skip coordinate position 2nd axis (L) $3 [M]
R5017		Skip coordinate position 2nd axis (H) $3 [M]
R5020		Skip coordinate position 3rd axis (L) $3 [M]
R5021		Skip coordinate position 3rd axis (H) $3 [M]
R5024		Skip coordinate position 4th axis (L) $3 [M]
R5025		Skip coordinate position 4th axis (H) $3 [M]
R5028		Skip coordinate position 5th axis (L) $3 [M]
R5029		Skip coordinate position 5th axis (H) $3 [M]
R5032		Skip coordinate position 6th axis (L) $3 [M]
R5033		Skip coordinate position 6th axis (H) $3 [M]
R5036		Skip coordinate position 7th axis (L) $3 [M]
R5037		Skip coordinate position 7th axis (H) $3 [M]
R5040		Skip coordinate position 8th axis (L) $3 [M]
R5041		Skip coordinate position 8th axis (H) $3 [M]
R5044		Skip coordinate position 1st axis (L) $4 [M]
R5045		Skip coordinate position 1st axis (H) $4 [M]
R5048		Skip coordinate position 2nd axis (L) $4 [M]
R5049		Skip coordinate position 2nd axis (H) $4 [M]
R5052		Skip coordinate position 3rd axis (L) $4 [M]
R5053		Skip coordinate position 3rd axis (H) $4 [M]
R5056		Skip coordinate position 4th axis (L) $4 [M]
R5057		Skip coordinate position 4th axis (H) $4 [M]
R5060		Skip coordinate position 5th axis (L) $4 [M]
R5061		Skip coordinate position 5th axis (H) $4 [M]
R5064		Skip coordinate position 6th axis (L) $4 [M]
R5065		Skip coordinate position 6th axis (H) $4 [M]
R5068		Skip coordinate position 7th axis (L) $4 [M]
R5069		Skip coordinate position 7th axis (H) $4 [M]
R5072		Skip coordinate position 8th axis (L) $4 [M]
R5073		Skip coordinate position 8th axis (H) $4 [M]
R5076		Synchronous error amount 1st, 9th, 17th, 25th axis (L) $1 [M]
R5077		Synchronous error amount 1st, 9th, 17th, 25th axis (H) $1 [M]
R5078		Synchronous error amount 2nd, 10th, 18th, 26th axis (L) $1 [M]
R5079		Synchronous error amount 2nd, 10th, 18th, 26th axis (H) $1 [M]
R5080		Synchronous error amount 3rd, 11th, 19th, 27th axis (L) $1 [M]
R5081		Synchronous error amount 3rd, 11th, 19th, 27th axis (H) $1 [M]
R5082		Synchronous error amount 4th, 12th, 20th, 28th axis (L) $1 [M]
R5083		Synchronous error amount 4th, 12th, 20th, 28th axis (H) $1 [M]
R5084		Synchronous error amount 5th, 13th, 21st, 29th axis (L) $1 [M]
R5085		Synchronous error amount 5th, 13th, 21st, 29th axis (H) $1 [M]
R5086		Synchronous error amount 6th, 14th, 22nd, 30th axis (L) $1 [M]
R5087		Synchronous error amount 6th, 14th, 22nd, 30th axis (H) $1 [M]
R5088		Synchronous error amount 7th, 15th, 23rd, 31st axis (L) $1 [M]
R5089		Synchronous error amount 7th, 15th, 23rd, 31st axis (H) $1 [M]
R5090		Synchronous error amount 8th, 16th, 24th, 32nd axis (L) $1 [M]
R5091		Synchronous error amount 8th, 16th, 24th, 32nd axis (H) $1 [M]
R5092		Synchronous error amount 1st, 9th, 17th, 25th axis (L) $2 [M]
R5093		Synchronous error amount 1st, 9th, 17th, 25th axis (H) $2 [M]
R5094		Synchronous error amount 2nd, 10th, 18th, 26th axis (L) $2 [M]
R5095		Synchronous error amount 2nd, 10th, 18th, 26th axis (H) $2 [M]
R5096		Synchronous error amount 3rd, 11th, 19th, 27th axis (L) $2 [M]
R5097		Synchronous error amount 3rd, 11th, 19th, 27th axis (H) $2 [M]
R5098		Synchronous error amount 4th, 12th, 20th, 28th axis (L) $2 [M]
R5099		Synchronous error amount 4th, 12th, 20th, 28th axis (H) $2 [M]
R5100		Synchronous error amount 5th, 13th, 21st, 29th axis (L) $2 [M]
R5101		Synchronous error amount 5th, 13th, 21st, 29th axis (H) $2 [M]
R5102		Synchronous error amount 6th, 14th, 22nd, 30th axis (L) $2 [M]
R5103		Synchronous error amount 6th, 14th, 22nd, 30th axis (H) $2 [M]
R5104		Synchronous error amount 7th, 15th, 23rd, 31st axis (L) $2 [M]
R5105		Synchronous error amount 7th, 15th, 23rd, 31st axis (H) $2 [M]
R5106		Synchronous error amount 8th, 16th, 24th, 32nd axis (L) $2 [M]
R5107		Synchronous error amount 8th, 16th, 24th, 32nd axis (H) $2 [M]
R5108		Synchronous error amount 1st, 9th, 17th, 25th axis (L) $3 [M]
R5109		Synchronous error amount 1st, 9th, 17th, 25th axis (H) $3 [M]
R5110		Synchronous error amount 2nd, 10th, 18th, 26th axis (L) $3 [M]
R5111		Synchronous error amount 2nd, 10th, 18th, 26th axis (H) $3 [M]
R5112		Synchronous error amount 3rd, 11th, 19th, 27th axis (L) $3 [M]
R5113		Synchronous error amount 3rd, 11th, 19th, 27th axis (H) $3 [M]

Device	Abbrev.	Signal name
R5114		Synchronous error amount 4th, 12th, 20th, 28th axis (L) $3 [M]
R5115		Synchronous error amount 4th, 12th, 20th, 28th axis (H) $3 [M]
R5116		Synchronous error amount 5th, 13th, 21st, 29th axis (L) $3 [M]
R5117		Synchronous error amount 5th, 13th, 21st, 29th axis (H) $3 [M]
R5118		Synchronous error amount 6th, 14th, 22nd, 30th axis (L) $3 [M]
R5119		Synchronous error amount 6th, 14th, 22nd, 30th axis (H) $3 [M]
R5120		Synchronous error amount 7th, 15th, 23rd, 31st axis (L) $3 [M]
R5121		Synchronous error amount 7th, 15th, 23rd, 31st axis (H) $3 [M]
R5122		Synchronous error amount 8th, 16th, 24th, 32nd axis (L) $3 [M]
R5123		Synchronous error amount 8th, 16th, 24th, 32nd axis (H) $3 [M]
R5124		Synchronous error amount 1st, 9th, 17th, 25th axis (L) $4 [M]
R5125		Synchronous error amount 1st, 9th, 17th, 25th axis (H) $4 [M]
R5126		Synchronous error amount 2nd, 10th, 18th, 26th axis (L) $4 [M]
R5127		Synchronous error amount 2nd, 10th, 18th, 26th axis (H) $4 [M]
R5128		Synchronous error amount 3rd, 11th, 19th, 27th axis (L) $4 [M]
R5129		Synchronous error amount 3rd, 11th, 19th, 27th axis (H) $4 [M]
R5130		Synchronous error amount 4th, 12th, 20th, 28th axis (L) $4 [M]
R5131		Synchronous error amount 4th, 12th, 20th, 28th axis (H) $4 [M]
R5132		Synchronous error amount 5th, 13th, 21st, 29th axis (L) $4 [M]
R5133		Synchronous error amount 5th, 13th, 21st, 29th axis (H) $4 [M]
R5134		Synchronous error amount 6th, 14th, 22nd, 30th axis (L) $4 [M]
R5135		Synchronous error amount 6th, 14th, 22nd, 30th axis (H) $4 [M]
R5136		Synchronous error amount 7th, 15th, 23rd, 31st axis (L) $4 [M]
R5137		Synchronous error amount 7th, 15th, 23rd, 31st axis (H) $4 [M]
R5138		Synchronous error amount 8th, 16th, 24th, 32nd axis (L) $4 [M]
R5139		Synchronous error amount 8th, 16th, 24th, 32nd axis (H) $4 [M]
R5140		Optimum acceleration/deceleration parameter group currently selected [axis] 1st axis $1 ▲
R5141		Optimum acceleration/deceleration parameter group currently selected [axis] 2nd axis $1 ▲
R5142		Optimum acceleration/deceleration parameter group currently selected [axis] 3rd axis $1 ▲
R5143		Optimum acceleration/deceleration parameter group currently selected [axis] 4th axis $1 ▲
R5144		Optimum acceleration/deceleration parameter group currently selected [axis] 5th axis $1 ▲
R5145		Optimum acceleration/deceleration parameter group currently selected [axis] 6th axis $1 ▲
R5146		Optimum acceleration/deceleration parameter group currently selected [axis] 7th axis $1 ▲
R5147		Optimum acceleration/deceleration parameter group currently selected [axis] 8th axis $1 ▲
R5148		Optimum acceleration/deceleration parameter group currently selected [axis] 1st axis $2 ▲
R5149		Optimum acceleration/deceleration parameter group currently selected [axis] 2nd axis $2 ▲
R5150		Optimum acceleration/deceleration parameter group currently selected [axis] 3rd axis $2 ▲
R5151		Optimum acceleration/deceleration parameter group currently selected [axis] 4th axis $2 ▲
R5152		Optimum acceleration/deceleration parameter group currently selected [axis] 5th axis $2 ▲
R5153		Optimum acceleration/deceleration parameter group currently selected [axis] 6th axis $2 ▲
R5154		Optimum acceleration/deceleration parameter group currently selected [axis] 7th axis $2 ▲
R5155		Optimum acceleration/deceleration parameter group currently selected [axis] 8th axis $2 ▲
R5156		Optimum acceleration/deceleration parameter group currently selected [axis] 1st axis $3 ▲
R5157		Optimum acceleration/deceleration parameter group currently selected [axis] 2nd axis $3 ▲
R5158		Optimum acceleration/deceleration parameter group currently selected [axis] 3rd axis $3 ▲
R5159		Optimum acceleration/deceleration parameter group currently selected [axis] 4th axis $3 ▲
R5160		Optimum acceleration/deceleration parameter group currently selected [axis] 5th axis $3 ▲
R5161		Optimum acceleration/deceleration parameter group currently selected [axis] 6th axis $3 ▲
R5162		Optimum acceleration/deceleration parameter group currently selected [axis] 7th axis $3 ▲
R5163		Optimum acceleration/deceleration parameter group currently selected [axis] 8th axis $3 ▲
R5164		Optimum acceleration/deceleration parameter group currently selected [axis] 1st axis $4 ▲
R5165		Optimum acceleration/deceleration parameter group currently selected [axis] 2nd axis $4 ▲
R5166		Optimum acceleration/deceleration parameter group currently selected [axis] 3rd axis $4 ▲
R5167		Optimum acceleration/deceleration parameter group currently selected [axis] 4th axis $4 ▲
R5168		Optimum acceleration/deceleration parameter group currently selected [axis] 5th axis $4 ▲
R5169		Optimum acceleration/deceleration parameter group currently selected [axis] 6th axis $4 ▲
R5170		Optimum acceleration/deceleration parameter group currently selected [axis] 7th axis $4 ▲

Device	Abbrev.	Signal name
R5171		Optimum acceleration/deceleration parameter group currently selected [axis] 8th axis $4 ▲
R5172		Cutting feed movement amount 1st axis (L) $1 [M]
R5173		Cutting feed movement amount 1st axis (H) $1 [M]
R5176		Cutting feed movement amount 2nd axis (L) $1 [M]
R5177		Cutting feed movement amount 2nd axis (H) $1 [M]
R5180		Cutting feed movement amount 3rd axis (L) $1 [M]
R5181		Cutting feed movement amount 3rd axis (H) $1 [M]
R5184		Cutting feed movement amount 4th axis (L) $1 [M]
R5185		Cutting feed movement amount 4th axis (H) $1 [M]
R5188		Cutting feed movement amount 5th axis (L) $1 [M]
R5189		Cutting feed movement amount 5th axis (H) $1 [M]
R5192		Cutting feed movement amount 6th axis (L) $1 [M]
R5193		Cutting feed movement amount 6th axis (H) $1 [M]
R5196		Cutting feed movement amount 7th axis (L) $1 [M]
R5197		Cutting feed movement amount 7th axis (H) $1 [M]
R5200		Cutting feed movement amount 8th axis (L) $1 [M]
R5201		Cutting feed movement amount 8th axis (H) $1 [M]
R5204		Cutting feed movement amount 1st axis (L) $2 [M]
R5205		Cutting feed movement amount 1st axis (H) $2 [M]
R5208		Cutting feed movement amount 2nd axis (L) $2 [M]
R5209		Cutting feed movement amount 2nd axis (H) $2 [M]
R5212		Cutting feed movement amount 3rd axis (L) $2 [M]
R5213		Cutting feed movement amount 3rd axis (H) $2 [M]
R5216		Cutting feed movement amount 4th axis (L) $2 [M]
R5217		Cutting feed movement amount 4th axis (H) $2 [M]
R5220		Cutting feed movement amount 5th axis (L) $2 [M]
R5221		Cutting feed movement amount 5th axis (H) $2 [M]
R5224		Cutting feed movement amount 6th axis (L) $2 [M]
R5225		Cutting feed movement amount 6th axis (H) $2 [M]
R5228		Cutting feed movement amount 7th axis (L) $2 [M]
R5229		Cutting feed movement amount 7th axis (H) $2 [M]
R5232		Cutting feed movement amount 8th axis (L) $2 [M]
R5233		Cutting feed movement amount 8th axis (H) $2 [M]
R5236		Cutting feed movement amount 1st axis (L) $3 [M]
R5237		Cutting feed movement amount 1st axis (H) $3 [M]
R5240		Cutting feed movement amount 2nd axis (L) $3 [M]
R5241		Cutting feed movement amount 2nd axis (H) $3 [M]
R5244		Cutting feed movement amount 3rd axis (L) $3 [M]
R5245		Cutting feed movement amount 3rd axis (H) $3 [M]
R5248		Cutting feed movement amount 4th axis (L) $3 [M]
R5249		Cutting feed movement amount 4th axis (H) $3 [M]
R5252		Cutting feed movement amount 5th axis (L) $3 [M]
R5253		Cutting feed movement amount 5th axis (H) $3 [M]
R5256		Cutting feed movement amount 6th axis (L) $3 [M]
R5257		Cutting feed movement amount 6th axis (H) $3 [M]
R5260		Cutting feed movement amount 7th axis (L) $3 [M]
R5261		Cutting feed movement amount 7th axis (H) $3 [M]
R5264		Cutting feed movement amount 8th axis (L) $3 [M]
R5265		Cutting feed movement amount 8th axis (H) $3 [M]
R5268		Cutting feed movement amount 1st axis (L) $4 [M]
R5269		Cutting feed movement amount 1st axis (H) $4 [M]
R5272		Cutting feed movement amount 2nd axis (L) $4 [M]
R5273		Cutting feed movement amount 2nd axis (H) $4 [M]
R5276		Cutting feed movement amount 3rd axis (L) $4 [M]
R5277		Cutting feed movement amount 3rd axis (H) $4 [M]
R5280		Cutting feed movement amount 4th axis (L) $4 [M]
R5281		Cutting feed movement amount 4th axis (H) $4 [M]
R5284		Cutting feed movement amount 5th axis (L) $4 [M]
R5285		Cutting feed movement amount 5th axis (H) $4 [M]
R5288		Cutting feed movement amount 6th axis (L) $4 [M]
R5289		Cutting feed movement amount 6th axis (H) $4 [M]
R5292		Cutting feed movement amount 7th axis (L) $4 [M]
R5293		Cutting feed movement amount 7th axis (H) $4 [M]
R5296		Cutting feed movement amount 8th axis (L) $4 [M]
R5297		Cutting feed movement amount 8th axis (H) $4 [M]
R5332		Servo alarm/warning No. 1st axis $1
R5333		Servo alarm/warning No. 2nd axis $1
R5334		Servo alarm/warning No. 3rd axis $1
R5335		Servo alarm/warning No. 4th axis $1
R5336		Servo alarm/warning No. 5th axis $1
R5337		Servo alarm/warning No. 6th axis $1
R5338		Servo alarm/warning No. 7th axis $1
R5339		Servo alarm/warning No. 8th axis $1
R5340		Servo alarm/warning No. 1st axis $2
R5341		Servo alarm/warning No. 2nd axis $2
R5342		Servo alarm/warning No. 3rd axis $2
R5343		Servo alarm/warning No. 4th axis $2
R5344		Servo alarm/warning No. 5th axis $2
R5345		Servo alarm/warning No. 6th axis $2
R5346		Servo alarm/warning No. 7th axis $2
R5347		Servo alarm/warning No. 8th axis $2
R5348		Servo alarm/warning No. 1st axis $3

Device	Abbrev.	Signal name
R5349		Servo alarm/warning No. 2nd axis $3
R5350		Servo alarm/warning No. 3rd axis $3
R5351		Servo alarm/warning No. 4th axis $3
R5352		Servo alarm/warning No. 5th axis $3
R5353		Servo alarm/warning No. 6th axis $3
R5354		Servo alarm/warning No. 7th axis $3
R5355		Servo alarm/warning No. 8th axis $3
R5356		Servo alarm/warning No. 1st axis $4
R5357		Servo alarm/warning No. 2nd axis $4
R5358		Servo alarm/warning No. 3rd axis $4
R5359		Servo alarm/warning No. 4th axis $4
R5360		Servo alarm/warning No. 5th axis $4
R5361		Servo alarm/warning No. 6th axis $4
R5362		Servo alarm/warning No. 7th axis $4
R5363		Servo alarm/warning No. 8th axis $4
R5364		Skip coordinate position 1st axis feature coordinate (L) $1 [M]
R5365		Skip coordinate position 1st axis feature coordinate (H) $1 [M]
R5368		Skip coordinate position 2nd axis feature coordinate (L) $1 [M]
R5369		Skip coordinate position 2nd axis feature coordinate (H) $1 [M]
R5372		Skip coordinate position 3rd axis feature coordinate (L) $1 [M]
R5373		Skip coordinate position 3rd axis feature coordinate (H) $1 [M]
R5376		Skip coordinate position 4th axis feature coordinate (L) $1 [M]
R5377		Skip coordinate position 4th axis feature coordinate (H) $1 [M]
R5380		Skip coordinate position 5th axis feature coordinate (L) $1 [M]
R5381		Skip coordinate position 5th axis feature coordinate (H) $1 [M]
R5384		Skip coordinate position 6th axis feature coordinate (L) $1 [M]
R5385		Skip coordinate position 6th axis feature coordinate (H) $1 [M]
R5388		Skip coordinate position 7th axis feature coordinate (L) $1 [M]
R5389		Skip coordinate position 7th axis feature coordinate (H) $1 [M]
R5392		Skip coordinate position 8th axis feature coordinate (L) $1 [M]
R5393		Skip coordinate position 8th axis feature coordinate (L) $1 [M]
R5396		Skip coordinate position 1st axis feature coordinate (L) $2 [M]
R5397		Skip coordinate position 1st axis feature coordinate (H) $2 [M]
R5400		Skip coordinate position 2nd axis feature coordinate (L) $2 [M]
R5401		Skip coordinate position 2nd axis feature coordinate (H) $2 [M]
R5404		Skip coordinate position 3rd axis feature coordinate (L) $2 [M]
R5405		Skip coordinate position 3rd axis feature coordinate (H) $2 [M]
R5408		Skip coordinate position 4th axis feature coordinate (L) $2 [M]
R5409		Skip coordinate position 4th axis feature coordinate (H) $2 [M]
R5412		Skip coordinate position 5th axis feature coordinate (L) $2 [M]
R5413		Skip coordinate position 5th axis feature coordinate (H) $2 [M]
R5416		Skip coordinate position 6th axis feature coordinate (L) $2 [M]
R5417		Skip coordinate position 6th axis feature coordinate (H) $2 [M]
R5420		Skip coordinate position 7th axis feature coordinate (L) $2 [M]
R5421		Skip coordinate position 7th axis feature coordinate (H) $2 [M]
R5424		Skip coordinate position 8th axis feature coordinate (L) $2 [M]
R5425		Skip coordinate position 8th axis feature coordinate (L) $2 [M]
R5428		Skip coordinate position 1st axis feature coordinate (L) $3 [M]
R5429		Skip coordinate position 1st axis feature coordinate (H) $3 [M]
R5432		Skip coordinate position 2nd axis feature coordinate (L) $3 [M]
R5433		Skip coordinate position 2nd axis feature coordinate (H) $3 [M]
R5436		Skip coordinate position 3rd axis feature coordinate (L) $3 [M]
R5437		Skip coordinate position 3rd axis feature coordinate (H) $3 [M]
R5440		Skip coordinate position 4th axis feature coordinate (L) $3 [M]
R5441		Skip coordinate position 4th axis feature coordinate (H) $3 [M]
R5444		Skip coordinate position 5th axis feature coordinate (L) $3 [M]
R5445		Skip coordinate position 5th axis feature coordinate (H) $3 [M]
R5448		Skip coordinate position 6th axis feature coordinate (L) $3 [M]
R5449		Skip coordinate position 6th axis feature coordinate (H) $3 [M]
R5452		Skip coordinate position 7th axis feature coordinate (L) $3 [M]
R5453		Skip coordinate position 7th axis feature coordinate (H) $3 [M]
R5456		Skip coordinate position 8th axis feature coordinate (L) $3 [M]
R5457		Skip coordinate position 8th axis feature coordinate (L) $3 [M]
R5460		Skip coordinate position 1st axis feature coordinate (L) $4 [M]
R5461		Skip coordinate position 1st axis feature coordinate (H) $4 [M]
R5464		Skip coordinate position 2nd axis feature coordinate (L) $4 [M]
R5465		Skip coordinate position 2nd axis feature coordinate (H) $4 [M]
R5468		Skip coordinate position 3rd axis feature coordinate (L) $4 [M]
R5469		Skip coordinate position 3rd axis feature coordinate (H) $4 [M]
R5472		Skip coordinate position 4th axis feature coordinate (L) $4 [M]
R5473		Skip coordinate position 4th axis feature coordinate (H) $4 [M]
R5476		Skip coordinate position 5th axis feature coordinate (L) $4 [M]
R5477		Skip coordinate position 5th axis feature coordinate (H) $4 [M]
R5480		Skip coordinate position 6th axis feature coordinate (L) $4 [M]
R5481		Skip coordinate position 6th axis feature coordinate (H) $4 [M]
R5484		Skip coordinate position 7th axis feature coordinate (L) $4 [M]
R5485		Skip coordinate position 7th axis feature coordinate (H) $4 [M]
R5488		Skip coordinate position 8th axis feature coordinate (L) $4 [M]
R5489		Skip coordinate position 8th axis feature coordinate (L) $4 [M]
R5492		Load monitor I : Cutting torque output value 1st axis $1 [M8]
R5493		Load monitor I : Cutting torque output value 2nd axis $1 [M8]
R5494		Load monitor I : Cutting torque output value 3rd axis $1 [M8]

Device	Abbrev.	Signal name
R5495		Load monitor I : Cutting torque output value 4th axis $1 [M8]
R5496		Load monitor I : Cutting torque output value 5th axis $1 [M8]
R5497		Load monitor I : Cutting torque output value 6th axis $1 [M8]
R5498		Load monitor I : Cutting torque output value 7th axis $1 [M8]
R5499		Load monitor I : Cutting torque output value 8th axis $1 [M8]
R5500		Load monitor I : Cutting torque output value 1st axis $2 [M8]
R5501		Load monitor I : Cutting torque output value 2nd axis $2 [M8]
R5502		Load monitor I : Cutting torque output value 3rd axis $2 [M8]
R5503		Load monitor I : Cutting torque output value 4th axis $2 [M8]
R5504		Load monitor I : Cutting torque output value 5th axis $2 [M8]
R5505		Load monitor I : Cutting torque output value 6th axis $2 [M8]
R5506		Load monitor I : Cutting torque output value 7th axis $2 [M8]
R5507		Load monitor I : Cutting torque output value 8th axis $2 [M8]
R5508		Load monitor I : Cutting torque output value 1st axis $3 [M8]
R5509		Load monitor I : Cutting torque output value 2nd axis $3 [M8]
R5510		Load monitor I : Cutting torque output value 3rd axis $3 [M8]
R5511		Load monitor I : Cutting torque output value 4th axis $3 [M8]
R5512		Load monitor I : Cutting torque output value 5th axis $3 [M8]
R5513		Load monitor I : Cutting torque output value 6th axis $3 [M8]
R5514		Load monitor I : Cutting torque output value 7th axis $3 [M8]
R5515		Load monitor I : Cutting torque output value 8th axis $3 [M8]
R5516		Load monitor I : Cutting torque output value 1st axis $4 [M8]
R5517		Load monitor I : Cutting torque output value 2nd axis $4 [M8]
R5518		Load monitor I : Cutting torque output value 3rd axis $4 [M8]
R5519		Load monitor I : Cutting torque output value 4th axis $4 [M8]
R5520		Load monitor I : Cutting torque output value 5th axis $4 [M8]
R5521		Load monitor I : Cutting torque output value 6th axis $4 [M8]
R5522		Load monitor I : Cutting torque output value 7th axis $4 [M8]
R5523		Load monitor I : Cutting torque output value 8th axis $4 [M8]
R5524		Actual machining time 1st axis $1 ▲
R5525		Actual machining time 2nd axis $1 ▲
R5526		Actual machining time 3rd axis $1 ▲
R5527		Actual machining time 4th axis $1 ▲
R5528		Actual machining time 5th axis $1 ▲
R5529		Actual machining time 6th axis $1 ▲
R5530		Actual machining time 7th axis $1 ▲
R5531		Actual machining time 8th axis $1 ▲
R5532		Actual machining time 1st axis $2 ▲
R5533		Actual machining time 2nd axis $2 ▲
R5534		Actual machining time 3rd axis $2 ▲
R5535		Actual machining time 4th axis $2 ▲
R5536		Actual machining time 5th axis $2 ▲
R5537		Actual machining time 6th axis $2 ▲
R5538		Actual machining time 7th axis $2 ▲
R5539		Actual machining time 8th axis $2 ▲
R5540		Actual machining time 1st axis $3 ▲
R5541		Actual machining time 2nd axis $3 ▲
R5542		Actual machining time 3rd axis $3 ▲
R5543		Actual machining time 4th axis $3 ▲
R5544		Actual machining time 5th axis $3 ▲
R5545		Actual machining time 6th axis $3 ▲
R5546		Actual machining time 7th axis $3 ▲
R5547		Actual machining time 8th axis $3 ▲
R5548		Actual machining time 1st axis $4 ▲
R5549		Actual machining time 2nd axis $4 ▲
R5550		Actual machining time 3rd axis $4 ▲
R5551		Actual machining time 4th axis $4 ▲
R5552		Actual machining time 5th axis $4 ▲
R5553		Actual machining time 6th axis $4 ▲
R5554		Actual machining time 7th axis $4 ▲
R5555		Actual machining time 8th axis $4 ▲
R5556	SVINER11	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 1st axis $1 ▲
R5557	SVINER21	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 2nd axis $1 ▲
R5558	SVINER31	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 3rd axis $1 ▲
R5559	SVINER41	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 4th axis $1 ▲
R5560	SVINER51	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 5th axis $1 ▲
R5561	SVINER61	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 6th axis $1 ▲
R5562	SVINER71	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 7th axis $1 ▲
R5563	SVINER81	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 8th axis $1 ▲
R5564	SVINER12	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 1st axis $2 ▲
R5565	SVINER22	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 2nd axis $2 ▲
R5566	SVINER32	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 3rd axis $2 ▲
R5567	SVINER42	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 4th axis $2 ▲

Device	Abbrev.	Signal name
R5568	SVINER52	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 5th axis $2 ▲
R5569	SVINER62	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 6th axis $2 ▲
R5570	SVINER72	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 7th axis $2 ▲
R5571	SVINER82	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 8th axis $2 ▲
R5572	SVINER13	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 1st axis $3 ▲
R5573	SVINER23	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 2nd axis $3 ▲
R5574	SVINER33	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 3rd axis $3 ▲
R5575	SVINER43	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 4th axis $3 ▲
R5576	SVINER53	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 5th axis $3 ▲
R5577	SVINER63	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 6th axis $3 ▲
R5578	SVINER73	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 7th axis $3 ▲
R5579	SVINER83	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 8th axis $3 ▲
R5580	SVINER14	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 1st axis $4 ▲
R5581	SVINER24	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 2nd axis $4 ▲
R5582	SVINER34	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 3rd axis $4 ▲
R5583	SVINER44	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 4th axis $4 ▲
R5584	SVINER54	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 5th axis $4 ▲
R5585	SVINER64	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 6th axis $4 ▲
R5586	SVINER74	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 7th axis $4 ▲
R5587	SVINER84	Optimum acceleration/deceleration selection : NC axis estimated inertia ratio 8th axis $4 ▲
R5588	SVAFLT11	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 1st axis $1 ▲
R5589	SVAFLT21	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 2nd axis $1 ▲
R5590	SVAFLT31	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 3rd axis $1 ▲
R5591	SVAFLT41	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 4th axis $1 ▲
R5592	SVAFLT51	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 5th axis $1 ▲
R5593	SVAFLT61	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 6th axis $1 ▲
R5594	SVAFLT71	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 7th axis $1 ▲
R5595	SVAFLT81	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 8th axis $1 ▲
R5596	SVAFLT12	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 1st axis $2 ▲
R5597	SVAFLT22	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 2nd axis $2 ▲
R5598	SVAFLT32	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 3rd axis $2 ▲
R5599	SVAFLT42	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 4th axis $2 ▲
R5600	SVAFLT52	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 5th axis $2 ▲
R5601	SVAFLT62	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 6th axis $2 ▲
R5602	SVAFLT72	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 7th axis $2 ▲
R5603	SVAFLT82	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 8th axis $2 ▲
R5604	SVAFLT13	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 1st axis $3 ▲
R5605	SVAFLT23	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 2nd axis $3 ▲
R5606	SVAFLT33	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 3rd axis $3 ▲
R5607	SVAFLT43	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 4th axis $3 ▲
R5608	SVAFLT53	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 5th axis $3 ▲
R5609	SVAFLT63	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 6th axis $3 ▲
R5610	SVAFLT73	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 7th axis $3 ▲
R5611	SVAFLT83	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 8th axis $3 ▲
R5612	SVAFLT14	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 1st axis $4 ▲
R5613	SVAFLT24	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 2nd axis $4 ▲

Device	Abbrev.	Signal name
R5614	SVAFLT34	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 3rd axis $4 ▲
R5615	SVAFLT44	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 4th axis $4 ▲
R5616	SVAFLT54	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 5th axis $4 ▲
R5617	SVAFLT64	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 6th axis $4 ▲
R5618	SVAFLT74	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 7th axis $4 ▲
R5619	SVAFLT84	Optimum acceleration/deceleration selection : NC axis estimated resonance frequency 8th axis $4 ▲
R5620		Load monitoring I: Effective torque output 1st axis $1 [M8]
R5621		Load monitoring I: Effective torque output 2nd axis $1 [M8]
R5622		Load monitoring I: Effective torque output 3rd axis $1 [M8]
R5623		Load monitoring I: Effective torque output 4th axis $1 [M8]
R5624		Load monitoring I: Effective torque output 5th axis $1 [M8]
R5625		Load monitoring I: Effective torque output 6th axis $1 [M8]
R5626		Load monitoring I: Effective torque output 7th axis $1 [M8]
R5627		Load monitoring I: Effective torque output 8th axis $1 [M8]
R5628		Load monitoring I: Effective torque output 1st axis $2 [M8]
R5629		Load monitoring I: Effective torque output 2nd axis $2 [M8]
R5630		Load monitoring I: Effective torque output 3rd axis $2 [M8]
R5631		Load monitoring I: Effective torque output 4th axis $2 [M8]
R5632		Load monitoring I: Effective torque output 5th axis $2 [M8]
R5633		Load monitoring I: Effective torque output 6th axis $2 [M8]
R5634		Load monitoring I: Effective torque output 7th axis $2 [M8]
R5635		Load monitoring I: Effective torque output 8th axis $2 [M8]
R5636		Load monitoring I: Effective torque output 1st axis $3 [M8]
R5637		Load monitoring I: Effective torque output 2nd axis $3 [M8]
R5638		Load monitoring I: Effective torque output 3rd axis $3 [M8]
R5639		Load monitoring I: Effective torque output 4th axis $3 [M8]
R5640		Load monitoring I: Effective torque output 5th axis $3 [M8]
R5641		Load monitoring I: Effective torque output 6th axis $3 [M8]
R5642		Load monitoring I: Effective torque output 7th axis $3 [M8]
R5643		Load monitoring I: Effective torque output 8th axis $3 [M8]
R5644		Load monitoring I: Effective torque output 1st axis $4 [M8]
R5645		Load monitoring I: Effective torque output 2nd axis $4 [M8]
R5646		Load monitoring I: Effective torque output 3rd axis $4 [M8]
R5647		Load monitoring I: Effective torque output 4th axis $4 [M8]
R5648		Load monitoring I: Effective torque output 5th axis $4 [M8]
R5649		Load monitoring I: Effective torque output 6th axis $4 [M8]
R5650		Load monitoring I: Effective torque output 7th axis $4 [M8]
R5651		Load monitoring I: Effective torque output 8th axis $4 [M8]
R6372		User macro output #1132 (NC -> PLC) (L) $1
R6373		User macro output #1132 (NC -> PLC) (H) $1
R6374		User macro output #1133 (NC -> PLC) (L) $1
R6375		User macro output #1133 (NC -> PLC) (H) $1
R6376		User macro output #1134 (NC -> PLC) (L) $1
R6377		User macro output #1134 (NC -> PLC) (H) $1
R6378		User macro output #1135 (NC -> PLC) (L) $1
R6379		User macro output #1135 (NC -> PLC) (H) $1
R6380		User macro output #1132 (NC -> PLC) (L) $2
R6381		User macro output #1132 (NC -> PLC) (H) $2
R6382		User macro output #1133 (NC -> PLC) (L) $2
R6383		User macro output #1133 (NC -> PLC) (H) $2
R6384		User macro output #1134 (NC -> PLC) (L) $2
R6385		User macro output #1134 (NC -> PLC) (H) $2
R6386		User macro output #1135 (NC -> PLC) (L) $2
R6387		User macro output #1135 (NC -> PLC) (H) $2
R6388		User macro output #1132 (NC -> PLC) (L) $3
R6389		User macro output #1132 (NC -> PLC) (H) $3
R6390		User macro output #1133 (NC -> PLC) (L) $3
R6391		User macro output #1133 (NC -> PLC) (H) $3
R6392		User macro output #1134 (NC -> PLC) (L) $3
R6393		User macro output #1134 (NC -> PLC) (H) $3
R6394		User macro output #1135 (NC -> PLC) (L) $3
R6395		User macro output #1135 (NC -> PLC) (H) $3
R6396		User macro output #1132 (NC -> PLC) (L) $4
R6397		User macro output #1132 (NC -> PLC) (H) $4
R6398		User macro output #1133 (NC -> PLC) (L) $4
R6399		User macro output #1133 (NC -> PLC) (H) $4
R6400		User macro output #1134 (NC -> PLC) (L) $4
R6401		User macro output #1134 (NC -> PLC) (H) $4
R6402		User macro output #1135 (NC -> PLC) (L) $4
R6403		User macro output #1135 (NC -> PLC) (H) $4
R6404		User macro output #1132 (NC -> PLC) (L) $5
R6405		User macro output #1132 (NC -> PLC) (H) $5
R6406		User macro output #1133 (NC -> PLC) (L) $5
R6407		User macro output #1133 (NC -> PLC) (H) $5
R6408		User macro output #1134 (NC -> PLC) (L) $5
R6409		User macro output #1134 (NC -> PLC) (H) $5
R6410		User macro output #1135 (NC -> PLC) (L) $5
R6411		User macro output #1135 (NC -> PLC) (H) $5

Device	Abbrev.	Signal name
R6412		User macro output #1132 (NC -> PLC) (L) $6
R6413		User macro output #1132 (NC -> PLC) (H) $6
R6414		User macro output #1133 (NC -> PLC) (L) $6
R6415		User macro output #1133 (NC -> PLC) (H) $6
R6416		User macro output #1134 (NC -> PLC) (L) $6
R6417		User macro output #1134 (NC -> PLC) (H) $6
R6418		User macro output #1135 (NC -> PLC) (L) $6
R6419		User macro output #1135 (NC -> PLC) (H) $6
R6420		User macro output #1132 (NC -> PLC) (L) $7
R6421		User macro output #1132 (NC -> PLC) (H) $7
R6422		User macro output #1133 (NC -> PLC) (L) $7
R6423		User macro output #1133 (NC -> PLC) (H) $7
R6424		User macro output #1134 (NC -> PLC) (L) $7
R6425		User macro output #1134 (NC -> PLC) (H) $7
R6426		User macro output #1135 (NC -> PLC) (L) $7
R6427		User macro output #1135 (NC -> PLC) (H) $7
R6428		User macro output #1132 (NC -> PLC) (L) $8
R6429		User macro output #1132 (NC -> PLC) (H) $8
R6430		User macro output #1133 (NC -> PLC) (L) $8
R6431		User macro output #1133 (NC -> PLC) (H) $8
R6432		User macro output #1134 (NC -> PLC) (L) $8
R6433		User macro output #1134 (NC -> PLC) (H) $8
R6434		User macro output #1135 (NC -> PLC) (L) $8
R6435		User macro output #1135 (NC -> PLC) (H) $8
R6500		Spindle command rotation speed input (L) 1stSP
R6501		Spindle command rotation speed input (H) 1stSP
R6502		Spindle command final data (rotation speed) (L) 1stSP
R6503		Spindle command final data (rotation speed) (H) 1stSP
R6504		Spindle command final data (12-bit binary) (L) 1stSP
R6505		Spindle command final data (12-bit binary) (H) 1stSP
R6506		Spindle actual speed (L) 1stSP
R6507		Spindle actual speed (H) 1stSP
R6514		Optimum acceleration/deceleration estimated inertia ratio [spindle] 1stSP ▲
R6515		Optimum acceleration/deceleration parameter group currently selected [spindle] 1stSP ▲
R6516		Spindle synchronization phase error /Hob axis delay angle 1stSP
R6517		Spindle synchronization Maximum phase error/Maximum hob axis delay angle 1stSP
R6518		Spindle synchronization Phase offset data 1stSP
R6519		Spindle synchronization Phase error monitor 1stSP
R6520		Spindle synchronization Phase error monitor (lower limit) 1stSP
R6521		Spindle synchronization Phase error monitor (upper limit) 1stSP
R6522		Spindle synchronization Phase error 1 1stSP
R6523		Spindle synchronization Phase error 2 1stSP
R6525		Spindle motor load ratio 1stSP
R6527		Spindle actual machining time 1stSP ▲
R6528		Load monitor I : Spindle cutting torque output value 1stSP [M8]
R6529		Spindle alarm/warning No. 1stSP
R6532		Synchronous tapping Current error width (L) 1stSP
R6533		Synchronous tapping Current error width (H) 1stSP
R6534		Synchronous tapping Maximum error width (L) 1stSP
R6535		Synchronous tapping Maximum error width (H) 1stSP
R6536		Synchronous tapping Current error angle (L) 1stSP
R6537		Synchronous tapping Current error angle (H) 1stSP
R6538		Synchronous tapping Maximum error angle (L) 1stSP
R6539		Synchronous tapping Maximum error angle (H) 1stSP
R6541		Load monitoring I: Estimated spindle disturbance torque output 1stSP [M8]
R6542		Load monitoring I: Effective spindle torque output 1stSP [M8]
R6550		Spindle command rotation speed input (L) 2ndSP
R6551		Spindle command rotation speed input (H) 2ndSP
R6552		Spindle command final data (rotation speed) (L) 2ndSP
R6553		Spindle command final data (rotation speed) (H) 2ndSP
R6554		Spindle command final data (12-bit binary) (L) 2ndSP
R6555		Spindle command final data (12-bit binary) (H) 2ndSP
R6556		Spindle actual speed (L) 2ndSP
R6557		Spindle actual speed (H) 2ndSP
R6564		Optimum acceleration/deceleration estimated inertia ratio [spindle] 2ndSP ▲
R6565		Optimum acceleration/deceleration parameter group currently selected [spindle] 2ndSP ▲
R6566		Spindle synchronization phase error /Hob axis delay angle 2ndSP
R6567		Spindle synchronization Maximum phase error/Maximum hob axis delay angle 2ndSP
R6568		Spindle synchronization Phase offset data 2ndSP
R6569		Spindle synchronization Phase error monitor 2ndSP
R6570		Spindle synchronization Phase error monitor (lower limit) 2ndSP
R6571		Spindle synchronization Phase error monitor (upper limit) 2ndSP
R6572		Spindle synchronization Phase error 1 2ndSP
R6573		Spindle synchronization Phase error 2 2ndSP
R6575		Spindle motor load ratio 2ndSP
R6577		Spindle actual machining time 2ndSP ▲
R6578		Load monitor I : Spindle cutting torque output value 2ndSP [M8]
R6579		Spindle alarm/warning No. 2ndSP
R6582		Synchronous tapping Current error width (L) 2ndSP

Device	Abbrev.	Signal name
R6583		Synchronous tapping Current error width (H) 2ndSP
R6584		Synchronous tapping Maximum error width (L) 2ndSP
R6585		Synchronous tapping Maximum error width (H) 2ndSP
R6586		Synchronous tapping Current error angle (L) 2ndSP
R6587		Synchronous tapping Current error angle (H) 2ndSP
R6588		Synchronous tapping Maximum error angle (L) 2ndSP
R6589		Synchronous tapping Maximum error angle (H) 2ndSP
R6591		Load monitoring I: Estimated spindle disturbance torque output 2ndSP [M8]
R6592		Load monitoring I: Effective spindle torque output 2ndSP [M8]
R6600		Spindle command rotation speed input (L) 3rdSP
R6601		Spindle command rotation speed input (H) 3rdSP
R6602		Spindle command final data (rotation speed) (L) 3rdSP
R6603		Spindle command final data (rotation speed) (H) 3rdSP
R6604		Spindle command final data (12-bit binary) (L) 3rdSP
R6605		Spindle command final data (12-bit binary) (H) 3rdSP
R6606		Spindle actual speed (L) 3rdSP
R6607		Spindle actual speed (H) 3rdSP
R6614		Optimum acceleration/deceleration estimated inertia ratio [spindle] 3rdSP ▲
R6615		Optimum acceleration/deceleration parameter group currently selected [spindle] 3rdSP ▲
R6616		Spindle synchronization phase error /Hob axis delay angle 3rdSP
R6617		Spindle synchronization Maximum phase error/Maximum hob axis delay angle 3rdSP
R6618		Spindle synchronization Phase offset data 3rdSP
R6619		Spindle synchronization Phase error monitor 3rdSP
R6620		Spindle synchronization Phase error monitor (lower limit) 3rdSP
R6621		Spindle synchronization Phase error monitor (upper limit) 3rdSP
R6622		Spindle synchronization Phase error 1 3rdSP
R6623		Spindle synchronization Phase error 2 3rdSP
R6625		Spindle motor load ratio 3rdSP
R6627		Spindle actual machining time 3rdSP ▲
R6628		Load monitor I : Spindle cutting torque output value 3rdSP [M8]
R6629		Spindle alarm/warning No. 3rdSP
R6632		Synchronous tapping Current error width (L) 3rdSP
R6633		Synchronous tapping Current error width (H) 3rdSP
R6634		Synchronous tapping Maximum error width (L) 3rdSP
R6635		Synchronous tapping Maximum error width (H) 3rdSP
R6636		Synchronous tapping Current error angle (L) 3rdSP
R6637		Synchronous tapping Current error angle (H) 3rdSP
R6638		Synchronous tapping Maximum error angle (L) 3rdSP
R6639		Synchronous tapping Maximum error angle (H) 3rdSP
R6641		Load monitoring I: Estimated spindle disturbance torque output 3rdSP [M8]
R6642		Load monitoring I: Effective spindle torque output 3rdSP [M8]
R6650		Spindle command rotation speed input (L) 4thSP
R6651		Spindle command rotation speed input (H) 4thSP
R6652		Spindle command final data (rotation speed) (L) 4thSP
R6653		Spindle command final data (rotation speed) (H) 4thSP
R6654		Spindle command final data (12-bit binary) (L) 4thSP
R6655		Spindle command final data (12-bit binary) (H) 4thSP
R6656		Spindle actual speed (L) 4thSP
R6657		Spindle actual speed (H) 4thSP
R6664		Optimum acceleration/deceleration estimated inertia ratio [spindle] 4thSP ▲
R6665		Optimum acceleration/deceleration parameter group currently selected [spindle] 4thSP ▲
R6666		Spindle synchronization phase error /Hob axis delay angle 4thSP
R6667		Spindle synchronization Maximum phase error/Maximum hob axis delay angle 4thSP
R6668		Spindle synchronization Phase offset data 4thSP
R6669		Spindle synchronization Phase error monitor 4thSP
R6670		Spindle synchronization Phase error monitor (lower limit) 4thSP
R6671		Spindle synchronization Phase error monitor (upper limit) 4thSP
R6672		Spindle synchronization Phase error 1 4thSP
R6673		Spindle synchronization Phase error 2 4thSP
R6675		Spindle motor load ratio 4thSP
R6677		Spindle actual machining time 4thSP ▲
R6678		Load monitor I : Spindle cutting torque output value 4thSP [M8]
R6679		Spindle alarm/warning No. 4thSP
R6682		Synchronous tapping Current error width (L) 4thSP
R6683		Synchronous tapping Current error width (H) 4thSP
R6684		Synchronous tapping Maximum error width (L) 4thSP
R6685		Synchronous tapping Maximum error width (H) 4thSP
R6686		Synchronous tapping Current error angle (L) 4thSP
R6687		Synchronous tapping Current error angle (H) 4thSP
R6688		Synchronous tapping Maximum error angle (L) 4thSP
R6689		Synchronous tapping Maximum error angle (H) 4thSP
R6691		Load monitoring I: Estimated spindle disturbance torque output 4thSP [M8]
R6692		Load monitoring I: Effective spindle torque output 4thSP [M8]
R6700		Spindle command rotation speed input (L) 5thSP
R6701		Spindle command rotation speed input (H) 5thSP
R6702		Spindle command final data (rotation speed) (L) 5thSP
R6703		Spindle command final data (rotation speed) (H) 5thSP
R6704		Spindle command final data (12-bit binary) (L) 5thSP
R6705		Spindle command final data (12-bit binary) (H) 5thSP

Device	Abbrev.	Signal name
R6706		Spindle actual speed (L) 5thSP
R6707		Spindle actual speed (H) 5thSP
R6714		Optimum acceleration/deceleration estimated inertia ratio [spindle] 5thSP ▲
R6715		Optimum acceleration/deceleration parameter group currently selected [spindle] 5thSP ▲
R6716		Spindle synchronization phase error /Hob axis delay angle 5thSP
R6717		Spindle synchronization Maximum phase error/Maximum hob axis delay angle 5thSP
R6718		Spindle synchronization Phase offset data 5thSP
R6719		Spindle synchronization Phase error monitor 5thSP
R6720		Spindle synchronization Phase error monitor (lower limit) 5thSP
R6721		Spindle synchronization Phase error monitor (upper limit) 5thSP
R6722		Spindle synchronization Phase error 1 5thSP
R6723		Spindle synchronization Phase error 2 5thSP
R6725		Spindle motor load ratio 5thSP
R6727		Spindle actual machining time 5thSP ▲
R6728		Load monitor I : Spindle cutting torque output value 5thSP [M8]
R6729		Spindle alarm/warning No. 5thSP
R6732		Synchronous tapping Current error width (L) 5thSP
R6733		Synchronous tapping Current error width (H) 5thSP
R6734		Synchronous tapping Maximum error width (L) 5thSP
R6735		Synchronous tapping Maximum error width (H) 5thSP
R6736		Synchronous tapping Current error angle (L) 5thSP
R6737		Synchronous tapping Current error angle (H) 5thSP
R6738		Synchronous tapping Maximum error angle (L) 5thSP
R6739		Synchronous tapping Maximum error angle (H) 5thSP
R6741		Load monitoring I: Estimated spindle disturbance torque output 5thSP [M8]
R6742		Load monitoring I: Effective spindle torque output 5thSP [M8]
R6750		Spindle command rotation speed input (L) 6thSP
R6751		Spindle command rotation speed input (H) 6thSP
R6752		Spindle command final data (rotation speed) (L) 6thSP
R6753		Spindle command final data (rotation speed) (H) 6thSP
R6754		Spindle command final data (12-bit binary) (L) 6thSP
R6755		Spindle command final data (12-bit binary) (H) 6thSP
R6756		Spindle actual speed (L) 6thSP
R6757		Spindle actual speed (H) 6thSP
R6764		Optimum acceleration/deceleration estimated inertia ratio [spindle] 6thSP ▲
R6765		Optimum acceleration/deceleration parameter group currently selected [spindle] 6thSP ▲
R6766		Spindle synchronization phase error /Hob axis delay angle 6thSP
R6767		Spindle synchronization Maximum phase error/Maximum hob axis delay angle 6thSP
R6768		Spindle synchronization Phase offset data 6thSP
R6769		Spindle synchronization Phase error monitor 6thSP
R6770		Spindle synchronization Phase error monitor (lower limit) 6thSP
R6771		Spindle synchronization Phase error monitor (upper limit) 6thSP
R6772		Spindle synchronization Phase error 1 6thSP
R6773		Spindle synchronization Phase error 2 6thSP
R6775		Spindle motor load ratio 6thSP
R6777		Spindle actual machining time 6thSP ▲
R6778		Load monitor I : Spindle cutting torque output value 6thSP [M8]
R6779		Spindle alarm/warning No. 6thSP
R6782		Synchronous tapping Current error width (L) 6thSP
R6783		Synchronous tapping Current error width (H) 6thSP
R6784		Synchronous tapping Maximum error width (L) 6thSP
R6785		Synchronous tapping Maximum error width (H) 6thSP
R6786		Synchronous tapping Current error angle (L) 6thSP
R6787		Synchronous tapping Current error angle (H) 6thSP
R6788		Synchronous tapping Maximum error angle (L) 6thSP
R6789		Synchronous tapping Maximum error angle (H) 6thSP
R6791		Load monitoring I: Estimated spindle disturbance torque output 6thSP [M8]
R6792		Load monitoring I: Effective spindle torque output 6thSP [M8]
R6800		Spindle command rotation speed input (L) 7thSP
R6801		Spindle command rotation speed input (H) 7thSP
R6802		Spindle command final data (rotation speed) (L) 7thSP
R6803		Spindle command final data (rotation speed) (H) 7thSP
R6804		Spindle command final data (12-bit binary) (L) 7thSP
R6805		Spindle command final data (12-bit binary) (H) 7thSP
R6806		Spindle actual speed (L) 7thSP
R6807		Spindle actual speed (H) 7thSP
R6814		Optimum acceleration/deceleration estimated inertia ratio [spindle] 7thSP ▲
R6815		Optimum acceleration/deceleration parameter group currently selected [spindle] 7thSP ▲
R6816		Spindle synchronization phase error /Hob axis delay angle 7thSP
R6817		Spindle synchronization Maximum phase error/Maximum hob axis delay angle 7thSP
R6818		Spindle synchronization Phase offset data 7thSP
R6819		Spindle synchronization Phase error monitor 7thSP
R6820		Spindle synchronization Phase error monitor (lower limit) 7thSP
R6821		Spindle synchronization Phase error monitor (upper limit) 7thSP
R6822		Spindle synchronization Phase error 1 7thSP
R6823		Spindle synchronization Phase error 2 7thSP
R6825		Spindle motor load ratio 7thSP
R6827		Spindle actual machining time 7thSP ▲

Device	Abbrev.	Signal name
R6828		Load monitor I : Spindle cutting torque output value 7thSP [M8]
R6829		Spindle alarm/warning No. 7thSP
R6832		Synchronous tapping Current error width (L) 7thSP
R6833		Synchronous tapping Current error width (H) 7thSP
R6834		Synchronous tapping Maximum error width (L) 7thSP
R6835		Synchronous tapping Maximum error width (H) 7thSP
R6836		Synchronous tapping Current error angle (L) 7thSP
R6837		Synchronous tapping Current error angle (H) 7thSP
R6838		Synchronous tapping Maximum error angle (L) 7thSP
R6839		Synchronous tapping Maximum error angle (H) 7thSP
R6841		Load monitoring I: Estimated spindle disturbance torque output 7thSP [M8]
R6842		Load monitoring I: Effective spindle torque output 7thSP [M8]
R6850		Spindle command rotation speed input (L) 8thSP
R6851		Spindle command rotation speed input (H) 8thSP
R6852		Spindle command final data (rotation speed) (L) 8thSP
R6853		Spindle command final data (rotation speed) (H) 8thSP
R6854		Spindle command final data (12-bit binary) (L) 8thSP
R6855		Spindle command final data (12-bit binary) (H) 8thSP
R6856		Spindle actual speed (L) 8thSP
R6857		Spindle actual speed (H) 8thSP
R6864		Optimum acceleration/deceleration estimated inertia ratio [spindle] 8thSP ▲
R6865		Optimum acceleration/deceleration parameter group currently selected [spindle] 8thSP ▲
R6866		Spindle synchronization phase error /Hob axis delay angle 8thSP
R6867		Spindle synchronization Maximum phase error/Maximum hob axis delay angle 8thSP
R6868		Spindle synchronization Phase offset data 8thSP
R6869		Spindle synchronization Phase error monitor 8thSP
R6870		Spindle synchronization Phase error monitor (lower limit) 8thSP
R6871		Spindle synchronization Phase error monitor (upper limit) 8thSP
R6872		Spindle synchronization Phase error 1 8thSP
R6873		Spindle synchronization Phase error 2 8thSP
R6875		Spindle motor load ratio 8thSP
R6877		Spindle actual machining time 8thSP ▲
R6878		Load monitor I : Spindle cutting torque output value 8thSP [M8]
R6879		Spindle alarm/warning No. 8thSP
R6882		Synchronous tapping Current error width (L) 8thSP
R6883		Synchronous tapping Current error width (H) 8thSP
R6884		Synchronous tapping Maximum error width (L) 8thSP
R6885		Synchronous tapping Maximum error width (H) 8thSP
R6886		Synchronous tapping Current error angle (L) 8thSP
R6887		Synchronous tapping Current error angle (H) 8thSP
R6888		Synchronous tapping Maximum error angle (L) 8thSP
R6889		Synchronous tapping Maximum error angle (H) 8thSP
R6891		Load monitoring I: Estimated spindle disturbance torque output 8thSP [M8]
R6892		Load monitoring I: Effective spindle torque output 8thSP [M8]
R10000		RIO1 No. of error occurrences 1st ch
R10001		RIO1 No. of error occurrences 2nd ch
R10002		RIO1 No. of error occurrences 3rd ch
R10003		RIO1 No. of error occurrences 4th ch
R10004		RIO1 No. of error occurrences 5th ch
R10005		RIO1 No. of error occurrences 6th ch
R10006		RIO1 No. of error occurrences 7th ch
R10007		RIO1 No. of error occurrences 8th ch
R10008		RIO2 No. of error occurrences 1st ch
R10009		RIO2 No. of error occurrences 2nd ch
R10010		RIO2 No. of error occurrences 3rd ch
R10011		RIO2 No. of error occurrences 4th ch
R10012		RIO2 No. of error occurrences 5th ch
R10013		RIO2 No. of error occurrences 6th ch
R10014		RIO2 No. of error occurrences 7th ch
R10015		RIO2 No. of error occurrences 8th ch
R10016		RIO3 No. of error occurrences 1st ch
R10017		RIO3 No. of error occurrences 2nd ch
R10018		RIO3 No. of error occurrences 3rd ch
R10019		RIO3 No. of error occurrences 4th ch
R10020		RIO3 No. of error occurrences 5th ch
R10021		RIO3 No. of error occurrences 6th ch
R10022		RIO3 No. of error occurrences 7th ch
R10023		RIO3 No. of error occurrences 8th ch
R10064		Connection status of each channel RIO1,2
R10065		Connection status of each channel RIO3
R10068		CRC warning channel RIO1,2
R10069		CRC warning channel RIO3
R11800		T life mgmt (M system) Spare tool: Group No. (L) $1
R11801		T life mgmt (M system) Spare tool: Group No. (H) $1
R11802		T life mgmt (M system) Spare tool: Tool No. (L) $1
R11803		T life mgmt (M system) Spare tool: Tool No. (H) $1
R11804		T life mgmt (M system) Spare tool: Tool data flag/Status $1

Device	Abbrev.	Signal name
R11805		T life mgmt (M system) Spare tool: Auxiliary data $1
R11806		T life mgmt (M system) Spare tool: Cumulative usage time (L) $1
R11807		T life mgmt (M system) Spare tool: Cumulative usage time (H) $1
R11808		T life mgmt (M system) Spare tool: Service lifetime (L) $1
R11809		T life mgmt (M system) Spare tool: Service lifetime (H) $1
R11810		T life mgmt (M system) Spare tool: Cumulative usage count $1
R11811		T life mgmt (M system) Spare tool: Service life count $1
R11812		T life mgmt (M system) Spare tool: Cumulative usage wear amount (L) $1
R11813		T life mgmt (M system) Spare tool: Cumulative usage wear amount (H) $1
R11814		T life mgmt (M system) Spare tool: Service life wear amount (L) $1
R11815		T life mgmt (M system) Spare tool: Service life wear amount (H) $1
R11816		T life mgmt (M system) Spare tool: Length compensation amount (L) $1
R11817		T life mgmt (M system) Spare tool: Length compensation amount (H) $1
R11818		T life mgmt (M system) Spare tool: Radius compensation amount (L) $1
R11819		T life mgmt (M system) Spare tool: Radius compensation amount (H) $1
R11820		T life mgmt (M system) Spare tool: Length wear amount (L) $1
R11821		T life mgmt (M system) Spare tool: Length wear amount (H) $1
R11822		T life mgmt (M system) Spare tool: Radius wear amount (L) $1
R11823		T life mgmt (M system) Spare tool: Radius wear amount (H) $1
R11824		T life mgmt (M system) Active tool: Group No. (L) $1
R11825		T life mgmt (M system) Active tool: Group No. (H) $1
R11826		T life mgmt (M system) Active tool: Tool No. (L) $1
R11827		T life mgmt (M system) Active tool: Tool No. (H) $1
R11828		T life mgmt (M system) Active tool: Tool data flag/Status $1
R11829		T life mgmt (M system) Active tool: Auxiliary data $1
R11830		T life mgmt (M system) Active tool: Cumulative usage time (L) $1
R11831		T life mgmt (M system) Active tool: Cumulative usage time (H) $1
R11832		T life mgmt (M system) Active tool: Service lifetime (L) $1
R11833		T life mgmt (M system) Active tool: Service lifetime (H) $1
R11834		T life mgmt (M system) Active tool: Cumulative usage count $1
R11835		T life mgmt (M system) Active tool: Service life count $1
R11836		T life mgmt (M system) Active tool: Cumulative usage wear amount (L) $1
R11837		T life mgmt (M system) Active tool: Cumulative usage wear amount (H) $1
R11838		T life mgmt (M system) Active tool: Service life wear amount (L) $1
R11839		T life mgmt (M system) Active tool: Service life wear amount (H) $1
R11840		T life mgmt (M system) Active tool: Length compensation amount (L) $1
R11841		T life mgmt (M system) Active tool: Length compensation amount (H) $1
R11842		T life mgmt (M system) Active tool: Radius compensation amount (L) $1
R11843		T life mgmt (M system) Active tool: Radius compensation amount (H) $1
R11844		T life mgmt (M system) Active tool: Length wear amount (L) $1
R11845		T life mgmt (M system) Active tool: Length wear amount (H) $1
R11846		T life mgmt (M system) Active tool: Radius wear amount (L) $1
R11847		T life mgmt (M system) Active tool: Radius wear amount (H) $1
R11850		T life mgmt (M system) Spare tool: Group No. (L) $2
R11851		T life mgmt (M system) Spare tool: Group No. (H) $2
R11852		T life mgmt (M system) Spare tool: Tool No. (L) $2

Device	Abbrev.	Signal name
R11853		T life mgmt (M system) Spare tool: Tool No. (H) $2
R11854		T life mgmt (M system) Spare tool: Tool data flag/Status $2
R11855		T life mgmt (M system) Spare tool: Auxiliary data $2
R11856		T life mgmt (M system) Spare tool: Cumulative usage time (L) $2
R11857		T life mgmt (M system) Spare tool: Cumulative usage time (H) $2
R11858		T life mgmt (M system) Spare tool: Service lifetime (L) $2
R11859		T life mgmt (M system) Spare tool: Service lifetime (H) $2
R11860		T life mgmt (M system) Spare tool: Cumulative usage count $2
R11861		T life mgmt (M system) Spare tool: Service life count $2
R11862		T life mgmt (M system) Spare tool: Cumulative usage wear amount (L) $2
R11863		T life mgmt (M system) Spare tool: Cumulative usage wear amount (H) $2
R11864		T life mgmt (M system) Spare tool: Service life wear amount (L) $2
R11865		T life mgmt (M system) Spare tool: Service life wear amount (H) $2
R11866		T life mgmt (M system) Spare tool: Length compensation amount (L) $2
R11867		T life mgmt (M system) Spare tool: Length compensation amount (H) $2
R11868		T life mgmt (M system) Spare tool: Radius compensation amount (L) $2
R11869		T life mgmt (M system) Spare tool: Radius compensation amount (H) $2
R11870		T life mgmt (M system) Spare tool: Length wear amount (L) $2
R11871		T life mgmt (M system) Spare tool: Length wear amount (H) $2
R11872		T life mgmt (M system) Spare tool: Radius wear amount (L) $2
R11873		T life mgmt (M system) Spare tool: Radius wear amount (H) $2
R11874		T life mgmt (M system) Active tool: Group No. (L) $2
R11875		T life mgmt (M system) Active tool: Group No. (H) $2
R11876		T life mgmt (M system) Active tool: Tool No. (L) $2
R11877		T life mgmt (M system) Active tool: Tool No. (H) $2
R11878		T life mgmt (M system) Active tool: Tool data flag/Status $2
R11879		T life mgmt (M system) Active tool: Auxiliary data $2
R11880		T life mgmt (M system) Active tool: Cumulative usage time (L) $2
R11881		T life mgmt (M system) Active tool: Cumulative usage time (H) $2
R11882		T life mgmt (M system) Active tool: Service lifetime (L) $2
R11883		T life mgmt (M system) Active tool: Service lifetime (H) $2
R11884		T life mgmt (M system) Active tool: Cumulative usage count $2
R11885		T life mgmt (M system) Active tool: Service life count $2
R11886		T life mgmt (M system) Active tool: Cumulative usage wear amount (L) $2
R11887		T life mgmt (M system) Active tool: Cumulative usage wear amount (H) $2
R11888		T life mgmt (M system) Active tool: Service life wear amount (L) $2
R11889		T life mgmt (M system) Active tool: Service life wear amount (H) $2
R11890		T life mgmt (M system) Active tool: Length compensation amount (L) $2
R11891		T life mgmt (M system) Active tool: Length compensation amount (H) $2
R11892		T life mgmt (M system) Active tool: Radius compensation amount (L) $2
R11893		T life mgmt (M system) Active tool: Radius compensation amount (H) $2
R11894		T life mgmt (M system) Active tool: Length wear amount (L) $2
R11895		T life mgmt (M system) Active tool: Length wear amount (H) $2
R11896		T life mgmt (M system) Active tool: Radius wear amount (L) $2
R11897		T life mgmt (M system) Active tool: Radius wear amount (H) $2
R11900		T life mgmt (M system) Spare tool: Group No. (L) $3

Device	Abbrev.	Signal name
R11901		T life mgmt (M system) Spare tool: Group No. (H) $3
R11902		T life mgmt (M system) Spare tool: Tool No. (L) $3
R11903		T life mgmt (M system) Spare tool: Tool No. (H) $3
R11904		T life mgmt (M system) Spare tool: Tool data flag/Status $3
R11905		T life mgmt (M system) Spare tool: Auxiliary data $3
R11906		T life mgmt (M system) Spare tool: Cumulative usage time (L) $3
R11907		T life mgmt (M system) Spare tool: Cumulative usage time (H) $3
R11908		T life mgmt (M system) Spare tool: Service lifetime (L) $3
R11909		T life mgmt (M system) Spare tool: Service lifetime (H) $3
R11910		T life mgmt (M system) Spare tool: Cumulative usage count $3
R11911		T life mgmt (M system) Spare tool: Service life count $3
R11912		T life mgmt (M system) Spare tool: Cumulative usage wear amount (L) $3
R11913		T life mgmt (M system) Spare tool: Cumulative usage wear amount (H) $3
R11914		T life mgmt (M system) Spare tool: Service life wear amount (L) $3
R11915		T life mgmt (M system) Spare tool: Service life wear amount (H) $3
R11916		T life mgmt (M system) Spare tool: Length compensation amount (L) $3
R11917		T life mgmt (M system) Spare tool: Length compensation amount (H) $3
R11918		T life mgmt (M system) Spare tool: Radius compensation amount (L) $3
R11919		T life mgmt (M system) Spare tool: Radius compensation amount (H) $3
R11920		T life mgmt (M system) Spare tool: Length wear amount (L) $3
R11921		T life mgmt (M system) Spare tool: Length wear amount (H) $3
R11922		T life mgmt (M system) Spare tool: Radius wear amount (L) $3
R11923		T life mgmt (M system) Spare tool: Radius wear amount (H) $3
R11924		T life mgmt (M system) Active tool: Group No. (L) $3
R11925		T life mgmt (M system) Active tool: Group No. (H) $3
R11926		T life mgmt (M system) Active tool: Tool No. (L) $3
R11927		T life mgmt (M system) Active tool: Tool No. (H) $3
R11928		T life mgmt (M system) Active tool: Tool data flag/Status $3
R11929		T life mgmt (M system) Active tool: Auxiliary data $3
R11930		T life mgmt (M system) Active tool: Cumulative usage time (L) $3
R11931		T life mgmt (M system) Active tool: Cumulative usage time (H) $3
R11932		T life mgmt (M system) Active tool: Service lifetime (L) $3
R11933		T life mgmt (M system) Active tool: Service lifetime (H) $3
R11934		T life mgmt (M system) Active tool: Cumulative usage count $3
R11935		T life mgmt (M system) Active tool: Service life count $3
R11936		T life mgmt (M system) Active tool: Cumulative usage wear amount (L) $3
R11937		T life mgmt (M system) Active tool: Cumulative usage wear amount (H) $3
R11938		T life mgmt (M system) Active tool: Service life wear amount (L) $3
R11939		T life mgmt (M system) Active tool: Service life wear amount (H) $3
R11940		T life mgmt (M system) Active tool: Length compensation amount (L) $3
R11941		T life mgmt (M system) Active tool: Length compensation amount (H) $3
R11942		T life mgmt (M system) Active tool: Radius compensation amount (L) $3
R11943		T life mgmt (M system) Active tool: Radius compensation amount (H) $3
R11944		T life mgmt (M system) Active tool: Length wear amount (L) $3
R11945		T life mgmt (M system) Active tool: Length wear amount (H) $3
R11946		T life mgmt (M system) Active tool: Radius wear amount (L) $3

Device	Abbrev.	Signal name
R11947		T life mgmt (M system) Active tool: Radius wear amount (H) $3
R11950		T life mgmt (M system) Spare tool: Group No. (L) $4
R11951		T life mgmt (M system) Spare tool: Group No. (H) $4
R11952		T life mgmt (M system) Spare tool: Tool No. (L) $4
R11953		T life mgmt (M system) Spare tool: Tool No. (H) $4
R11954		T life mgmt (M system) Spare tool: Tool data flag/Status $4
R11955		T life mgmt (M system) Spare tool: Auxiliary data $4
R11956		T life mgmt (M system) Spare tool: Cumulative usage time (L) $4
R11957		T life mgmt (M system) Spare tool: Cumulative usage time (H) $4
R11958		T life mgmt (M system) Spare tool: Service lifetime (L) $4
R11959		T life mgmt (M system) Spare tool: Service lifetime (H) $4
R11960		T life mgmt (M system) Spare tool: Cumulative usage count $4
R11961		T life mgmt (M system) Spare tool: Service life count $4
R11962		T life mgmt (M system) Spare tool: Cumulative usage wear amount (L) $4
R11963		T life mgmt (M system) Spare tool: Cumulative usage wear amount (H) $4
R11964		T life mgmt (M system) Spare tool: Service life wear amount (L) $4
R11965		T life mgmt (M system) Spare tool: Service life wear amount (H) $4
R11966		T life mgmt (M system) Spare tool: Length compensation amount (L) $4
R11967		T life mgmt (M system) Spare tool: Length compensation amount (H) $4
R11968		T life mgmt (M system) Spare tool: Radius compensation amount (L) $4
R11969		T life mgmt (M system) Spare tool: Radius compensation amount (H) $4
R11970		T life mgmt (M system) Spare tool: Length wear amount (L) $4
R11971		T life mgmt (M system) Spare tool: Length wear amount (H) $4
R11972		T life mgmt (M system) Spare tool: Radius wear amount (L) $4
R11973		T life mgmt (M system) Spare tool: Radius wear amount (H) $4
R11974		T life mgmt (M system) Active tool: Group No. (L) $4
R11975		T life mgmt (M system) Active tool: Group No. (H) $4
R11976		T life mgmt (M system) Active tool: Tool No. (L) $4
R11977		T life mgmt (M system) Active tool: Tool No. (H) $4
R11978		T life mgmt (M system) Active tool: Tool data flag/Status $4
R11979		T life mgmt (M system) Active tool: Auxiliary data $4
R11980		T life mgmt (M system) Active tool: Cumulative usage time (L) $4
R11981		T life mgmt (M system) Active tool: Cumulative usage time (H) $4
R11982		T life mgmt (M system) Active tool: Service lifetime (L) $4
R11983		T life mgmt (M system) Active tool: Service lifetime (H) $4
R11984		T life mgmt (M system) Active tool: Cumulative usage count $4
R11985		T life mgmt (M system) Active tool: Service life count $4
R11986		T life mgmt (M system) Active tool: Cumulative usage wear amount (L) $4
R11987		T life mgmt (M system) Active tool: Cumulative usage wear amount (H) $4
R11988		T life mgmt (M system) Active tool: Service life wear amount (L) $4
R11989		T life mgmt (M system) Active tool: Service life wear amount (H) $4
R11990		T life mgmt (M system) Active tool: Length compensation amount (L) $4
R11991		T life mgmt (M system) Active tool: Length compensation amount (H) $4
R11992		T life mgmt (M system) Active tool: Radius compensation amount (L) $4
R11993		T life mgmt (M system) Active tool: Radius compensation amount (H) $4
R11994		T life mgmt (M system) Active tool: Length wear amount (L) $4

Device	Abbrev.	Signal name
R11995		T life mgmt (M system) Active tool: Length wear amount (H) $4
R11996		T life mgmt (M system) Active tool: Radius wear amount (L) $4
R11997		T life mgmt (M system) Active tool: Radius wear amount (H) $4
R12000		T life mgmt (M system) Spare tool: Group No. (L) $5
R12001		T life mgmt (M system) Spare tool: Group No. (H) $5
R12002		T life mgmt (M system) Spare tool: Tool No. (L) $5
R12003		T life mgmt (M system) Spare tool: Tool No. (H) $5
R12004		T life mgmt (M system) Spare tool: Tool data flag/Status $5
R12005		T life mgmt (M system) Spare tool: Auxiliary data $5
R12006		T life mgmt (M system) Spare tool: Cumulative usage time (L) $5
R12007		T life mgmt (M system) Spare tool: Cumulative usage time (H) $5
R12008		T life mgmt (M system) Spare tool: Service lifetime (L) $5
R12009		T life mgmt (M system) Spare tool: Service lifetime (H) $5
R12010		T life mgmt (M system) Spare tool: Cumulative usage count $5
R12011		T life mgmt (M system) Spare tool: Service life count $5
R12012		T life mgmt (M system) Spare tool: Cumulative usage wear amount (L) $5
R12013		T life mgmt (M system) Spare tool: Cumulative usage wear amount (H) $5
R12014		T life mgmt (M system) Spare tool: Service life wear amount (L) $5
R12015		T life mgmt (M system) Spare tool: Service life wear amount (H) $5
R12016		T life mgmt (M system) Spare tool: Length compensation amount (L) $5
R12017		T life mgmt (M system) Spare tool: Length compensation amount (H) $5
R12018		T life mgmt (M system) Spare tool: Radius compensation amount (L) $5
R12019		T life mgmt (M system) Spare tool: Radius compensation amount (H) $5
R12020		T life mgmt (M system) Spare tool: Length wear amount (L) $5
R12021		T life mgmt (M system) Spare tool: Length wear amount (H) $5
R12022		T life mgmt (M system) Spare tool: Radius wear amount (L) $5
R12023		T life mgmt (M system) Spare tool: Radius wear amount (H) $5
R12024		T life mgmt (M system) Active tool: Group No. (L) $5
R12025		T life mgmt (M system) Active tool: Group No. (H) $5
R12026		T life mgmt (M system) Active tool: Tool No. (L) $5
R12027		T life mgmt (M system) Active tool: Tool No. (H) $5
R12028		T life mgmt (M system) Active tool: Tool data flag/Status $5
R12029		T life mgmt (M system) Active tool: Auxiliary data $5
R12030		T life mgmt (M system) Active tool: Cumulative usage time (L) $5
R12031		T life mgmt (M system) Active tool: Cumulative usage time (H) $5
R12032		T life mgmt (M system) Active tool: Service lifetime (L) $5
R12033		T life mgmt (M system) Active tool: Service lifetime (H) $5
R12034		T life mgmt (M system) Active tool: Cumulative usage count $5
R12035		T life mgmt (M system) Active tool: Service life count $5
R12036		T life mgmt (M system) Active tool: Cumulative usage wear amount (L) $5
R12037		T life mgmt (M system) Active tool: Cumulative usage wear amount (H) $5
R12038		T life mgmt (M system) Active tool: Service life wear amount (L) $5
R12039		T life mgmt (M system) Active tool: Service life wear amount (H) $5
R12040		T life mgmt (M system) Active tool: Length compensation amount (L) $5
R12041		T life mgmt (M system) Active tool: Length compensation amount (H) $5
R12042		T life mgmt (M system) Active tool: Radius compensation amount (L) $5

Device	Abbrev.	Signal name
R12043		T life mgmt (M system) Active tool: Radius compensation amount (H) $5
R12044		T life mgmt (M system) Active tool: Length wear amount (L) $5
R12045		T life mgmt (M system) Active tool: Length wear amount (H) $5
R12046		T life mgmt (M system) Active tool: Radius wear amount (L) $5
R12047		T life mgmt (M system) Active tool: Radius wear amount (H) $5
R12050		T life mgmt (M system) Spare tool: Group No. (L) $6
R12051		T life mgmt (M system) Spare tool: Group No. (H) $6
R12052		T life mgmt (M system) Spare tool: Tool No. (L) $6
R12053		T life mgmt (M system) Spare tool: Tool No. (H) $6
R12054		T life mgmt (M system) Spare tool: Tool data flag/Status $6
R12055		T life mgmt (M system) Spare tool: Auxiliary data $6
R12056		T life mgmt (M system) Spare tool: Cumulative usage time (L) $6
R12057		T life mgmt (M system) Spare tool: Cumulative usage time (H) $6
R12058		T life mgmt (M system) Spare tool: Service lifetime (L) $6
R12059		T life mgmt (M system) Spare tool: Service lifetime (H) $6
R12060		T life mgmt (M system) Spare tool: Cumulative usage count $6
R12061		T life mgmt (M system) Spare tool: Service life count $6
R12062		T life mgmt (M system) Spare tool: Cumulative usage wear amount (L) $6
R12063		T life mgmt (M system) Spare tool: Cumulative usage wear amount (H) $6
R12064		T life mgmt (M system) Spare tool: Service life wear amount (L) $6
R12065		T life mgmt (M system) Spare tool: Service life wear amount (H) $6
R12066		T life mgmt (M system) Spare tool: Length compensation amount (L) $6
R12067		T life mgmt (M system) Spare tool: Length compensation amount (H) $6
R12068		T life mgmt (M system) Spare tool: Radius compensation amount (L) $6
R12069		T life mgmt (M system) Spare tool: Radius compensation amount (H) $6
R12070		T life mgmt (M system) Spare tool: Length wear amount (L) $6
R12071		T life mgmt (M system) Spare tool: Length wear amount (H) $6
R12072		T life mgmt (M system) Spare tool: Radius wear amount (L) $6
R12073		T life mgmt (M system) Spare tool: Radius wear amount (H) $6
R12074		T life mgmt (M system) Active tool: Group No. (L) $6
R12075		T life mgmt (M system) Active tool: Group No. (H) $6
R12076		T life mgmt (M system) Active tool: Tool No. (L) $6
R12077		T life mgmt (M system) Active tool: Tool No. (H) $6
R12078		T life mgmt (M system) Active tool: Tool data flag/Status $6
R12079		T life mgmt (M system) Active tool: Auxiliary data $6
R12080		T life mgmt (M system) Active tool: Cumulative usage time (L) $6
R12081		T life mgmt (M system) Active tool: Cumulative usage time (H) $6
R12082		T life mgmt (M system) Active tool: Service lifetime (L) $6
R12083		T life mgmt (M system) Active tool: Service lifetime (H) $6
R12084		T life mgmt (M system) Active tool: Cumulative usage count $6
R12085		T life mgmt (M system) Active tool: Service life count $6
R12086		T life mgmt (M system) Active tool: Cumulative usage wear amount (L) $6
R12087		T life mgmt (M system) Active tool: Cumulative usage wear amount (H) $6
R12088		T life mgmt (M system) Active tool: Service life wear amount (L) $6
R12089		T life mgmt (M system) Active tool: Service life wear amount (H) $6
R12090		T life mgmt (M system) Active tool: Length compensation amount (L) $6

Device	Abbrev.	Signal name
R12091		T life mgmt (M system) Active tool: Length compensation amount (H) $6
R12092		T life mgmt (M system) Active tool: Radius compensation amount (L) $6
R12093		T life mgmt (M system) Active tool: Radius compensation amount (H) $6
R12094		T life mgmt (M system) Active tool: Length wear amount (L) $6
R12095		T life mgmt (M system) Active tool: Length wear amount (H) $6
R12096		T life mgmt (M system) Active tool: Radius wear amount (L) $6
R12097		T life mgmt (M system) Active tool: Radius wear amount (H) $6
R12100		T life mgmt (M system) Spare tool: Group No. (L) $7
R12101		T life mgmt (M system) Spare tool: Group No. (H) $7
R12102		T life mgmt (M system) Spare tool: Tool No. (L) $7
R12103		T life mgmt (M system) Spare tool: Tool No. (H) $7
R12104		T life mgmt (M system) Spare tool: Tool data flag/Status $7
R12105		T life mgmt (M system) Spare tool: Auxiliary data $7
R12106		T life mgmt (M system) Spare tool: Cumulative usage time (L) $7
R12107		T life mgmt (M system) Spare tool: Cumulative usage time (H) $7
R12108		T life mgmt (M system) Spare tool: Service lifetime (L) $7
R12109		T life mgmt (M system) Spare tool: Service lifetime (H) $7
R12110		T life mgmt (M system) Spare tool: Cumulative usage count $7
R12111		T life mgmt (M system) Spare tool: Service life count $7
R12112		T life mgmt (M system) Spare tool: Cumulative usage wear amount (L) $7
R12113		T life mgmt (M system) Spare tool: Cumulative usage wear amount (H) $7
R12114		T life mgmt (M system) Spare tool: Service life wear amount (L) $7
R12115		T life mgmt (M system) Spare tool: Service life wear amount (H) $7
R12116		T life mgmt (M system) Spare tool: Length compensation amount (L) $7
R12117		T life mgmt (M system) Spare tool: Length compensation amount (H) $7
R12118		T life mgmt (M system) Spare tool: Radius compensation amount (L) $7
R12119		T life mgmt (M system) Spare tool: Radius compensation amount (H) $7
R12120		T life mgmt (M system) Spare tool: Length wear amount (L) $7
R12121		T life mgmt (M system) Spare tool: Length wear amount (H) $7
R12122		T life mgmt (M system) Spare tool: Radius wear amount (L) $7
R12123		T life mgmt (M system) Spare tool: Radius wear amount (H) $7
R12124		T life mgmt (M system) Active tool: Group No. (L) $7
R12125		T life mgmt (M system) Active tool: Group No. (H) $7
R12126		T life mgmt (M system) Active tool: Tool No. (L) $7
R12127		T life mgmt (M system) Active tool: Tool No. (H) $7
R12128		T life mgmt (M system) Active tool: Tool data flag/Status $7
R12129		T life mgmt (M system) Active tool: Auxiliary data $7
R12130		T life mgmt (M system) Active tool: Cumulative usage time (L) $7
R12131		T life mgmt (M system) Active tool: Cumulative usage time (H) $7
R12132		T life mgmt (M system) Active tool: Service lifetime (L) $7
R12133		T life mgmt (M system) Active tool: Service lifetime (H) $7
R12134		T life mgmt (M system) Active tool: Cumulative usage count $7
R12135		T life mgmt (M system) Active tool: Service life count $7
R12136		T life mgmt (M system) Active tool: Cumulative usage wear amount (L) $7
R12137		T life mgmt (M system) Active tool: Cumulative usage wear amount (H) $7
R12138		T life mgmt (M system) Active tool: Service life wear amount (L) $7

Device	Abbrev.	Signal name
R12139		T life mgmt (M system) Active tool: Service life wear amount (H) $7
R12140		T life mgmt (M system) Active tool: Length compensation amount (L) $7
R12141		T life mgmt (M system) Active tool: Length compensation amount (H) $7
R12142		T life mgmt (M system) Active tool: Radius compensation amount (L) $7
R12143		T life mgmt (M system) Active tool: Radius compensation amount (H) $7
R12144		T life mgmt (M system) Active tool: Length wear amount (L) $7
R12145		T life mgmt (M system) Active tool: Length wear amount (H) $7
R12146		T life mgmt (M system) Active tool: Radius wear amount (L) $7
R12147		T life mgmt (M system) Active tool: Radius wear amount (H) $7
R12150		T life mgmt (M system) Spare tool: Group No. (L) $8
R12151		T life mgmt (M system) Spare tool: Group No. (H) $8
R12152		T life mgmt (M system) Spare tool: Tool No. (L) $8
R12153		T life mgmt (M system) Spare tool: Tool No. (H) $8
R12154		T life mgmt (M system) Spare tool: Tool data flag/Status $8
R12155		T life mgmt (M system) Spare tool: Auxiliary data $8
R12156		T life mgmt (M system) Spare tool: Cumulative usage time (L) $8
R12157		T life mgmt (M system) Spare tool: Cumulative usage time (H) $8
R12158		T life mgmt (M system) Spare tool: Service lifetime (L) $8
R12159		T life mgmt (M system) Spare tool: Service lifetime (H) $8
R12160		T life mgmt (M system) Spare tool: Cumulative usage count $8
R12161		T life mgmt (M system) Spare tool: Service life count $8
R12162		T life mgmt (M system) Spare tool: Cumulative usage wear amount (L) $8
R12163		T life mgmt (M system) Spare tool: Cumulative usage wear amount (H) $8
R12164		T life mgmt (M system) Spare tool: Service life wear amount (L) $8
R12165		T life mgmt (M system) Spare tool: Service life wear amount (H) $8
R12166		T life mgmt (M system) Spare tool: Length compensation amount (L) $8
R12167		T life mgmt (M system) Spare tool: Length compensation amount (H) $8
R12168		T life mgmt (M system) Spare tool: Radius compensation amount (L) $8
R12169		T life mgmt (M system) Spare tool: Radius compensation amount (H) $8
R12170		T life mgmt (M system) Spare tool: Length wear amount (L) $8
R12171		T life mgmt (M system) Spare tool: Length wear amount (H) $8
R12172		T life mgmt (M system) Spare tool: Radius wear amount (L) $8
R12173		T life mgmt (M system) Spare tool: Radius wear amount (H) $8
R12174		T life mgmt (M system) Active tool: Group No. (L) $8
R12175		T life mgmt (M system) Active tool: Group No. (H) $8
R12176		T life mgmt (M system) Active tool: Tool No. (L) $8
R12177		T life mgmt (M system) Active tool: Tool No. (H) $8
R12178		T life mgmt (M system) Active tool: Tool data flag/Status $8
R12179		T life mgmt (M system) Active tool: Auxiliary data $8
R12180		T life mgmt (M system) Active tool: Cumulative usage time (L) $8
R12181		T life mgmt (M system) Active tool: Cumulative usage time (H) $8
R12182		T life mgmt (M system) Active tool: Service lifetime (L) $8
R12183		T life mgmt (M system) Active tool: Service lifetime (H) $8
R12184		T life mgmt (M system) Active tool: Cumulative usage count $8
R12185		T life mgmt (M system) Active tool: Service life count $8
R12186		T life mgmt (M system) Active tool: Cumulative usage wear amount (L) $8

Device	Abbrev.	Signal name
R12187		T life mgmt (M system) Active tool: Cumulative usage wear amount (H) $8
R12188		T life mgmt (M system) Active tool: Service life wear amount (L) $8
R12189		T life mgmt (M system) Active tool: Service life wear amount (H) $8
R12190		T life mgmt (M system) Active tool: Length compensation amount (L) $8
R12191		T life mgmt (M system) Active tool: Length compensation amount (H) $8
R12192		T life mgmt (M system) Active tool: Radius compensation amount (L) $8
R12193		T life mgmt (M system) Active tool: Radius compensation amount (H) $8
R12194		T life mgmt (M system) Active tool: Length wear amount (L) $8
R12195		T life mgmt (M system) Active tool: Length wear amount (H) $8
R12196		T life mgmt (M system) Active tool: Radius wear amount (L) $8
R12197		T life mgmt (M system) Active tool: Radius wear amount (H) $8
R14000		EcoMonitorLight connection: Station #1 consumed power
R14001		
R14002		EcoMonitorLight connection: Station #1 regenerated power
R14003		
R14010		EcoMonitorLight connection: Station #2 consumed power
R14011		
R14012		EcoMonitorLight connection: Station #2 regenerated power
R14013		
R14020		EcoMonitorLight connection: Station #3 consumed power
R14021		
R14022		EcoMonitorLight connection: Station #3 regenerated power
R14023		
R14030		EcoMonitorLight connection: Station #4 consumed power
R14031		
R14032		EcoMonitorLight connection: Station #4 regenerated power
R14033		
R14040		EcoMonitorLight connection: Station #5 consumed power
R14041		
R14042		EcoMonitorLight connection: Station #5 regenerated power
R14043		
R14050		EcoMonitorLight connection: Station #6 consumed power
R14051		
R14052		EcoMonitorLight connection: Station #6 regenerated power
R14053		
R14060		EcoMonitorLight connection: Station #7 consumed power
R14061		
R14062		EcoMonitorLight connection: Station #7 regenerated power
R14063		
R14070		EcoMonitorLight connection: Station #8 consumed power
R14071		
R14072		EcoMonitorLight connection: Station #8 regenerated power
R14073		
R14080		EcoMonitorLight connection: Station #9 consumed power
R14081		
R14082		EcoMonitorLight connection: Station #9 regenerated power
R14083		
R14090		EcoMonitorLight connection: Station #10 consumed power
R14091		
R14092		EcoMonitorLight connection: Station #10 regenerated power
R14093		
R14100		EcoMonitorLight connection: Station #11 consumed power
R14101		
R14102		EcoMonitorLight connection: Station #11 regenerated power
R14103		
R14110		EcoMonitorLight connection: Station #12 consumed power
R14111		
R14112		EcoMonitorLight connection: Station #12 regenerated power
R14113		
R14120		EcoMonitorLight connection: Station #13 consumed power
R14121		
R14122		EcoMonitorLight connection: Station #13 regenerated power
R14123		
R14130		EcoMonitorLight connection: Station #14 consumed power
R14131		
R14132		EcoMonitorLight connection: Station #14 regenerated power
R14133		
R14140		EcoMonitorLight connection: Station #15 consumed power
R14141		
R14142		EcoMonitorLight connection: Station #15 regenerated power
R14143		
R14150		EcoMonitorLight connection: Station #16 consumed power
R14151		

Device	Abbrev.	Signal name
R14152		EcoMonitorLight connection: Station #16 regenerated power
R14153		
R14200		EcoMonitorLight connection: Station #1 number of reception errors
R14201		EcoMonitorLight connection: Station #1 maximum number of successive reception errors
R14202		EcoMonitorLight connection: Station #1 number of transmission errors
R14203		EcoMonitorLight connection: Station #1 maximum number of successive transmission errors
R14210		EcoMonitorLight connection: Station #2 number of reception errors
R14211		EcoMonitorLight connection: Station #2 maximum number of successive reception errors
R14212		EcoMonitorLight connection: Station #2 number of transmission errors
R14213		EcoMonitorLight connection: Station #2 maximum number of successive transmission errors
R14220		EcoMonitorLight connection: Station #3 number of reception errors
R14221		EcoMonitorLight connection: Station #3 maximum number of successive reception errors
R14222		EcoMonitorLight connection: Station #3 number of transmission errors
R14223		EcoMonitorLight connection: Station #3 maximum number of successive transmission errors
R14230		EcoMonitorLight connection: Station #4 number of reception errors
R14231		EcoMonitorLight connection: Station #4 maximum number of successive reception errors
R14232		EcoMonitorLight connection: Station #4 number of transmission errors
R14233		EcoMonitorLight connection: Station #4 maximum number of successive transmission errors
R14240		EcoMonitorLight connection: Station #5 number of reception errors
R14241		EcoMonitorLight connection: Station #5 maximum number of successive reception errors
R14242		EcoMonitorLight connection: Station #5 number of transmission errors
R14243		EcoMonitorLight connection: Station #5 maximum number of successive transmission errors
R14250		EcoMonitorLight connection: Station #6 number of reception errors
R14251		EcoMonitorLight connection: Station #6 maximum number of successive reception errors
R14252		EcoMonitorLight connection: Station #6 number of transmission errors
R14253		EcoMonitorLight connection: Station #6 maximum number of successive transmission errors
R14260		EcoMonitorLight connection: Station #7 number of reception errors
R14261		EcoMonitorLight connection: Station #7 maximum number of successive reception errors
R14262		EcoMonitorLight connection: Station #7 number of transmission errors
R14263		EcoMonitorLight connection: Station #7 maximum number of successive transmission errors
R14270		EcoMonitorLight connection: Station #8 number of reception errors
R14271		EcoMonitorLight connection: Station #8 maximum number of successive reception errors
R14272		EcoMonitorLight connection: Station #8 number of transmission errors
R14273		EcoMonitorLight connection: Station #8 maximum number of successive transmission errors
R14280		EcoMonitorLight connection: Station #9 number of reception errors
R14281		EcoMonitorLight connection: Station #9 maximum number of successive reception errors
R14282		EcoMonitorLight connection: Station #9 number of transmission errors
R14283		EcoMonitorLight connection: Station #9 maximum number of successive transmission errors
R14290		EcoMonitorLight connection: Station #10 number of reception errors
R14291		EcoMonitorLight connection: Station #10 maximum number of successive reception errors
R14292		EcoMonitorLight connection: Station #10 number of transmission errors
R14293		EcoMonitorLight connection: Station #10 maximum number of successive transmission errors
R14300		EcoMonitorLight connection: Station #11 number of reception errors
R14301		EcoMonitorLight connection: Station #11 maximum number of successive reception errors
R14302		EcoMonitorLight connection: Station #11 number of transmission errors
R14303		EcoMonitorLight connection: Station #11 maximum number of successive transmission errors
R14310		EcoMonitorLight connection: Station #12 number of reception errors
R14311		EcoMonitorLight connection: Station #12 maximum number of successive reception errors
R14312		EcoMonitorLight connection: Station #12 number of transmission errors
R14313		EcoMonitorLight connection: Station #12 maximum number of successive transmission errors
R14320		EcoMonitorLight connection: Station #13 number of reception errors
R14321		EcoMonitorLight connection: Station #13 maximum number of successive reception errors
R14322		EcoMonitorLight connection: Station #13 number of transmission errors
R14323		EcoMonitorLight connection: Station #13 maximum number of successive transmission errors
R14330		EcoMonitorLight connection: Station #14 number of reception errors
R14331		EcoMonitorLight connection: Station #14 maximum number of successive reception errors
R14332		EcoMonitorLight connection: Station #14 number of transmission errors
R14333		EcoMonitorLight connection: Station #14 maximum number of successive transmission errors
R14340		EcoMonitorLight connection: Station #15 number of reception errors

Device	Abbrev.	Signal name
R14341		EcoMonitorLight connection: Station #15 maximum number of successive reception errors
R14342		EcoMonitorLight connection: Station #15 number of transmission errors
R14343		EcoMonitorLight connection: Station #15 maximum number of successive transmission errors
R14350		EcoMonitorLight connection: Station #16 number of reception errors
R14351		EcoMonitorLight connection: Station #16 maximum number of successive reception errors
R14352		EcoMonitorLight connection: Station #16 number of transmission errors
R14353		EcoMonitorLight connection: Station #16 maximum number of successive transmission errors
R14400		EcoMonitorLight connection: Completion bit
R14401		EcoMonitorLight connection: Completion status
R14402 R14403 R14404 R14405		EcoMonitorLight connection: Acquired data
R14500 R14501 R14502 R14503 R14504 R14505 R14506 R14507 R14508 R14509 R14510 R14511 R14512 R14513 R14514 R14515 R14516 R14517 R14518 R14519 R14520 R14521 R14522 R14523 R14524 R14525 R14526 R14527 R14528 R14529 R14530 R14531		MES interface library: Serial number [M8]
R14532 R14533 R14534 R14535 R14536 R14537 R14538 R14539 R14540 R14541 R14542 R14543 R14544 R14545 R14546 R14547 R14548 R14549 R14550 R14551 R14552 R14553 R14554 R14555 R14556 R14557 R14558 R14559 R14560 R14561 R14562 R14563		MES interface library: Operator ID [M8]

Device	Abbrev.	Signal name
R14564		MES interface library: NC unit number [M8]
R14565		
R14566		
R14567		
R14568		
R14569		
R14570		
R14571		
R14572		MES interface library: Line number [M8]
R14573		
R14574		
R14575		
R14576		
R14577		
R14578		
R14579		
R14580		
R14581		
R14582		
R14583		
R14584		
R14585		
R14586		
R14587		
R14588		MES interface library: Machine type [M8]
R14589		MES interface library: Database connection status [M8]
R14590		MES interface library: Database operation request register [M8]
R14591		MES interface library: Database operation reception register [M8]
R14592		MES interface library: Database operation result register [M8]
R14593		
R14594		
R14595		
R14596		
R14597		
R14598		MES interface library: DB operation selection [M8]
R14599		MES interface library: Operation table selection [M8]
R14600		MES interface library: Function selection at machining end [M8]
R14601		MES interface library: Function selection at alarm [M8]
R14602		MES interface library: Function selection at user's option [M8]
R14604		MES interface library: G code modal registration selection [M8]
R14605		
R20000	FLSYSM	FL-net : System monitor ▲
R20001	LNA	FL-net : Local node address ▲
R20002	LULS	FL-net : Upper layer status of local node ▲
R20003	LLKS	FL-net : Link status of local node ▲
R20004	LSTS	FL-net : Status of local node ▲
R20005	PNADSP	FL-net : Participating node top address on display ▲
R20006	PNALST	FL-net : List of participating nodes ▲
R20007	RNADSP	FL-net : Reference node address on display ▲
R20008	RULS	FL-net : Upper layer status of reference node ▲
R20009	RCAD1	FL-net : Common memory area 1 data top address of reference node ▲
R20010	RCSZ1	FL-net : Common memory area 1 data size of reference node ▲
R20011	RCAD2	FL-net : Common memory area 2 data top address of reference node ▲
R20012	RCSZ2	FL-net : Common memory area 2 data size of reference node ▲
R20013	RLKS	FFL-net : Link status of reference node ▲
R20014	RMFT	FL-net : Allowable minimum frame interval time of reference node ▲
R20015	RCTNOW	FL-net : Present value of refresh cycle measurement time ▲
R20016	RVCYR	FL-net : API return value of cyclic transmission read ▲
R20017	RVCYW	FL-net : API return value of cyclic transmission write ▲
R20024		NC warning display: Alarm 3D accumulation counter ▲
R20025		
R20026		
R20027		
R20028		
R20029		
R20030		
R20031		
R20032		NC warning display: Alarm 3D frequency counter ▲
R20033		
R20034		
R20035		
R20036		
R20037		
R20038		
R20039		
R20040		NC warning display: "Z48 Power supply voltage error warning at acceleration/deceleration" state ▲
R20041	*SVIDDDS	Diagnosis data output: Handling for servo motor insulation deterioration detection (PLC axis) [C80]
R20042	*SVIDDDW	Diagnosis data output: Waiting for servo motor insulation deterioration detection (PLC axis) [C80]
R20043	SVIDDD	Diagnosis data output: Servomotor insulation degradation detection in progress (PLC axis)

Device	Abbrev.	Signal name
R20044	*SVIDDCA	Diagnosis data output: Caution in servo motor insulation deterioration detection (PLC axis) [C80]
R20045	*SVIDDCH	Diagnosis data output: Servo motor exchange due to insulation deterioration detection (PLC axis) [C80]
R20046	*SPIDDDS	Diagnosis data output: Handling for spindle motor insulation deterioration detection [C80]
R20047	*SPIDDDW	Diagnosis data output: Waiting for spindle motor insulation deterioration detection [C80]
R20048	SPIDDD	Diagnosis data output: Spindle motor insulation degradation detection in progress
R20049	*SPIDDCA	Diagnosis data output: Caution in spindle motor insulation deterioration detection [C80]
R20050	*SPIDDCH	Diagnosis data output: Spindle motor exchange due to insulation deterioration detection [C80]
R20500 R20501		Current spatial error compensation value (orthogonal coordinate horizontal axis) $1 [M8]
R20502 R20503		Current spatial error compensation value (orthogonal coordinate vertical axis) $1 [M8]
R20504 R20505		Current spatial error compensation value (orthogonal coordinate height axis) $1 [M8]
R20506 R20507		Current spatial error compensation value (1st rotary axis) $1 [M8]
R20508 R20509		Current spatial error compensation value (2nd rotary axis) $1 [M8]
R20516		Appropriate machining diagnosis error axis $1 ▲
R20517	TRTNCNT1	Tool retract and return 2: Number of transit points stored $1 ▲
R20519		NC warning display: "Z48 Power supply voltage error warning at acceleration/deceleration" state $1 ▲
R20520	*SVIDDDS1	Diagnosis data output: Handling for servo motor insulation deterioration detection $1 [C80]
R20521	*SVIDDDW1	Diagnosis data output: Waiting for servo motor insulation deterioration detection $1 [C80]
R20522	SVIDDD1	Diagnosis data output: Servomotor insulation degradation detection in progress $1
R20523	*SVIDDCA1	Diagnosis data output: Caution in servo motor insulation deterioration detection $1 [C80]
R20524	*SVIDDCH1	Diagnosis data output: Servo motor exchange due to insulation deterioration detection $1 [C80]
R20536 R20537		L system T code data $1
R20700 R20701		Current spatial error compensation value (orthogonal coordinate horizontal axis) $2 [M8]
R20702 R20703		Current spatial error compensation value (orthogonal coordinate vertical axis) $2 [M8]
R20704 R20705		Current spatial error compensation value (orthogonal coordinate height axis) $2 [M8]
R20706 R20707		Current spatial error compensation value (1st rotary axis) $2 [M8]
R20708 R20709		Current spatial error compensation value (2nd rotary axis) $2 [M8]
R20716		Appropriate machining diagnosis error axis $2 ▲
R20717	TRTNCNT2	Tool retract and return 2: Number of transit points stored $2 ▲
R20719		NC warning display: "Z48 Power supply voltage error warning at acceleration/deceleration" state $2 ▲
R20720	*SVIDDDS2	Diagnosis data output: Handling for servo motor insulation deterioration detection $2 [C80]
R20721	*SVIDDDW2	Diagnosis data output: Waiting for servo motor insulation deterioration detection $2 [C80]
R20722	SVIDDD2	Diagnosis data output: Servomotor insulation degradation detection in progress $2
R20723	*SVIDDCA2	Diagnosis data output: Caution in servo motor insulation deterioration detection $2 [C80]
R20724	*SVIDDCH2	Diagnosis data output: Servo motor exchange due to insulation deterioration detection $2 [C80]
R20736 R20737		L system T code data $2
R20900 R20901		Current spatial error compensation value (orthogonal coordinate horizontal axis) $3 [M8]
R20902 R20903		Current spatial error compensation value (orthogonal coordinate vertical axis) $3 [M8]
R20904 R20905		Current spatial error compensation value (orthogonal coordinate height axis) $3 [M8]
R20906 R20907		Current spatial error compensation value (1st rotary axis) $3 [M8]
R20908 R20909		Current spatial error compensation value (2nd rotary axis) $3 [M8]
R20916		Appropriate machining diagnosis error axis $3 ▲
R20917	TRTNCNT3	Tool retract and return 2: Number of transit points stored $3 ▲
R20919		NC warning display: "Z48 Power supply voltage error warning at acceleration/deceleration" state $3 ▲
R20920	*SVIDDDS3	Diagnosis data output: Handling for servo motor insulation deterioration detection $3 [C80]
R20921	*SVIDDDW3	Diagnosis data output: Waiting for servo motor insulation deterioration detection $3 [C80]
R20922	SVIDDD3	Diagnosis data output: Servomotor insulation degradation detection in progress $3

Device	Abbrev.	Signal name
R20923	*SVIDDCA3	Diagnosis data output: Caution in servo motor insulation deterioration detection $3 [C80]
R20924	*SVIDDCH3	Diagnosis data output: Servo motor exchange due to insulation deterioration detection $3 [C80]
R20936		L system T code data $3
R20937		
R21100		Current spatial error compensation value (orthogonal coordinate horizontal axis) $4 [M8]
R21101		
R21102		Current spatial error compensation value (orthogonal coordinate vertical axis) $4 [M8]
R21103		
R21104		Current spatial error compensation value (orthogonal coordinate height axis) $4 [M8]
R21105		
R21106		Current spatial error compensation value (1st rotary axis) $4 [M8]
R21107		
R21108		Current spatial error compensation value (2nd rotary axis) $4 [M8]
R21109		
R21116		Appropriate machining diagnosis error axis $4 ▲
R21117	TRTNCNT4	Tool retract and return 2: Number of transit points stored $4 ▲
R21119		NC warning display: "Z48 Power supply voltage error warning at acceleration/deceleration" state $4 ▲
R21120	*SVIDDDS4	Diagnosis data output: Handling for servo motor insulation deterioration detection $4 [C80]
R21121	*SVIDDDW4	Diagnosis data output: Waiting for servo motor insulation deterioration detection $4 [C80]
R21122	SVIDDD4	Diagnosis data output: Servomotor insulation degradation detection in progress $4
R21123	*SVIDDCA4	Diagnosis data output: Caution in servo motor insulation deterioration detection $4 [C80]
R21124	*SVIDDCH4	Diagnosis data output: Servo motor exchange due to insulation deterioration detection $4 [C80]
R21136		L system T code data $4
R21137		
R21300		Current spatial error compensation value (orthogonal coordinate horizontal axis) $5 [M8]
R21301		
R21302		Current spatial error compensation value (orthogonal coordinate vertical axis) $5 [M8]
R21303		
R21304		Current spatial error compensation value (orthogonal coordinate height axis) $5 [M8]
R21305		
R21306		Current spatial error compensation value (1st rotary axis) $5 [M8]
R21307		
R21308		Current spatial error compensation value (2nd rotary axis) $5 [M8]
R21309		
R21316		Appropriate machining diagnosis error axis $5 ▲
R21317	TRTNCNT5	Tool retract and return 2: Number of transit points stored $5 ▲
R21319		NC warning display: "Z48 Power supply voltage error warning at acceleration/deceleration" state $5 ▲
R21320	*SVIDDDS5	Diagnosis data output: Handling for servo motor insulation deterioration detection $5 [C80]
R21321	*SVIDDDW5	Diagnosis data output: Waiting for servo motor insulation deterioration detection $5 [C80]
R21322	SVIDDD5	Diagnosis data output: Servomotor insulation degradation detection in progress $5
R21323	*SVIDDCA5	Diagnosis data output: Caution in servo motor insulation deterioration detection $5 [C80]
R21324	*SVIDDCH5	Diagnosis data output: Servo motor exchange due to insulation deterioration detection $5 [C80]
R21336		L system T code data $5
R21337		
R21500		Current spatial error compensation value (orthogonal coordinate horizontal axis) $6 [M8]
R21501		
R21502		Current spatial error compensation value (orthogonal coordinate vertical axis) $6 [M8]
R21503		
R21504		Current spatial error compensation value (orthogonal coordinate height axis) $6 [M8]
R21505		
R21506		Current spatial error compensation value (1st rotary axis) $6 [M8]
R21507		
R21508		Current spatial error compensation value (2nd rotary axis) $6 [M8]
R21509		
R21516		Appropriate machining diagnosis error axis $6 ▲
R21517	TRTNCNT6	Tool retract and return 2: Number of transit points stored $6 ▲
R21519		NC warning display: "Z48 Power supply voltage error warning at acceleration/deceleration" state $6 ▲
R21520	*SVIDDDS6	Diagnosis data output: Handling for servo motor insulation deterioration detection $6 [C80]
R21521	*SVIDDDW6	Diagnosis data output: Waiting for servo motor insulation deterioration detection $6 [C80]
R21522	SVIDDD6	Diagnosis data output: Servomotor insulation degradation detection in progress $6
R21523	*SVIDDCA6	Diagnosis data output: Caution in servo motor insulation deterioration detection $6 [C80]
R21524	*SVIDDCH6	Diagnosis data output: Servo motor exchange due to insulation deterioration detection $6 [C80]
R21536		L system T code data $6
R21537		
R21700		Current spatial error compensation value (orthogonal coordinate horizontal axis) $7 [M8]
R21701		

Device	Abbrev.	Signal name
R21702		Current spatial error compensation value (orthogonal coordinate vertical axis) $7 [M8]
R21703		
R21704		Current spatial error compensation value (orthogonal coordinate height axis) $7 [M8]
R21705		
R21706		Current spatial error compensation value (1st rotary axis) $7 [M8]
R21707		
R21708		Current spatial error compensation value (2nd rotary axis) $7 [M8]
R21709		
R21716		Appropriate machining diagnosis error axis $7 ▲
R21717	TRTNCNT7	Tool retract and return 2: Number of transit points stored $7 ▲
R21719		NC warning display: "Z48 Power supply voltage error warning at acceleration/ deceleration" state $7 ▲
R21720	*SVIDDDS7	Diagnosis data output: Handling for servo motor insulation deterioration detection $7 [C80]
R21721	*SVIDDDW7	Diagnosis data output: Waiting for servo motor insulation deterioration detection $7 [C80]
R21722	SVIDDD7	Diagnosis data output: Servomotor insulation degradation detection in progress $7
R21723	*SVIDDCA7	Diagnosis data output: Caution in servo motor insulation deterioration detection $7 [C80]
R21724	*SVIDDCH7	Diagnosis data output: Servo motor exchange due to insulation deterioration detection $7 [C80]
R21736		L system T code data $7
R21737		
R21900		Current spatial error compensation value (orthogonal coordinate horizontal axis) $8 [M8]
R21901		
R21902		Current spatial error compensation value (orthogonal coordinate vertical axis) $8 [M8]
R21903		
R21904		Current spatial error compensation value (orthogonal coordinate height axis) $8 [M8]
R21905		
R21906		Current spatial error compensation value (1st rotary axis) $8 [M8]
R21907		
R21908		Current spatial error compensation value (2nd rotary axis) $8 [M8]
R21909		
R21916		Appropriate machining diagnosis error axis $8 ▲
R21917	TRTNCNT8	Tool retract and return 2: Number of transit points stored $8 ▲
R21919		NC warning display: "Z48 Power supply voltage error warning at acceleration/ deceleration" state $8 ▲
R21920	*SVIDDDS8	Diagnosis data output: Handling for servo motor insulation deterioration detection $8 [C80]
R21921	*SVIDDDW8	Diagnosis data output: Waiting for servo motor insulation deterioration detection $8 [C80]
R21922	SVIDDD8	Diagnosis data output: Servomotor insulation degradation detection in progress $8
R21923	*SVIDDCA8	Diagnosis data output: Caution in servo motor insulation deterioration detection $8 [C80]
R21924	*SVIDDCH8	Diagnosis data output: Servo motor exchange due to insulation deterioration detection $8 [C80]
R21936		L system T code data $8
R21937		
R24500		NC warning display: Alarm 3D accumulation counter 1st axis $1 ▲
R24501		NC warning display: Alarm 3D accumulation counter 2nd axis $1 ▲
R24502		NC warning display: Alarm 3D accumulation counter 3rd axis $1 ▲
R24503		NC warning display: Alarm 3D accumulation counter 4th axis $1 ▲
R24504		NC warning display: Alarm 3D accumulation counter 5th axis $1 ▲
R24505		NC warning display: Alarm 3D accumulation counter 6th axis $1 ▲
R24506		NC warning display: Alarm 3D accumulation counter 7th axis $1 ▲
R24507		NC warning display: Alarm 3D accumulation counter 8th axis $1 ▲
R24508		NC warning display: Alarm 3D frequency counter 1st axis $1 ▲
R24509		NC warning display: Alarm 3D frequency counter 2nd axis $1 ▲
R24510		NC warning display: Alarm 3D frequency counter 3rd axis $1 ▲
R24511		NC warning display: Alarm 3D frequency counter 4th axis $1 ▲
R24512		NC warning display: Alarm 3D frequency counter 5th axis $1 ▲
R24513		NC warning display: Alarm 3D frequency counter 6th axis $1 ▲
R24514		NC warning display: Alarm 3D frequency counter 7th axis $1 ▲
R24515		NC warning display: Alarm 3D frequency counter 8th axis $1 ▲
R24532		NC warning display: Alarm 3D accumulation counter 1st axis $2 ▲
R24533		NC warning display: Alarm 3D accumulation counter 2nd axis $2 ▲
R24534		NC warning display: Alarm 3D accumulation counter 3rd axis $2 ▲
R24535		NC warning display: Alarm 3D accumulation counter 4th axis $2 ▲
R24536		NC warning display: Alarm 3D accumulation counter 5th axis $2 ▲
R24537		NC warning display: Alarm 3D accumulation counter 6th axis $2 ▲
R24538		NC warning display: Alarm 3D accumulation counter 7th axis $2 ▲
R24539		NC warning display: Alarm 3D accumulation counter 8th axis $2 ▲
R24540		NC warning display: Alarm 3D frequency counter 1st axis $2 ▲
R24541		NC warning display: Alarm 3D frequency counter 2nd axis $2 ▲
R24542		NC warning display: Alarm 3D frequency counter 3rd axis $2 ▲
R24543		NC warning display: Alarm 3D frequency counter 4th axis $2 ▲
R24544		NC warning display: Alarm 3D frequency counter 5th axis $2 ▲
R24545		NC warning display: Alarm 3D frequency counter 6th axis $2 ▲
R24546		NC warning display: Alarm 3D frequency counter 7th axis $2 ▲
R24547		NC warning display: Alarm 3D frequency counter 8th axis $2 ▲
R24564		NC warning display: Alarm 3D accumulation counter 1st axis $3 ▲
R24565		NC warning display: Alarm 3D accumulation counter 2nd axis $3 ▲
R24566		NC warning display: Alarm 3D accumulation counter 3rd axis $3 ▲

Device	Abbrev.	Signal name
R24567		NC warning display: Alarm 3D accumulation counter 4th axis $3 ▲
R24568		NC warning display: Alarm 3D accumulation counter 5th axis $3 ▲
R24569		NC warning display: Alarm 3D accumulation counter 6th axis $3 ▲
R24570		NC warning display: Alarm 3D accumulation counter 7th axis $3 ▲
R24571		NC warning display: Alarm 3D accumulation counter 8th axis $3 ▲
R24572		NC warning display: Alarm 3D frequency counter 1st axis $3 ▲
R24573		NC warning display: Alarm 3D frequency counter 2nd axis $3 ▲
R24574		NC warning display: Alarm 3D frequency counter 3rd axis $3 ▲
R24575		NC warning display: Alarm 3D frequency counter 4th axis $3 ▲
R24576		NC warning display: Alarm 3D frequency counter 5th axis $3 ▲
R24577		NC warning display: Alarm 3D frequency counter 6th axis $3 ▲
R24578		NC warning display: Alarm 3D frequency counter 7th axis $3 ▲
R24579		NC warning display: Alarm 3D frequency counter 8th axis $3 ▲
R24596		NC warning display: Alarm 3D accumulation counter 1st axis $4 ▲
R24597		NC warning display: Alarm 3D accumulation counter 2nd axis $4 ▲
R24598		NC warning display: Alarm 3D accumulation counter 3rd axis $4 ▲
R24599		NC warning display: Alarm 3D accumulation counter 4th axis $4 ▲
R24600		NC warning display: Alarm 3D accumulation counter 5th axis $4 ▲
R24601		NC warning display: Alarm 3D accumulation counter 6th axis $4 ▲
R24602		NC warning display: Alarm 3D accumulation counter 7th axis $4 ▲
R24603		NC warning display: Alarm 3D accumulation counter 8th axis $4 ▲
R24604		NC warning display: Alarm 3D frequency counter 1st axis $4 ▲
R24605		NC warning display: Alarm 3D frequency counter 2nd axis $4 ▲
R24606		NC warning display: Alarm 3D frequency counter 3rd axis $4 ▲
R24607		NC warning display: Alarm 3D frequency counter 4th axis $4 ▲
R24608		NC warning display: Alarm 3D frequency counter 5th axis $4 ▲
R24609		NC warning display: Alarm 3D frequency counter 6th axis $4 ▲
R24610		NC warning display: Alarm 3D frequency counter 7th axis $4 ▲
R24611		NC warning display: Alarm 3D frequency counter 8th axis $4 ▲

3 PLC Output Signals (Bit type: Y***)

(Note) Signals marked with " ▲ " are prepared for a specific machine tool builder.

Device	Abbrev.	Signal name
Y700	IPCC1	Power consumption computation: Clear consumption accumulation 1
Y701	IPCC2	Power consumption computation: Clear consumption accumulation 2
Y702	IPCC3	Power consumption computation: Clear consumption accumulation 3
Y703	IPCC4	Power consumption computation: Clear consumption accumulation 4
Y704	RHD1	Integration time input 1
Y705	RHD2	Integration time input 2
Y706	MDBUSRST1	Modbus Time-out 1 cancel ▲
Y707	MDBUSRST2	Modbus Time-out 2 cancel ▲
Y708	*KEY1	Data protect key 1
Y709	*KEY2	Data protect key 2
Y70A	*KEY3	Data protect key 3
Y70C	PDISP	Program display during operation ▲
Y70D		Handle pulse encoder communication connector priority
Y711		Optimum acceleration/deceleration parameter switch request [spindle] ▲
Y718	*PCD1	PLC axis near point detection 1st axis
Y719	*PCD2	PLC axis near point detection 2nd axis
Y71A	*PCD3	PLC axis near point detection 3rd axis
Y71B	*PCD4	PLC axis near point detection 4th axis
Y71C	*PCD5	PLC axis near point detection 5th axis
Y71D	*PCD6	PLC axis near point detection 6th axis
Y720	HS1P	PLC axis 1st handle valid
Y721	HS2P	PLC axis 2nd handle valid
Y722	HS3P	PLC axis 3rd handle valid
Y723		PLC axis control buffering mode valid
Y724	IPCE1	Power consumption computation: Enable consumption accumulation 1
Y725	IPCE2	Power consumption computation: Enable consumption accumulation 2
Y726	IPCE3	Power consumption computation: Enable consumption accumulation 3
Y727	IPCE4	Power consumption computation: Enable consumption accumulation 4
Y728	CRTFN	CRT changeover completion [M8]
Y729	SCRON	Screen display request [M8]
Y72B		Collecting diagnosis data stop
Y72C	SMPTRG	Sampling start/stop
Y72E		Pallet program registration In APC execution
Y72F		Pallet program registration Ext. workpiece coordinate transfer ready
Y730	DISP1	Display changeover $1
Y731	DISP2	Display changeover $2
Y732	DISP3	Display changeover $3
Y733	DISP4	Display changeover $4
Y734	DISP5	Display changeover $5
Y735	DISP6	Display changeover $6
Y736	DISP7	Display changeover $7
Y737	DISP8	Display changeover $8
Y73A	MSBK	Single block with part systems synchronized
Y73C	MORR	Manual arbitrary reverse run mode
Y73D	MORSP	Manual arbitrary reverse run speed selection
Y73E	SMLK	High-speed simple program check mode
Y73F	CCHK	Interference check between part systems: Interference check enabled [M8]
Y740		Tool IC new read ▲
Y741		Tool IC exchange read ▲
Y742	MCT	Contactor shutoff test
Y747		Turret interference check valid
Y748		PLC skip 1
Y749		PLC skip 2
Y74A		PLC skip 3
Y74B		PLC skip 4
Y74C		PLC skip 5
Y74D		PLC skip 6
Y74E		PLC skip 7
Y74F		PLC skip 8
Y75D		Automatic power OFF request
Y761	MRCMD	Actual cutting mode (thread, tap) in manual arbitrary reverse run
Y764		Encoder 1 arbitrary pulse selection
Y765		Encoder 2 arbitrary pulse selection
Y766		Encoder 1 arbitrary pulse valid
Y767		Encoder 2 arbitrary pulse valid
Y768		Door open I
Y769	ITF3VLDT	Interference check III: Enable interfering object selection data
Y76A	ITF3CMD	Interference check III: Interference check III mode
Y76B	SPSC	High-speed simple program check: Enable coordinate position check
Y76C		Remote program input start ▲
Y76D		Tool ID data read ▲
Y76E		Tool ID data write ▲
Y76F		Tool ID data erase ▲
Y770		PLC axis control valid 1st axis
Y771		PLC axis control valid 2nd axis
Y772		PLC axis control valid 3rd axis
Y773		PLC axis control valid 4th axis
Y774		PLC axis control valid 5th axis
Y775		PLC axis control valid 6th axis

Device	Abbrev.	Signal name
Y778	GBON	G/B spindle synchronization valid
Y77A	GBPHS	G/B spindle synchronization: phase alignment
Y77B	GBPHM	G/B spindle synchronization: phase memory
Y77C	GBCMON	G/B spindle synchronization: position error compensation
Y77D	GBOFF	G/B spindle synchronization: temporary cancel
Y77E	GBCMKP	G/B spindle synchronization: keep position error compensation amount signal
Y77F	HISAVE	Operation history retract [C80]
Y780	DTCH11	Control axis detach 1st axis $1
Y781	DTCH21	Control axis detach 2nd axis $1
Y782	DTCH31	Control axis detach 3rd axis $1
Y783	DTCH41	Control axis detach 4th axis $1
Y784	DTCH51	Control axis detach 5th axis $1
Y785	DTCH61	Control axis detach 6th axis $1
Y786	DTCH71	Control axis detach 7th axis $1
Y787	DTCH81	Control axis detach 8th axis $1
Y788	DTCH12	Control axis detach 1st axis $2
Y789	DTCH22	Control axis detach 2nd axis $2
Y78A	DTCH32	Control axis detach 3rd axis $2
Y78B	DTCH42	Control axis detach 4th axis $2
Y78C	DTCH52	Control axis detach 5th axis $2
Y78D	DTCH62	Control axis detach 6th axis $2
Y78E	DTCH72	Control axis detach 7th axis $2
Y78F	DTCH82	Control axis detach 8th axis $2
Y790	DTCH13	Control axis detach 1st axis $3
Y791	DTCH23	Control axis detach 2nd axis $3
Y792	DTCH33	Control axis detach 3rd axis $3
Y793	DTCH43	Control axis detach 4th axis $3
Y794	DTCH53	Control axis detach 5th axis $3
Y795	DTCH63	Control axis detach 6th axis $3
Y796	DTCH73	Control axis detach 7th axis $3
Y797	DTCH83	Control axis detach 8th axis $3
Y798	DTCH14	Control axis detach 1st axis $4
Y799	DTCH24	Control axis detach 2nd axis $4
Y79A	DTCH34	Control axis detach 3rd axis $4
Y79B	DTCH44	Control axis detach 4th axis $4
Y79C	DTCH54	Control axis detach 5th axis $4
Y79D	DTCH64	Control axis detach 6th axis $4
Y79E	DTCH74	Control axis detach 7th axis $4
Y79F	DTCH84	Control axis detach 8th axis $4
Y7A0	*SVF11	Servo OFF 1st axis $1
Y7A1	*SVF21	Servo OFF 2nd axis $1
Y7A2	*SVF31	Servo OFF 3rd axis $1
Y7A3	*SVF41	Servo OFF 4th axis $1
Y7A4	*SVF51	Servo OFF 5th axis $1
Y7A5	*SVF61	Servo OFF 6th axis $1
Y7A6	*SVF71	Servo OFF 7th axis $1
Y7A7	*SVF81	Servo OFF 8th axis $1
Y7A8	*SVF12	Servo OFF 1st axis $2
Y7A9	*SVF22	Servo OFF 2nd axis $2
Y7AA	*SVF32	Servo OFF 3rd axis $2
Y7AB	*SVF42	Servo OFF 4th axis $2
Y7AC	*SVF52	Servo OFF 5th axis $2
Y7AD	*SVF62	Servo OFF 6th axis $2
Y7AE	*SVF72	Servo OFF 7th axis $2
Y7AF	*SVF82	Servo OFF 8th axis $2
Y7B0	*SVF13	Servo OFF 1st axis $3
Y7B1	*SVF23	Servo OFF 2nd axis $3
Y7B2	*SVF33	Servo OFF 3rd axis $3
Y7B3	*SVF43	Servo OFF 4th axis $3
Y7B4	*SVF53	Servo OFF 5th axis $3
Y7B5	*SVF63	Servo OFF 6th axis $3
Y7B6	*SVF73	Servo OFF 7th axis $3
Y7B7	*SVF83	Servo OFF 8th axis $3
Y7B8	*SVF14	Servo OFF 1st axis $4
Y7B9	*SVF24	Servo OFF 2nd axis $4
Y7BA	*SVF34	Servo OFF 3rd axis $4
Y7BB	*SVF44	Servo OFF 4th axis $4
Y7BC	*SVF54	Servo OFF 5th axis $4
Y7BD	*SVF64	Servo OFF 6th axis $4
Y7BE	*SVF74	Servo OFF 7th axis $4
Y7BF	*SVF84	Servo OFF 8th axis $4
Y7C0	MI11	Mirror image 1st axis $1
Y7C1	MI21	Mirror image 2nd axis $1
Y7C2	MI31	Mirror image 3rd axis $1
Y7C3	MI41	Mirror image 4th axis $1
Y7C4	MI51	Mirror image 5th axis $1
Y7C5	MI61	Mirror image 6th axis $1
Y7C6	MI71	Mirror image 7th axis $1
Y7C7	MI81	Mirror image 8th axis $1
Y7C8	MI12	Mirror image 1st axis $2
Y7C9	MI22	Mirror image 2nd axis $2
Y7CA	MI32	Mirror image 3rd axis $2

Device	Abbrev.	Signal name
Y7CB	MI42	Mirror image 4th axis $2
Y7CC	MI52	Mirror image 5th axis $2
Y7CD	MI62	Mirror image 6th axis $2
Y7CE	MI72	Mirror image 7th axis $2
Y7CF	MI82	Mirror image 8th axis $2
Y7D0	MI13	Mirror image 1st axis $3
Y7D1	MI23	Mirror image 2nd axis $3
Y7D2	MI33	Mirror image 3rd axis $3
Y7D3	MI43	Mirror image 4th axis $3
Y7D4	MI53	Mirror image 5th axis $3
Y7D5	MI63	Mirror image 6th axis $3
Y7D6	MI73	Mirror image 7th axis $3
Y7D7	MI83	Mirror image 8th axis $3
Y7D8	MI14	Mirror image 1st axis $4
Y7D9	MI24	Mirror image 2nd axis $4
Y7DA	MI34	Mirror image 3rd axis $4
Y7DB	MI44	Mirror image 4th axis $4
Y7DC	MI54	Mirror image 5th axis $4
Y7DD	MI64	Mirror image 6th axis $4
Y7DE	MI74	Mirror image 7th axis $4
Y7DF	MI84	Mirror image 8th axis $4
Y7E0	*+EDT11	External deceleration+ 1st axis $1
Y7E1	*+EDT21	External deceleration+ 2nd axis $1
Y7E2	*+EDT31	External deceleration+ 3rd axis $1
Y7E3	*+EDT41	External deceleration+ 4th axis $1
Y7E4	*+EDT51	External deceleration+ 5th axis $1
Y7E5	*+EDT61	External deceleration+ 6th axis $1
Y7E6	*+EDT71	External deceleration+ 7th axis $1
Y7E7	*+EDT81	External deceleration+ 8th axis $1
Y7E8	*+EDT12	External deceleration+ 1st axis $2
Y7E9	*+EDT22	External deceleration+ 2nd axis $2
Y7EA	*+EDT32	External deceleration+ 3rd axis $2
Y7EB	*+EDT42	External deceleration+ 4th axis $2
Y7EC	*+EDT52	External deceleration+ 5th axis $2
Y7ED	*+EDT62	External deceleration+ 6th axis $2
Y7EE	*+EDT72	External deceleration+ 7th axis $2
Y7EF	*+EDT82	External deceleration+ 8th axis $2
Y7F0	*+EDT13	External deceleration+ 1st axis $3
Y7F1	*+EDT23	External deceleration+ 2nd axis $3
Y7F2	*+EDT33	External deceleration+ 3rd axis $3
Y7F3	*+EDT43	External deceleration+ 4th axis $3
Y7F4	*+EDT53	External deceleration+ 5th axis $3
Y7F5	*+EDT63	External deceleration+ 6th axis $3
Y7F6	*+EDT73	External deceleration+ 7th axis $3
Y7F7	*+EDT83	External deceleration+ 8th axis $3
Y7F8	*+EDT14	External deceleration+ 1st axis $4
Y7F9	*+EDT24	External deceleration+ 2nd axis $4
Y7FA	*+EDT34	External deceleration+ 3rd axis $4
Y7FB	*+EDT44	External deceleration+ 4th axis $4
Y7FC	*+EDT54	External deceleration+ 5th axis $4
Y7FD	*+EDT64	External deceleration+ 6th axis $4
Y7FE	*+EDT74	External deceleration+ 7th axis $4
Y7FF	*+EDT84	External deceleration+ 8th axis $4
Y800	*-EDT11	External deceleration- 1st axis $1
Y801	*-EDT21	External deceleration- 2nd axis $1
Y802	*-EDT31	External deceleration- 3rd axis $1
Y803	*-EDT41	External deceleration- 4th axis $1
Y804	*-EDT51	External deceleration- 5th axis $1
Y805	*-EDT61	External deceleration- 6th axis $1
Y806	*-EDT71	External deceleration- 7th axis $1
Y807	*-EDT81	External deceleration- 8th axis $1
Y808	*-EDT12	External deceleration- 1st axis $2
Y809	*-EDT22	External deceleration- 2nd axis $2
Y80A	*-EDT32	External deceleration- 3rd axis $2
Y80B	*-EDT42	External deceleration- 4th axis $2
Y80C	*-EDT52	External deceleration- 5th axis $2
Y80D	*-EDT62	External deceleration- 6th axis $2
Y80E	*-EDT72	External deceleration- 7th axis $2
Y80F	*-EDT82	External deceleration- 8th axis $2
Y810	*-EDT13	External deceleration- 1st axis $3
Y811	*-EDT23	External deceleration- 2nd axis $3
Y812	*-EDT33	External deceleration- 3rd axis $3
Y813	*-EDT43	External deceleration- 4th axis $3
Y814	*-EDT53	External deceleration- 5th axis $3
Y815	*-EDT63	External deceleration- 6th axis $3
Y816	*-EDT73	External deceleration- 7th axis $3
Y817	*-EDT83	External deceleration- 8th axis $3
Y818	*-EDT14	External deceleration- 1st axis $4
Y819	*-EDT24	External deceleration- 2nd axis $4
Y81A	*-EDT34	External deceleration- 3rd axis $4
Y81B	*-EDT44	External deceleration- 4th axis $4
Y81C	*-EDT54	External deceleration- 5th axis $4

Device	Abbrev.	Signal name
Y81D	*-EDT64	External deceleration- 6th axis $4
Y81E	*-EDT74	External deceleration- 7th axis $4
Y81F	*-EDT84	External deceleration- 8th axis $4
Y820	*+AIT11	Automatic interlock+ 1st axis $1
Y821	*+AIT21	Automatic interlock+ 2nd axis $1
Y822	*+AIT31	Automatic interlock+ 3rd axis $1
Y823	*+AIT41	Automatic interlock+ 4th axis $1
Y824	*+AIT51	Automatic interlock+ 5th axis $1
Y825	*+AIT61	Automatic interlock+ 6th axis $1
Y826	*+AIT71	Automatic interlock+ 7th axis $1
Y827	*+AIT81	Automatic interlock+ 8th axis $1
Y828	*+AIT12	Automatic interlock+ 1st axis $2
Y829	*+AIT22	Automatic interlock+ 2nd axis $2
Y82A	*+AIT32	Automatic interlock+ 3rd axis $2
Y82B	*+AIT42	Automatic interlock+ 4th axis $2
Y82C	*+AIT52	Automatic interlock+ 5th axis $2
Y82D	*+AIT62	Automatic interlock+ 6th axis $2
Y82E	*+AIT72	Automatic interlock+ 7th axis $2
Y82F	*+AIT82	Automatic interlock+ 8th axis $2
Y830	*+AIT13	Automatic interlock+ 1st axis $3
Y831	*+AIT23	Automatic interlock+ 2nd axis $3
Y832	*+AIT33	Automatic interlock+ 3rd axis $3
Y833	*+AIT43	Automatic interlock+ 4th axis $3
Y834	*+AIT53	Automatic interlock+ 5th axis $3
Y835	*+AIT63	Automatic interlock+ 6th axis $3
Y836	*+AIT73	Automatic interlock+ 7th axis $3
Y837	*+AIT83	Automatic interlock+ 8th axis $3
Y838	*+AIT14	Automatic interlock+ 1st axis $4
Y839	*+AIT24	Automatic interlock+ 2nd axis $4
Y83A	*+AIT34	Automatic interlock+ 3rd axis $4
Y83B	*+AIT44	Automatic interlock+ 4th axis $4
Y83C	*+AIT54	Automatic interlock+ 5th axis $4
Y83D	*+AIT64	Automatic interlock+ 6th axis $4
Y83E	*+AIT74	Automatic interlock+ 7th axis $4
Y83F	*+AIT84	Automatic interlock+ 8th axis $4
Y840	*-AIT11	Automatic interlock- 1st axis $1
Y841	*-AIT21	Automatic interlock- 2nd axis $1
Y842	*-AIT31	Automatic interlock- 3rd axis $1
Y843	*-AIT41	Automatic interlock- 4th axis $1
Y844	*-AIT51	Automatic interlock- 5th axis $1
Y845	*-AIT61	Automatic interlock- 6th axis $1
Y846	*-AIT71	Automatic interlock- 7th axis $1
Y847	*-AIT81	Automatic interlock- 8th axis $1
Y848	*-AIT12	Automatic interlock- 1st axis $2
Y849	*-AIT22	Automatic interlock- 2nd axis $2
Y84A	*-AIT32	Automatic interlock- 3rd axis $2
Y84B	*-AIT42	Automatic interlock- 4th axis $2
Y84C	*-AIT52	Automatic interlock- 5th axis $2
Y84D	*-AIT62	Automatic interlock- 6th axis $2
Y84E	*-AIT72	Automatic interlock- 7th axis $2
Y84F	*-AIT82	Automatic interlock- 8th axis $2
Y850	*-AIT13	Automatic interlock- 1st axis $3
Y851	*-AIT23	Automatic interlock- 2nd axis $3
Y852	*-AIT33	Automatic interlock- 3rd axis $3
Y853	*-AIT43	Automatic interlock- 4th axis $3
Y854	*-AIT53	Automatic interlock- 5th axis $3
Y855	*-AIT63	Automatic interlock- 6th axis $3
Y856	*-AIT73	Automatic interlock- 7th axis $3
Y857	*-AIT83	Automatic interlock- 8th axis $3
Y858	*-AIT14	Automatic interlock- 1st axis $4
Y859	*-AIT24	Automatic interlock- 2nd axis $4
Y85A	*-AIT34	Automatic interlock- 3rd axis $4
Y85B	*-AIT44	Automatic interlock- 4th axis $4
Y85C	*-AIT54	Automatic interlock- 5th axis $4
Y85D	*-AIT64	Automatic interlock- 6th axis $4
Y85E	*-AIT74	Automatic interlock- 7th axis $4
Y85F	*-AIT84	Automatic interlock- 8th axis $4
Y860	*+MIT11	Manual interlock+ 1st axis $1
Y861	*+MIT21	Manual interlock+ 2nd axis $1
Y862	*+MIT31	Manual interlock+ 3rd axis $1
Y863	*+MIT41	Manual interlock+ 4th axis $1
Y864	*+MIT51	Manual interlock+ 5th axis $1
Y865	*+MIT61	Manual interlock+ 6th axis $1
Y866	*+MIT71	Manual interlock+ 7th axis $1
Y867	*+MIT81	Manual interlock+ 8th axis $1
Y868	*+MIT12	Manual interlock+ 1st axis $2
Y869	*+MIT22	Manual interlock+ 2nd axis $2
Y86A	*+MIT32	Manual interlock+ 3rd axis $2
Y86B	*+MIT42	Manual interlock+ 4th axis $2
Y86C	*+MIT52	Manual interlock+ 5th axis $2
Y86D	*+MIT62	Manual interlock+ 6th axis $2
Y86E	*+MIT72	Manual interlock+ 7th axis $2

Device	Abbrev.	Signal name
Y86F	*+MIT82	Manual interlock+ 8th axis $2
Y870	*+MIT13	Manual interlock+ 1st axis $3
Y871	*+MIT23	Manual interlock+ 2nd axis $3
Y872	*+MIT33	Manual interlock+ 3rd axis $3
Y873	*+MIT43	Manual interlock+ 4th axis $3
Y874	*+MIT53	Manual interlock+ 5th axis $3
Y875	*+MIT63	Manual interlock+ 6th axis $3
Y876	*+MIT73	Manual interlock+ 7th axis $3
Y877	*+MIT83	Manual interlock+ 8th axis $3
Y878	*+MIT14	Manual interlock+ 1st axis $4
Y879	*+MIT24	Manual interlock+ 2nd axis $4
Y87A	*+MIT34	Manual interlock+ 3rd axis $4
Y87B	*+MIT44	Manual interlock+ 4th axis $4
Y87C	*+MIT54	Manual interlock+ 5th axis $4
Y87D	*+MIT64	Manual interlock+ 6th axis $4
Y87E	*+MIT74	Manual interlock+ 7th axis $4
Y87F	*+MIT84	Manual interlock+ 8th axis $4
Y880	*-MIT11	Manual interlock- 1st axis $1
Y881	*-MIT21	Manual interlock- 2nd axis $1
Y882	*-MIT31	Manual interlock- 3rd axis $1
Y883	*-MIT41	Manual interlock- 4th axis $1
Y884	*-MIT51	Manual interlock- 5th axis $1
Y885	*-MIT61	Manual interlock- 6th axis $1
Y886	*-MIT71	Manual interlock- 7th axis $1
Y887	*-MIT81	Manual interlock- 8th axis $1
Y888	*-MIT12	Manual interlock- 1st axis $2
Y889	*-MIT22	Manual interlock- 2nd axis $2
Y88A	*-MIT32	Manual interlock- 3rd axis $2
Y88B	*-MIT42	Manual interlock- 4th axis $2
Y88C	*-MIT52	Manual interlock- 5th axis $2
Y88D	*-MIT62	Manual interlock- 6th axis $2
Y88E	*-MIT72	Manual interlock- 7th axis $2
Y88F	*-MIT82	Manual interlock- 8th axis $2
Y890	*-MIT13	Manual interlock- 1st axis $3
Y891	*-MIT23	Manual interlock- 2nd axis $3
Y892	*-MIT33	Manual interlock- 3rd axis $3
Y893	*-MIT43	Manual interlock- 4th axis $3
Y894	*-MIT53	Manual interlock- 5th axis $3
Y895	*-MIT63	Manual interlock- 6th axis $3
Y896	*-MIT73	Manual interlock- 7th axis $3
Y897	*-MIT83	Manual interlock- 8th axis $3
Y898	*-MIT14	Manual interlock- 1st axis $4
Y899	*-MIT24	Manual interlock- 2nd axis $4
Y89A	*-MIT34	Manual interlock- 3rd axis $4
Y89B	*-MIT44	Manual interlock- 4th axis $4
Y89C	*-MIT54	Manual interlock- 5th axis $4
Y89D	*-MIT64	Manual interlock- 6th axis $4
Y89E	*-MIT74	Manual interlock- 7th axis $4
Y89F	*-MIT84	Manual interlock- 8th axis $4
Y8A0	AMLK11	Automatic machine lock 1st axis $1
Y8A1	AMLK21	Automatic machine lock 2nd axis $1
Y8A2	AMLK31	Automatic machine lock 3rd axis $1
Y8A3	AMLK41	Automatic machine lock 4th axis $1
Y8A4	AMLK51	Automatic machine lock 5th axis $1
Y8A5	AMLK61	Automatic machine lock 6th axis $1
Y8A6	AMLK71	Automatic machine lock 7th axis $1
Y8A7	AMLK81	Automatic machine lock 8th axis $1
Y8A8	AMLK12	Automatic machine lock 1st axis $2
Y8A9	AMLK22	Automatic machine lock 2nd axis $2
Y8AA	AMLK32	Automatic machine lock 3rd axis $2
Y8AB	AMLK42	Automatic machine lock 4th axis $2
Y8AC	AMLK52	Automatic machine lock 5th axis $2
Y8AD	AMLK62	Automatic machine lock 6th axis $2
Y8AE	AMLK72	Automatic machine lock 7th axis $2
Y8AF	AMLK82	Automatic machine lock 8th axis $2
Y8B0	AMLK13	Automatic machine lock 1st axis $3
Y8B1	AMLK23	Automatic machine lock 2nd axis $3
Y8B2	AMLK33	Automatic machine lock 3rd axis $3
Y8B3	AMLK43	Automatic machine lock 4th axis $3
Y8B4	AMLK53	Automatic machine lock 5th axis $3
Y8B5	AMLK63	Automatic machine lock 6th axis $3
Y8B6	AMLK73	Automatic machine lock 7th axis $3
Y8B7	AMLK83	Automatic machine lock 8th axis $3
Y8B8	AMLK14	Automatic machine lock 1st axis $4
Y8B9	AMLK24	Automatic machine lock 2nd axis $4
Y8BA	AMLK34	Automatic machine lock 3rd axis $4
Y8BB	AMLK44	Automatic machine lock 4th axis $4
Y8BC	AMLK54	Automatic machine lock 5th axis $4
Y8BD	AMLK64	Automatic machine lock 6th axis $4
Y8BE	AMLK74	Automatic machine lock 7th axis $4
Y8BF	AMLK84	Automatic machine lock 8th axis $4
Y8C0	MMLK11	Manual machine lock 1st axis $1

Device	Abbrev.	Signal name
Y8C1	MMLK21	Manual machine lock 2nd axis $1
Y8C2	MMLK31	Manual machine lock 3rd axis $1
Y8C3	MMLK41	Manual machine lock 4th axis $1
Y8C4	MMLK51	Manual machine lock 5th axis $1
Y8C5	MMLK61	Manual machine lock 6th axis $1
Y8C6	MMLK71	Manual machine lock 7th axis $1
Y8C7	MMLK81	Manual machine lock 8th axis $1
Y8C8	MMLK12	Manual machine lock 1st axis $2
Y8C9	MMLK22	Manual machine lock 2nd axis $2
Y8CA	MMLK32	Manual machine lock 3rd axis $2
Y8CB	MMLK42	Manual machine lock 4th axis $2
Y8CC	MMLK52	Manual machine lock 5th axis $2
Y8CD	MMLK62	Manual machine lock 6th axis $2
Y8CE	MMLK72	Manual machine lock 7th axis $2
Y8CF	MMLK82	Manual machine lock 8th axis $2
Y8D0	MMLK13	Manual machine lock 1st axis $3
Y8D1	MMLK23	Manual machine lock 2nd axis $3
Y8D2	MMLK33	Manual machine lock 3rd axis $3
Y8D3	MMLK43	Manual machine lock 4th axis $3
Y8D4	MMLK53	Manual machine lock 5th axis $3
Y8D5	MMLK63	Manual machine lock 6th axis $3
Y8D6	MMLK73	Manual machine lock 7th axis $3
Y8D7	MMLK83	Manual machine lock 8th axis $3
Y8D8	MMLK14	Manual machine lock 1st axis $4
Y8D9	MMLK24	Manual machine lock 2nd axis $4
Y8DA	MMLK34	Manual machine lock 3rd axis $4
Y8DB	MMLK44	Manual machine lock 4th axis $4
Y8DC	MMLK54	Manual machine lock 5th axis $4
Y8DD	MMLK64	Manual machine lock 6th axis $4
Y8DE	MMLK74	Manual machine lock 7th axis $4
Y8DF	MMLK84	Manual machine lock 8th axis $4
Y8E0	+J11	Feed axis selection+ 1st axis $1
Y8E1	+J21	Feed axis selection+ 2nd axis $1
Y8E2	+J31	Feed axis selection+ 3rd axis $1
Y8E3	+J41	Feed axis selection+ 4th axis $1
Y8E4	+J51	Feed axis selection+ 5th axis $1
Y8E5	+J61	Feed axis selection+ 6th axis $1
Y8E6	+J71	Feed axis selection+ 7th axis $1
Y8E7	+J81	Feed axis selection+ 8th axis $1
Y8E8	+J12	Feed axis selection+ 1st axis $2
Y8E9	+J22	Feed axis selection+ 2nd axis $2
Y8EA	+J32	Feed axis selection+ 3rd axis $2
Y8EB	+J42	Feed axis selection+ 4th axis $2
Y8EC	+J52	Feed axis selection+ 5th axis $2
Y8ED	+J62	Feed axis selection+ 6th axis $2
Y8EE	+J72	Feed axis selection+ 7th axis $2
Y8EF	+J82	Feed axis selection+ 8th axis $2
Y8F0	+J13	Feed axis selection+ 1st axis $3
Y8F1	+J23	Feed axis selection+ 2nd axis $3
Y8F2	+J33	Feed axis selection+ 3rd axis $3
Y8F3	+J43	Feed axis selection+ 4th axis $3
Y8F4	+J53	Feed axis selection+ 5th axis $3
Y8F5	+J63	Feed axis selection+ 6th axis $3
Y8F6	+J73	Feed axis selection+ 7th axis $3
Y8F7	+J83	Feed axis selection+ 8th axis $3
Y8F8	+J14	Feed axis selection+ 1st axis $4
Y8F9	+J24	Feed axis selection+ 2nd axis $4
Y8FA	+J34	Feed axis selection+ 3rd axis $4
Y8FB	+J44	Feed axis selection+ 4th axis $4
Y8FC	+J54	Feed axis selection+ 5th axis $4
Y8FD	+J64	Feed axis selection+ 6th axis $4
Y8FE	+J74	Feed axis selection+ 7th axis $4
Y8FF	+J84	Feed axis selection+ 8th axis $4
Y900	-J11	Feed axis selection- 1st axis $1
Y901	-J21	Feed axis selection- 2nd axis $1
Y902	-J31	Feed axis selection- 3rd axis $1
Y903	-J41	Feed axis selection- 4th axis $1
Y904	-J51	Feed axis selection- 5th axis $1
Y905	-J61	Feed axis selection- 6th axis $1
Y906	-J71	Feed axis selection- 7th axis $1
Y907	-J81	Feed axis selection- 8th axis $1
Y908	-J12	Feed axis selection- 1st axis $2
Y909	-J22	Feed axis selection- 2nd axis $2
Y90A	-J32	Feed axis selection- 3rd axis $2
Y90B	-J42	Feed axis selection- 4th axis $2
Y90C	-J52	Feed axis selection- 5th axis $2
Y90D	-J62	Feed axis selection- 6th axis $2
Y90E	-J72	Feed axis selection- 7th axis $2
Y90F	-J82	Feed axis selection- 8th axis $2
Y910	-J13	Feed axis selection- 1st axis $3
Y911	-J23	Feed axis selection- 2nd axis $3
Y912	-J33	Feed axis selection- 3rd axis $3

Device	Abbrev.	Signal name
Y913	-J43	Feed axis selection- 4th axis $3
Y914	-J53	Feed axis selection- 5th axis $3
Y915	-J63	Feed axis selection- 6th axis $3
Y916	-J73	Feed axis selection- 7th axis $3
Y917	-J83	Feed axis selection- 8th axis $3
Y918	-J14	Feed axis selection- 1st axis $4
Y919	-J24	Feed axis selection- 2nd axis $4
Y91A	-J34	Feed axis selection- 3rd axis $4
Y91B	-J44	Feed axis selection- 4th axis $4
Y91C	-J54	Feed axis selection- 5th axis $4
Y91D	-J64	Feed axis selection- 6th axis $4
Y91E	-J74	Feed axis selection- 7th axis $4
Y91F	-J84	Feed axis selection- 8th axis $4
Y920	MAE11	Manual/Automatic simultaneous valid 1st axis $1
Y921	MAE21	Manual/Automatic simultaneous valid 2nd axis $1
Y922	MAE31	Manual/Automatic simultaneous valid 3rd axis $1
Y923	MAE41	Manual/Automatic simultaneous valid 4th axis $1
Y924	MAE51	Manual/Automatic simultaneous valid 5th axis $1
Y925	MAE61	Manual/Automatic simultaneous valid 6th axis $1
Y926	MAE71	Manual/Automatic simultaneous valid 7th axis $1
Y927	MAE81	Manual/Automatic simultaneous valid 8th axis $1
Y928	MAE12	Manual/Automatic simultaneous valid 1st axis $2
Y929	MAE22	Manual/Automatic simultaneous valid 2nd axis $2
Y92A	MAE32	Manual/Automatic simultaneous valid 3rd axis $2
Y92B	MAE42	Manual/Automatic simultaneous valid 4th axis $2
Y92C	MAE52	Manual/Automatic simultaneous valid 5th axis $2
Y92D	MAE62	Manual/Automatic simultaneous valid 6th axis $2
Y92E	MAE72	Manual/Automatic simultaneous valid 7th axis $2
Y92F	MAE82	Manual/Automatic simultaneous valid 8th axis $2
Y930	MAE13	Manual/Automatic simultaneous valid 1st axis $3
Y931	MAE23	Manual/Automatic simultaneous valid 2nd axis $3
Y932	MAE33	Manual/Automatic simultaneous valid 3rd axis $3
Y933	MAE43	Manual/Automatic simultaneous valid 4th axis $3
Y934	MAE53	Manual/Automatic simultaneous valid 5th axis $3
Y935	MAE63	Manual/Automatic simultaneous valid 6th axis $3
Y936	MAE73	Manual/Automatic simultaneous valid 7th axis $3
Y937	MAE83	Manual/Automatic simultaneous valid 8th axis $3
Y938	MAE14	Manual/Automatic simultaneous valid 1st axis $4
Y939	MAE24	Manual/Automatic simultaneous valid 2nd axis $4
Y93A	MAE34	Manual/Automatic simultaneous valid 3rd axis $4
Y93B	MAE44	Manual/Automatic simultaneous valid 4th axis $4
Y93C	MAE54	Manual/Automatic simultaneous valid 5th axis $4
Y93D	MAE64	Manual/Automatic simultaneous valid 6th axis $4
Y93E	MAE74	Manual/Automatic simultaneous valid 7th axis $4
Y93F	MAE84	Manual/Automatic simultaneous valid 8th axis $4
Y940	FBE11	Manual feedrate B valid 1st axis $1
Y941	FBE21	Manual feedrate B valid 2nd axis $1
Y942	FBE31	Manual feedrate B valid 3rd axis $1
Y943	FBE41	Manual feedrate B valid 4th axis $1
Y944	FBE51	Manual feedrate B valid 5th axis $1
Y945	FBE61	Manual feedrate B valid 6th axis $1
Y946	FBE71	Manual feedrate B valid 7th axis $1
Y947	FBE81	Manual feedrate B valid 8th axis $1
Y948	FBE12	Manual feedrate B valid 1st axis $2
Y949	FBE22	Manual feedrate B valid 2nd axis $2
Y94A	FBE32	Manual feedrate B valid 3rd axis $2
Y94B	FBE42	Manual feedrate B valid 4th axis $2
Y94C	FBE52	Manual feedrate B valid 5th axis $2
Y94D	FBE62	Manual feedrate B valid 6th axis $2
Y94E	FBE72	Manual feedrate B valid 7th axis $2
Y94F	FBE82	Manual feedrate B valid 8th axis $2
Y950	FBE13	Manual feedrate B valid 1st axis $3
Y951	FBE23	Manual feedrate B valid 2nd axis $3
Y952	FBE33	Manual feedrate B valid 3rd axis $3
Y953	FBE43	Manual feedrate B valid 4th axis $3
Y954	FBE53	Manual feedrate B valid 5th axis $3
Y955	FBE63	Manual feedrate B valid 6th axis $3
Y956	FBE73	Manual feedrate B valid 7th axis $3
Y957	FBE83	Manual feedrate B valid 8th axis $3
Y958	FBE14	Manual feedrate B valid 1st axis $4
Y959	FBE24	Manual feedrate B valid 2nd axis $4
Y95A	FBE34	Manual feedrate B valid 3rd axis $4
Y95B	FBE44	Manual feedrate B valid 4th axis $4
Y95C	FBE54	Manual feedrate B valid 5th axis $4
Y95D	FBE64	Manual feedrate B valid 6th axis $4
Y95E	FBE74	Manual feedrate B valid 7th axis $4
Y95F	FBE84	Manual feedrate B valid 8th axis $4
Y960	AZS11	Zero point initialization set mode 1st axis $1
Y961	AZS21	Zero point initialization set mode 2nd axis $1
Y962	AZS31	Zero point initialization set mode 3rd axis $1
Y963	AZS41	Zero point initialization set mode 4th axis $1
Y964	AZS51	Zero point initialization set mode 5th axis $1

Device	Abbrev.	Signal name
Y965	AZS61	Zero point initialization set mode 6th axis $1
Y966	AZS71	Zero point initialization set mode 7th axis $1
Y967	AZS81	Zero point initialization set mode 8th axis $1
Y968	AZS12	Zero point initialization set mode 1st axis $2
Y969	AZS22	Zero point initialization set mode 2nd axis $2
Y96A	AZS32	Zero point initialization set mode 3rd axis $2
Y96B	AZS42	Zero point initialization set mode 4th axis $2
Y96C	AZS52	Zero point initialization set mode 5th axis $2
Y96D	AZS62	Zero point initialization set mode 6th axis $2
Y96E	AZS72	Zero point initialization set mode 7th axis $2
Y96F	AZS82	Zero point initialization set mode 8th axis $2
Y970	AZS13	Zero point initialization set mode 1st axis $3
Y971	AZS23	Zero point initialization set mode 2nd axis $3
Y972	AZS33	Zero point initialization set mode 3rd axis $3
Y973	AZS43	Zero point initialization set mode 4th axis $3
Y974	AZS53	Zero point initialization set mode 5th axis $3
Y975	AZS63	Zero point initialization set mode 6th axis $3
Y976	AZS73	Zero point initialization set mode 7th axis $3
Y977	AZS83	Zero point initialization set mode 8th axis $3
Y978	AZS14	Zero point initialization set mode 1st axis $4
Y979	AZS24	Zero point initialization set mode 2nd axis $4
Y97A	AZS34	Zero point initialization set mode 3rd axis $4
Y97B	AZS44	Zero point initialization set mode 4th axis $4
Y97C	AZS54	Zero point initialization set mode 5th axis $4
Y97D	AZS64	Zero point initialization set mode 6th axis $4
Y97E	AZS74	Zero point initialization set mode 7th axis $4
Y97F	AZS84	Zero point initialization set mode 8th axis $4
Y980	ZST11	Zero point initialization set start 1st axis $1
Y981	ZST21	Zero point initialization set start 2nd axis $1
Y982	ZST31	Zero point initialization set start 3rd axis $1
Y983	ZST41	Zero point initialization set start 4th axis $1
Y984	ZST51	Zero point initialization set start 5th axis $1
Y985	ZST61	Zero point initialization set start 6th axis $1
Y986	ZST71	Zero point initialization set start 7th axis $1
Y987	ZST81	Zero point initialization set start 8th axis $1
Y988	ZST12	Zero point initialization set start 1st axis $2
Y989	ZST22	Zero point initialization set start 2nd axis $2
Y98A	ZST32	Zero point initialization set start 3rd axis $2
Y98B	ZST42	Zero point initialization set start 4th axis $2
Y98C	ZST52	Zero point initialization set start 5th axis $2
Y98D	ZST62	Zero point initialization set start 6th axis $2
Y98E	ZST72	Zero point initialization set start 7th axis $2
Y98F	ZST82	Zero point initialization set start 8th axis $2
Y990	ZST13	Zero point initialization set start 1st axis $3
Y991	ZST23	Zero point initialization set start 2nd axis $3
Y992	ZST33	Zero point initialization set start 3rd axis $3
Y993	ZST43	Zero point initialization set start 4th axis $3
Y994	ZST53	Zero point initialization set start 5th axis $3
Y995	ZST63	Zero point initialization set start 6th axis $3
Y996	ZST73	Zero point initialization set start 7th axis $3
Y997	ZST83	Zero point initialization set start 8th axis $3
Y998	ZST14	Zero point initialization set start 1st axis $4
Y999	ZST24	Zero point initialization set start 2nd axis $4
Y99A	ZST34	Zero point initialization set start 3rd axis $4
Y99B	ZST44	Zero point initialization set start 4th axis $4
Y99C	ZST54	Zero point initialization set start 5th axis $4
Y99D	ZST64	Zero point initialization set start 6th axis $4
Y99E	ZST74	Zero point initialization set start 7th axis $4
Y99F	ZST84	Zero point initialization set start 8th axis $4
Y9A0	ILC11	Current limit changeover 1st axis $1
Y9A1	ILC21	Current limit changeover 2nd axis $1
Y9A2	ILC31	Current limit changeover 3rd axis $1
Y9A3	ILC41	Current limit changeover 4th axis $1
Y9A4	ILC51	Current limit changeover 5th axis $1
Y9A5	ILC61	Current limit changeover 6th axis $1
Y9A6	ILC71	Current limit changeover 7th axis $1
Y9A7	ILC81	Current limit changeover 8th axis $1
Y9A8	ILC12	Current limit changeover 1st axis $2
Y9A9	ILC22	Current limit changeover 2nd axis $2
Y9AA	ILC32	Current limit changeover 3rd axis $2
Y9AB	ILC42	Current limit changeover 4th axis $2
Y9AC	ILC52	Current limit changeover 5th axis $2
Y9AD	ILC62	Current limit changeover 6th axis $2
Y9AE	ILC72	Current limit changeover 7th axis $2
Y9AF	ILC82	Current limit changeover 8th axis $2
Y9B0	ILC13	Current limit changeover 1st axis $3
Y9B1	ILC23	Current limit changeover 2nd axis $3
Y9B2	ILC33	Current limit changeover 3rd axis $3
Y9B3	ILC43	Current limit changeover 4th axis $3
Y9B4	ILC53	Current limit changeover 5th axis $3
Y9B5	ILC63	Current limit changeover 6th axis $3
Y9B6	ILC73	Current limit changeover 7th axis $3

Device	Abbrev.	Signal name
Y9B7	ILC83	Current limit changeover 8th axis $3
Y9B8	ILC14	Current limit changeover 1st axis $4
Y9B9	ILC24	Current limit changeover 2nd axis $4
Y9BA	ILC34	Current limit changeover 3rd axis $4
Y9BB	ILC44	Current limit changeover 4th axis $4
Y9BC	ILC54	Current limit changeover 5th axis $4
Y9BD	ILC64	Current limit changeover 6th axis $4
Y9BE	ILC74	Current limit changeover 7th axis $4
Y9BF	ILC84	Current limit changeover 8th axis $4
Y9C0	DOR11	Droop cancel request 1st axis $1
Y9C1	DOR21	Droop cancel request 2nd axis $1
Y9C2	DOR31	Droop cancel request 3rd axis $1
Y9C3	DOR41	Droop cancel request 4th axis $1
Y9C4	DOR51	Droop cancel request 5th axis $1
Y9C5	DOR61	Droop cancel request 6th axis $1
Y9C6	DOR71	Droop cancel request 7th axis $1
Y9C7	DOR81	Droop cancel request 8th axis $1
Y9C8	DOR12	Droop cancel request 1st axis $2
Y9C9	DOR22	Droop cancel request 2nd axis $2
Y9CA	DOR32	Droop cancel request 3rd axis $2
Y9CB	DOR42	Droop cancel request 4th axis $2
Y9CC	DOR52	Droop cancel request 5th axis $2
Y9CD	DOR62	Droop cancel request 6th axis $2
Y9CE	DOR72	Droop cancel request 7th axis $2
Y9CF	DOR82	Droop cancel request 8th axis $2
Y9D0	DOR13	Droop cancel request 1st axis $3
Y9D1	DOR23	Droop cancel request 2nd axis $3
Y9D2	DOR33	Droop cancel request 3rd axis $3
Y9D3	DOR43	Droop cancel request 4th axis $3
Y9D4	DOR53	Droop cancel request 5th axis $3
Y9D5	DOR63	Droop cancel request 6th axis $3
Y9D6	DOR73	Droop cancel request 7th axis $3
Y9D7	DOR83	Droop cancel request 8th axis $3
Y9D8	DOR14	Droop cancel request 1st axis $4
Y9D9	DOR24	Droop cancel request 2nd axis $4
Y9DA	DOR34	Droop cancel request 3rd axis $4
Y9DB	DOR44	Droop cancel request 4th axis $4
Y9DC	DOR54	Droop cancel request 5th axis $4
Y9DD	DOR64	Droop cancel request 6th axis $4
Y9DE	DOR74	Droop cancel request 7th axis $4
Y9DF	DOR84	Droop cancel request 8th axis $4
Y9E0		Workpiece coordinate Measurement 1st axis (Spare) $1
Y9E1		Workpiece coordinate Measurement 2nd axis $1
Y9E2		Workpiece coordinate Measurement 3rd axis (Spare) $1
Y9E3		Workpiece coordinate Measurement 4th axis (Spare) $1
Y9E4		Workpiece coordinate Measurement 5th axis (Spare) $1
Y9E5		Workpiece coordinate Measurement 6th axis (Spare) $1
Y9E6		Workpiece coordinate Measurement 7th axis (Spare) $1
Y9E7		Workpiece coordinate Measurement 8th axis (Spare) $1
Y9E8		Workpiece coordinate Measurement 1st axis (Spare) $2
Y9E9		Workpiece coordinate Measurement 2nd axis $2
Y9EA		Workpiece coordinate Measurement 3rd axis (Spare) $2
Y9EB		Workpiece coordinate Measurement 4th axis (Spare) $2
Y9EC		Workpiece coordinate Measurement 5th axis (Spare) $2
Y9ED		Workpiece coordinate Measurement 6th axis (Spare) $2
Y9EE		Workpiece coordinate Measurement 7th axis (Spare) $2
Y9EF		Workpiece coordinate Measurement 8th axis (Spare) $2
Y9F0		Workpiece coordinate Measurement 1st axis (Spare) $3
Y9F1		Workpiece coordinate Measurement 2nd axis $3
Y9F2		Workpiece coordinate Measurement 3rd axis (Spare) $3
Y9F3		Workpiece coordinate Measurement 4th axis (Spare) $3
Y9F4		Workpiece coordinate Measurement 5th axis (Spare) $3
Y9F5		Workpiece coordinate Measurement 6th axis (Spare) $3
Y9F6		Workpiece coordinate Measurement 7th axis (Spare) $3
Y9F7		Workpiece coordinate Measurement 8th axis (Spare) $3
Y9F8		Workpiece coordinate Measurement 1st axis (Spare) $4
Y9F9		Workpiece coordinate Measurement 2nd axis $4
Y9FA		Workpiece coordinate Measurement 3rd axis (Spare) $4
Y9FB		Workpiece coordinate Measurement 4th axis (Spare) $4
Y9FC		Workpiece coordinate Measurement 5th axis (Spare) $4
Y9FD		Workpiece coordinate Measurement 6th axis (Spare) $4
Y9FE		Workpiece coordinate Measurement 7th axis (Spare) $4
Y9FF		Workpiece coordinate Measurement 8th axis (Spare) $4
YA00	DTCH211	Control axis detach 2 1st axis $1
YA01	DTCH221	Control axis detach 2 2nd axis $1
YA02	DTCH231	Control axis detach 2 3rd axis $1
YA03	DTCH241	Control axis detach 2 4th axis $1
YA04	DTCH251	Control axis detach 2 5th axis $1
YA05	DTCH261	Control axis detach 2 6th axis $1
YA06	DTCH271	Control axis detach 2 7th axis $1
YA07	DTCH281	Control axis detach 2 8th axis $1
YA08	DTCH212	Control axis detach 2 1st axis $2

Device	Abbrev.	Signal name
YA09	DTCH222	Control axis detach 2 2nd axis $2
YA0A	DTCH232	Control axis detach 2 3rd axis $2
YA0B	DTCH242	Control axis detach 2 4th axis $2
YA0C	DTCH252	Control axis detach 2 5th axis $2
YA0D	DTCH262	Control axis detach 2 6th axis $2
YA0E	DTCH272	Control axis detach 2 7th axis $2
YA0F	DTCH282	Control axis detach 2 8th axis $2
YA10	DTCH213	Control axis detach 2 1st axis $3
YA11	DTCH223	Control axis detach 2 2nd axis $3
YA12	DTCH233	Control axis detach 2 3rd axis $3
YA13	DTCH243	Control axis detach 2 4th axis $3
YA14	DTCH253	Control axis detach 2 5th axis $3
YA15	DTCH263	Control axis detach 2 6th axis $3
YA16	DTCH273	Control axis detach 2 7th axis $3
YA17	DTCH283	Control axis detach 2 8th axis $3
YA18	DTCH214	Control axis detach 2 1st axis $4
YA19	DTCH224	Control axis detach 2 2nd axis $4
YA1A	DTCH234	Control axis detach 2 3rd axis $4
YA1B	DTCH244	Control axis detach 2 4th axis $4
YA1C	DTCH254	Control axis detach 2 5th axis $4
YA1D	DTCH264	Control axis detach 2 6th axis $4
YA1E	DTCH274	Control axis detach 2 7th axis $4
YA1F	DTCH284	Control axis detach 2 8th axis $4
YA20	UCLPF11	Unclamp completion 1st axis $1
YA21	UCLPF21	Unclamp completion 2nd axis $1
YA22	UCLPF31	Unclamp completion 3rd axis $1
YA23	UCLPF41	Unclamp completion 4th axis $1
YA24	UCLPF51	Unclamp completion 5th axis $1
YA25	UCLPF61	Unclamp completion 6th axis $1
YA26	UCLPF71	Unclamp completion 7th axis $1
YA27	UCLPF81	Unclamp completion 8th axis $1
YA28	UCLPF12	Unclamp completion 1st axis $2
YA29	UCLPF22	Unclamp completion 2nd axis $2
YA2A	UCLPF32	Unclamp completion 3rd axis $2
YA2B	UCLPF42	Unclamp completion 4th axis $2
YA2C	UCLPF52	Unclamp completion 5th axis $2
YA2D	UCLPF62	Unclamp completion 6th axis $2
YA2E	UCLPF72	Unclamp completion 7th axis $2
YA2F	UCLPF82	Unclamp completion 8th axis $2
YA30	UCLPF13	Unclamp completion 1st axis $3
YA31	UCLPF23	Unclamp completion 2nd axis $3
YA32	UCLPF33	Unclamp completion 3rd axis $3
YA33	UCLPF43	Unclamp completion 4th axis $3
YA34	UCLPF53	Unclamp completion 5th axis $3
YA35	UCLPF63	Unclamp completion 6th axis $3
YA36	UCLPF73	Unclamp completion 7th axis $3
YA37	UCLPF83	Unclamp completion 8th axis $3
YA38	UCLPF14	Unclamp completion 1st axis $4
YA39	UCLPF24	Unclamp completion 2nd axis $4
YA3A	UCLPF34	Unclamp completion 3rd axis $4
YA3B	UCLPF44	Unclamp completion 4th axis $4
YA3C	UCLPF54	Unclamp completion 5th axis $4
YA3D	UCLPF64	Unclamp completion 6th axis $4
YA3E	UCLPF74	Unclamp completion 7th axis $4
YA3F	UCLPF84	Unclamp completion 8th axis $4
YA40		Each axis reference position return 1st axis $1
YA41		Each axis reference position return 2nd axis $1
YA42		Each axis reference position return 3rd axis $1
YA43		Each axis reference position return 4th axis $1
YA44		Each axis reference position return 5th axis $1
YA45		Each axis reference position return 6th axis $1
YA46		Each axis reference position return 7th axis $1
YA47		Each axis reference position return 8th axis $1
YA48		Each axis reference position return 1st axis $2
YA49		Each axis reference position return 2nd axis $2
YA4A		Each axis reference position return 3rd axis $2
YA4B		Each axis reference position return 4th axis $2
YA4C		Each axis reference position return 5th axis $2
YA4D		Each axis reference position return 6th axis $2
YA4E		Each axis reference position return 7th axis $2
YA4F		Each axis reference position return 8th axis $2
YA50		Each axis reference position return 1st axis $3
YA51		Each axis reference position return 2nd axis $3
YA52		Each axis reference position return 3rd axis $3
YA53		Each axis reference position return 4th axis $3
YA54		Each axis reference position return 5th axis $3
YA55		Each axis reference position return 6th axis $3
YA56		Each axis reference position return 7th axis $3
YA57		Each axis reference position return 8th axis $3
YA58		Each axis reference position return 1st axis $4
YA59		Each axis reference position return 2nd axis $4
YA5A		Each axis reference position return 3rd axis $4

Device	Abbrev.	Signal name
YA5B		Each axis reference position return 4th axis $4
YA5C		Each axis reference position return 5th axis $4
YA5D		Each axis reference position return 6th axis $4
YA5E		Each axis reference position return 7th axis $4
YA5F		Each axis reference position return 8th axis $4
YA60		Mixed control (cross axis control) request 1st axis $1
YA61		Mixed control (cross axis control) request 2nd axis $1
YA62		Mixed control (cross axis control) request 3rd axis $1
YA63		Mixed control (cross axis control) request 4th axis $1
YA64		Mixed control (cross axis control) request 5th axis $1
YA65		Mixed control (cross axis control) request 6th axis $1
YA66		Mixed control (cross axis control) request 7th axis $1
YA67		Mixed control (cross axis control) request 8th axis $1
YA68		Mixed control (cross axis control) request 1st axis $2
YA69		Mixed control (cross axis control) request 2nd axis $2
YA6A		Mixed control (cross axis control) request 3rd axis $2
YA6B		Mixed control (cross axis control) request 4th axis $2
YA6C		Mixed control (cross axis control) request 5th axis $2
YA6D		Mixed control (cross axis control) request 6th axis $2
YA6E		Mixed control (cross axis control) request 7th axis $2
YA6F		Mixed control (cross axis control) request 8th axis $2
YA70		Mixed control (cross axis control) request 1st axis $3
YA71		Mixed control (cross axis control) request 2nd axis $3
YA72		Mixed control (cross axis control) request 3rd axis $3
YA73		Mixed control (cross axis control) request 4th axis $3
YA74		Mixed control (cross axis control) request 5th axis $3
YA75		Mixed control (cross axis control) request 6th axis $3
YA76		Mixed control (cross axis control) request 7th axis $3
YA77		Mixed control (cross axis control) request 8th axis $3
YA78		Mixed control (cross axis control) request 1st axis $4
YA79		Mixed control (cross axis control) request 2nd axis $4
YA7A		Mixed control (cross axis control) request 3rd axis $4
YA7B		Mixed control (cross axis control) request 4th axis $4
YA7C		Mixed control (cross axis control) request 5th axis $4
YA7D		Mixed control (cross axis control) request 6th axis $4
YA7E		Mixed control (cross axis control) request 7th axis $4
YA7F		Mixed control (cross axis control) request 8th axis $4
YA80	SYNC11	Synchronous control request 1st axis $1
YA81	SYNC21	Synchronous control request 2nd axis $1
YA82	SYNC31	Synchronous control request 3rd axis $1
YA83	SYNC41	Synchronous control request 4th axis $1
YA84	SYNC51	Synchronous control request 5th axis $1
YA85	SYNC61	Synchronous control request 6th axis $1
YA86	SYNC71	Synchronous control request 7th axis $1
YA87	SYNC81	Synchronous control request 8th axis $1
YA88	SYNC12	Synchronous control request 1st axis $2
YA89	SYNC22	Synchronous control request 2nd axis $2
YA8A	SYNC32	Synchronous control request 3rd axis $2
YA8B	SYNC42	Synchronous control request 4th axis $2
YA8C	SYNC52	Synchronous control request 5th axis $2
YA8D	SYNC62	Synchronous control request 6th axis $2
YA8E	SYNC72	Synchronous control request 7th axis $2
YA8F	SYNC82	Synchronous control request 8th axis $2
YA90	SYNC13	Synchronous control request 1st axis $3
YA91	SYNC23	Synchronous control request 2nd axis $3
YA92	SYNC33	Synchronous control request 3rd axis $3
YA93	SYNC43	Synchronous control request 4th axis $3
YA94	SYNC53	Synchronous control request 5th axis $3
YA95	SYNC63	Synchronous control request 6th axis $3
YA96	SYNC73	Synchronous control request 7th axis $3
YA97	SYNC83	Synchronous control request 8th axis $3
YA98	SYNC14	Synchronous control request 1st axis $4
YA99	SYNC24	Synchronous control request 2nd axis $4
YA9A	SYNC34	Synchronous control request 3rd axis $4
YA9B	SYNC44	Synchronous control request 4th axis $4
YA9C	SYNC54	Synchronous control request 5th axis $4
YA9D	SYNC64	Synchronous control request 6th axis $4
YA9E	SYNC74	Synchronous control request 7th axis $4
YA9F	SYNC84	Synchronous control request 8th axis $4
YAA0	PILE11	Superimposition control request 1st axis $1
YAA1	PILE21	Superimposition control request 2nd axis $1
YAA2	PILE31	Superimposition control request 3rd axis $1
YAA3	PILE41	Superimposition control request 4th axis $1
YAA4	PILE51	Superimposition control request 5th axis $1
YAA5	PILE61	Superimposition control request 6th axis $1
YAA6	PILE71	Superimposition control request 7th axis $1
YAA7	PILE81	Superimposition control request 8th axis $1
YAA8	PILE12	Superimposition control request 1st axis $2
YAA9	PILE22	Superimposition control request 2nd axis $2
YAAA	PILE32	Superimposition control request 3rd axis $2
YAAB	PILE42	Superimposition control request 4th axis $2
YAAC	PILE52	Superimposition control request 5th axis $2

Device	Abbrev.	Signal name
YAAD	PILE62	Superimposition control request 6th axis $2
YAAE	PILE72	Superimposition control request 7th axis $2
YAAF	PILE82	Superimposition control request 8th axis $2
YAB0	PILE13	Superimposition control request 1st axis $3
YAB1	PILE23	Superimposition control request 2nd axis $3
YAB2	PILE33	Superimposition control request 3rd axis $3
YAB3	PILE43	Superimposition control request 4th axis $3
YAB4	PILE53	Superimposition control request 5th axis $3
YAB5	PILE63	Superimposition control request 6th axis $3
YAB6	PILE73	Superimposition control request 7th axis $3
YAB7	PILE83	Superimposition control request 8th axis $3
YAB8	PILE14	Superimposition control request 1st axis $4
YAB9	PILE24	Superimposition control request 2nd axis $4
YABA	PILE34	Superimposition control request 3rd axis $4
YABB	PILE44	Superimposition control request 4th axis $4
YABC	PILE54	Superimposition control request 5th axis $4
YABD	PILE64	Superimposition control request 6th axis $4
YABE	PILE74	Superimposition control request 7th axis $4
YABF	PILE84	Superimposition control request 8th axis $4
YAC0		NC axis control selection 1st axis $1
YAC1		NC axis control selection 2nd axis $1
YAC2		NC axis control selection 3rd axis $1
YAC3		NC axis control selection 4th axis $1
YAC4		NC axis control selection 5th axis $1
YAC5		NC axis control selection 6th axis $1
YAC6		NC axis control selection 7th axis $1
YAC7		NC axis control selection 8th axis $1
YAC8		NC axis control selection 1st axis $2
YAC9		NC axis control selection 2nd axis $2
YACA		NC axis control selection 3rd axis $2
YACB		NC axis control selection 4th axis $2
YACC		NC axis control selection 5th axis $2
YACD		NC axis control selection 6th axis $2
YACE		NC axis control selection 7th axis $2
YACF		NC axis control selection 8th axis $2
YAD0		NC axis control selection 1st axis $3
YAD1		NC axis control selection 2nd axis $3
YAD2		NC axis control selection 3rd axis $3
YAD3		NC axis control selection 4th axis $3
YAD4		NC axis control selection 5th axis $3
YAD5		NC axis control selection 6th axis $3
YAD6		NC axis control selection 7th axis $3
YAD7		NC axis control selection 8th axis $3
YAD8		NC axis control selection 1st axis $4
YAD9		NC axis control selection 2nd axis $4
YADA		NC axis control selection 3rd axis $4
YADB		NC axis control selection 4th axis $4
YADC		NC axis control selection 5th axis $4
YADD		NC axis control selection 6th axis $4
YADE		NC axis control selection 7th axis $4
YADF		NC axis control selection 8th axis $4
YAE0		Vertical axis pull-up prevention request 1st axis $1
YAE1		Vertical axis pull-up prevention request 2nd axis $1
YAE2		Vertical axis pull-up prevention request 3rd axis $1
YAE3		Vertical axis pull-up prevention request 4th axis $1
YAE4		Vertical axis pull-up prevention request 5th axis $1
YAE5		Vertical axis pull-up prevention request 6th axis $1
YAE6		Vertical axis pull-up prevention request 7th axis $1
YAE7		Vertical axis pull-up prevention request 8th axis $1
YAE8		Vertical axis pull-up prevention request 1st axis $2
YAE9		Vertical axis pull-up prevention request 2nd axis $2
YAEA		Vertical axis pull-up prevention request 3rd axis $2
YAEB		Vertical axis pull-up prevention request 4th axis $2
YAEC		Vertical axis pull-up prevention request 5th axis $2
YAED		Vertical axis pull-up prevention request 6th axis $2
YAEE		Vertical axis pull-up prevention request 7th axis $2
YAEF		Vertical axis pull-up prevention request 8th axis $2
YAF0		Vertical axis pull-up prevention request 1st axis $3
YAF1		Vertical axis pull-up prevention request 2nd axis $3
YAF2		Vertical axis pull-up prevention request 3rd axis $3
YAF3		Vertical axis pull-up prevention request 4th axis $3
YAF4		Vertical axis pull-up prevention request 5th axis $3
YAF5		Vertical axis pull-up prevention request 6th axis $3
YAF6		Vertical axis pull-up prevention request 7th axis $3
YAF7		Vertical axis pull-up prevention request 8th axis $3
YAF8		Vertical axis pull-up prevention request 1st axis $4
YAF9		Vertical axis pull-up prevention request 2nd axis $4
YAFA		Vertical axis pull-up prevention request 3rd axis $4
YAFB		Vertical axis pull-up prevention request 4th axis $4
YAFC		Vertical axis pull-up prevention request 5th axis $4
YAFD		Vertical axis pull-up prevention request 6th axis $4
YAFE		Vertical axis pull-up prevention request 7th axis $4

Device	Abbrev.	Signal name
YAFF		Vertical axis pull-up prevention request 8th axis $4
YB00	CLPF11	Clamp completion 1st axis $1
YB01	CLPF21	Clamp completion 2nd axis $1
YB02	CLPF31	Clamp completion 3rd axis $1
YB03	CLPF41	Clamp completion 4th axis $1
YB04	CLPF51	Clamp completion 5th axis $1
YB05	CLPF61	Clamp completion 6th axis $1
YB06	CLPF71	Clamp completion 7th axis $1
YB07	CLPF81	Clamp completion 8th axis $1
YB08	CLPF12	Clamp completion 1st axis $2
YB09	CLPF22	Clamp completion 2nd axis $2
YB0A	CLPF32	Clamp completion 3rd axis $2
YB0B	CLPF42	Clamp completion 4th axis $2
YB0C	CLPF52	Clamp completion 5th axis $2
YB0D	CLPF62	Clamp completion 6th axis $2
YB0E	CLPF72	Clamp completion 7th axis $2
YB0F	CLPF82	Clamp completion 8th axis $2
YB10	CLPF13	Clamp completion 1st axis $3
YB11	CLPF23	Clamp completion 2nd axis $3
YB12	CLPF33	Clamp completion 3rd axis $3
YB13	CLPF43	Clamp completion 4th axis $3
YB14	CLPF53	Clamp completion 5th axis $3
YB15	CLPF63	Clamp completion 6th axis $3
YB16	CLPF73	Clamp completion 7th axis $3
YB17	CLPF83	Clamp completion 8th axis $3
YB18	CLPF14	Clamp completion 1st axis $4
YB19	CLPF24	Clamp completion 2nd axis $4
YB1A	CLPF34	Clamp completion 3rd axis $4
YB1B	CLPF44	Clamp completion 4th axis $4
YB1C	CLPF54	Clamp completion 5th axis $4
YB1D	CLPF64	Clamp completion 6th axis $4
YB1E	CLPF74	Clamp completion 7th axis $4
YB1F	CLPF84	Clamp completion 8th axis $4
YB20	HOBRTV11	Hob machining: retract amount selection 1st axis $1
YB21	HOBRTV21	Hob machining: retract amount selection 2nd axis $1
YB22	HOBRTV31	Hob machining: retract amount selection 3rd axis $1
YB23	HOBRTV41	Hob machining: retract amount selection 4th axis $1
YB24	HOBRTV51	Hob machining: retract amount selection 5th axis $1
YB25	HOBRTV61	Hob machining: retract amount selection 6th axis $1
YB26	HOBRTV71	Hob machining: retract amount selection 7th axis $1
YB27	HOBRTV81	Hob machining: retract amount selection 8th axis $1
YB28	HOBRTV12	Hob machining: retract amount selection 1st axis $2
YB29	HOBRTV22	Hob machining: retract amount selection 2nd axis $2
YB2A	HOBRTV32	Hob machining: retract amount selection 3rd axis $2
YB2B	HOBRTV42	Hob machining: retract amount selection 4th axis $2
YB2C	HOBRTV52	Hob machining: retract amount selection 5th axis $2
YB2D	HOBRTV62	Hob machining: retract amount selection 6th axis $2
YB2E	HOBRTV72	Hob machining: retract amount selection 7th axis $2
YB2F	HOBRTV82	Hob machining: retract amount selection 8th axis $2
YB30	HOBRTV13	Hob machining: retract amount selection 1st axis $3
YB31	HOBRTV23	Hob machining: retract amount selection 2nd axis $3
YB32	HOBRTV33	Hob machining: retract amount selection 3rd axis $3
YB33	HOBRTV43	Hob machining: retract amount selection 4th axis $3
YB34	HOBRTV53	Hob machining: retract amount selection 5th axis $3
YB35	HOBRTV63	Hob machining: retract amount selection 6th axis $3
YB36	HOBRTV73	Hob machining: retract amount selection 7th axis $3
YB37	HOBRTV83	Hob machining: retract amount selection 8th axis $3
YB38	HOBRTV14	Hob machining: retract amount selection 1st axis $4
YB39	HOBRTV24	Hob machining: retract amount selection 2nd axis $4
YB3A	HOBRTV34	Hob machining: retract amount selection 3rd axis $4
YB3B	HOBRTV44	Hob machining: retract amount selection 4th axis $4
YB3C	HOBRTV54	Hob machining: retract amount selection 5th axis $4
YB3D	HOBRTV64	Hob machining: retract amount selection 6th axis $4
YB3E	HOBRTV74	Hob machining: retract amount selection 7th axis $4
YB3F	HOBRTV84	Hob machining: retract amount selection 8th axis $4
YB40	ROTSPC11	Spindle-mode rotary axis control command 1st axis $1
YB41	ROTSPC21	Spindle-mode rotary axis control command 2nd axis $1
YB42	ROTSPC31	Spindle-mode rotary axis control command 3rd axis $1
YB43	ROTSPC41	Spindle-mode rotary axis control command 4th axis $1
YB44	ROTSPC51	Spindle-mode rotary axis control command 5th axis $1
YB45	ROTSPC61	Spindle-mode rotary axis control command 6th axis $1
YB46	ROTSPC71	Spindle-mode rotary axis control command 7th axis $1
YB47	ROTSPC81	Spindle-mode rotary axis control command 8th axis $1
YB48	ROTSPC12	Spindle-mode rotary axis control command 1st axis $2
YB49	ROTSPC22	Spindle-mode rotary axis control command 2nd axis $2
YB4A	ROTSPC32	Spindle-mode rotary axis control command 3rd axis $2
YB4B	ROTSPC42	Spindle-mode rotary axis control command 4th axis $2
YB4C	ROTSPC52	Spindle-mode rotary axis control command 5th axis $2
YB4D	ROTSPC62	Spindle-mode rotary axis control command 6th axis $2
YB4E	ROTSPC72	Spindle-mode rotary axis control command 7th axis $2
YB4F	ROTSPC82	Spindle-mode rotary axis control command 8th axis $2
YB50	ROTSPC13	Spindle-mode rotary axis control command 1st axis $3

Device	Abbrev.	Signal name
YB51	ROTSPC23	Spindle-mode rotary axis control command 2nd axis $3
YB52	ROTSPC33	Spindle-mode rotary axis control command 3rd axis $3
YB53	ROTSPC43	Spindle-mode rotary axis control command 4th axis $3
YB54	ROTSPC53	Spindle-mode rotary axis control command 5th axis $3
YB55	ROTSPC63	Spindle-mode rotary axis control command 6th axis $3
YB56	ROTSPC73	Spindle-mode rotary axis control command 7th axis $3
YB57	ROTSPC83	Spindle-mode rotary axis control command 8th axis $3
YB58	ROTSPC14	Spindle-mode rotary axis control command 1st axis $4
YB59	ROTSPC24	Spindle-mode rotary axis control command 2nd axis $4
YB5A	ROTSPC34	Spindle-mode rotary axis control command 3rd axis $4
YB5B	ROTSPC44	Spindle-mode rotary axis control command 4th axis $4
YB5C	ROTSPC54	Spindle-mode rotary axis control command 5th axis $4
YB5D	ROTSPC64	Spindle-mode rotary axis control command 6th axis $4
YB5E	ROTSPC74	Spindle-mode rotary axis control command 7th axis $4
YB5F	ROTSPC84	Spindle-mode rotary axis control command 8th axis $4
YB60	SLMC11	Stored stroke limit I :Change request 1st axis $1
YB61	SLMC21	Stored stroke limit I :Change request 2nd axis $1
YB62	SLMC31	Stored stroke limit I :Change request 3rd axis $1
YB63	SLMC41	Stored stroke limit I :Change request 4th axis $1
YB64	SLMC51	Stored stroke limit I :Change request 5th axis $1
YB65	SLMC61	Stored stroke limit I :Change request 6th axis $1
YB66	SLMC71	Stored stroke limit I :Change request 7th axis $1
YB67	SLMC81	Stored stroke limit I :Change request 8th axis $1
YB68	SLMC12	Stored stroke limit I :Change request 1st axis $2
YB69	SLMC22	Stored stroke limit I :Change request 2nd axis $2
YB6A	SLMC32	Stored stroke limit I :Change request 3rd axis $2
YB6B	SLMC42	Stored stroke limit I :Change request 4th axis $2
YB6C	SLMC52	Stored stroke limit I :Change request 5th axis $2
YB6D	SLMC62	Stored stroke limit I :Change request 6th axis $2
YB6E	SLMC72	Stored stroke limit I :Change request 7th axis $2
YB6F	SLMC82	Stored stroke limit I :Change request 8th axis $2
YB70	SLMC13	Stored stroke limit I :Change request 1st axis $3
YB71	SLMC23	Stored stroke limit I :Change request 2nd axis $3
YB72	SLMC33	Stored stroke limit I :Change request 3rd axis $3
YB73	SLMC43	Stored stroke limit I :Change request 4th axis $3
YB74	SLMC53	Stored stroke limit I :Change request 5th axis $3
YB75	SLMC63	Stored stroke limit I :Change request 6th axis $3
YB76	SLMC73	Stored stroke limit I :Change request 7th axis $3
YB77	SLMC83	Stored stroke limit I :Change request 8th axis $3
YB78	SLMC14	Stored stroke limit I :Change request 1st axis $4
YB79	SLMC24	Stored stroke limit I :Change request 2nd axis $4
YB7A	SLMC34	Stored stroke limit I :Change request 3rd axis $4
YB7B	SLMC44	Stored stroke limit I :Change request 4th axis $4
YB7C	SLMC54	Stored stroke limit I :Change request 5th axis $4
YB7D	SLMC64	Stored stroke limit I :Change request 6th axis $4
YB7E	SLMC74	Stored stroke limit I :Change request 7th axis $4
YB7F	SLMC84	Stored stroke limit I :Change request 8th axis $4
YB80	VGHLDC11	Real-time tuning 1: Speed control gain changeover hold-down command 1st axis $1
YB81	VGHLDC21	Real-time tuning 1: Speed control gain changeover hold-down command 2nd axis $1
YB82	VGHLDC31	Real-time tuning 1: Speed control gain changeover hold-down command 3rd axis $1
YB83	VGHLDC41	Real-time tuning 1: Speed control gain changeover hold-down command 4th axis $1
YB84	VGHLDC51	Real-time tuning 1: Speed control gain changeover hold-down command 5th axis $1
YB85	VGHLDC61	Real-time tuning 1: Speed control gain changeover hold-down command 6th axis $1
YB86	VGHLDC71	Real-time tuning 1: Speed control gain changeover hold-down command 7th axis $1
YB87	VGHLDC81	Real-time tuning 1: Speed control gain changeover hold-down command 8th axis $1
YB88	VGHLDC12	Real-time tuning 1: Speed control gain changeover hold-down command 1st axis $2
YB89	VGHLDC22	Real-time tuning 1: Speed control gain changeover hold-down command 2nd axis $2
YB8A	VGHLDC32	Real-time tuning 1: Speed control gain changeover hold-down command 3rd axis $2
YB8B	VGHLDC42	Real-time tuning 1: Speed control gain changeover hold-down command 4th axis $2
YB8C	VGHLDC52	Real-time tuning 1: Speed control gain changeover hold-down command 5th axis $2
YB8D	VGHLDC62	Real-time tuning 1: Speed control gain changeover hold-down command 6th axis $2
YB8E	VGHLDC72	Real-time tuning 1: Speed control gain changeover hold-down command 7th axis $2
YB8F	VGHLDC82	Real-time tuning 1: Speed control gain changeover hold-down command 8th axis $2
YB90	VGHLDC13	Real-time tuning 1: Speed control gain changeover hold-down command 1st axis $3
YB91	VGHLDC23	Real-time tuning 1: Speed control gain changeover hold-down command 2nd axis $3
YB92	VGHLDC33	Real-time tuning 1: Speed control gain changeover hold-down command 3rd axis $3

Device	Abbrev.	Signal name
YB93	VGHLDC43	Real-time tuning 1: Speed control gain changeover hold-down command 4th axis $3
YB94	VGHLDC53	Real-time tuning 1: Speed control gain changeover hold-down command 5th axis $3
YB95	VGHLDC63	Real-time tuning 1: Speed control gain changeover hold-down command 6th axis $3
YB96	VGHLDC73	Real-time tuning 1: Speed control gain changeover hold-down command 7th axis $3
YB97	VGHLDC83	Real-time tuning 1: Speed control gain changeover hold-down command 8th axis $3
YB98	VGHLDC14	Real-time tuning 1: Speed control gain changeover hold-down command 1st axis $4
YB99	VGHLDC24	Real-time tuning 1: Speed control gain changeover hold-down command 2nd axis $4
YB9A	VGHLDC34	Real-time tuning 1: Speed control gain changeover hold-down command 3rd axis $4
YB9B	VGHLDC44	Real-time tuning 1: Speed control gain changeover hold-down command 4th axis $4
YB9C	VGHLDC54	Real-time tuning 1: Speed control gain changeover hold-down command 5th axis $4
YB9D	VGHLDC64	Real-time tuning 1: Speed control gain changeover hold-down command 6th axis $4
YB9E	VGHLDC74	Real-time tuning 1: Speed control gain changeover hold-down command 7th axis $4
YB9F	VGHLDC84	Real-time tuning 1: Speed control gain changeover hold-down command 8th axis $4
YBA0	CNT011	Counter zero 1st axis $1 [C80]
YBA1	CNT021	Counter zero 2nd axis $1 [C80]
YBA2	CNT031	Counter zero 3rd axis $1 [C80]
YBA3	CNT041	Counter zero 4th axis $1 [C80]
YBA4	CNT051	Counter zero 5th axis $1 [C80]
YBA5	CNT061	Counter zero 6th axis $1 [C80]
YBA6	CNT071	Counter zero 7th axis $1 [C80]
YBA7	CNT081	Counter zero 8th axis $1 [C80]
YBA8	CNT012	Counter zero 1st axis $2 [C80]
YBA9	CNT022	Counter zero 2nd axis $2 [C80]
YBAA	CNT032	Counter zero 3rd axis $2 [C80]
YBAB	CNT042	Counter zero 4th axis $2 [C80]
YBAC	CNT052	Counter zero 5th axis $2 [C80]
YBAD	CNT062	Counter zero 6th axis $2 [C80]
YBAE	CNT072	Counter zero 7th axis $2 [C80]
YBAF	CNT082	Counter zero 8th axis $2 [C80]
YBB0	CNT013	Counter zero 1st axis $3 [C80]
YBB1	CNT023	Counter zero 2nd axis $3 [C80]
YBB2	CNT033	Counter zero 3rd axis $3 [C80]
YBB3	CNT043	Counter zero 4th axis $3 [C80]
YBB4	CNT053	Counter zero 5th axis $3 [C80]
YBB5	CNT063	Counter zero 6th axis $3 [C80]
YBB6	CNT073	Counter zero 7th axis $3 [C80]
YBB7	CNT083	Counter zero 8th axis $3 [C80]
YBB8	CNT014	Counter zero 1st axis $4 [C80]
YBB9	CNT024	Counter zero 2nd axis $4 [C80]
YBBA	CNT034	Counter zero 3rd axis $4 [C80]
YBBB	CNT044	Counter zero 4th axis $4 [C80]
YBBC	CNT054	Counter zero 5th axis $4 [C80]
YBBD	CNT064	Counter zero 6th axis $4 [C80]
YBBE	CNT074	Counter zero 7th axis $4 [C80]
YBBF	CNT084	Counter zero 8th axis $4 [C80]
YBC0	NPCHGREQ11	NC axis/PLC axis switchover request 1st axis $1
YBC1	NPCHGREQ21	NC axis/PLC axis switchover request 2nd axis $1
YBC2	NPCHGREQ31	NC axis/PLC axis switchover request 3rd axis $1
YBC3	NPCHGREQ41	NC axis/PLC axis switchover request 4th axis $1
YBC4	NPCHGREQ51	NC axis/PLC axis switchover request 5th axis $1
YBC5	NPCHGREQ61	NC axis/PLC axis switchover request 6th axis $1
YBC6	NPCHGREQ71	NC axis/PLC axis switchover request 7th axis $1
YBC7	NPCHGREQ81	NC axis/PLC axis switchover request 8th axis $1
YBC8	NPCHGREQ12	NC axis/PLC axis switchover request 1st axis $2
YBC9	NPCHGREQ22	NC axis/PLC axis switchover request 2nd axis $2
YBCA	NPCHGREQ32	NC axis/PLC axis switchover request 3rd axis $2
YBCB	NPCHGREQ42	NC axis/PLC axis switchover request 4th axis $2
YBCC	NPCHGREQ52	NC axis/PLC axis switchover request 5th axis $2
YBCD	NPCHGREQ62	NC axis/PLC axis switchover request 6th axis $2
YBCE	NPCHGREQ72	NC axis/PLC axis switchover request 7th axis $2
YBCF	NPCHGREQ82	NC axis/PLC axis switchover request 8th axis $2
YBD0	NPCHGREQ13	NC axis/PLC axis switchover request 1st axis $3
YBD1	NPCHGREQ23	NC axis/PLC axis switchover request 2nd axis $3
YBD2	NPCHGREQ33	NC axis/PLC axis switchover request 3rd axis $3
YBD3	NPCHGREQ43	NC axis/PLC axis switchover request 4th axis $3
YBD4	NPCHGREQ53	NC axis/PLC axis switchover request 5th axis $3
YBD5	NPCHGREQ63	NC axis/PLC axis switchover request 6th axis $3
YBD6	NPCHGREQ73	NC axis/PLC axis switchover request 7th axis $3
YBD7	NPCHGREQ83	NC axis/PLC axis switchover request 8th axis $3
YBD8	NPCHGREQ14	NC axis/PLC axis switchover request 1st axis $4
YBD9	NPCHGREQ24	NC axis/PLC axis switchover request 2nd axis $4
YBDA	NPCHGREQ34	NC axis/PLC axis switchover request 3rd axis $4

Device	Abbrev.	Signal name
YBDB	NPCHGREQ44	NC axis/PLC axis switchover request 4th axis $4
YBDC	NPCHGREQ54	NC axis/PLC axis switchover request 5th axis $4
YBDD	NPCHGREQ64	NC axis/PLC axis switchover request 6th axis $4
YBDE	NPCHGREQ74	NC axis/PLC axis switchover request 7th axis $4
YBDF	NPCHGREQ84	NC axis/PLC axis switchover request 8th axis $4
YBE0	GQEMG11	Machine group-based alarm stop: Machine group-based PLC interlock 1st axis $1
YBE1	GQEMG21	Machine group-based alarm stop: Machine group-based PLC interlock 2nd axis $1
YBE2	GQEMG31	Machine group-based alarm stop: Machine group-based PLC interlock 3rd axis $1
YBE3	GQEMG41	Machine group-based alarm stop: Machine group-based PLC interlock 4th axis $1
YBE4	GQEMG51	Machine group-based alarm stop: Machine group-based PLC interlock 5th axis $1
YBE5	GQEMG61	Machine group-based alarm stop: Machine group-based PLC interlock 6th axis $1
YBE6	GQEMG71	Machine group-based alarm stop: Machine group-based PLC interlock 7th axis $1
YBE7	GQEMG81	Machine group-based alarm stop: Machine group-based PLC interlock 8th axis $1
YBE8	GQEMG12	Machine group-based alarm stop: Machine group-based PLC interlock 1st axis $2
YBE9	GQEMG22	Machine group-based alarm stop: Machine group-based PLC interlock 2nd axis $2
YBEA	GQEMG32	Machine group-based alarm stop: Machine group-based PLC interlock 3rd axis $2
YBEB	GQEMG42	Machine group-based alarm stop: Machine group-based PLC interlock 4th axis $2
YBEC	GQEMG52	Machine group-based alarm stop: Machine group-based PLC interlock 5th axis $2
YBED	GQEMG62	Machine group-based alarm stop: Machine group-based PLC interlock 6th axis $2
YBEE	GQEMG72	Machine group-based alarm stop: Machine group-based PLC interlock 7th axis $2
YBEF	GQEMG82	Machine group-based alarm stop: Machine group-based PLC interlock 8th axis $2
YBF0	GQEMG13	Machine group-based alarm stop: Machine group-based PLC interlock 1st axis $3
YBF1	GQEMG23	Machine group-based alarm stop: Machine group-based PLC interlock 2nd axis $3
YBF2	GQEMG33	Machine group-based alarm stop: Machine group-based PLC interlock 3rd axis $3
YBF3	GQEMG43	Machine group-based alarm stop: Machine group-based PLC interlock 4th axis $3
YBF4	GQEMG53	Machine group-based alarm stop: Machine group-based PLC interlock 5th axis $3
YBF5	GQEMG63	Machine group-based alarm stop: Machine group-based PLC interlock 6th axis $3
YBF6	GQEMG73	Machine group-based alarm stop: Machine group-based PLC interlock 7th axis $3
YBF7	GQEMG83	Machine group-based alarm stop: Machine group-based PLC interlock 8th axis $3
YBF8	GQEMG14	Machine group-based alarm stop: Machine group-based PLC interlock 1st axis $4
YBF9	GQEMG24	Machine group-based alarm stop: Machine group-based PLC interlock 2nd axis $4
YBFA	GQEMG34	Machine group-based alarm stop: Machine group-based PLC interlock 3rd axis $4
YBFB	GQEMG44	Machine group-based alarm stop: Machine group-based PLC interlock 4th axis $4
YBFC	GQEMG54	Machine group-based alarm stop: Machine group-based PLC interlock 5th axis $4
YBFD	GQEMG64	Machine group-based alarm stop: Machine group-based PLC interlock 6th axis $4
YBFE	GQEMG74	Machine group-based alarm stop: Machine group-based PLC interlock 7th axis $4
YBFF	GQEMG84	Machine group-based alarm stop: Machine group-based PLC interlock 8th axis $4
YC00	J1	Jog mode $1
YC01	H1	Handle mode $1
YC02	S1	Incremental mode $1
YC03	PTP1	Manual arbitrary feed mode $1
YC04	ZRN1	Reference position return mode $1
YC05	AST1	Automatic initialization mode $1
YC08	MEM1	Memory mode $1
YC09	T1	Tape mode $1
YC0A		Online operation mode (Computer link B) $1
YC0B	D1	MDI mode $1
YC0E	SBSM1	Sub part system control: Sub part system control I mode $1
YC10	ST1	Automatic operation "start" command (Cycle start) $1
YC11	*SP1	Automatic operation "pause" command (Feed hold) $1
YC12	SBK1	Single block $1
YC13	*BSL1	Block start interlock $1
YC14	*CSL1	Cutting block start interlock $1
YC15	DRN1	Dry run $1
YC17	ERD1	Error detection $1
YC18	NRST11	NC reset 1 $1
YC19	NRST21	NC reset 2 $1

Device	Abbrev.	Signal name
YC1A	RRW1	Reset & rewind $1
YC1B	*CDZ1	Chamfering $1
YC1C	ARST1	Automatic restart $1
YC1D		External search strobe $1
YC1E	FIN11	M function finish 1 $1
YC1F	FIN21	M function finish 2 $1
YC20	TLM1	Tool length measurement 1 $1
YC21	TLMS1	Tool length measurement 2 $1
YC22		Synchronization correction mode $1
YC23	PRST1	Program restart $1
YC24	PB1	Playback $1
YC25	UIT1	Macro interrupt $1
YC26	RT1	Rapid traverse $1
YC27	VRV1	Reverse run $1
YC28	ABS1	Manual absolute $1
YC29	DLK1	Display lock $1
YC2A	F1D1	F1-digit speed change valid $1
YC2B	CRQ1	Recalculation request $1
YC2C	QEMG1	PLC emergency stop $1
YC2D	RTN1	Reference position retract $1
YC2E	PIT1	PLC interrupt $1
YC30	CHPS1	Chopping $1
YC31	RSST1	Search & start $1
YC34		Chopping parameter valid $1
YC35		Inclined axis control valid $1
YC36		Inclined axis control: No Z axis compensation $1
YC37	BDT11	Optional block skip 1 $1
YC38	BDT21	Optional block skip 2 $1
YC39	BDT31	Optional block skip 3 $1
YC3A	BDT41	Optional block skip 4 $1
YC3B	BDT51	Optional block skip 5 $1
YC3C	BDT61	Optional block skip 6 $1
YC3D	BDT71	Optional block skip 7 $1
YC3E	BDT81	Optional block skip 8 $1
YC3F	BDT91	Optional block skip 9 $1
YC40	HS111	1st handle axis selection code 1 $1
YC41	HS121	1st handle axis selection code 2 $1
YC42	HS141	1st handle axis selection code 4 $1
YC43	HS181	1st handle axis selection code 8 $1
YC44	HS1161	1st handle axis selection code 16 $1
YC47	HS1S1	1st handle valid $1
YC48	HS211	2nd handle axis selection code 1 $1
YC49	HS221	2nd handle axis selection code 2 $1
YC4A	HS241	2nd handle axis selection code 4 $1
YC4B	HS281	2nd handle axis selection code 8 $1
YC4C	HS2161	2nd handle axis selection code 16 $1
YC4F	HS2S1	2nd handle valid $1
YC50	HS311	3rd handle axis selection code 1 $1
YC51	HS321	3rd handle axis selection code 2 $1
YC52	HS341	3rd handle axis selection code 4 $1
YC53	HS381	3rd handle axis selection code 8 $1
YC54	HS3161	3rd handle axis selection code 16 $1
YC57	HS3S1	3rd handle valid $1
YC58	OVC1	Override cancel $1
YC59	OVSL1	Manual override method selection $1
YC5A	AFL1	Miscellaneous function lock $1
YC5C	TRV1	Tap retract $1
YC5E		Tool handle feed mode $1
YC60	*FV11	Cutting feedrate override code 1 $1
YC61	*FV21	Cutting feedrate override code 2 $1
YC62	*FV41	Cutting feedrate override code 4 $1
YC63	*FV81	Cutting feedrate override code 8 $1
YC64	*FV161	Cutting feedrate override code 16 $1
YC66	FV2E1	2nd cutting feedrate override valid $1
YC67	FVS1	Cutting feedrate override method selection $1
YC68	ROV11	Rapid traverse override code 1 $1
YC69	ROV21	Rapid traverse override code 2 $1
YC6F	ROVS1	Rapid traverse override method selection $1
YC70	*JV11	Manual feedrate code 1 $1
YC71	*JV21	Manual feedrate code 2 $1
YC72	*JV41	Manual feedrate code 4 $1
YC73	*JV81	Manual feedrate code 8 $1
YC74	*JV161	Manual feedrate code 16 $1
YC76	MCLMP1	Manual speed clamp ON $1
YC77	JVS1	Manual feedrate method selection $1
YC78	PCF11	Feedrate least increment code 1 $1
YC79	PCF21	Feedrate least increment code 2 $1
YC7B	JHAN1	Jog handle synchronous $1
YC7C		Each axis manual feedrate B valid $1
YC7D		Manual feedrate B surface speed control valid $1
YC7E		Circular feed in manual mode valid $1
YC7F		Coordinate rotation by parameter: Coordinate switch for manual feed $1

Device	Abbrev.	Signal name
YC80	MP11	Handle/incremental feed magnification code 1 $1
YC81	MP21	Handle/incremental feed magnification code 2 $1
YC82	MP41	Handle/incremental feed magnification code 4 $1
YC86		Magnification valid for each handle $1
YC87	MPS1	Handle/incremental feed magnification method selection $1
YC88	TAL11	Tool alarm 1/Tool-skip $1
YC89	TAL21	Tool alarm 2 $1
YC8A	TCEF1	Usage data count valid $1
YC8B	TLF11	Tool life management input $1
YC8C	TRST1	Tool change reset $1
YC8D		Tool escape and return Transit point designation $1
YC8E		Manual tool length measurement interlock temporarily canceled $1 ▲
YC90	ZSL11	Reference position selection code 1 $1
YC91	ZSL21	Reference position selection code 2 $1
YC92		Tool length compensation along the tool axis Compensation amount change mode $1
YC93	RTNST1	Tool retract and return 2: Tool return start $1 ▲
YC94	FFC1	Thread cutting: Feed-forward control request $1
YC95		In balance cut timing synchronization invalid $1 ▲
YC97		Reference position selection method $1
YC98		Tool life management: Temporary cancel of tool life expiration $1
YC99		Tool life management: Temporary cancel of tool group life expiration $1
YC9A	PRTN1	External search: Program return $1
YC9B		MES interface library: User arbitrary information send request $1 [M8]
YC9D		Manual speed command valid $1
YC9E		Manual speed command sign reversed $1
YC9F		Manual speed command reverse run valid $1
YCA0	CX111	Manual arbitrary feed 1st axis selection code 1 $1
YCA1	CX121	Manual arbitrary feed 1st axis selection code 2 $1
YCA2	CX141	Manual arbitrary feed 1st axis selection code 4 $1
YCA3	CX181	Manual arbitrary feed 1st axis selection code 8 $1
YCA4	CX1161	Manual arbitrary feed 1st axis selection code 16 $1
YCA7	CX1S1	Manual arbitrary feed 1st axis valid $1
YCA8	CX211	Manual arbitrary feed 2nd axis selection code 1 $1
YCA9	CX221	Manual arbitrary feed 2nd axis selection code 2 $1
YCAA	CX241	Manual arbitrary feed 2nd axis selection code 4 $1
YCAB	CX281	Manual arbitrary feed 2nd axis selection code 8 $1
YCAC	CX2161	Manual arbitrary feed 2nd axis selection code 16 $1
YCAF	CX2S1	Manual arbitrary feed 2nd axis valid $1
YCB0	CX311	Manual arbitrary feed 3rd axis selection code 1 $1
YCB1	CX321	Manual arbitrary feed 3rd axis selection code 2 $1
YCB2	CX341	Manual arbitrary feed 3rd axis selection code 4 $1
YCB3	CX381	Manual arbitrary feed 3rd axis selection code 8 $1
YCB4	CX3161	Manual arbitrary feed 3rd axis selection code 16 $1
YCB7	CX3S1	Manual arbitrary feed 3rd axis valid $1
YCB8	CXS11	Manual arbitrary feed Smoothing off $1
YCB9	CXS21	Manual arbitrary feed Axis independent $1
YCBA	CXS31	Manual arbitrary feed EX.F/MODAL.F $1
YCBB	CXS41	Manual arbitrary feed G0/G1 $1
YCBC	CXS51	Manual arbitrary feed MC/WK $1
YCBD	CXS61	Manual arbitrary feed ABS/INC $1
YCBE	*CXS71	Manual arbitrary feed Stop $1
YCBF	CXS81	Manual arbitrary feed Strobe $1
YCC0	ILM11	Current limit mode 1 $1
YCC1	ILM21	Current limit mode 2 $1
YCC3	LDWT1	Load monitor I : Teaching/Monitor execution $1 ▲
YCC4		Load monitor I : Teaching mode $1 ▲
YCC5		Load monitor I : Monitor mode $1 ▲
YCC6		Load monitor I : Alarm reset $1 [M8]
YCC7		Load monitor I : Warning reset $1 ▲
YCC8	*ZRIT1	2nd reference position return interlock $1
YCC9		Load monitor I : Adaptive control execution $1 ▲
YCCA		Small diameter deep hole drilling cycle $1
YCCB		Chuck barrier ON $1
YCCC		High-speed retract function valid $1 ▲
YCCF		Tool retract start $1 ▲
YCD0		Waiting ignore $1
YCD1		Spindle-spindle polygon cancel $1
YCD2		Synchronous tapping command polarity reversal $1
YCD3		Spindle OFF mode $1
YCD4		Longitudinal hole drilling axis selection $1
YCD5		Optimum acceleration/deceleration parameter switching request [axis] $1 ▲
YCD6	TRVEC1	Tap retract possible state cancel $1
YCD7	CHPRCR1	Chopping compensation update prevention request $1
YCD8		Barrier valid (left) $1
YCD9		Barrier valid (right) $1
YCDA		Tool presetter sub-side valid $1 ▲
YCDE	HOBRTR1	Hob machining: retract request $1
YCDF	HOBARTC1	Hob machining: alarm retract control $1
YCE1		Door open II $1
YCE2		Door open signal input (spindle speed monitor) $1
YCE3		Door interlock spindle speed clamp $1
YCE8		Door open II (2 channels per 1 part system) $1

Device	Abbrev.	Signal name
YCEF		Load monitor I : Cutting torque estimation execution $1 [M8]
YCF1	VFTCI1	Variable feed thread cutting invalid $1 ▲
YCF4	BCHK1	Barrier check invalid $1
YCF8	MSYNC1	Synchronization between part systems OFF $1
YCFA	DRNC1	Dry run invalid $1
YCFB	AUTED1	Automatic error detection $1
YCFC	MRPSG1	Manual arbitrary reverse run: MSTB reverse run prohibited $1
YCFD		G71 Shape judgement disable $1 ▲
YCFE		Appropriate machining diagnosis in progress $1 ▲
YCFF		Appropriate machining diagnosis error reset $1 ▲
YD00	PFCHR1	Program format switch request $1 [M8]
YD01	RBSSY1	Manual arbitrary reverse run: Reverse run block stop designated part system $1
YD08	RVSP1	Reverse run from block start $1
YD09	RVIT1	Macro interrupt priority $1
YD0A	RVMD1	Reverse run control mode $1
YD0B	ACCG1	Rapid traverse time constant: Switchover request $1
YD0C	RT2CHGA1	Real-time tuning 2: Acceleration/deceleration time constant in automatic switchover $1
YD0D	RT2CHGM1	Real-time tuning 2: Acceleration/deceleration time constant in manual switchover $1
YD0E	RT2RST1	Real-time tuning 2: Acceleration/deceleration time constant reset $1
YD14		3D coordinate conversion : Manual feed coordinates conversion $1 [M8]
YD15	RCEE1	Rotation center error compensation enabled $1
YD17	SECE1	Spatial error compensation enabled $1 [M8]
YD18	MJCT1	3D manual feed (JOG, INC) in tool axis coordinate system $1
YD19	MJCB1	3D manual feed (JOG, INC) in table coordinate system $1
YD1A	MJCF1	3D manual feed (JOG, INC) in feature coordinate system $1
YD1B	MH1CT1	3D manual feed (1st handle) in tool axis coordinate system $1
YD1C	MH1CB1	3D manual feed (1st handle) in table coordinate system $1
YD1D	MH1CF1	3D manual feed (1st handle) in feature coordinate system $1
YD1E	MH2CT1	3D manual feed (2nd handle) in tool axis coordinate system $1
YD1F	MH2CB1	3D manual feed (2nd handle) in table coordinate system $1
YD20	MH2CF1	3D manual feed (2nd handle) in feature coordinate system $1
YD21	MH3CT1	3D manual feed (3rd handle) in tool axis coordinate system $1
YD22	MH3CB1	3D manual feed (3rd handle) in table coordinate system $1
YD23	MH3CF1	3D manual feed (3rd handle) in feature coordinate system $1
YD27	TCPRC1	Tool center point rotation $1
YD28	MFIN11	Miscellaneous Function Command High-speed Output: M function finish 1 $1
YD29	MFIN21	Miscellaneous Function Command High-speed Output: M function finish 2 $1
YD2A	MFIN31	Miscellaneous Function Command High-speed Output: M function finish 3 $1
YD2B	MFIN41	Miscellaneous Function Command High-speed Output: M function finish 4 $1
YD2C	SFIN11	Miscellaneous Function Command High-speed Output: S function finish 1 $1
YD2D	SFIN21	Miscellaneous Function Command High-speed Output: S function finish 2 $1
YD2E	SFIN31	Miscellaneous Function Command High-speed Output: S function finish 3 $1
YD2F	SFIN41	Miscellaneous Function Command High-speed Output: S function finish 4 $1
YD30	TFIN11	Miscellaneous Function Command High-speed Output: T function finish 1 $1
YD31	TFIN21	Miscellaneous Function Command High-speed Output: T function finish 2 $1
YD32	TFIN31	Miscellaneous Function Command High-speed Output: T function finish 3 $1
YD33	TFIN41	Miscellaneous Function Command High-speed Output: T function finish 4 $1
YD34	BFIN11	Miscellaneous Function Command High-speed Output: 2nd M function finish 1 $1
YD35	BFIN21	Miscellaneous Function Command High-speed Output: 2nd M function finish 2 $1
YD36	BFIN31	Miscellaneous Function Command High-speed Output: 2nd M function finish 3 $1
YD37	BFIN41	Miscellaneous Function Command High-speed Output: 2nd M function finish 4 $1
YD38	SFIN51	Miscellaneous Function Command High-speed Output: S function finish 5 $1
YD39	SFIN61	Miscellaneous Function Command High-speed Output: S function finish 6 $1
YD40	J2	Jog mode $2
YD41	H2	Handle mode $2
YD42	S2	Incremental mode $2
YD43	PTP2	Manual arbitrary feed mode $2
YD44	ZRN2	Reference position return mode $2
YD45	AST2	Automatic initialization mode $2
YD48	MEM2	Memory mode $2
YD49	T2	Tape mode $2
YD4A		Online operation mode (Computer link B) $2
YD4B	D2	MDI mode $2
YD4E	SBSM2	Sub part system control: Sub part system control I mode $2
YD50	ST2	Automatic operation "start" command (Cycle start) $2
YD51	*SP2	Automatic operation "pause" command (Feed hold) $2
YD52	SBK2	Single block $2
YD53	*BSL2	Block start interlock $2
YD54	*CSL2	Cutting block start interlock $2
YD55	DRN2	Dry run $2
YD57	ERD2	Error detection $2
YD58	NRST12	NC reset 1 $2
YD59	NRST22	NC reset 2 $2
YD5A	RRW2	Reset & rewind $2
YD5B	*CDZ2	Chamfering $2
YD5C	ARST2	Automatic restart $2
YD5D		External search strobe $2
YD5E	FIN12	M function finish 1 $2

Device	Abbrev.	Signal name
YD5F	FIN22	M function finish 2 $2
YD60	TLM2	Tool length measurement 1 $2
YD61	TLMS2	Tool length measurement 2 $2
YD62		Synchronization correction mode $2
YD63	PRST2	Program restart $2
YD64	PB2	Playback $2
YD65	UIT2	Macro interrupt $2
YD66	RT2	Rapid traverse $2
YD67	VRV2	Reverse run $2
YD68	ABS2	Manual absolute $2
YD69	DLK2	Display lock $2
YD6A	F1D2	F1-digit speed change valid $2
YD6B	CRQ2	Recalculation request $2
YD6C	QEMG2	PLC emergency stop $2
YD6D	RTN2	Reference position retract $2
YD6E	PIT2	PLC interrupt $2
YD70	CHPS2	Chopping $2
YD71	RSST2	Search & start $2
YD74		Chopping parameter valid $2
YD75		Inclined axis control valid $2
YD76		Inclined axis control: No Z axis compensation $2
YD77	BDT12	Optional block skip 1 $2
YD78	BDT22	Optional block skip 2 $2
YD79	BDT32	Optional block skip 3 $2
YD7A	BDT42	Optional block skip 4 $2
YD7B	BDT52	Optional block skip 5 $2
YD7C	BDT62	Optional block skip 6 $2
YD7D	BDT72	Optional block skip 7 $2
YD7E	BDT82	Optional block skip 8 $2
YD7F	BDT92	Optional block skip 9 $2
YD80	HS112	1st handle axis selection code 1 $2
YD81	HS122	1st handle axis selection code 2 $2
YD82	HS142	1st handle axis selection code 4 $2
YD83	HS182	1st handle axis selection code 8 $2
YD84	HS1162	1st handle axis selection code 16 $2
YD87	HS1S2	1st handle valid $2
YD88	HS212	2nd handle axis selection code 1 $2
YD89	HS222	2nd handle axis selection code 2 $2
YD8A	HS242	2nd handle axis selection code 4 $2
YD8B	HS282	2nd handle axis selection code 8 $2
YD8C	HS2162	2nd handle axis selection code 16 $2
YD8F	HS2S2	2nd handle valid $2
YD90	HS312	3rd handle axis selection code 1 $2
YD91	HS322	3rd handle axis selection code 2 $2
YD92	HS342	3rd handle axis selection code 4 $2
YD93	HS382	3rd handle axis selection code 8 $2
YD94	HS3162	3rd handle axis selection code 16 $2
YD97	HS3S2	3rd handle valid $2
YD98	OVC2	Override cancel $2
YD99	OVSL2	Manual override method selection $2
YD9A	AFL2	Miscellaneous function lock $2
YD9C	TRV2	Tap retract $2
YD9E		Tool handle feed mode $2
YDA0	*FV12	Cutting feedrate override code 1 $2
YDA1	*FV22	Cutting feedrate override code 2 $2
YDA2	*FV42	Cutting feedrate override code 4 $2
YDA3	*FV82	Cutting feedrate override code 8 $2
YDA4	*FV162	Cutting feedrate override code 16 $2
YDA6	FV2E2	2nd cutting feedrate override valid $2
YDA7	FVS2	Cutting feedrate override method selection $2
YDA8	ROV12	Rapid traverse override code 1 $2
YDA9	ROV22	Rapid traverse override code 2 $2
YDAF	ROVS2	Rapid traverse override method selection $2
YDB0	*JV12	Manual feedrate code 1 $2
YDB1	*JV22	Manual feedrate code 2 $2
YDB2	*JV42	Manual feedrate code 4 $2
YDB3	*JV82	Manual feedrate code 8 $2
YDB4	*JV162	Manual feedrate code 16 $2
YDB6	MCLMP2	Manual speed clamp ON $2
YDB7	JVS2	Manual feedrate method selection $2
YDB8	PCF12	Feedrate least increment code 1 $2
YDB9	PCF22	Feedrate least increment code 2 $2
YDBB	JHAN2	Jog handle synchronous $2
YDBC		Each axis manual feedrate B valid $2
YDBD		Manual feedrate B surface speed control valid $2
YDBE		Circular feed in manual mode valid $2
YDBF		Coordinate rotation by parameter: Coordinate switch for manual feed $2
YDC0	MP12	Handle/incremental feed magnification code 1 $2
YDC1	MP22	Handle/incremental feed magnification code 2 $2
YDC2	MP42	Handle/incremental feed magnification code 4 $2
YDC6		Magnification valid for each handle $2
YDC7	MPS2	Handle/incremental feed magnification method selection $2

Device	Abbrev.	Signal name
YDC8	TAL12	Tool alarm 1/Tool-skip $2
YDC9	TAL22	Tool alarm 2 $2
YDCA	TCEF2	Usage data count valid $2
YDCB	TLF12	Tool life management input $2
YDCC	TRST2	Tool change reset $2
YDCD		Tool escape and return Transit point designation $2
YDCE		Manual tool length measurement interlock temporarily canceled $2 ▲
YDD0	ZSL12	Reference position selection code 1 $2
YDD1	ZSL22	Reference position selection code 2 $2
YDD2		Tool length compensation along the tool axis Compensation amount change mode $2
YDD3	RTNST2	Tool retract and return 2: Tool return start $2 ▲
YDD4	FFC2	Thread cutting: Feed-forward control request $2
YDD5		In balance cut timing synchronization invalid $2 ▲
YDD7		Reference position selection method $2
YDD8		Tool life management: Temporary cancel of tool life expiration $2
YDD9		Tool life management: Temporary cancel of tool group life expiration $2
YDDA	PRTN2	External search: Program return $2
YDDB		MES interface library: User arbitrary information send request $2 [M8]
YDDD		Manual speed command valid $2
YDDE		Manual speed command sign reversed $2
YDDF		Manual speed command reverse run valid $2
YDE0	CX112	Manual arbitrary feed 1st axis selection code 1 $2
YDE1	CX122	Manual arbitrary feed 1st axis selection code 2 $2
YDE2	CX142	Manual arbitrary feed 1st axis selection code 4 $2
YDE3	CX182	Manual arbitrary feed 1st axis selection code 8 $2
YDE4	CX1162	Manual arbitrary feed 1st axis selection code 16 $2
YDE7	CX1S2	Manual arbitrary feed 1st axis valid $2
YDE8	CX212	Manual arbitrary feed 2nd axis selection code 1 $2
YDE9	CX222	Manual arbitrary feed 2nd axis selection code 2 $2
YDEA	CX242	Manual arbitrary feed 2nd axis selection code 4 $2
YDEB	CX282	Manual arbitrary feed 2nd axis selection code 8 $2
YDEC	CX2162	Manual arbitrary feed 2nd axis selection code 16 $2
YDEF	CX2S2	Manual arbitrary feed 2nd axis valid $2
YDF0	CX312	Manual arbitrary feed 3rd axis selection code 1 $2
YDF1	CX322	Manual arbitrary feed 3rd axis selection code 2 $2
YDF2	CX342	Manual arbitrary feed 3rd axis selection code 4 $2
YDF3	CX382	Manual arbitrary feed 3rd axis selection code 8 $2
YDF4	CX3162	Manual arbitrary feed 3rd axis selection code 16 $2
YDF7	CX3S2	Manual arbitrary feed 3rd axis valid $2
YDF8	CXS12	Manual arbitrary feed Smoothing off $2
YDF9	CXS22	Manual arbitrary feed Axis independent $2
YDFA	CXS32	Manual arbitrary feed EX.F/MODAL.F $2
YDFB	CXS42	Manual arbitrary feed G0/G1 $2
YDFC	CXS52	Manual arbitrary feed MC/WK $2
YDFD	CXS62	Manual arbitrary feed ABS/INC $2
YDFE	*CXS72	Manual arbitrary feed Stop $2
YDFF	CXS82	Manual arbitrary feed Strobe $2
YE00	ILM12	Current limit mode 1 $2
YE01	ILM22	Current limit mode 2 $2
YE03	LDWT2	Load monitor I : Teaching/Monitor execution $2 ▲
YE04		Load monitor I : Teaching mode $2 ▲
YE05		Load monitor I : Monitor mode $2 ▲
YE06		Load monitor I : Alarm reset $2 [M8]
YE07		Load monitor I : Warning reset $2 ▲
YE08	*ZRIT2	2nd reference position return interlock $2
YE09		Load monitor I : Adaptive control execution $2 ▲
YE0A		Small diameter deep hole drilling cycle $2
YE0B		Chuck barrier ON $2
YE0C		High-speed retract function valid $2 ▲
YE0F		Tool retract start $2 ▲
YE10		Waiting ignore $2
YE11		Spindle-spindle polygon cancel $2
YE12		Synchronous tapping command polarity reversal $2
YE13		Spindle OFF mode $2
YE14		Longitudinal hole drilling axis selection $2
YE15		Optimum acceleration/deceleration parameter switching request [axis] $2 ▲
YE16	TRVEC2	Tap retract possible state cancel $2
YE17	CHPRCR2	Chopping compensation update prevention request $2
YE18		Barrier valid (left) $2
YE19		Barrier valid (right) $2
YE1A		Tool presetter sub-side valid $2 ▲
YE1E	HOBRTR2	Hob machining: retract request $2
YE1F	HOBARTC2	Hob machining: alarm retract control $2
YE21		Door open II $2
YE22		Door open signal input (spindle speed monitor) $2
YE23		Door interlock spindle speed clamp $2
YE28		Door open II (2 channels per 1 part system) $2
YE2F		Load monitor I : Cutting torque estimation execution $2 [M8]
YE31	VFTCI2	Variable feed thread cutting invalid $2 ▲
YE34	BCHK2	Barrier check invalid $2
YE38	MSYNC2	Synchronization between part systems OFF $2
YE3A	DRNC2	Dry run invalid $2

Device	Abbrev.	Signal name
YE3B	AUTED2	Automatic error detection $2
YE3C	MRPSG2	Manual arbitrary reverse run: MSTB reverse run prohibited $2
YE3D		G71 Shape judgement disable $2 ▲
YE3E		Appropriate machining diagnosis in progress $2 ▲
YE3F		Appropriate machining diagnosis error reset $2 ▲
YE40	PFCHR2	Program format switch request $2 [M8]
YE41	RBSSY2	Manual arbitrary reverse run: Reverse run block stop designated part system $2
YE48	RVSP2	Reverse run from block start $2
YE49	RVIT2	Macro interrupt priority $2
YE4A	RVMD2	Reverse run control mode $2
YE4B	ACCG2	Rapid traverse time constant: Switchover request $2
YE4C	RT2CHGA2	Real-time tuning 2: Acceleration/deceleration time constant in automatic switchover $2
YE4D	RT2CHGM2	Real-time tuning 2: Acceleration/deceleration time constant in manual switchover $2
YE4E	RT2RST2	Real-time tuning 2: Acceleration/deceleration time constant reset $2
YE54		3D coordinate conversion : Manual feed coordinates conversion $2 [M8]
YE55	RCEE2	Rotation center error compensation enabled $2
YE57	SECE2	Spatial error compensation enabled $2 [M8]
YE58	MJCT2	3D manual feed (JOG, INC) in tool axis coordinate system $2
YE59	MJCB2	3D manual feed (JOG, INC) in table coordinate system $2
YE5A	MJCF2	3D manual feed (JOG, INC) in feature coordinate system $2
YE5B	MH1CT2	3D manual feed (1st handle) in tool axis coordinate system $2
YE5C	MH1CB2	3D manual feed (1st handle) in table coordinate system $2
YE5D	MH1CF2	3D manual feed (1st handle) in feature coordinate system $2
YE5E	MH2CT2	3D manual feed (2nd handle) in tool axis coordinate system $2
YE5F	MH2CB2	3D manual feed (2nd handle) in table coordinate system $2
YE60	MH2CF2	3D manual feed (2nd handle) in feature coordinate system $2
YE61	MH3CT2	3D manual feed (3rd handle) in tool axis coordinate system $2
YE62	MH3CB2	3D manual feed (3rd handle) in table coordinate system $2
YE63	MH3CF2	3D manual feed (3rd handle) in feature coordinate system $2
YE67	TCPRC2	Tool center point rotation $2
YE68	MFIN12	Miscellaneous Function Command High-speed Output: M function finish 1 $2
YE69	MFIN22	Miscellaneous Function Command High-speed Output: M function finish 2 $2
YE6A	MFIN32	Miscellaneous Function Command High-speed Output: M function finish 3 $2
YE6B	MFIN42	Miscellaneous Function Command High-speed Output: M function finish 4 $2
YE6C	SFIN12	Miscellaneous Function Command High-speed Output: S function finish 1 $2
YE6D	SFIN22	Miscellaneous Function Command High-speed Output: S function finish 2 $2
YE6E	SFIN32	Miscellaneous Function Command High-speed Output: S function finish 3 $2
YE6F	SFIN42	Miscellaneous Function Command High-speed Output: S function finish 4 $2
YE70	TFIN12	Miscellaneous Function Command High-speed Output: T function finish 1 $2
YE71	TFIN22	Miscellaneous Function Command High-speed Output: T function finish 2 $2
YE72	TFIN32	Miscellaneous Function Command High-speed Output: T function finish 3 $2
YE73	TFIN42	Miscellaneous Function Command High-speed Output: T function finish 4 $2
YE74	BFIN12	Miscellaneous Function Command High-speed Output: 2nd M function finish 1 $2
YE75	BFIN22	Miscellaneous Function Command High-speed Output: 2nd M function finish 2 $2
YE76	BFIN32	Miscellaneous Function Command High-speed Output: 2nd M function finish 3 $2
YE77	BFIN42	Miscellaneous Function Command High-speed Output: 2nd M function finish 4 $2
YE78	SFIN52	Miscellaneous Function Command High-speed Output: S function finish 5 $2
YE79	SFIN62	Miscellaneous Function Command High-speed Output: S function finish 6 $2
YE80	J3	Jog mode $3
YE81	H3	Handle mode $3
YE82	S3	Incremental mode $3
YE83	PTP3	Manual arbitrary feed mode $3
YE84	ZRN3	Reference position return mode $3
YE85	AST3	Automatic initialization mode $3
YE88	MEM3	Memory mode $3
YE89	T3	Tape mode $3
YE8A		Online operation mode (Computer link B) $3
YE8B	D3	MDI mode $3
YE8E	SBSM3	Sub part system control: Sub part system control I mode $3
YE90	ST3	Automatic operation "start" command (Cycle start) $3
YE91	*SP3	Automatic operation "pause" command (Feed hold) $3
YE92	SBK3	Single block $3
YE93	*BSL3	Block start interlock $3
YE94	*CSL3	Cutting block start interlock $3
YE95	DRN3	Dry run $3
YE97	ERD3	Error detection $3
YE98	NRST13	NC reset 1 $3
YE99	NRST23	NC reset 2 $3
YE9A	RRW3	Reset & rewind $3
YE9B	*CDZ3	Chamfering $3
YE9C	ARST3	Automatic restart $3
YE9D		External search strobe $3
YE9E	FIN13	M function finish 1 $3
YE9F	FIN23	M function finish 2 $3
YEA0	TLM3	Tool length measurement 1 $3
YEA1	TLMS3	Tool length measurement 2 $3
YEA2		Synchronization correction mode $3
YEA3	PRST3	Program restart $3

Device	Abbrev.	Signal name
YEA4	PB3	Playback $3
YEA5	UIT3	Macro interrupt $3
YEA6	RT3	Rapid traverse $3
YEA7	VRV3	Reverse run $3
YEA8	ABS3	Manual absolute $3
YEA9	DLK3	Display lock $3
YEAA	F1D3	F1-digit speed change valid $3
YEAB	CRQ3	Recalculation request $3
YEAC	QEMG3	PLC emergency stop $3
YEAD	RTN3	Reference position retract $3
YEAE	PIT3	PLC interrupt $3
YEB0	CHPS3	Chopping $3
YEB1	RSST3	Search & start $3
YEB4		Chopping parameter valid $3
YEB5		Inclined axis control valid $3
YEB6		Inclined axis control: No Z axis compensation $3
YEB7	BDT13	Optional block skip 1 $3
YEB8	BDT23	Optional block skip 2 $3
YEB9	BDT33	Optional block skip 3 $3
YEBA	BDT43	Optional block skip 4 $3
YEBB	BDT53	Optional block skip 5 $3
YEBC	BDT63	Optional block skip 6 $3
YEBD	BDT73	Optional block skip 7 $3
YEBE	BDT83	Optional block skip 8 $3
YEBF	BDT93	Optional block skip 9 $3
YEC0	HS113	1st handle axis selection code 1 $3
YEC1	HS123	1st handle axis selection code 2 $3
YEC2	HS143	1st handle axis selection code 4 $3
YEC3	HS183	1st handle axis selection code 8 $3
YEC4	HS1163	1st handle axis selection code 16 $3
YEC7	HS1S3	1st handle valid $3
YEC8	HS213	2nd handle axis selection code 1 $3
YEC9	HS223	2nd handle axis selection code 2 $3
YECA	HS243	2nd handle axis selection code 4 $3
YECB	HS283	2nd handle axis selection code 8 $3
YECC	HS2163	2nd handle axis selection code 16 $3
YECF	HS2S3	2nd handle valid $3
YED0	HS313	3rd handle axis selection code 1 $3
YED1	HS323	3rd handle axis selection code 2 $3
YED2	HS343	3rd handle axis selection code 4 $3
YED3	HS383	3rd handle axis selection code 8 $3
YED4	HS3163	3rd handle axis selection code 16 $3
YED7	HS3S3	3rd handle valid $3
YED8	OVC3	Override cancel $3
YED9	OVSL3	Manual override method selection $3
YEDA	AFL3	Miscellaneous function lock $3
YEDC	TRV3	Tap retract $3
YEDE		Tool handle feed mode $3
YEE0	*FV13	Cutting feedrate override code 1 $3
YEE1	*FV23	Cutting feedrate override code 2 $3
YEE2	*FV43	Cutting feedrate override code 4 $3
YEE3	*FV83	Cutting feedrate override code 8 $3
YEE4	*FV163	Cutting feedrate override code 16 $3
YEE6	FV2E3	2nd cutting feedrate override valid $3
YEE7	FVS3	Cutting feedrate override method selection $3
YEE8	ROV13	Rapid traverse override code 1 $3
YEE9	ROV23	Rapid traverse override code 2 $3
YEEF	ROVS3	Rapid traverse override method selection $3
YEF0	*JV13	Manual feedrate code 1 $3
YEF1	*JV23	Manual feedrate code 2 $3
YEF2	*JV43	Manual feedrate code 4 $3
YEF3	*JV83	Manual feedrate code 8 $3
YEF4	*JV163	Manual feedrate code 16 $3
YEF6	MCLMP3	Manual speed clamp ON $3
YEF7	JVS3	Manual feedrate method selection $3
YEF8	PCF13	Feedrate least increment code 1 $3
YEF9	PCF23	Feedrate least increment code 2 $3
YEFB	JHAN3	Jog handle synchronous $3
YEFC		Each axis manual feedrate B valid $3
YEFD		Manual feedrate B surface speed control valid $3
YEFE		Circular feed in manual mode valid $3
YEFF		Coordinate rotation by parameter: Coordinate switch for manual feed $3
YF00	MP13	Handle/incremental feed magnification code 1 $3
YF01	MP23	Handle/incremental feed magnification code 2 $3
YF02	MP43	Handle/incremental feed magnification code 4 $3
YF06		Magnification valid for each handle $3
YF07	MPS3	Handle/incremental feed magnification method selection $3
YF08	TAL13	Tool alarm 1/Tool-skip $3
YF09	TAL23	Tool alarm 2 $3
YF0A	TCEF3	Usage data count valid $3
YF0B	TLF13	Tool life management input $3
YF0C	TRST3	Tool change reset $3

Device	Abbrev.	Signal name
YF0D		Tool escape and return Transit point designation $3
YF0E		Manual tool length measurement interlock temporarily canceled $3 ▲
YF10	ZSL13	Reference position selection code 1 $3
YF11	ZSL23	Reference position selection code 2 $3
YF12		Tool length compensation along the tool axis Compensation amount change mode $3
YF13	RTNST3	Tool retract and return 2: Tool return start $3 ▲
YF14	FFC3	Thread cutting: Feed-forward control request $3
YF15		In balance cut timing synchronization invalid $3 ▲
YF17		Reference position selection method $3
YF18		Tool life management: Temporary cancel of tool life expiration $3
YF19		Tool life management: Temporary cancel of tool group life expiration $3
YF1A	PRTN3	External search: Program return $3
YF1B		MES interface library: User arbitrary information send request $3 [M8]
YF1D		Manual speed command valid $3
YF1E		Manual speed command sign reversed $3
YF1F		Manual speed command reverse run valid $3
YF20	CX113	Manual arbitrary feed 1st axis selection code 1 $3
YF21	CX123	Manual arbitrary feed 1st axis selection code 2 $3
YF22	CX143	Manual arbitrary feed 1st axis selection code 4 $3
YF23	CX183	Manual arbitrary feed 1st axis selection code 8 $3
YF24	CX1163	Manual arbitrary feed 1st axis selection code 16 $3
YF27	CX1S3	Manual arbitrary feed 1st axis valid $3
YF28	CX213	Manual arbitrary feed 2nd axis selection code 1 $3
YF29	CX223	Manual arbitrary feed 2nd axis selection code 2 $3
YF2A	CX243	Manual arbitrary feed 2nd axis selection code 4 $3
YF2B	CX283	Manual arbitrary feed 2nd axis selection code 8 $3
YF2C	CX2163	Manual arbitrary feed 2nd axis selection code 16 $3
YF2F	CX2S3	Manual arbitrary feed 2nd axis valid $3
YF30	CX313	Manual arbitrary feed 3rd axis selection code 1 $3
YF31	CX323	Manual arbitrary feed 3rd axis selection code 2 $3
YF32	CX343	Manual arbitrary feed 3rd axis selection code 4 $3
YF33	CX383	Manual arbitrary feed 3rd axis selection code 8 $3
YF34	CX3163	Manual arbitrary feed 3rd axis selection code 16 $3
YF37	CX3S3	Manual arbitrary feed 3rd axis valid $3
YF38	CXS13	Manual arbitrary feed Smoothing off $3
YF39	CXS23	Manual arbitrary feed Axis independent $3
YF3A	CXS33	Manual arbitrary feed EX.F/MODAL.F $3
YF3B	CXS43	Manual arbitrary feed G0/G1 $3
YF3C	CXS53	Manual arbitrary feed MC/WK $3
YF3D	CXS63	Manual arbitrary feed ABS/INC $3
YF3E	*CXS73	Manual arbitrary feed Stop $3
YF3F	CXS83	Manual arbitrary feed Strobe $3
YF40	ILM13	Current limit mode 1 $3
YF41	ILM23	Current limit mode 2 $3
YF43	LDWT3	Load monitor I : Teaching/Monitor execution $3 ▲
YF44		Load monitor I : Teaching mode $3 ▲
YF45		Load monitor I : Monitor mode $3 ▲
YF46		Load monitor I : Alarm reset $3 [M8]
YF47		Load monitor I : Warning reset $3 ▲
YF48	*ZRIT3	2nd reference position return interlock $3
YF49		Load monitor I : Adaptive control execution $3 ▲
YF4A		Small diameter deep hole drilling cycle $3
YF4B		Chuck barrier ON $3
YF4C		High-speed retract function valid $3 ▲
YF4F		Tool retract start $3 ▲
YF50		Waiting ignore $3
YF51		Spindle-spindle polygon cancel $3
YF52		Synchronous tapping command polarity reversal $3
YF53		Spindle OFF mode $3
YF54		Longitudinal hole drilling axis selection $3
YF55		Optimum acceleration/deceleration parameter switching request [axis] $3 ▲
YF56	TRVEC3	Tap retract possible state cancel $3
YF57	CHPRCR3	Chopping compensation update prevention request $3
YF58		Barrier valid (left) $3
YF59		Barrier valid (right) $3
YF5A		Tool presetter sub-side valid $3 ▲
YF5E	HOBRTR3	Hob machining: retract request $3
YF5F	HOBARTC3	Hob machining: alarm retract control $3
YF61		Door open II $3
YF62		Door open signal input (spindle speed monitor) $3
YF63		Door interlock spindle speed clamp $3
YF68		Door open II (2 channels per 1 part system) $3
YF6F		Load monitor I : Cutting torque estimation execution $3 [M8]
YF71	VFTCI3	Variable feed thread cutting invalid $3 ▲
YF74	BCHK3	Barrier check invalid $3
YF78	MSYNC3	Synchronization between part systems OFF $3
YF7A	DRNC3	Dry run invalid $3
YF7B	AUTED3	Automatic error detection $3
YF7C	MRPSG3	Manual arbitrary reverse run: MSTB reverse run prohibited $3
YF7D		G71 Shape judgement disable $3 ▲
YF7E		Appropriate machining diagnosis in progress $3 ▲
YF7F		Appropriate machining diagnosis error reset $3 ▲

Device	Abbrev.	Signal name
YF80	PFCHR3	Program format switch request $3 [M8]
YF81	RBSSY3	Manual arbitrary reverse run: Reverse run block stop designated part system $3
YF88	RVSP3	Reverse run from block start $3
YF89	RVIT3	Macro interrupt priority $3
YF8A	RVMD3	Reverse run control mode $3
YF8B	ACCG3	Rapid traverse time constant: Switchover request $3
YF8C	RT2CHGA3	Real-time tuning 2: Acceleration/deceleration time constant in automatic switchover $3
YF8D	RT2CHGM3	Real-time tuning 2: Acceleration/deceleration time constant in manual switchover $3
YF8E	RT2RST3	Real-time tuning 2: Acceleration/deceleration time constant reset $3
YF94		3D coordinate conversion : Manual feed coordinates conversion $3 [M8]
YF95	RCEE3	Rotation center error compensation enabled $3
YF97	SECE3	Spatial error compensation enabled $3 [M8]
YF98	MJCT3	3D manual feed (JOG, INC) in tool axis coordinate system $3
YF99	MJCB3	3D manual feed (JOG, INC) in table coordinate system $3
YF9A	MJCF3	3D manual feed (JOG, INC) in feature coordinate system $3
YF9B	MH1CT3	3D manual feed (1st handle) in tool axis coordinate system $3
YF9C	MH1CB3	3D manual feed (1st handle) in table coordinate system $3
YF9D	MH1CF3	3D manual feed (1st handle) in feature coordinate system $3
YF9E	MH2CT3	3D manual feed (2nd handle) in tool axis coordinate system $3
YF9F	MH2CB3	3D manual feed (2nd handle) in table coordinate system $3
YFA0	MH2CF3	3D manual feed (2nd handle) in feature coordinate system $3
YFA1	MH3CT3	3D manual feed (3rd handle) in tool axis coordinate system $3
YFA2	MH3CB3	3D manual feed (3rd handle) in table coordinate system $3
YFA3	MH3CF3	3D manual feed (3rd handle) in feature coordinate system $3
YFA7	TCPRC3	Tool center point rotation $3
YFA8	MFIN13	Miscellaneous Function Command High-speed Output: M function finish 1 $3
YFA9	MFIN23	Miscellaneous Function Command High-speed Output: M function finish 2 $3
YFAA	MFIN33	Miscellaneous Function Command High-speed Output: M function finish 3 $3
YFAB	MFIN43	Miscellaneous Function Command High-speed Output: M function finish 4 $3
YFAC	SFIN13	Miscellaneous Function Command High-speed Output: S function finish 1 $3
YFAD	SFIN23	Miscellaneous Function Command High-speed Output: S function finish 2 $3
YFAE	SFIN33	Miscellaneous Function Command High-speed Output: S function finish 3 $3
YFAF	SFIN43	Miscellaneous Function Command High-speed Output: S function finish 4 $3
YFB0	TFIN13	Miscellaneous Function Command High-speed Output: T function finish 1 $3
YFB1	TFIN23	Miscellaneous Function Command High-speed Output: T function finish 2 $3
YFB2	TFIN33	Miscellaneous Function Command High-speed Output: T function finish 3 $3
YFB3	TFIN43	Miscellaneous Function Command High-speed Output: T function finish 4 $3
YFB4	BFIN13	Miscellaneous Function Command High-speed Output: 2nd M function finish 1 $3
YFB5	BFIN23	Miscellaneous Function Command High-speed Output: 2nd M function finish 2 $3
YFB6	BFIN33	Miscellaneous Function Command High-speed Output: 2nd M function finish 3 $3
YFB7	BFIN43	Miscellaneous Function Command High-speed Output: 2nd M function finish 4 $3
YFB8	SFIN53	Miscellaneous Function Command High-speed Output: S function finish 5 $3
YFB9	SFIN63	Miscellaneous Function Command High-speed Output: S function finish 6 $3
YFC0	J4	Jog mode $4
YFC1	H4	Handle mode $4
YFC2	S4	Incremental mode $4
YFC3	PTP4	Manual arbitrary feed mode $4
YFC4	ZRN4	Reference position return mode $4
YFC5	AST4	Automatic initialization mode $4
YFC8	MEM4	Memory mode $4
YFC9	T4	Tape mode $4
YFCA		Online operation mode (Computer link B) $4
YFCB	D4	MDI mode $4
YFCE	SBSM4	Sub part system control: Sub part system control I mode $4
YFD0	ST4	Automatic operation "start" command (Cycle start) $4
YFD1	*SP4	Automatic operation "pause" command (Feed hold) $4
YFD2	SBK4	Single block $4
YFD3	*BSL4	Block start interlock $4
YFD4	*CSL4	Cutting block start interlock $4
YFD5	DRN4	Dry run $4
YFD7	ERD4	Error detection $4
YFD8	NRST14	NC reset 1 $4
YFD9	NRST24	NC reset 2 $4
YFDA	RRW4	Reset & rewind $4
YFDB	*CDZ4	Chamfering $4
YFDC	ARST4	Automatic restart $4
YFDD		External search strobe $4
YFDE	FIN14	M function finish 1 $4
YFDF	FIN24	M function finish 2 $4
YFE0	TLM4	Tool length measurement 1 $4
YFE1	TLMS4	Tool length measurement 2 $4
YFE2		Synchronization correction mode $4
YFE3	PRST4	Program restart $4
YFE4	PB4	Playback $4
YFE5	UIT4	Macro interrupt $4
YFE6	RT4	Rapid traverse $4
YFE7	VRV4	Reverse run $4
YFE8	ABS4	Manual absolute $4

Device	Abbrev.	Signal name
YFE9	DLK4	Display lock $4
YFEA	F1D4	F1-digit speed change valid $4
YFEB	CRQ4	Recalculation request $4
YFEC	QEMG4	PLC emergency stop $4
YFED	RTN4	Reference position retract $4
YFEE	PIT4	PLC interrupt $4
YFF0	CHPS4	Chopping $4
YFF1	RSST4	Search & start $4
YFF4		Chopping parameter valid $4
YFF5		Inclined axis control valid $4
YFF6		Inclined axis control: No Z axis compensation $4
YFF7	BDT14	Optional block skip 1 $4
YFF8	BDT24	Optional block skip 2 $4
YFF9	BDT34	Optional block skip 3 $4
YFFA	BDT44	Optional block skip 4 $4
YFFB	BDT54	Optional block skip 5 $4
YFFC	BDT64	Optional block skip 6 $4
YFFD	BDT74	Optional block skip 7 $4
YFFE	BDT84	Optional block skip 8 $4
YFFF	BDT94	Optional block skip 9 $4
Y1000	HS114	1st handle axis selection code 1 $4
Y1001	HS124	1st handle axis selection code 2 $4
Y1002	HS144	1st handle axis selection code 4 $4
Y1003	HS184	1st handle axis selection code 8 $4
Y1004	HS1164	1st handle axis selection code 16 $4
Y1007	HS1S4	1st handle valid $4
Y1008	HS214	2nd handle axis selection code 1 $4
Y1009	HS224	2nd handle axis selection code 2 $4
Y100A	HS244	2nd handle axis selection code 4 $4
Y100B	HS284	2nd handle axis selection code 8 $4
Y100C	HS2164	2nd handle axis selection code 16 $4
Y100F	HS2S4	2nd handle valid $4
Y1010	HS314	3rd handle axis selection code 1 $4
Y1011	HS324	3rd handle axis selection code 2 $4
Y1012	HS344	3rd handle axis selection code 4 $4
Y1013	HS384	3rd handle axis selection code 8 $4
Y1014	HS3164	3rd handle axis selection code 16 $4
Y1017	HS3S4	3rd handle valid $4
Y1018	OVC4	Override cancel $4
Y1019	OVSL4	Manual override method selection $4
Y101A	AFL4	Miscellaneous function lock $4
Y101C	TRV4	Tap retract $4
Y101E		Tool handle feed mode $4
Y1020	*FV14	Cutting feedrate override code 1 $4
Y1021	*FV24	Cutting feedrate override code 2 $4
Y1022	*FV44	Cutting feedrate override code 4 $4
Y1023	*FV84	Cutting feedrate override code 8 $4
Y1024	*FV164	Cutting feedrate override code 16 $4
Y1026	FV2E4	2nd cutting feedrate override valid $4
Y1027	FVS4	Cutting feedrate override method selection $4
Y1028	ROV14	Rapid traverse override code 1 $4
Y1029	ROV24	Rapid traverse override code 2 $4
Y102F	ROVS4	Rapid traverse override method selection $4
Y1030	*JV14	Manual feedrate code 1 $4
Y1031	*JV24	Manual feedrate code 2 $4
Y1032	*JV44	Manual feedrate code 4 $4
Y1033	*JV84	Manual feedrate code 8 $4
Y1034	*JV164	Manual feedrate code 16 $4
Y1036	MCLMP4	Manual speed clamp ON $4
Y1037	JVS4	Manual feedrate method selection $4
Y1038	PCF14	Feedrate least increment code 1 $4
Y1039	PCF24	Feedrate least increment code 2 $4
Y103B	JHAN4	Jog handle synchronous $4
Y103C		Each axis manual feedrate B valid $4
Y103D		Manual feedrate B surface speed control valid $4
Y103E		Circular feed in manual mode valid $4
Y103F		Coordinate rotation by parameter: Coordinate switch for manual feed $4
Y1040	MP14	Handle/incremental feed magnification code 1 $4
Y1041	MP24	Handle/incremental feed magnification code 2 $4
Y1042	MP44	Handle/incremental feed magnification code 4 $4
Y1046		Magnification valid for each handle $4
Y1047	MPS4	Handle/incremental feed magnification method selection $4
Y1048	TAL14	Tool alarm 1/Tool-skip $4
Y1049	TAL24	Tool alarm 2 $4
Y104A	TCEF4	Usage data count valid $4
Y104B	TLF14	Tool life management input $4
Y104C	TRST4	Tool change reset $4
Y104D		Tool escape and return Transit point designation $4
Y104E		Manual tool length measurement interlock temporarily canceled $4 ▲
Y1050	ZSL14	Reference position selection code 1 $4
Y1051	ZSL24	Reference position selection code 2 $4
Y1052		Tool length compensation along the tool axis Compensation amount change mode $4

Device	Abbrev.	Signal name
Y1053	RTNST4	Tool retract and return 2: Tool return start $4 ▲
Y1054	FFC4	Thread cutting: Feed-forward control request $4
Y1055		In balance cut timing synchronization invalid $4 ▲
Y1057		Reference position selection method $4
Y1058		Tool life management: Temporary cancel of tool life expiration $4
Y1059		Tool life management: Temporary cancel of tool group life expiration $4
Y105A	PRTN4	External search: Program return $4
Y105B		MES interface library: User arbitrary information send request $4 [M8]
Y105D		Manual speed command valid $4
Y105E		Manual speed command sign reversed $4
Y105F		Manual speed command reverse run valid $4
Y1060	CX114	Manual arbitrary feed 1st axis selection code 1 $4
Y1061	CX124	Manual arbitrary feed 1st axis selection code 2 $4
Y1062	CX144	Manual arbitrary feed 1st axis selection code 4 $4
Y1063	CX184	Manual arbitrary feed 1st axis selection code 8 $4
Y1064	CX1164	Manual arbitrary feed 1st axis selection code 16 $4
Y1067	CX1S4	Manual arbitrary feed 1st axis valid $4
Y1068	CX214	Manual arbitrary feed 2nd axis selection code 1 $4
Y1069	CX224	Manual arbitrary feed 2nd axis selection code 2 $4
Y106A	CX244	Manual arbitrary feed 2nd axis selection code 4 $4
Y106B	CX284	Manual arbitrary feed 2nd axis selection code 8 $4
Y106C	CX2164	Manual arbitrary feed 2nd axis selection code 16 $4
Y106F	CX2S4	Manual arbitrary feed 2nd axis valid $4
Y1070	CX314	Manual arbitrary feed 3rd axis selection code 1 $4
Y1071	CX324	Manual arbitrary feed 3rd axis selection code 2 $4
Y1072	CX344	Manual arbitrary feed 3rd axis selection code 4 $4
Y1073	CX384	Manual arbitrary feed 3rd axis selection code 8 $4
Y1074	CX3164	Manual arbitrary feed 3rd axis selection code 16 $4
Y1077	CX3S4	Manual arbitrary feed 3rd axis valid $4
Y1078	CXS14	Manual arbitrary feed Smoothing off $4
Y1079	CXS24	Manual arbitrary feed Axis independent $4
Y107A	CXS34	Manual arbitrary feed EX.F/MODAL.F $4
Y107B	CXS44	Manual arbitrary feed G0/G1 $4
Y107C	CXS54	Manual arbitrary feed MC/WK $4
Y107D	CXS64	Manual arbitrary feed ABS/INC $4
Y107E	*CXS74	Manual arbitrary feed Stop $4
Y107F	CXS84	Manual arbitrary feed Strobe $4
Y1080	ILM14	Current limit mode 1 $4
Y1081	ILM24	Current limit mode 2 $4
Y1083	LDWT4	Load monitor I : Teaching/Monitor execution $4 ▲
Y1084		Load monitor I : Teaching mode $4 ▲
Y1085		Load monitor I : Monitor mode $4 ▲
Y1086		Load monitor I : Alarm reset $4 [M8]
Y1087		Load monitor I : Warning reset $4 ▲
Y1088	*ZRIT4	2nd reference position return interlock $4
Y1089		Load monitor I : Adaptive control execution $4 ▲
Y108A		Small diameter deep hole drilling cycle $4
Y108B		Chuck barrier ON $4
Y108C		High-speed retract function valid $4 ▲
Y108F		Tool retract start $4 ▲
Y1090		Waiting ignore $4
Y1091		Spindle-spindle polygon cancel $4
Y1092		Synchronous tapping command polarity reversal $4
Y1093		Spindle OFF mode $4
Y1094		Longitudinal hole drilling axis selection $4
Y1095		Optimum acceleration/deceleration parameter switching request [axis] $4 ▲
Y1096	TRVEC4	Tap retract possible state cancel $4
Y1097	CHPRCR4	Chopping compensation update prevention request $4
Y1098		Barrier valid (left) $4
Y1099		Barrier valid (right) $4
Y109A		Tool presetter sub-side valid $4 ▲
Y109E	HOBRTR4	Hob machining: retract request $4
Y109F	HOBARTC4	Hob machining: alarm retract control $4
Y10A1		Door open II $4
Y10A2		Door open signal input (spindle speed monitor) $4
Y10A3		Door interlock spindle speed clamp $4
Y10A8		Door open II (2 channels per 1 part system) $4
Y10AF		Load monitor I : Cutting torque estimation execution $4 [M8]
Y10B1	VFTCI4	Variable feed thread cutting invalid $4 ▲
Y10B4	BCHK4	Barrier check invalid $4
Y10B8	MSYNC4	Synchronization between part systems OFF $4
Y10BA	DRNC4	Dry run invalid $4
Y10BB	AUTED4	Automatic error detection $4
Y10BC	MRPSG4	Manual arbitrary reverse run: MSTB reverse run prohibited $4
Y10BD		G71 Shape judgement disable $4 ▲
Y10BE		Appropriate machining diagnosis in progress $4 ▲
Y10BF		Appropriate machining diagnosis error reset $4 ▲
Y10C0	PFCHR4	Program format switch request $4 [M8]
Y10C1	RBSSY4	Manual arbitrary reverse run: Reverse run block stop designated part system $4
Y10C8	RVSP4	Reverse run from block start $4
Y10C9	RVIT4	Macro interrupt priority $4
Y10CA	RVMD4	Reverse run control mode $4

Device	Abbrev.	Signal name
Y10CB	ACCG4	Rapid traverse time constant: Switchover request $4
Y10CC	RT2CHGA4	Real-time tuning 2: Acceleration/deceleration time constant in automatic switchover $4
Y10CD	RT2CHGM4	Real-time tuning 2: Acceleration/deceleration time constant in manual switchover $4
Y10CE	RT2RST4	Real-time tuning 2: Acceleration/deceleration time constant reset $4
Y10D4		3D coordinate conversion : Manual feed coordinates conversion $4 [M8]
Y10D5	RCEE4	Rotation center error compensation enabled $4
Y10D7	SECE4	Spatial error compensation enabled $4 [M8]
Y10D8	MJCT4	3D manual feed (JOG, INC) in tool axis coordinate system $4
Y10D9	MJCB4	3D manual feed (JOG, INC) in table coordinate system $4
Y10DA	MJCF4	3D manual feed (JOG, INC) in feature coordinate system $4
Y10DB	MH1CT4	3D manual feed (1st handle) in tool axis coordinate system $4
Y10DC	MH1CB4	3D manual feed (1st handle) in table coordinate system $4
Y10DD	MH1CF4	3D manual feed (1st handle) in feature coordinate system $4
Y10DE	MH2CT4	3D manual feed (2nd handle) in tool axis coordinate system $4
Y10DF	MH2CB4	3D manual feed (2nd handle) in table coordinate system $4
Y10E0	MH2CF4	3D manual feed (2nd handle) in feature coordinate system $4
Y10E1	MH3CT4	3D manual feed (3rd handle) in tool axis coordinate system $4
Y10E2	MH3CB4	3D manual feed (3rd handle) in table coordinate system $4
Y10E3	MH3CF4	3D manual feed (3rd handle) in feature coordinate system $4
Y10E7	TCPRC4	Tool center point rotation $4
Y10E8	MFIN14	Miscellaneous Function Command High-speed Output: M function finish 1 $4
Y10E9	MFIN24	Miscellaneous Function Command High-speed Output: M function finish 2 $4
Y10EA	MFIN34	Miscellaneous Function Command High-speed Output: M function finish 3 $4
Y10EB	MFIN44	Miscellaneous Function Command High-speed Output: M function finish 4 $4
Y10EC	SFIN14	Miscellaneous Function Command High-speed Output: S function finish 1 $4
Y10ED	SFIN24	Miscellaneous Function Command High-speed Output: S function finish 2 $4
Y10EE	SFIN34	Miscellaneous Function Command High-speed Output: S function finish 3 $4
Y10EF	SFIN44	Miscellaneous Function Command High-speed Output: S function finish 4 $4
Y10F0	TFIN14	Miscellaneous Function Command High-speed Output: T function finish 1 $4
Y10F1	TFIN24	Miscellaneous Function Command High-speed Output: T function finish 2 $4
Y10F2	TFIN34	Miscellaneous Function Command High-speed Output: T function finish 3 $4
Y10F3	TFIN44	Miscellaneous Function Command High-speed Output: T function finish 4 $4
Y10F4	BFIN14	Miscellaneous Function Command High-speed Output: 2nd M function finish 1 $4
Y10F5	BFIN24	Miscellaneous Function Command High-speed Output: 2nd M function finish 2 $4
Y10F6	BFIN34	Miscellaneous Function Command High-speed Output: 2nd M function finish 3 $4
Y10F7	BFIN44	Miscellaneous Function Command High-speed Output: 2nd M function finish 4 $4
Y10F8	SFIN54	Miscellaneous Function Command High-speed Output: S function finish 5 $4
Y10F9	SFIN64	Miscellaneous Function Command High-speed Output: S function finish 6 $4
Y1100	J5	Jog mode $5
Y1101	H5	Handle mode $5
Y1102	S5	Incremental mode $5
Y1103	PTP5	Manual arbitrary feed mode $5
Y1104	ZRN5	Reference position return mode $5
Y1105	AST5	Automatic initialization mode $5
Y1108	MEM5	Memory mode $5
Y1109	T5	Tape mode $5
Y110A		Online operation mode (Computer link B) $5
Y110B	D5	MDI mode $5
Y110E	SBSM5	Sub part system control: Sub part system control I mode $5
Y1110	ST5	Automatic operation "start" command (Cycle start) $5
Y1111	*SP5	Automatic operation "pause" command (Feed hold) $5
Y1112	SBK5	Single block $5
Y1113	*BSL5	Block start interlock $5
Y1114	*CSL5	Cutting block start interlock $5
Y1115	DRN5	Dry run $5
Y1117	ERD5	Error detection $5
Y1118	NRST15	NC reset 1 $5
Y1119	NRST25	NC reset 2 $5
Y111A	RRW5	Reset & rewind $5
Y111B	*CDZ5	Chamfering $5
Y111C	ARST5	Automatic restart $5
Y111D		External search strobe $5
Y111E	FIN15	M function finish 1 $5
Y111F	FIN25	M function finish 2 $5
Y1120	TLM5	Tool length measurement 1 $5
Y1121	TLMS5	Tool length measurement 2 $5
Y1122		Synchronization correction mode $5
Y1123	PRST5	Program restart $5
Y1124	PB5	Playback $5
Y1125	UIT5	Macro interrupt $5
Y1126	RT5	Rapid traverse $5
Y1127	VRV5	Reverse run $5
Y1128	ABS5	Manual absolute $5
Y1129	DLK5	Display lock $5
Y112A	F1D5	F1-digit speed change valid $5
Y112B	CRQ5	Recalculation request $5
Y112C	QEMG5	PLC emergency stop $5
Y112D	RTN5	Reference position retract $5

Device	Abbrev.	Signal name
Y112E	PIT5	PLC interrupt $5
Y1130	CHPS5	Chopping $5
Y1131	RSST5	Search & start $5
Y1134		Chopping parameter valid $5
Y1135		Inclined axis control valid $5
Y1136		Inclined axis control: No Z axis compensation $5
Y1137	BDT15	Optional block skip 1 $5
Y1138	BDT25	Optional block skip 2 $5
Y1139	BDT35	Optional block skip 3 $5
Y113A	BDT45	Optional block skip 4 $5
Y113B	BDT55	Optional block skip 5 $5
Y113C	BDT65	Optional block skip 6 $5
Y113D	BDT75	Optional block skip 7 $5
Y113E	BDT85	Optional block skip 8 $5
Y113F	BDT95	Optional block skip 9 $5
Y1140	HS115	1st handle axis selection code 1 $5
Y1141	HS125	1st handle axis selection code 2 $5
Y1142	HS145	1st handle axis selection code 4 $5
Y1143	HS185	1st handle axis selection code 8 $5
Y1144	HS1165	1st handle axis selection code 16 $5
Y1147	HS1S5	1st handle valid $5
Y1148	HS215	2nd handle axis selection code 1 $5
Y1149	HS225	2nd handle axis selection code 2 $5
Y114A	HS245	2nd handle axis selection code 4 $5
Y114B	HS285	2nd handle axis selection code 8 $5
Y114C	HS2165	2nd handle axis selection code 16 $5
Y114F	HS2S5	2nd handle valid $5
Y1150	HS315	3rd handle axis selection code 1 $5
Y1151	HS325	3rd handle axis selection code 2 $5
Y1152	HS345	3rd handle axis selection code 4 $5
Y1153	HS385	3rd handle axis selection code 8 $5
Y1154	HS3165	3rd handle axis selection code 16 $5
Y1157	HS3S5	3rd handle valid $5
Y1158	OVC5	Override cancel $5
Y1159	OVSL5	Manual override method selection $5
Y115A	AFL5	Miscellaneous function lock $5
Y115C	TRV5	Tap retract $5
Y115E		Tool handle feed mode $5
Y1160	*FV15	Cutting feedrate override code 1 $5
Y1161	*FV25	Cutting feedrate override code 2 $5
Y1162	*FV45	Cutting feedrate override code 4 $5
Y1163	*FV85	Cutting feedrate override code 8 $5
Y1164	*FV165	Cutting feedrate override code 16 $5
Y1166	FV2E5	2nd cutting feedrate override valid $5
Y1167	FVS5	Cutting feedrate override method selection $5
Y1168	ROV15	Rapid traverse override code 1 $5
Y1169	ROV25	Rapid traverse override code 2 $5
Y116F	ROVS5	Rapid traverse override method selection $5
Y1170	*JV15	Manual feedrate code 1 $5
Y1171	*JV25	Manual feedrate code 2 $5
Y1172	*JV45	Manual feedrate code 4 $5
Y1173	*JV85	Manual feedrate code 8 $5
Y1174	*JV165	Manual feedrate code 16 $5
Y1176	MCLMP5	Manual speed clamp ON $5
Y1177	JVS5	Manual feedrate method selection $5
Y1178	PCF15	Feedrate least increment code 1 $5
Y1179	PCF25	Feedrate least increment code 2 $5
Y117B	JHAN5	Jog handle synchronous $5
Y117C		Each axis manual feedrate B valid $5
Y117D		Manual feedrate B surface speed control valid $5
Y117E		Circular feed in manual mode valid $5
Y117F		Coordinate rotation by parameter: Coordinate switch for manual feed $5
Y1180	MP15	Handle/incremental feed magnification code 1 $5
Y1181	MP25	Handle/incremental feed magnification code 2 $5
Y1182	MP45	Handle/incremental feed magnification code 4 $5
Y1186		Magnification valid for each handle $5
Y1187	MPS5	Handle/incremental feed magnification method selection $5
Y1188	TAL15	Tool alarm 1/Tool-skip $5
Y1189	TAL25	Tool alarm 2 $5
Y118A	TCEF5	Usage data count valid $5
Y118B	TLF15	Tool life management input $5
Y118C	TRST5	Tool change reset $5
Y118D		Tool escape and return Transit point designation $5
Y118E		Manual tool length measurement interlock temporarily canceled $5 ▲
Y1190	ZSL15	Reference position selection code 1 $5
Y1191	ZSL25	Reference position selection code 2 $5
Y1192		Tool length compensation along the tool axis Compensation amount change mode $5
Y1193	RTNST5	Tool retract and return 2: Tool return start $5 ▲
Y1194	FFC5	Thread cutting: Feed-forward control request $5
Y1195		In balance cut timing synchronization invalid $5 ▲
Y1197		Reference position selection method $5
Y1198		Tool life management: Temporary cancel of tool life expiration $5

Device	Abbrev.	Signal name
Y1199		Tool life management: Temporary cancel of tool group life expiration $5
Y119A	PRTN5	External search: Program return $5
Y119B		MES interface library: User arbitrary information send request $5 [M8]
Y119D		Manual speed command valid $5
Y119E		Manual speed command sign reversed $5
Y119F		Manual speed command reverse run valid $5
Y11A0	CX115	Manual arbitrary feed 1st axis selection code 1 $5
Y11A1	CX125	Manual arbitrary feed 1st axis selection code 2 $5
Y11A2	CX145	Manual arbitrary feed 1st axis selection code 4 $5
Y11A3	CX185	Manual arbitrary feed 1st axis selection code 8 $5
Y11A4	CX1165	Manual arbitrary feed 1st axis selection code 16 $5
Y11A7	CX1S5	Manual arbitrary feed 1st axis valid $5
Y11A8	CX215	Manual arbitrary feed 2nd axis selection code 1 $5
Y11A9	CX225	Manual arbitrary feed 2nd axis selection code 2 $5
Y11AA	CX245	Manual arbitrary feed 2nd axis selection code 4 $5
Y11AB	CX285	Manual arbitrary feed 2nd axis selection code 8 $5
Y11AC	CX2165	Manual arbitrary feed 2nd axis selection code 16 $5
Y11AF	CX2S5	Manual arbitrary feed 2nd axis valid $5
Y11B0	CX315	Manual arbitrary feed 3rd axis selection code 1 $5
Y11B1	CX325	Manual arbitrary feed 3rd axis selection code 2 $5
Y11B2	CX345	Manual arbitrary feed 3rd axis selection code 4 $5
Y11B3	CX385	Manual arbitrary feed 3rd axis selection code 8 $5
Y11B4	CX3165	Manual arbitrary feed 3rd axis selection code 16 $5
Y11B7	CX3S5	Manual arbitrary feed 3rd axis valid $5
Y11B8	CXS15	Manual arbitrary feed Smoothing off $5
Y11B9	CXS25	Manual arbitrary feed Axis independent $5
Y11BA	CXS35	Manual arbitrary feed EX.F/MODAL.F $5
Y11BB	CXS45	Manual arbitrary feed G0/G1 $5
Y11BC	CXS55	Manual arbitrary feed MC/WK $5
Y11BD	CXS65	Manual arbitrary feed ABS/INC $5
Y11BE	*CXS75	Manual arbitrary feed Stop $5
Y11BF	CXS85	Manual arbitrary feed Strobe $5
Y11C0	ILM15	Current limit mode 1 $5
Y11C1	ILM25	Current limit mode 2 $5
Y11C3	LDWT5	Load monitor I : Teaching/Monitor execution $5 ▲
Y11C4		Load monitor I : Teaching mode $5 ▲
Y11C5		Load monitor I : Monitor mode $5 ▲
Y11C6		Load monitor I : Alarm reset $5 [M8]
Y11C7		Load monitor I : Warning reset $5 ▲
Y11C8	*ZRIT5	2nd reference position return interlock $5
Y11C9		Load monitor I : Adaptive control execution $5 ▲
Y11CA		Small diameter deep hole drilling cycle $5
Y11CB		Chuck barrier ON $5
Y11CC		High-speed retract function valid $5 ▲
Y11CF		Tool retract start $5 ▲
Y11D0		Waiting ignore $5
Y11D1		Spindle-spindle polygon cancel $5
Y11D2		Synchronous tapping command polarity reversal $5
Y11D3		Spindle OFF mode $5
Y11D4		Longitudinal hole drilling axis selection $5
Y11D5		Optimum acceleration/deceleration parameter switching request [axis] $5 ▲
Y11D6	TRVEC5	Tap retract possible state cancel $5
Y11D7	CHPRCR5	Chopping compensation update prevention request $5
Y11D8		Barrier valid (left) $5
Y11D9		Barrier valid (right) $5
Y11DA		Tool presetter sub-side valid $5 ▲
Y11DE	HOBRTR5	Hob machining: retract request $5
Y11DF	HOBARTC5	Hob machining: alarm retract control $5
Y11E1		Door open II $5
Y11E2		Door open signal input (spindle speed monitor) $5
Y11E3		Door interlock spindle speed clamp $5
Y11E8		Door open II (2 channels per 1 part system) $5
Y11EF		Load monitor I : Cutting torque estimation execution $5 [M8]
Y11F1	VFTCI5	Variable feed thread cutting invalid $5 ▲
Y11F4	BCHK5	Barrier check invalid $5
Y11F8	MSYNC5	Synchronization between part systems OFF $5
Y11FA	DRNC5	Dry run invalid $5
Y11FB	AUTED5	Automatic error detection $5
Y11FC	MRPSG5	Manual arbitrary reverse run: MSTB reverse run prohibited $5
Y11FD		G71 Shape judgement disable $5 ▲
Y11FE		Appropriate machining diagnosis in progress $5 ▲
Y11FF		Appropriate machining diagnosis error reset $5 ▲
Y1200	PFCHR5	Program format switch request $5 [M8]
Y1201	RBSSY5	Manual arbitrary reverse run: Reverse run block stop designated part system $5
Y1208	RVSP5	Reverse run from block start $5
Y1209	RVIT5	Macro interrupt priority $5
Y120A	RVMD5	Reverse run control mode $5
Y120B	ACCG5	Rapid traverse time constant: Switchover request $5
Y120C	RT2CHGA5	Real-time tuning 2: Acceleration/deceleration time constant in automatic switchover $5
Y120D	RT2CHGM5	Real-time tuning 2: Acceleration/deceleration time constant in manual switchover $5
Y120E	RT2RST5	Real-time tuning 2: Acceleration/deceleration time constant reset $5

Device	Abbrev.	Signal name
Y1214		3D coordinate conversion : Manual feed coordinates conversion $5 [M8]
Y1215	RCEE5	Rotation center error compensation enabled $5
Y1217	SECE5	Spatial error compensation enabled $5 [M8]
Y1218	MJCT5	3D manual feed (JOG, INC) in tool axis coordinate system $5
Y1219	MJCB5	3D manual feed (JOG, INC) in table coordinate system $5
Y121A	MJCF5	3D manual feed (JOG, INC) in feature coordinate system $5
Y121B	MH1CT5	3D manual feed (1st handle) in tool axis coordinate system $5
Y121C	MH1CB5	3D manual feed (1st handle) in table coordinate system $5
Y121D	MH1CF5	3D manual feed (1st handle) in feature coordinate system $5
Y121E	MH2CT5	3D manual feed (2nd handle) in tool axis coordinate system $5
Y121F	MH2CB5	3D manual feed (2nd handle) in table coordinate system $5
Y1220	MH2CF5	3D manual feed (2nd handle) in feature coordinate system $5
Y1221	MH3CT5	3D manual feed (3rd handle) in tool axis coordinate system $5
Y1222	MH3CB5	3D manual feed (3rd handle) in table coordinate system $5
Y1223	MH3CF5	3D manual feed (3rd handle) in feature coordinate system $5
Y1227	TCPRC5	Tool center point rotation $5
Y1228	MFIN15	Miscellaneous Function Command High-speed Output: M function finish 1 $5
Y1229	MFIN25	Miscellaneous Function Command High-speed Output: M function finish 2 $5
Y122A	MFIN35	Miscellaneous Function Command High-speed Output: M function finish 3 $5
Y122B	MFIN45	Miscellaneous Function Command High-speed Output: M function finish 4 $5
Y122C	SFIN15	Miscellaneous Function Command High-speed Output: S function finish 1 $5
Y122D	SFIN25	Miscellaneous Function Command High-speed Output: S function finish 2 $5
Y122E	SFIN35	Miscellaneous Function Command High-speed Output: S function finish 3 $5
Y122F	SFIN45	Miscellaneous Function Command High-speed Output: S function finish 4 $5
Y1230	TFIN15	Miscellaneous Function Command High-speed Output: T function finish 1 $5
Y1231	TFIN25	Miscellaneous Function Command High-speed Output: T function finish 2 $5
Y1232	TFIN35	Miscellaneous Function Command High-speed Output: T function finish 3 $5
Y1233	TFIN45	Miscellaneous Function Command High-speed Output: T function finish 4 $5
Y1234	BFIN15	Miscellaneous Function Command High-speed Output: 2nd M function finish 1 $5
Y1235	BFIN25	Miscellaneous Function Command High-speed Output: 2nd M function finish 2 $5
Y1236	BFIN35	Miscellaneous Function Command High-speed Output: 2nd M function finish 3 $5
Y1237	BFIN45	Miscellaneous Function Command High-speed Output: 2nd M function finish 4 $5
Y1238	SFIN55	Miscellaneous Function Command High-speed Output: S function finish 5 $5
Y1239	SFIN65	Miscellaneous Function Command High-speed Output: S function finish 6 $5
Y1240	J6	Jog mode $6
Y1241	H6	Handle mode $6
Y1242	S6	Incremental mode $6
Y1243	PTP6	Manual arbitrary feed mode $6
Y1244	ZRN6	Reference position return mode $6
Y1245	AST6	Automatic initialization mode $6
Y1248	MEM6	Memory mode $6
Y1249	T6	Tape mode $6
Y124A		Online operation mode (Computer link B) $6
Y124B	D6	MDI mode $6
Y124E	SBSM6	Sub part system control: Sub part system control I mode $6
Y1250	ST6	Automatic operation "start" command (Cycle start) $6
Y1251	*SP6	Automatic operation "pause" command (Feed hold) $6
Y1252	SBK6	Single block $6
Y1253	*BSL6	Block start interlock $6
Y1254	*CSL6	Cutting block start interlock $6
Y1255	DRN6	Dry run $6
Y1257	ERD6	Error detection $6
Y1258	NRST16	NC reset 1 $6
Y1259	NRST26	NC reset 2 $6
Y125A	RRW6	Reset & rewind $6
Y125B	*CDZ6	Chamfering $6
Y125C	ARST6	Automatic restart $6
Y125D		External search strobe $6
Y125E	FIN16	M function finish 1 $6
Y125F	FIN26	M function finish 2 $6
Y1260	TLM6	Tool length measurement 1 $6
Y1261	TLMS6	Tool length measurement 2 $6
Y1262		Synchronization correction mode $6
Y1263	PRST6	Program restart $6
Y1264	PB6	Playback $6
Y1265	UIT6	Macro interrupt $6
Y1266	RT6	Rapid traverse $6
Y1267	VRV6	Reverse run $6
Y1268	ABS6	Manual absolute $6
Y1269	DLK6	Display lock $6
Y126A	F1D6	F1-digit speed change valid $6
Y126B	CRQ6	Recalculation request $6
Y126C	QEMG6	PLC emergency stop $6
Y126D	RTN6	Reference position retract $6
Y126E	PIT6	PLC interrupt $6
Y1270	CHPS6	Chopping $6
Y1271	RSST6	Search & start $6
Y1274		Chopping parameter valid $6
Y1275		Inclined axis control valid $6

Device	Abbrev.	Signal name
Y1276		Inclined axis control: No Z axis compensation $6
Y1277	BDT16	Optional block skip 1 $6
Y1278	BDT26	Optional block skip 2 $6
Y1279	BDT36	Optional block skip 3 $6
Y127A	BDT46	Optional block skip 4 $6
Y127B	BDT56	Optional block skip 5 $6
Y127C	BDT66	Optional block skip 6 $6
Y127D	BDT76	Optional block skip 7 $6
Y127E	BDT86	Optional block skip 8 $6
Y127F	BDT96	Optional block skip 9 $6
Y1280	HS116	1st handle axis selection code 1 $6
Y1281	HS126	1st handle axis selection code 2 $6
Y1282	HS146	1st handle axis selection code 4 $6
Y1283	HS186	1st handle axis selection code 8 $6
Y1284	HS1166	1st handle axis selection code 16 $6
Y1287	HS1S6	1st handle valid $6
Y1288	HS216	2nd handle axis selection code 1 $6
Y1289	HS226	2nd handle axis selection code 2 $6
Y128A	HS246	2nd handle axis selection code 4 $6
Y128B	HS286	2nd handle axis selection code 8 $6
Y128C	HS2166	2nd handle axis selection code 16 $6
Y128F	HS2S6	2nd handle valid $6
Y1290	HS316	3rd handle axis selection code 1 $6
Y1291	HS326	3rd handle axis selection code 2 $6
Y1292	HS346	3rd handle axis selection code 4 $6
Y1293	HS386	3rd handle axis selection code 8 $6
Y1294	HS3166	3rd handle axis selection code 16 $6
Y1297	HS3S6	3rd handle valid $6
Y1298	OVC6	Override cancel $6
Y1299	OVSL6	Manual override method selection $6
Y129A	AFL6	Miscellaneous function lock $6
Y129C	TRV6	Tap retract $6
Y129E		Tool handle feed mode $6
Y12A0	*FV16	Cutting feedrate override code 1 $6
Y12A1	*FV26	Cutting feedrate override code 2 $6
Y12A2	*FV46	Cutting feedrate override code 4 $6
Y12A3	*FV86	Cutting feedrate override code 8 $6
Y12A4	*FV166	Cutting feedrate override code 16 $6
Y12A6	FV2E6	2nd cutting feedrate override valid $6
Y12A7	FVS6	Cutting feedrate override method selection $6
Y12A8	ROV16	Rapid traverse override code 1 $6
Y12A9	ROV26	Rapid traverse override code 2 $6
Y12AF	ROVS6	Rapid traverse override method selection $6
Y12B0	*JV16	Manual feedrate code 1 $6
Y12B1	*JV26	Manual feedrate code 2 $6
Y12B2	*JV46	Manual feedrate code 4 $6
Y12B3	*JV86	Manual feedrate code 8 $6
Y12B4	*JV166	Manual feedrate code 16 $6
Y12B6	MCLMP6	Manual speed clamp ON $6
Y12B7	JVS6	Manual feedrate method selection $6
Y12B8	PCF16	Feedrate least increment code 1 $6
Y12B9	PCF26	Feedrate least increment code 2 $6
Y12BB	JHAN6	Jog handle synchronous $6
Y12BC		Each axis manual feedrate B valid $6
Y12BD		Manual feedrate B surface speed control valid $6
Y12BE		Circular feed in manual mode valid $6
Y12BF		Coordinate rotation by parameter: Coordinate switch for manual feed $6
Y12C0	MP16	Handle/incremental feed magnification code 1 $6
Y12C1	MP26	Handle/incremental feed magnification code 2 $6
Y12C2	MP46	Handle/incremental feed magnification code 4 $6
Y12C6		Magnification valid for each handle $6
Y12C7	MPS6	Handle/incremental feed magnification method selection $6
Y12C8	TAL16	Tool alarm 1/Tool-skip $6
Y12C9	TAL26	Tool alarm 2 $6
Y12CA	TCEF6	Usage data count valid $6
Y12CB	TLF16	Tool life management input $6
Y12CC	TRST6	Tool change reset $6
Y12CD		Tool escape and return Transit point designation $6
Y12CE		Manual tool length measurement interlock temporarily canceled $6 ▲
Y12D0	ZSL16	Reference position selection code 1 $6
Y12D1	ZSL26	Reference position selection code 2 $6
Y12D2		Tool length compensation along the tool axis Compensation amount change mode $6
Y12D3	RTNST6	Tool retract and return 2: Tool return start $6 ▲
Y12D4	FFC6	Thread cutting: Feed-forward control request $6
Y12D5		In balance cut timing synchronization invalid $6 ▲
Y12D7		Reference position selection method $6
Y12D8		Tool life management: Temporary cancel of tool life expiration $6
Y12D9		Tool life management: Temporary cancel of tool group life expiration $6
Y12DA	PRTN6	External search: Program return $6
Y12DB		MES interface library: User arbitrary information send request $6 [M8]
Y12DD		Manual speed command valid $6
Y12DE		Manual speed command sign reversed $6

Device	Abbrev.	Signal name
Y12DF		Manual speed command reverse run valid $6
Y12E0	CX116	Manual arbitrary feed 1st axis selection code 1 $6
Y12E1	CX126	Manual arbitrary feed 1st axis selection code 2 $6
Y12E2	CX146	Manual arbitrary feed 1st axis selection code 4 $6
Y12E3	CX186	Manual arbitrary feed 1st axis selection code 8 $6
Y12E4	CX1166	Manual arbitrary feed 1st axis selection code 16 $6
Y12E7	CX1S6	Manual arbitrary feed 1st axis valid $6
Y12E8	CX216	Manual arbitrary feed 2nd axis selection code 1 $6
Y12E9	CX226	Manual arbitrary feed 2nd axis selection code 2 $6
Y12EA	CX246	Manual arbitrary feed 2nd axis selection code 4 $6
Y12EB	CX286	Manual arbitrary feed 2nd axis selection code 8 $6
Y12EC	CX2166	Manual arbitrary feed 2nd axis selection code 16 $6
Y12EF	CX2S6	Manual arbitrary feed 2nd axis valid $6
Y12F0	CX316	Manual arbitrary feed 3rd axis selection code 1 $6
Y12F1	CX326	Manual arbitrary feed 3rd axis selection code 2 $6
Y12F2	CX346	Manual arbitrary feed 3rd axis selection code 4 $6
Y12F3	CX386	Manual arbitrary feed 3rd axis selection code 8 $6
Y12F4	CX3166	Manual arbitrary feed 3rd axis selection code 16 $6
Y12F7	CX3S6	Manual arbitrary feed 3rd axis valid $6
Y12F8	CXS16	Manual arbitrary feed Smoothing off $6
Y12F9	CXS26	Manual arbitrary feed Axis independent $6
Y12FA	CXS36	Manual arbitrary feed EX.F/MODAL.F $6
Y12FB	CXS46	Manual arbitrary feed G0/G1 $6
Y12FC	CXS56	Manual arbitrary feed MC/WK $6
Y12FD	CXS66	Manual arbitrary feed ABS/INC $6
Y12FE	*CXS76	Manual arbitrary feed Stop $6
Y12FF	CXS86	Manual arbitrary feed Strobe $6
Y1300	ILM16	Current limit mode 1 $6
Y1301	ILM26	Current limit mode 2 $6
Y1303	LDWT6	Load monitor I : Teaching/Monitor execution $6 ▲
Y1304		Load monitor I : Teaching mode $6 ▲
Y1305		Load monitor I : Monitor mode $6 ▲
Y1306		Load monitor I : Alarm reset $6 [M8]
Y1307		Load monitor I : Warning reset $6 ▲
Y1308	*ZRIT6	2nd reference position return interlock $6
Y1309		Load monitor I : Adaptive control execution $6 ▲
Y130A		Small diameter deep hole drilling cycle $6
Y130B		Chuck barrier ON $6
Y130C		High-speed retract function valid $6 ▲
Y130F		Tool retract start $6 ▲
Y1310		Waiting ignore $6
Y1311		Spindle-spindle polygon cancel $6
Y1312		Synchronous tapping command polarity reversal $6
Y1313		Spindle OFF mode $6
Y1314		Longitudinal hole drilling axis selection $6
Y1315		Optimum acceleration/deceleration parameter switching request [axis] $6 ▲
Y1316	TRVEC6	Tap retract possible state cancel $6
Y1317	CHPRCR6	Chopping compensation update prevention request $6
Y1318		Barrier valid (left) $6
Y1319		Barrier valid (right) $6
Y131A		Tool presetter sub-side valid $6 ▲
Y131E	HOBRTR6	Hob machining: retract request $6
Y131F	HOBARTC6	Hob machining: alarm retract control $6
Y1321		Door open II $6
Y1322		Door open signal input (spindle speed monitor) $6
Y1323		Door interlock spindle speed clamp $6
Y1328		Door open II (2 channels per 1 part system) $6
Y132F		Load monitor I : Cutting torque estimation execution $6 [M8]
Y1331	VFTCI6	Variable feed thread cutting invalid $6 ▲
Y1334	BCHK6	Barrier check invalid $6
Y1338	MSYNC6	Synchronization between part systems OFF $6
Y133A	DRNC6	Dry run invalid $6
Y133B	AUTED6	Automatic error detection $6
Y133C	MRPSG6	Manual arbitrary reverse run: MSTB reverse run prohibited $6
Y133D		G71 Shape judgement disable $6 ▲
Y133E		Appropriate machining diagnosis in progress $6 ▲
Y133F		Appropriate machining diagnosis error reset $6 ▲
Y1340	PFCHR6	Program format switch request $6 [M8]
Y1341	RBSSY6	Manual arbitrary reverse run: Reverse run block stop designated part system $6
Y1348	RVSP6	Reverse run from block start $6
Y1349	RVIT6	Macro interrupt priority $6
Y134A	RVMD6	Reverse run control mode $6
Y134B	ACCG6	Rapid traverse time constant: Switchover request $6
Y134C	RT2CHGA6	Real-time tuning 2: Acceleration/deceleration time constant in automatic switchover $6
Y134D	RT2CHGM6	Real-time tuning 2: Acceleration/deceleration time constant in manual switchover $6
Y134E	RT2RST6	Real-time tuning 2: Acceleration/deceleration time constant reset $6
Y1354		3D coordinate conversion : Manual feed coordinates conversion $6 [M8]
Y1355	RCEE6	Rotation center error compensation enabled $6
Y1357	SECE6	Spatial error compensation enabled $6 [M8]
Y1358	MJCT6	3D manual feed (JOG, INC) in tool axis coordinate system $6
Y1359	MJCB6	3D manual feed (JOG, INC) in table coordinate system $6

Device	Abbrev.	Signal name
Y135A	MJCF6	3D manual feed (JOG, INC) in feature coordinate system $6
Y135B	MH1CT6	3D manual feed (1st handle) in tool axis coordinate system $6
Y135C	MH1CB6	3D manual feed (1st handle) in table coordinate system $6
Y135D	MH1CF6	3D manual feed (1st handle) in feature coordinate system $6
Y135E	MH2CT6	3D manual feed (2nd handle) in tool axis coordinate system $6
Y135F	MH2CB6	3D manual feed (2nd handle) in table coordinate system $6
Y1360	MH2CF6	3D manual feed (2nd handle) in feature coordinate system $6
Y1361	MH3CT6	3D manual feed (3rd handle) in tool axis coordinate system $6
Y1362	MH3CB6	3D manual feed (3rd handle) in table coordinate system $6
Y1363	MH3CF6	3D manual feed (3rd handle) in feature coordinate system $6
Y1367	TCPRC6	Tool center point rotation $6
Y1368	MFIN16	Miscellaneous Function Command High-speed Output: M function finish 1 $6
Y1369	MFIN26	Miscellaneous Function Command High-speed Output: M function finish 2 $6
Y136A	MFIN36	Miscellaneous Function Command High-speed Output: M function finish 3 $6
Y136B	MFIN46	Miscellaneous Function Command High-speed Output: M function finish 4 $6
Y136C	SFIN16	Miscellaneous Function Command High-speed Output: S function finish 1 $6
Y136D	SFIN26	Miscellaneous Function Command High-speed Output: S function finish 2 $6
Y136E	SFIN36	Miscellaneous Function Command High-speed Output: S function finish 3 $6
Y136F	SFIN46	Miscellaneous Function Command High-speed Output: S function finish 4 $6
Y1370	TFIN16	Miscellaneous Function Command High-speed Output: T function finish 1 $6
Y1371	TFIN26	Miscellaneous Function Command High-speed Output: T function finish 2 $6
Y1372	TFIN36	Miscellaneous Function Command High-speed Output: T function finish 3 $6
Y1373	TFIN46	Miscellaneous Function Command High-speed Output: T function finish 4 $6
Y1374	BFIN16	Miscellaneous Function Command High-speed Output: 2nd M function finish 1 $6
Y1375	BFIN26	Miscellaneous Function Command High-speed Output: 2nd M function finish 2 $6
Y1376	BFIN36	Miscellaneous Function Command High-speed Output: 2nd M function finish 3 $6
Y1377	BFIN46	Miscellaneous Function Command High-speed Output: 2nd M function finish 4 $6
Y1378	SFIN56	Miscellaneous Function Command High-speed Output: S function finish 5 $6
Y1379	SFIN66	Miscellaneous Function Command High-speed Output: S function finish 6 $6
Y1380	J7	Jog mode $7
Y1381	H7	Handle mode $7
Y1382	S7	Incremental mode $7
Y1383	PTP7	Manual arbitrary feed mode $7
Y1384	ZRN7	Reference position return mode $7
Y1385	AST7	Automatic initialization mode $7
Y1388	MEM7	Memory mode $7
Y1389	T7	Tape mode $7
Y138A		Online operation mode (Computer link B) $7
Y138B	D7	MDI mode $7
Y138E	SBSM7	Sub part system control: Sub part system control I mode $7
Y1390	ST7	Automatic operation "start" command (Cycle start) $7
Y1391	*SP7	Automatic operation "pause" command (Feed hold) $7
Y1392	SBK7	Single block $7
Y1393	*BSL7	Block start interlock $7
Y1394	*CSL7	Cutting block start interlock $7
Y1395	DRN7	Dry run $7
Y1397	ERD7	Error detection $7
Y1398	NRST17	NC reset 1 $7
Y1399	NRST27	NC reset 2 $7
Y139A	RRW7	Reset & rewind $7
Y139B	*CDZ7	Chamfering $7
Y139C	ARST7	Automatic restart $7
Y139D		External search strobe $7
Y139E	FIN17	M function finish 1 $7
Y139F	FIN27	M function finish 2 $7
Y13A0	TLM7	Tool length measurement 1 $7
Y13A1	TLMS7	Tool length measurement 2 $7
Y13A2		Synchronization correction mode $7
Y13A3	PRST7	Program restart $7
Y13A4	PB7	Playback $7
Y13A5	UIT7	Macro interrupt $7
Y13A6	RT7	Rapid traverse $7
Y13A7	VRV7	Reverse run $7
Y13A8	ABS7	Manual absolute $7
Y13A9	DLK7	Display lock $7
Y13AA	F1D7	F1-digit speed change valid $7
Y13AB	CRQ7	Recalculation request $7
Y13AC	QEMG7	PLC emergency stop $7
Y13AD	RTN7	Reference position retract $7
Y13AE	PIT7	PLC interrupt $7
Y13B0	CHPS7	Chopping $7
Y13B1	RSST7	Search & start $7
Y13B4		Chopping parameter valid $7
Y13B5		Inclined axis control valid $7
Y13B6		Inclined axis control: No Z axis compensation $7
Y13B7	BDT17	Optional block skip 1 $7
Y13B8	BDT27	Optional block skip 2 $7
Y13B9	BDT37	Optional block skip 3 $7
Y13BA	BDT47	Optional block skip 4 $7

Device	Abbrev.	Signal name
Y13BB	BDT57	Optional block skip 5 $7
Y13BC	BDT67	Optional block skip 6 $7
Y13BD	BDT77	Optional block skip 7 $7
Y13BE	BDT87	Optional block skip 8 $7
Y13BF	BDT97	Optional block skip 9 $7
Y13C0	HS117	1st handle axis selection code 1 $7
Y13C1	HS127	1st handle axis selection code 2 $7
Y13C2	HS147	1st handle axis selection code 4 $7
Y13C3	HS187	1st handle axis selection code 8 $7
Y13C4	HS1167	1st handle axis selection code 16 $7
Y13C7	HS1S7	1st handle valid $7
Y13C8	HS217	2nd handle axis selection code 1 $7
Y13C9	HS227	2nd handle axis selection code 2 $7
Y13CA	HS247	2nd handle axis selection code 4 $7
Y13CB	HS287	2nd handle axis selection code 8 $7
Y13CC	HS2167	2nd handle axis selection code 16 $7
Y13CF	HS2S7	2nd handle valid $7
Y13D0	HS317	3rd handle axis selection code 1 $7
Y13D1	HS327	3rd handle axis selection code 2 $7
Y13D2	HS347	3rd handle axis selection code 4 $7
Y13D3	HS387	3rd handle axis selection code 8 $7
Y13D4	HS3167	3rd handle axis selection code 16 $7
Y13D7	HS3S7	3rd handle valid $7
Y13D8	OVC7	Override cancel $7
Y13D9	OVSL7	Manual override method selection $7
Y13DA	AFL7	Miscellaneous function lock $7
Y13DC	TRV7	Tap retract $7
Y13DE		Tool handle feed mode $7
Y13E0	*FV17	Cutting feedrate override code 1 $7
Y13E1	*FV27	Cutting feedrate override code 2 $7
Y13E2	*FV47	Cutting feedrate override code 4 $7
Y13E3	*FV87	Cutting feedrate override code 8 $7
Y13E4	*FV167	Cutting feedrate override code 16 $7
Y13E6	FV2E7	2nd cutting feedrate override valid $7
Y13E7	FVS7	Cutting feedrate override method selection $7
Y13E8	ROV17	Rapid traverse override code 1 $7
Y13E9	ROV27	Rapid traverse override code 2 $7
Y13EF	ROVS7	Rapid traverse override method selection $7
Y13F0	*JV17	Manual feedrate code 1 $7
Y13F1	*JV27	Manual feedrate code 2 $7
Y13F2	*JV47	Manual feedrate code 4 $7
Y13F3	*JV87	Manual feedrate code 8 $7
Y13F4	*JV167	Manual feedrate code 16 $7
Y13F6	MCLMP7	Manual speed clamp ON $7
Y13F7	JVS7	Manual feedrate method selection $7
Y13F8	PCF17	Feedrate least increment code 1 $7
Y13F9	PCF27	Feedrate least increment code 2 $7
Y13FB	JHAN7	Jog handle synchronous $7
Y13FC		Each axis manual feedrate B valid $7
Y13FD		Manual feedrate B surface speed control valid $7
Y13FE		Circular feed in manual mode valid $7
Y13FF		Coordinate rotation by parameter: Coordinate switch for manual feed $7
Y1400	MP17	Handle/incremental feed magnification code 1 $7
Y1401	MP27	Handle/incremental feed magnification code 2 $7
Y1402	MP47	Handle/incremental feed magnification code 4 $7
Y1406		Magnification valid for each handle $7
Y1407	MPS7	Handle/incremental feed magnification method selection $7
Y1408	TAL17	Tool alarm 1/Tool-skip $7
Y1409	TAL27	Tool alarm 2 $7
Y140A	TCEF7	Usage data count valid $7
Y140B	TLF17	Tool life management input $7
Y140C	TRST7	Tool change reset $7
Y140D		Tool escape and return Transit point designation $7
Y140E		Manual tool length measurement interlock temporarily canceled $7 ▲
Y1410	ZSL17	Reference position selection code 1 $7
Y1411	ZSL27	Reference position selection code 2 $7
Y1412		Tool length compensation along the tool axis Compensation amount change mode $7
Y1413	RTNST7	Tool retract and return 2: Tool return start $7 ▲
Y1414	FFC7	Thread cutting: Feed-forward control request $7
Y1415		In balance cut timing synchronization invalid $7 ▲
Y1417		Reference position selection method $7
Y1418		Tool life management: Temporary cancel of tool life expiration $7
Y1419		Tool life management: Temporary cancel of tool group life expiration $7
Y141A	PRTN7	External search: Program return $7
Y141B		MES interface library: User arbitrary information send request $7 [M8]
Y141D		Manual speed command valid $7
Y141E		Manual speed command sign reversed $7
Y141F		Manual speed command reverse run valid $7
Y1420	CX117	Manual arbitrary feed 1st axis selection code 1 $7
Y1421	CX127	Manual arbitrary feed 1st axis selection code 2 $7
Y1422	CX147	Manual arbitrary feed 1st axis selection code 4 $7
Y1423	CX187	Manual arbitrary feed 1st axis selection code 8 $7

Device	Abbrev.	Signal name
Y1424	CX1167	Manual arbitrary feed 1st axis selection code 16 $7
Y1427	CX1S7	Manual arbitrary feed 1st axis valid $7
Y1428	CX217	Manual arbitrary feed 2nd axis selection code 1 $7
Y1429	CX227	Manual arbitrary feed 2nd axis selection code 2 $7
Y142A	CX247	Manual arbitrary feed 2nd axis selection code 4 $7
Y142B	CX287	Manual arbitrary feed 2nd axis selection code 8 $7
Y142C	CX2167	Manual arbitrary feed 2nd axis selection code 16 $7
Y142F	CX2S7	Manual arbitrary feed 2nd axis valid $7
Y1430	CX317	Manual arbitrary feed 3rd axis selection code 1 $7
Y1431	CX327	Manual arbitrary feed 3rd axis selection code 2 $7
Y1432	CX347	Manual arbitrary feed 3rd axis selection code 4 $7
Y1433	CX387	Manual arbitrary feed 3rd axis selection code 8 $7
Y1434	CX3167	Manual arbitrary feed 3rd axis selection code 16 $7
Y1437	CX3S7	Manual arbitrary feed 3rd axis valid $7
Y1438	CXS17	Manual arbitrary feed Smoothing off $7
Y1439	CXS27	Manual arbitrary feed Axis independent $7
Y143A	CXS37	Manual arbitrary feed EX.F/MODAL.F $7
Y143B	CXS47	Manual arbitrary feed G0/G1 $7
Y143C	CXS57	Manual arbitrary feed MC/WK $7
Y143D	CXS67	Manual arbitrary feed ABS/INC $7
Y143E	*CXS77	Manual arbitrary feed Stop $7
Y143F	CXS87	Manual arbitrary feed Strobe $7
Y1440	ILM17	Current limit mode 1 $7
Y1441	ILM27	Current limit mode 2 $7
Y1443	LDWT7	Load monitor I : Teaching/Monitor execution $7 ▲
Y1444		Load monitor I : Teaching mode $7 ▲
Y1445		Load monitor I : Monitor mode $7 ▲
Y1446		Load monitor I : Alarm reset $7 [M8]
Y1447		Load monitor I : Warning reset $7 ▲
Y1448	*ZRIT7	2nd reference position return interlock $7
Y1449		Load monitor I : Adaptive control execution $7 ▲
Y144A		Small diameter deep hole drilling cycle $7
Y144B		Chuck barrier ON $7
Y144C		High-speed retract function valid $7 ▲
Y144F		Tool retract start $7 ▲
Y1450		Waiting ignore $7
Y1451		Spindle-spindle polygon cancel $7
Y1452		Synchronous tapping command polarity reversal $7
Y1453		Spindle OFF mode $7
Y1454		Longitudinal hole drilling axis selection $7
Y1455		Optimum acceleration/deceleration parameter switching request [axis] $7 ▲
Y1456	TRVEC7	Tap retract possible state cancel $7
Y1457	CHPRCR7	Chopping compensation update prevention request $7
Y1458		Barrier valid (left) $7
Y1459		Barrier valid (right) $7
Y145A		Tool presetter sub-side valid $7 ▲
Y145E	HOBRTR7	Hob machining: retract request $7
Y145F	HOBARTC7	Hob machining: alarm retract control $7
Y1461		Door open II $7
Y1462		Door open signal input (spindle speed monitor) $7
Y1463		Door interlock spindle speed clamp $7
Y1468		Door open II (2 channels per 1 part system) $7
Y146F		Load monitor I : Cutting torque estimation execution $7 [M8]
Y1471	VFTCI7	Variable feed thread cutting invalid $7 ▲
Y1474	BCHK7	Barrier check invalid $7
Y1478	MSYNC7	Synchronization between part systems OFF $7
Y147A	DRNC7	Dry run invalid $7
Y147B	AUTED7	Automatic error detection $7
Y147C	MRPSG7	Manual arbitrary reverse run: MSTB reverse run prohibited $7
Y147D		G71 Shape judgement disable $7 ▲
Y147E		Appropriate machining diagnosis in progress $7 ▲
Y147F		Appropriate machining diagnosis error reset $7 ▲
Y1480	PFCHR7	Program format switch request $7 [M8]
Y1481	RBSSY7	Manual arbitrary reverse run: Reverse run block stop designated part system $7
Y1488	RVSP7	Reverse run from block start $7
Y1489	RVIT7	Macro interrupt priority $7
Y148A	RVMD7	Reverse run control mode $7
Y148B	ACCG7	Rapid traverse time constant: Switchover request $7
Y148C	RT2CHGA7	Real-time tuning 2: Acceleration/deceleration time constant in automatic switchover $7
Y148D	RT2CHGM7	Real-time tuning 2: Acceleration/deceleration time constant in manual switchover $7
Y148E	RT2RST7	Real-time tuning 2: Acceleration/deceleration time constant reset $7
Y1494		3D coordinate conversion : Manual feed coordinates conversion $7 [M8]
Y1495	RCEE7	Rotation center error compensation enabled $7
Y1497	SECE7	Spatial error compensation enabled $7 [M8]
Y1498	MJCT7	3D manual feed (JOG, INC) in tool axis coordinate system $7
Y1499	MJCB7	3D manual feed (JOG, INC) in table coordinate system $7
Y149A	MJCF7	3D manual feed (JOG, INC) in feature coordinate system $7
Y149B	MH1CT7	3D manual feed (1st handle) in tool axis coordinate system $7
Y149C	MH1CB7	3D manual feed (1st handle) in table coordinate system $7
Y149D	MH1CF7	3D manual feed (1st handle) in feature coordinate system $7
Y149E	MH2CT7	3D manual feed (2nd handle) in tool axis coordinate system $7

Device	Abbrev.	Signal name
Y149F	MH2CB7	3D manual feed (2nd handle) in table coordinate system $7
Y14A0	MH2CF7	3D manual feed (2nd handle) in feature coordinate system $7
Y14A1	MH3CT7	3D manual feed (3rd handle) in tool axis coordinate system $7
Y14A2	MH3CB7	3D manual feed (3rd handle) in table coordinate system $7
Y14A3	MH3CF7	3D manual feed (3rd handle) in feature coordinate system $7
Y14A7	TCPRC7	Tool center point rotation $7
Y14A8	MFIN17	Miscellaneous Function Command High-speed Output: M function finish 1 $7
Y14A9	MFIN27	Miscellaneous Function Command High-speed Output: M function finish 2 $7
Y14AA	MFIN37	Miscellaneous Function Command High-speed Output: M function finish 3 $7
Y14AB	MFIN47	Miscellaneous Function Command High-speed Output: M function finish 4 $7
Y14AC	SFIN17	Miscellaneous Function Command High-speed Output: S function finish 1 $7
Y14AD	SFIN27	Miscellaneous Function Command High-speed Output: S function finish 2 $7
Y14AE	SFIN37	Miscellaneous Function Command High-speed Output: S function finish 3 $7
Y14AF	SFIN47	Miscellaneous Function Command High-speed Output: S function finish 4 $7
Y14B0	TFIN17	Miscellaneous Function Command High-speed Output: T function finish 1 $7
Y14B1	TFIN27	Miscellaneous Function Command High-speed Output: T function finish 2 $7
Y14B2	TFIN37	Miscellaneous Function Command High-speed Output: T function finish 3 $7
Y14B3	TFIN47	Miscellaneous Function Command High-speed Output: T function finish 4 $7
Y14B4	BFIN17	Miscellaneous Function Command High-speed Output: 2nd M function finish 1 $7
Y14B5	BFIN27	Miscellaneous Function Command High-speed Output: 2nd M function finish 2 $7
Y14B6	BFIN37	Miscellaneous Function Command High-speed Output: 2nd M function finish 3 $7
Y14B7	BFIN47	Miscellaneous Function Command High-speed Output: 2nd M function finish 4 $7
Y14B8	SFIN57	Miscellaneous Function Command High-speed Output: S function finish 5 $7
Y14B9	SFIN67	Miscellaneous Function Command High-speed Output: S function finish 6 $7
Y14C0	J8	Jog mode $8
Y14C1	H8	Handle mode $8
Y14C2	S8	Incremental mode $8
Y14C3	PTP8	Manual arbitrary feed mode $8
Y14C4	ZRN8	Reference position return mode $8
Y14C5	AST8	Automatic initialization mode $8
Y14C8	MEM8	Memory mode $8
Y14C9	T8	Tape mode $8
Y14CA		Online operation mode (Computer link B) $8
Y14CB	D8	MDI mode $8
Y14CE	SBSM8	Sub part system control: Sub part system control I mode $8
Y14D0	ST8	Automatic operation "start" command (Cycle start) $8
Y14D1	*SP8	Automatic operation "pause" command (Feed hold) $8
Y14D2	SBK8	Single block $8
Y14D3	*BSL8	Block start interlock $8
Y14D4	*CSL8	Cutting block start interlock $8
Y14D5	DRN8	Dry run $8
Y14D7	ERD8	Error detection $8
Y14D8	NRST18	NC reset 1 $8
Y14D9	NRST28	NC reset 2 $8
Y14DA	RRW8	Reset & rewind $8
Y14DB	*CDZ8	Chamfering $8
Y14DC	ARST8	Automatic restart $8
Y14DD		External search strobe $8
Y14DE	FIN18	M function finish 1 $8
Y14DF	FIN28	M function finish 2 $8
Y14E0	TLM8	Tool length measurement 1 $8
Y14E1	TLMS8	Tool length measurement 2 $8
Y14E2		Synchronization correction mode $8
Y14E3	PRST8	Program restart $8
Y14E4	PB8	Playback $8
Y14E5	UIT8	Macro interrupt $8
Y14E6	RT8	Rapid traverse $8
Y14E7	VRV8	Reverse run $8
Y14E8	ABS8	Manual absolute $8
Y14E9	DLK8	Display lock $8
Y14EA	F1D8	F1-digit speed change valid $8
Y14EB	CRQ8	Recalculation request $8
Y14EC	QEMG8	PLC emergency stop $8
Y14ED	RTN8	Reference position retract $8
Y14EE	PIT8	PLC interrupt $8
Y14F0	CHPS8	Chopping $8
Y14F1	RSST8	Search & start $8
Y14F4		Chopping parameter valid $8
Y14F5		Inclined axis control valid $8
Y14F6		Inclined axis control: No Z axis compensation $8
Y14F7	BDT18	Optional block skip 1 $8
Y14F8	BDT28	Optional block skip 2 $8
Y14F9	BDT38	Optional block skip 3 $8
Y14FA	BDT48	Optional block skip 4 $8
Y14FB	BDT58	Optional block skip 5 $8
Y14FC	BDT68	Optional block skip 6 $8
Y14FD	BDT78	Optional block skip 7 $8
Y14FE	BDT88	Optional block skip 8 $8
Y14FF	BDT98	Optional block skip 9 $8

Device	Abbrev.	Signal name
Y1500	HS118	1st handle axis selection code 1 $8
Y1501	HS128	1st handle axis selection code 2 $8
Y1502	HS148	1st handle axis selection code 4 $8
Y1503	HS188	1st handle axis selection code 8 $8
Y1504	HS1168	1st handle axis selection code 16 $8
Y1507	HS1S8	1st handle valid $8
Y1508	HS218	2nd handle axis selection code 1 $8
Y1509	HS228	2nd handle axis selection code 2 $8
Y150A	HS248	2nd handle axis selection code 4 $8
Y150B	HS288	2nd handle axis selection code 8 $8
Y150C	HS2168	2nd handle axis selection code 16 $8
Y150F	HS2S8	2nd handle valid $8
Y1510	HS318	3rd handle axis selection code 1 $8
Y1511	HS328	3rd handle axis selection code 2 $8
Y1512	HS348	3rd handle axis selection code 4 $8
Y1513	HS388	3rd handle axis selection code 8 $8
Y1514	HS3168	3rd handle axis selection code 16 $8
Y1517	HS3S8	3rd handle valid $8
Y1518	OVC8	Override cancel $8
Y1519	OVSL8	Manual override method selection $8
Y151A	AFL8	Miscellaneous function lock $8
Y151C	TRV8	Tap retract $8
Y151E		Tool handle feed mode $8
Y1520	*FV18	Cutting feedrate override code 1 $8
Y1521	*FV28	Cutting feedrate override code 2 $8
Y1522	*FV48	Cutting feedrate override code 4 $8
Y1523	*FV88	Cutting feedrate override code 8 $8
Y1524	*FV168	Cutting feedrate override code 16 $8
Y1526	FV2E8	2nd cutting feedrate override valid $8
Y1527	FVS8	Cutting feedrate override method selection $8
Y1528	ROV18	Rapid traverse override code 1 $8
Y1529	ROV28	Rapid traverse override code 2 $8
Y152F	ROVS8	Rapid traverse override method selection $8
Y1530	*JV18	Manual feedrate code 1 $8
Y1531	*JV28	Manual feedrate code 2 $8
Y1532	*JV48	Manual feedrate code 4 $8
Y1533	*JV88	Manual feedrate code 8 $8
Y1534	*JV168	Manual feedrate code 16 $8
Y1536	MCLMP8	Manual speed clamp ON $8
Y1537	JVS8	Manual feedrate method selection $8
Y1538	PCF18	Feedrate least increment code 1 $8
Y1539	PCF28	Feedrate least increment code 2 $8
Y153B	JHAN8	Jog handle synchronous $8
Y153C		Each axis manual feedrate B valid $8
Y153D		Manual feedrate B surface speed control valid $8
Y153E		Circular feed in manual mode valid $8
Y153F		Coordinate rotation by parameter: Coordinate switch for manual feed $8
Y1540	MP18	Handle/incremental feed magnification code 1 $8
Y1541	MP28	Handle/incremental feed magnification code 2 $8
Y1542	MP48	Handle/incremental feed magnification code 4 $8
Y1546		Magnification valid for each handle $8
Y1547	MPS8	Handle/incremental feed magnification method selection $8
Y1548	TAL18	Tool alarm 1/Tool-skip $8
Y1549	TAL28	Tool alarm 2 $8
Y154A	TCEF8	Usage data count valid $8
Y154B	TLF18	Tool life management input $8
Y154C	TRST8	Tool change reset $8
Y154D		Tool escape and return Transit point designation $8
Y154E		Manual tool length measurement interlock temporarily canceled $8 ▲
Y1550	ZSL18	Reference position selection code 1 $8
Y1551	ZSL28	Reference position selection code 2 $8
Y1552		Tool length compensation along the tool axis Compensation amount change mode $8
Y1553	RTNST8	Tool retract and return 2: Tool return start $8 ▲
Y1554	FFC8	Thread cutting: Feed-forward control request $8
Y1555		In balance cut timing synchronization invalid $8 ▲
Y1557		Reference position selection method $8
Y1558		Tool life management: Temporary cancel of tool life expiration $8
Y1559		Tool life management: Temporary cancel of tool group life expiration $8
Y155A	PRTN8	External search: Program return $8
Y155B		MES interface library: User arbitrary information send request $8 [M8]
Y155D		Manual speed command valid $8
Y155E		Manual speed command sign reversed $8
Y155F		Manual speed command reverse run valid $8
Y1560	CX118	Manual arbitrary feed 1st axis selection code 1 $8
Y1561	CX128	Manual arbitrary feed 1st axis selection code 2 $8
Y1562	CX148	Manual arbitrary feed 1st axis selection code 4 $8
Y1563	CX188	Manual arbitrary feed 1st axis selection code 8 $8
Y1564	CX1168	Manual arbitrary feed 1st axis selection code 16 $8
Y1567	CX1S8	Manual arbitrary feed 1st axis valid $8
Y1568	CX218	Manual arbitrary feed 2nd axis selection code 1 $8
Y1569	CX228	Manual arbitrary feed 2nd axis selection code 2 $8
Y156A	CX248	Manual arbitrary feed 2nd axis selection code 4 $8

Device	Abbrev.	Signal name
Y156B	CX288	Manual arbitrary feed 2nd axis selection code 8 $8
Y156C	CX2168	Manual arbitrary feed 2nd axis selection code 16 $8
Y156F	CX2S8	Manual arbitrary feed 2nd axis valid $8
Y1570	CX318	Manual arbitrary feed 3rd axis selection code 1 $8
Y1571	CX328	Manual arbitrary feed 3rd axis selection code 2 $8
Y1572	CX348	Manual arbitrary feed 3rd axis selection code 4 $8
Y1573	CX388	Manual arbitrary feed 3rd axis selection code 8 $8
Y1574	CX3168	Manual arbitrary feed 3rd axis selection code 16 $8
Y1577	CX3S8	Manual arbitrary feed 3rd axis valid $8
Y1578	CXS18	Manual arbitrary feed Smoothing off $8
Y1579	CXS28	Manual arbitrary feed Axis independent $8
Y157A	CXS38	Manual arbitrary feed EX.F/MODAL.F $8
Y157B	CXS48	Manual arbitrary feed G0/G1 $8
Y157C	CXS58	Manual arbitrary feed MC/WK $8
Y157D	CXS68	Manual arbitrary feed ABS/INC $8
Y157E	*CXS78	Manual arbitrary feed Stop $8
Y157F	CXS88	Manual arbitrary feed Strobe $8
Y1580	ILM18	Current limit mode 1 $8
Y1581	ILM28	Current limit mode 2 $8
Y1583	LDWT8	Load monitor I : Teaching/Monitor execution $8 ▲
Y1584		Load monitor I : Teaching mode $8 ▲
Y1585		Load monitor I : Monitor mode $8 ▲
Y1586		Load monitor I : Alarm reset $8 [M8]
Y1587		Load monitor I : Warning reset $8 ▲
Y1588	*ZRIT8	2nd reference position return interlock $8
Y1589		Load monitor I : Adaptive control execution $8 ▲
Y158A		Small diameter deep hole drilling cycle $8
Y158B		Chuck barrier ON $8
Y158C		High-speed retract function valid $8 ▲
Y158F		Tool retract start $8 ▲
Y1590		Waiting ignore $8
Y1591		Spindle-spindle polygon cancel $8
Y1592		Synchronous tapping command polarity reversal $8
Y1593		Spindle OFF mode $8
Y1594		Longitudinal hole drilling axis selection $8
Y1595		Optimum acceleration/deceleration parameter switching request [axis] $8 ▲
Y1596	TRVEC8	Tap retract possible state cancel $8
Y1597	CHPRCR8	Chopping compensation update prevention request $8
Y1598		Barrier valid (left) $8
Y1599		Barrier valid (right) $8
Y159A		Tool presetter sub-side valid $8 ▲
Y159E	HOBRTR8	Hob machining: retract request $8
Y159F	HOBARTC8	Hob machining: alarm retract control $8
Y15A1		Door open II $8
Y15A2		Door open signal input (spindle speed monitor) $8
Y15A3		Door interlock spindle speed clamp $8
Y15A8		Door open II (2 channels per 1 part system) $8
Y15AF		Load monitor I : Cutting torque estimation execution $8 [M8]
Y15B1	VFTCI8	Variable feed thread cutting invalid $8 ▲
Y15B4	BCHK8	Barrier check invalid $8
Y15B8	MSYNC8	Synchronization between part systems OFF $8
Y15BA	DRNC8	Dry run invalid $8
Y15BB	AUTED8	Automatic error detection $8
Y15BC	MRPSG8	Manual arbitrary reverse run: MSTB reverse run prohibited $8
Y15BD		G71 Shape judgement disable $8 ▲
Y15BE		Appropriate machining diagnosis in progress $8 ▲
Y15BF		Appropriate machining diagnosis error reset $8 ▲
Y15C0	PFCHR8	Program format switch request $8 [M8]
Y15C1	RBSSY8	Manual arbitrary reverse run: Reverse run block stop designated part system $8
Y15C8	RVSP8	Reverse run from block start $8
Y15C9	RVIT8	Macro interrupt priority $8
Y15CA	RVMD8	Reverse run control mode $8
Y15CB	ACCG8	Rapid traverse time constant: Switchover request $8
Y15CC	RT2CHGA8	Real-time tuning 2: Acceleration/deceleration time constant in automatic switchover $8
Y15CD	RT2CHGM8	Real-time tuning 2: Acceleration/deceleration time constant in manual switchover $8
Y15CE	RT2RST8	Real-time tuning 2: Acceleration/deceleration time constant reset $8
Y15D4		3D coordinate conversion : Manual feed coordinates conversion $8 [M8]
Y15D5	RCEE8	Rotation center error compensation enabled $8
Y15D7	SECE8	Spatial error compensation enabled $8 [M8]
Y15D8	MJCT8	3D manual feed (JOG, INC) in tool axis coordinate system $8
Y15D9	MJCB8	3D manual feed (JOG, INC) in table coordinate system $8
Y15DA	MJCF8	3D manual feed (JOG, INC) in feature coordinate system $8
Y15DB	MH1CT8	3D manual feed (1st handle) in tool axis coordinate system $8
Y15DC	MH1CB8	3D manual feed (1st handle) in table coordinate system $8
Y15DD	MH1CF8	3D manual feed (1st handle) in feature coordinate system $8
Y15DE	MH2CT8	3D manual feed (2nd handle) in tool axis coordinate system $8
Y15DF	MH2CB8	3D manual feed (2nd handle) in table coordinate system $8
Y15E0	MH2CF8	3D manual feed (2nd handle) in feature coordinate system $8
Y15E1	MH3CT8	3D manual feed (3rd handle) in tool axis coordinate system $8
Y15E2	MH3CB8	3D manual feed (3rd handle) in table coordinate system $8
Y15E3	MH3CF8	3D manual feed (3rd handle) in feature coordinate system $8

Device	Abbrev.	Signal name
Y15E7	TCPRC8	Tool center point rotation $8
Y15E8	MFIN18	Miscellaneous Function Command High-speed Output: M function finish 1 $8
Y15E9	MFIN28	Miscellaneous Function Command High-speed Output: M function finish 2 $8
Y15EA	MFIN38	Miscellaneous Function Command High-speed Output: M function finish 3 $8
Y15EB	MFIN48	Miscellaneous Function Command High-speed Output: M function finish 4 $8
Y15EC	SFIN18	Miscellaneous Function Command High-speed Output: S function finish 1 $8
Y15ED	SFIN28	Miscellaneous Function Command High-speed Output: S function finish 2 $8
Y15EE	SFIN38	Miscellaneous Function Command High-speed Output: S function finish 3 $8
Y15EF	SFIN48	Miscellaneous Function Command High-speed Output: S function finish 4 $8
Y15F0	TFIN18	Miscellaneous Function Command High-speed Output: T function finish 1 $8
Y15F1	TFIN28	Miscellaneous Function Command High-speed Output: T function finish 2 $8
Y15F2	TFIN38	Miscellaneous Function Command High-speed Output: T function finish 3 $8
Y15F3	TFIN48	Miscellaneous Function Command High-speed Output: T function finish 4 $8
Y15F4	BFIN18	Miscellaneous Function Command High-speed Output: 2nd M function finish 1 $8
Y15F5	BFIN28	Miscellaneous Function Command High-speed Output: 2nd M function finish 2 $8
Y15F6	BFIN38	Miscellaneous Function Command High-speed Output: 2nd M function finish 3 $8
Y15F7	BFIN48	Miscellaneous Function Command High-speed Output: 2nd M function finish 4 $8
Y15F8	SFIN58	Miscellaneous Function Command High-speed Output: S function finish 5 $8
Y15F9	SFIN68	Miscellaneous Function Command High-speed Output: S function finish 6 $8
Y1878		Edit/search
Y1885	GFIN1	Gear shift completion 1stSP
Y1888	SP11	Spindle speed override code 1 1stSP
Y1889	SP21	Spindle speed override code 2 1stSP
Y188A	SP41	Spindle speed override code 4 1stSP
Y188F	SPS1	Spindle override method selection 1stSP
Y1890	GI11	Spindle gear selection code 1 1stSP
Y1891	GI21	Spindle gear selection code 2 1stSP
Y1893	EXOBS1	Increase holding power of spindle 1stSP
Y1894	SSTP1	Spindle stop 1stSP
Y1895	SSFT1	Spindle gear shift 1stSP
Y1896	SORC1	Spindle orientation 1stSP
Y1897		Spindle command invalid 1stSP
Y1898	SRN1	Spindle forward run start 1stSP
Y1899	SRI1	Spindle reverse run start 1stSP
Y189A	TL11	Spindle torque limit 1 1stSP
Y189B	TL21	Spindle torque limit 2 1stSP
Y189C	WRN1	Spindle forward run index 1stSP
Y189D	WRI1	Spindle reverse run index 1stSP
Y189E	ORC1	Spindle orientation command 1stSP
Y189F	LRSL1	L coil selection 1stSP
Y18A2		Spindle position control (C axis)Cutting gain L 1stSP
Y18A3		Spindle position control (C axis)Cutting gain H 1stSP
Y18A5	CMOD1	Spindle position control (Spindle/C axis control): C axis selection 1stSP
Y18A6	LRSM1	M coil selection 1stSP
Y18A8	SWS1	Spindle selection 1stSP
Y18AA	SPRR1	Spindle rotation reversal 1stSP
Y18AB	SPRS1	Spindle rotation direction switch method selection 1stSP
Y18AF	MPCSL1	PLC coil changeover 1stSP
Y18B0	SPSY1	Spindle synchronization 1stSP
Y18B1	SPPHS1	Spindle phase synchronization 1stSP
Y18B2	SPSDR1	Spindle synchronous rotation direction 1stSP
Y18B3	SSPHM1	Phase shift calculation request 1stSP
Y18B4	SSPHF1	Phase offset request 1stSP
Y18B5	SPDRPO1	Error temporary cancel 1stSP
Y18B8	SPSYC1	Spindle synchronization/ superimposition cancel 1stSP
Y18B9	SPCMPC1	Chuck close 1stSP
Y18BF	SPOFF1	Exclude spindle 1stSP
Y18C8		Spindle oscillation command 1stSP
Y18C9	WGTSC1	Spindle control : Coil changeover gate cutoff timer interruption 1stSP ▲
Y18CA	VGHLDC1	Real-time tuning 1: Speed control gain changeover hold-down command 1stSP
Y18E5	GFIN2	Gear shift completion 2ndSP
Y18E8	SP12	Spindle speed override code 1 2ndSP
Y18E9	SP22	Spindle speed override code 2 2ndSP
Y18EA	SP42	Spindle speed override code 4 2ndSP
Y18EF	SPS2	Spindle override method selection 2ndSP
Y18F0	GI12	Spindle gear selection code 1 2ndSP
Y18F1	GI22	Spindle gear selection code 2 2ndSP
Y18F3	EXOBS2	Increase holding power of spindle 2ndSP
Y18F4	SSTP2	Spindle stop 2ndSP
Y18F5	SSFT2	Spindle gear shift 2ndSP
Y18F6	SORC2	Spindle orientation 2ndSP
Y18F7		Spindle command invalid 2ndSP
Y18F8	SRN2	Spindle forward run start 2ndSP
Y18F9	SRI2	Spindle reverse run start 2ndSP
Y18FA	TL12	Spindle torque limit 1 2ndSP
Y18FB	TL22	Spindle torque limit 2 2ndSP
Y18FC	WRN2	Spindle forward run index 2ndSP
Y18FD	WRI2	Spindle reverse run index 2ndSP
Y18FE	ORC2	Spindle orientation command 2ndSP

Device	Abbrev.	Signal name
Y18FF	LRSL2	L coil selection 2ndSP
Y1902		Spindle position control (C axis)Cutting gain L 2ndSP
Y1903		Spindle position control (C axis)Cutting gain H 2ndSP
Y1905	CMOD2	Spindle position control (Spindle/C axis control): C axis selection 2ndSP
Y1906	LRSM2	M coil selection 2ndSP
Y1908	SWS2	Spindle selection 2ndSP
Y190A	SPRR2	Spindle rotation reversal 2ndSP
Y190B	SPRS2	Spindle rotation direction switch method selection 2ndSP
Y190F	MPCSL2	PLC coil changeover 2ndSP
Y1910	SPSY2	Spindle synchronization 2ndSP
Y1911	SPPHS2	Spindle phase synchronization 2ndSP
Y1912	SPSDR2	Spindle synchronous rotation direction 2ndSP
Y1913	SSPHM2	Phase shift calculation request 2ndSP
Y1914	SSPHF2	Phase offset request 2ndSP
Y1915	SPDRPO2	Error temporary cancel 2ndSP
Y1918	SPSYC2	Spindle synchronization/ superimposition cancel 2ndSP
Y1919	SPCMPC2	Chuck close 2ndSP
Y191F	SPOFF2	Exclude spindle 2ndSP
Y1928		Spindle oscillation command 2ndSP
Y1929	WGTSC2	Spindle control : Coil changeover gate cutoff timer interruption 2ndSP ▲
Y192A	VGHLDC2	Real-time tuning 1: Speed control gain changeover hold-down command 2ndSP
Y1945	GFIN3	Gear shift completion 3rdSP
Y1948	SP13	Spindle speed override code 1 3rdSP
Y1949	SP23	Spindle speed override code 2 3rdSP
Y194A	SP43	Spindle speed override code 4 3rdSP
Y194F	SPS3	Spindle override method selection 3rdSP
Y1950	GI13	Spindle gear selection code 1 3rdSP
Y1951	GI23	Spindle gear selection code 2 3rdSP
Y1953	EXOBS3	Increase holding power of spindle 3rdSP
Y1954	SSTP3	Spindle stop 3rdSP
Y1955	SSFT3	Spindle gear shift 3rdSP
Y1956	SORC3	Spindle orientation 3rdSP
Y1957		Spindle command invalid 3rdSP
Y1958	SRN3	Spindle forward run start 3rdSP
Y1959	SRI3	Spindle reverse run start 3rdSP
Y195A	TL13	Spindle torque limit 1 3rdSP
Y195B	TL23	Spindle torque limit 2 3rdSP
Y195C	WRN3	Spindle forward run index 3rdSP
Y195D	WRI3	Spindle reverse run index 3rdSP
Y195E	ORC3	Spindle orientation command 3rdSP
Y195F	LRSL3	L coil selection 3rdSP
Y1962		Spindle position control (C axis)Cutting gain L 3rdSP
Y1963		Spindle position control (C axis)Cutting gain H 3rdSP
Y1965	CMOD3	Spindle position control (Spindle/C axis control): C axis selection 3rdSP
Y1966	LRSM3	M coil selection 3rdSP
Y1968	SWS3	Spindle selection 3rdSP
Y196A	SPRR3	Spindle rotation reversal 3rdSP
Y196B	SPRS3	Spindle rotation direction switch method selection 3rdSP
Y196F	MPCSL3	PLC coil changeover 3rdSP
Y1970	SPSY3	Spindle synchronization 3rdSP
Y1971	SPPHS3	Spindle phase synchronization 3rdSP
Y1972	SPSDR3	Spindle synchronous rotation direction 3rdSP
Y1973	SSPHM3	Phase shift calculation request 3rdSP
Y1974	SSPHF3	Phase offset request 3rdSP
Y1975	SPDRPO3	Error temporary cancel 3rdSP
Y1978	SPSYC3	Spindle synchronization/ superimposition cancel 3rdSP
Y1979	SPCMPC3	Chuck close 3rdSP
Y197F	SPOFF3	Exclude spindle 3rdSP
Y1988		Spindle oscillation command 3rdSP
Y1989	WGTSC3	Spindle control : Coil changeover gate cutoff timer interruption 3rdSP ▲
Y198A	VGHLDC3	Real-time tuning 1: Speed control gain changeover hold-down command 3rdSP
Y19A5	GFIN4	Gear shift completion 4thSP
Y19A8	SP14	Spindle speed override code 1 4thSP
Y19A9	SP24	Spindle speed override code 2 4thSP
Y19AA	SP44	Spindle speed override code 4 4thSP
Y19AF	SPS4	Spindle override method selection 4thSP
Y19B0	GI14	Spindle gear selection code 1 4thSP
Y19B1	GI24	Spindle gear selection code 2 4thSP
Y19B3	EXOBS4	Increase holding power of spindle 4thSP
Y19B4	SSTP4	Spindle stop 4thSP
Y19B5	SSFT4	Spindle gear shift 4thSP
Y19B6	SORC4	Spindle orientation 4thSP
Y19B7		Spindle command invalid 4thSP
Y19B8	SRN4	Spindle forward run start 4thSP
Y19B9	SRI4	Spindle reverse run start 4thSP
Y19BA	TL14	Spindle torque limit 1 4thSP
Y19BB	TL24	Spindle torque limit 2 4thSP
Y19BC	WRN4	Spindle forward run index 4thSP
Y19BD	WRI4	Spindle reverse run index 4thSP
Y19BE	ORC4	Spindle orientation command 4thSP
Y19BF	LRSL4	L coil selection 4thSP
Y19C2		Spindle position control (C axis)Cutting gain L 4thSP

Device	Abbrev.	Signal name
Y19C3		Spindle position control (C axis)Cutting gain H 4thSP
Y19C5	CMOD4	Spindle position control (Spindle/C axis control): C axis selection 4thSP
Y19C6	LRSM4	M coil selection 4thSP
Y19C8	SWS4	Spindle selection 4thSP
Y19CA	SPRR4	Spindle rotation reversal 4thSP
Y19CB	SPRS4	Spindle rotation direction switch method selection 4thSP
Y19CF	MPCSL4	PLC coil changeover 4thSP
Y19D0	SPSY4	Spindle synchronization 4thSP
Y19D1	SPPHS4	Spindle phase synchronization 4thSP
Y19D2	SPSDR4	Spindle synchronous rotation direction 4thSP
Y19D3	SSPHM4	Phase shift calculation request 4thSP
Y19D4	SSPHF4	Phase offset request 4thSP
Y19D5	SPDRPO4	Error temporary cancel 4thSP
Y19D8	SPSYC4	Spindle synchronization/ superimposition cancel 4thSP
Y19D9	SPCMPC4	Chuck close 4thSP
Y19DF	SPOFF4	Exclude spindle 4thSP
Y19E8		Spindle oscillation command 4thSP
Y19E9	WGTSC4	Spindle control : Coil changeover gate cutoff timer interruption 4thSP ▲
Y19EA	VGHLDC4	Real-time tuning 1: Speed control gain changeover hold-down command 4thSP
Y1A05	GFIN5	Gear shift completion 5thSP
Y1A08	SP15	Spindle speed override code 1 5thSP
Y1A09	SP25	Spindle speed override code 2 5thSP
Y1A0A	SP45	Spindle speed override code 4 5thSP
Y1A0F	SPS5	Spindle override method selection 5thSP
Y1A10	GI15	Spindle gear selection code 1 5thSP
Y1A11	GI25	Spindle gear selection code 2 5thSP
Y1A13	EXOBS5	Increase holding power of spindle 5thSP
Y1A14	SSTP5	Spindle stop 5thSP
Y1A15	SSFT5	Spindle gear shift 5thSP
Y1A16	SORC5	Spindle orientation 5thSP
Y1A17		Spindle command invalid 5thSP
Y1A18	SRN5	Spindle forward run start 5thSP
Y1A19	SRI5	Spindle reverse run start 5thSP
Y1A1A	TL15	Spindle torque limit 1 5thSP
Y1A1B	TL25	Spindle torque limit 2 5thSP
Y1A1C	WRN5	Spindle forward run index 5thSP
Y1A1D	WRI5	Spindle reverse run index 5thSP
Y1A1E	ORC5	Spindle orientation command 5thSP
Y1A1F	LRSL5	L coil selection 5thSP
Y1A22		Spindle position control (C axis)Cutting gain L 5thSP
Y1A23		Spindle position control (C axis)Cutting gain H 5thSP
Y1A25	CMOD5	Spindle position control (Spindle/C axis control): C axis selection 5thSP
Y1A26	LRSM5	M coil selection 5thSP
Y1A28	SWS5	Spindle selection 5thSP
Y1A2A	SPRR5	Spindle rotation reversal 5thSP
Y1A2B	SPRS5	Spindle rotation direction switch method selection 5thSP
Y1A2F	MPCSL5	PLC coil changeover 5thSP
Y1A30	SPSY5	Spindle synchronization 5thSP
Y1A31	SPPHS5	Spindle phase synchronization 5thSP
Y1A32	SPSDR5	Spindle synchronous rotation direction 5thSP
Y1A33	SSPHM5	Phase shift calculation request 5thSP
Y1A34	SSPHF5	Phase offset request 5thSP
Y1A35	SPDRPO5	Error temporary cancel 5thSP
Y1A38	SPSYC5	Spindle synchronization/ superimposition cancel 5thSP
Y1A39	SPCMPC5	Chuck close 5thSP
Y1A3F	SPOFF5	Exclude spindle 5thSP
Y1A48		Spindle oscillation command 5thSP
Y1A49	WGTSC5	Spindle control : Coil changeover gate cutoff timer interruption 5thSP ▲
Y1A4A	VGHLDC5	Real-time tuning 1: Speed control gain changeover hold-down command 5thSP
Y1A65	GFIN6	Gear shift completion 6thSP
Y1A68	SP16	Spindle speed override code 1 6thSP
Y1A69	SP26	Spindle speed override code 2 6thSP
Y1A6A	SP46	Spindle speed override code 4 6thSP
Y1A6F	SPS6	Spindle override method selection 6thSP
Y1A70	GI16	Spindle gear selection code 1 6thSP
Y1A71	GI26	Spindle gear selection code 2 6thSP
Y1A73	EXOBS6	Increase holding power of spindle 6thSP
Y1A74	SSTP6	Spindle stop 6thSP
Y1A75	SSFT6	Spindle gear shift 6thSP
Y1A76	SORC6	Spindle orientation 6thSP
Y1A77		Spindle command invalid 6thSP
Y1A78	SRN6	Spindle forward run start 6thSP
Y1A79	SRI6	Spindle reverse run start 6thSP
Y1A7A	TL16	Spindle torque limit 1 6thSP
Y1A7B	TL26	Spindle torque limit 2 6thSP
Y1A7C	WRN6	Spindle forward run index 6thSP
Y1A7D	WRI6	Spindle reverse run index 6thSP
Y1A7E	ORC6	Spindle orientation command 6thSP
Y1A7F	LRSL6	L coil selection 6thSP
Y1A82		Spindle position control (C axis)Cutting gain L 6thSP
Y1A83		Spindle position control (C axis)Cutting gain H 6thSP
Y1A85	CMOD6	Spindle position control (Spindle/C axis control): C axis selection 6thSP

Device	Abbrev.	Signal name
Y1A86	LRSM6	M coil selection 6thSP
Y1A88	SWS6	Spindle selection 6thSP
Y1A8A	SPRR6	Spindle rotation reversal 6thSP
Y1A8B	SPRS6	Spindle rotation direction switch method selection 6thSP
Y1A8F	MPCSL6	PLC coil changeover 6thSP
Y1A90	SPSY6	Spindle synchronization 6thSP
Y1A91	SPPHS6	Spindle phase synchronization 6thSP
Y1A92	SPSDR6	Spindle synchronous rotation direction 6thSP
Y1A93	SSPHM6	Phase shift calculation request 6thSP
Y1A94	SSPHF6	Phase offset request 6thSP
Y1A95	SPDRPO6	Error temporary cancel 6thSP
Y1A98	SPSYC6	Spindle synchronization/ superimposition cancel 6thSP
Y1A99	SPCMPC6	Chuck close 6thSP
Y1A9F	SPOFF6	Exclude spindle 6thSP
Y1AA8		Spindle oscillation command 6thSP
Y1AA9	WGTSC6	Spindle control : Coil changeover gate cutoff timer interruption 6thSP ▲
Y1AAA	VGHLDC6	Real-time tuning 1: Speed control gain changeover hold-down command 6thSP
Y1AC5	GFIN7	Gear shift completion 7thSP
Y1AC8	SP17	Spindle speed override code 1 7thSP
Y1AC9	SP27	Spindle speed override code 2 7thSP
Y1ACA	SP47	Spindle speed override code 4 7thSP
Y1ACF	SPS7	Spindle override method selection 7thSP
Y1AD0	GI17	Spindle gear selection code 1 7thSP
Y1AD1	GI27	Spindle gear selection code 2 7thSP
Y1AD3	EXOBS7	Increase holding power of spindle 7thSP
Y1AD4	SSTP7	Spindle stop 7thSP
Y1AD5	SSFT7	Spindle gear shift 7thSP
Y1AD6	SORC7	Spindle orientation 7thSP
Y1AD7		Spindle command invalid 7thSP
Y1AD8	SRN7	Spindle forward run start 7thSP
Y1AD9	SRI7	Spindle reverse run start 7thSP
Y1ADA	TL17	Spindle torque limit 1 7thSP
Y1ADB	TL27	Spindle torque limit 2 7thSP
Y1ADC	WRN7	Spindle forward run index 7thSP
Y1ADD	WRI7	Spindle reverse run index 7thSP
Y1ADE	ORC7	Spindle orientation command 7thSP
Y1ADF	LRSL7	L coil selection 7thSP
Y1AE2		Spindle position control (C axis)Cutting gain L 7thSP
Y1AE3		Spindle position control (C axis)Cutting gain H 7thSP
Y1AE5	CMOD7	Spindle position control (Spindle/C axis control): C axis selection 7thSP
Y1AE6	LRSM7	M coil selection 7thSP
Y1AE8	SWS7	Spindle selection 7thSP
Y1AEA	SPRR7	Spindle rotation reversal 7thSP
Y1AEB	SPRS7	Spindle rotation direction switch method selection 7thSP
Y1AEF	MPCSL7	PLC coil changeover 7thSP
Y1AF0	SPSY7	Spindle synchronization 7thSP
Y1AF1	SPPHS7	Spindle phase synchronization 7thSP
Y1AF2	SPSDR7	Spindle synchronous rotation direction 7thSP
Y1AF3	SSPHM7	Phase shift calculation request 7thSP
Y1AF4	SSPHF7	Phase offset request 7thSP
Y1AF5	SPDRPO7	Error temporary cancel 7thSP
Y1AF8	SPSYC7	Spindle synchronization/ superimposition cancel 7thSP
Y1AF9	SPCMPC7	Chuck close 7thSP
Y1AFF	SPOFF7	Exclude spindle 7thSP
Y1B08		Spindle oscillation command 7thSP
Y1B09	WGTSC7	Spindle control : Coil changeover gate cutoff timer interruption 7thSP ▲
Y1B0A	VGHLDC7	Real-time tuning 1: Speed control gain changeover hold-down command 7thSP
Y1B25	GFIN8	Gear shift completion 8thSP
Y1B28	SP18	Spindle speed override code 1 8thSP
Y1B29	SP28	Spindle speed override code 2 8thSP
Y1B2A	SP48	Spindle speed override code 4 8thSP
Y1B2F	SPS8	Spindle override method selection 8thSP
Y1B30	GI18	Spindle gear selection code 1 8thSP
Y1B31	GI28	Spindle gear selection code 2 8thSP
Y1B33	EXOBS8	Increase holding power of spindle 8thSP
Y1B34	SSTP8	Spindle stop 8thSP
Y1B35	SSFT8	Spindle gear shift 8thSP
Y1B36	SORC8	Spindle orientation 8thSP
Y1B37		Spindle command invalid 8thSP
Y1B38	SRN8	Spindle forward run start 8thSP
Y1B39	SRI8	Spindle reverse run start 8thSP
Y1B3A	TL18	Spindle torque limit 1 8thSP
Y1B3B	TL28	Spindle torque limit 2 8thSP
Y1B3C	WRN8	Spindle forward run index 8thSP
Y1B3D	WRI8	Spindle reverse run index 8thSP
Y1B3E	ORC8	Spindle orientation command 8thSP
Y1B3F	LRSL8	L coil selection 8thSP
Y1B42		Spindle position control (C axis)Cutting gain L 8thSP
Y1B43		Spindle position control (C axis)Cutting gain H 8thSP
Y1B45	CMOD8	Spindle position control (Spindle/C axis control): C axis selection 8thSP
Y1B46	LRSM8	M coil selection 8thSP
Y1B48	SWS8	Spindle selection 8thSP

Device	Abbrev.	Signal name
Y1B4A	SPRR8	Spindle rotation reversal 8thSP
Y1B4B	SPRS8	Spindle rotation direction switch method selection 8thSP
Y1B4F	MPCSL8	PLC coil changeover 8thSP
Y1B50	SPSY8	Spindle synchronization 8thSP
Y1B51	SPPHS8	Spindle phase synchronization 8thSP
Y1B52	SPSDR8	Spindle synchronous rotation direction 8thSP
Y1B53	SSPHM8	Phase shift calculation request 8thSP
Y1B54	SSPHF8	Phase offset request 8thSP
Y1B55	SPDRPO8	Error temporary cancel 8thSP
Y1B58	SPSYC8	Spindle synchronization/ superimposition cancel 8thSP
Y1B59	SPCMPC8	Chuck close 8thSP
Y1B5F	SPOFF8	Exclude spindle 8thSP
Y1B68		Spindle oscillation command 8thSP
Y1B69	WGTSC8	Spindle control : Coil changeover gate cutoff timer interruption 8thSP ▲
Y1B6A	VGHLDC8	Real-time tuning 1: Speed control gain changeover hold-down command 8thSP
Y1C80		MES interface library: Operation trigger [M8]
Y1C81	*KEY_MemC	Data protect key (memory card) [M8]
Y1C82	*KEY_DS	Data protect key (DS) [M8]
Y1C83	BZR	Buzzer sound control: Buzzer ON [M8]
Y1C84	EQLDWR	Spindle protection: Resetting alarm of equivalent load factor over limit [M8]
Y1C88	ENC1PCLR	External encoder 1: Position output clear request [M8]
Y1D00		Position switch 1 interlock $1
Y1D01		Position switch 2 interlock $1
Y1D02		Position switch 3 interlock $1
Y1D03		Position switch 4 interlock $1
Y1D04		Position switch 5 interlock $1
Y1D05		Position switch 6 interlock $1
Y1D06		Position switch 7 interlock $1
Y1D07		Position switch 8 interlock $1
Y1D08		Position switch 9 interlock $1
Y1D09		Position switch 10 interlock $1
Y1D0A		Position switch 11 interlock $1
Y1D0B		Position switch 12 interlock $1
Y1D0C		Position switch 13 interlock $1
Y1D0D		Position switch 14 interlock $1
Y1D0E		Position switch 15 interlock $1
Y1D0F		Position switch 16 interlock $1
Y1D10		Position switch 17 interlock $1
Y1D11		Position switch 18 interlock $1
Y1D12		Position switch 19 interlock $1
Y1D13		Position switch 20 interlock $1
Y1D14		Position switch 21 interlock $1
Y1D15		Position switch 22 interlock $1
Y1D16		Position switch 23 interlock $1
Y1D17		Position switch 24 interlock $1
Y1D20		Position switch 1 interlock $2
Y1D21		Position switch 2 interlock $2
Y1D22		Position switch 3 interlock $2
Y1D23		Position switch 4 interlock $2
Y1D24		Position switch 5 interlock $2
Y1D25		Position switch 6 interlock $2
Y1D26		Position switch 7 interlock $2
Y1D27		Position switch 8 interlock $2
Y1D28		Position switch 9 interlock $2
Y1D29		Position switch 10 interlock $2
Y1D2A		Position switch 11 interlock $2
Y1D2B		Position switch 12 interlock $2
Y1D2C		Position switch 13 interlock $2
Y1D2D		Position switch 14 interlock $2
Y1D2E		Position switch 15 interlock $2
Y1D2F		Position switch 16 interlock $2
Y1D30		Position switch 17 interlock $2
Y1D31		Position switch 18 interlock $2
Y1D32		Position switch 19 interlock $2
Y1D33		Position switch 20 interlock $2
Y1D34		Position switch 21 interlock $2
Y1D35		Position switch 22 interlock $2
Y1D36		Position switch 23 interlock $2
Y1D37		Position switch 24 interlock $2
Y1D40		Position switch 1 interlock $3
Y1D41		Position switch 2 interlock $3
Y1D42		Position switch 3 interlock $3
Y1D43		Position switch 4 interlock $3
Y1D44		Position switch 5 interlock $3
Y1D45		Position switch 6 interlock $3
Y1D46		Position switch 7 interlock $3
Y1D47		Position switch 8 interlock $3
Y1D48		Position switch 9 interlock $3
Y1D49		Position switch 10 interlock $3
Y1D4A		Position switch 11 interlock $3
Y1D4B		Position switch 12 interlock $3
Y1D4C		Position switch 13 interlock $3

Device	Abbrev.	Signal name
Y1D4D		Position switch 14 interlock $3
Y1D4E		Position switch 15 interlock $3
Y1D4F		Position switch 16 interlock $3
Y1D50		Position switch 17 interlock $3
Y1D51		Position switch 18 interlock $3
Y1D52		Position switch 19 interlock $3
Y1D53		Position switch 20 interlock $3
Y1D54		Position switch 21 interlock $3
Y1D55		Position switch 22 interlock $3
Y1D56		Position switch 23 interlock $3
Y1D57		Position switch 24 interlock $3
Y1D60		Position switch 1 interlock $4
Y1D61		Position switch 2 interlock $4
Y1D62		Position switch 3 interlock $4
Y1D63		Position switch 4 interlock $4
Y1D64		Position switch 5 interlock $4
Y1D65		Position switch 6 interlock $4
Y1D66		Position switch 7 interlock $4
Y1D67		Position switch 8 interlock $4
Y1D68		Position switch 9 interlock $4
Y1D69		Position switch 10 interlock $4
Y1D6A		Position switch 11 interlock $4
Y1D6B		Position switch 12 interlock $4
Y1D6C		Position switch 13 interlock $4
Y1D6D		Position switch 14 interlock $4
Y1D6E		Position switch 15 interlock $4
Y1D6F		Position switch 16 interlock $4
Y1D70		Position switch 17 interlock $4
Y1D71		Position switch 18 interlock $4
Y1D72		Position switch 19 interlock $4
Y1D73		Position switch 20 interlock $4
Y1D74		Position switch 21 interlock $4
Y1D75		Position switch 22 interlock $4
Y1D76		Position switch 23 interlock $4
Y1D77		Position switch 24 interlock $4
Y1D80		Position switch 1 interlock $5
Y1D81		Position switch 2 interlock $5
Y1D82		Position switch 3 interlock $5
Y1D83		Position switch 4 interlock $5
Y1D84		Position switch 5 interlock $5
Y1D85		Position switch 6 interlock $5
Y1D86		Position switch 7 interlock $5
Y1D87		Position switch 8 interlock $5
Y1D88		Position switch 9 interlock $5
Y1D89		Position switch 10 interlock $5
Y1D8A		Position switch 11 interlock $5
Y1D8B		Position switch 12 interlock $5
Y1D8C		Position switch 13 interlock $5
Y1D8D		Position switch 14 interlock $5
Y1D8E		Position switch 15 interlock $5
Y1D8F		Position switch 16 interlock $5
Y1D90		Position switch 17 interlock $5
Y1D91		Position switch 18 interlock $5
Y1D92		Position switch 19 interlock $5
Y1D93		Position switch 20 interlock $5
Y1D94		Position switch 21 interlock $5
Y1D95		Position switch 22 interlock $5
Y1D96		Position switch 23 interlock $5
Y1D97		Position switch 24 interlock $5
Y1DA0		Position switch 1 interlock $6
Y1DA1		Position switch 2 interlock $6
Y1DA2		Position switch 3 interlock $6
Y1DA3		Position switch 4 interlock $6
Y1DA4		Position switch 5 interlock $6
Y1DA5		Position switch 6 interlock $6
Y1DA6		Position switch 7 interlock $6
Y1DA7		Position switch 8 interlock $6
Y1DA8		Position switch 9 interlock $6
Y1DA9		Position switch 10 interlock $6
Y1DAA		Position switch 11 interlock $6
Y1DAB		Position switch 12 interlock $6
Y1DAC		Position switch 13 interlock $6
Y1DAD		Position switch 14 interlock $6
Y1DAE		Position switch 15 interlock $6
Y1DAF		Position switch 16 interlock $6
Y1DB0		Position switch 17 interlock $6
Y1DB1		Position switch 18 interlock $6
Y1DB2		Position switch 19 interlock $6
Y1DB3		Position switch 20 interlock $6
Y1DB4		Position switch 21 interlock $6
Y1DB5		Position switch 22 interlock $6
Y1DB6		Position switch 23 interlock $6

Device	Abbrev.	Signal name
Y1DB7		Position switch 24 interlock $6
Y1DC0		Position switch 1 interlock $7
Y1DC1		Position switch 2 interlock $7
Y1DC2		Position switch 3 interlock $7
Y1DC3		Position switch 4 interlock $7
Y1DC4		Position switch 5 interlock $7
Y1DC5		Position switch 6 interlock $7
Y1DC6		Position switch 7 interlock $7
Y1DC7		Position switch 8 interlock $7
Y1DC8		Position switch 9 interlock $7
Y1DC9		Position switch 10 interlock $7
Y1DCA		Position switch 11 interlock $7
Y1DCB		Position switch 12 interlock $7
Y1DCC		Position switch 13 interlock $7
Y1DCD		Position switch 14 interlock $7
Y1DCE		Position switch 15 interlock $7
Y1DCF		Position switch 16 interlock $7
Y1DD0		Position switch 17 interlock $7
Y1DD1		Position switch 18 interlock $7
Y1DD2		Position switch 19 interlock $7
Y1DD3		Position switch 20 interlock $7
Y1DD4		Position switch 21 interlock $7
Y1DD5		Position switch 22 interlock $7
Y1DD6		Position switch 23 interlock $7
Y1DD7		Position switch 24 interlock $7
Y1DE0		Position switch 1 interlock $8
Y1DE1		Position switch 2 interlock $8
Y1DE2		Position switch 3 interlock $8
Y1DE3		Position switch 4 interlock $8
Y1DE4		Position switch 5 interlock $8
Y1DE5		Position switch 6 interlock $8
Y1DE6		Position switch 7 interlock $8
Y1DE7		Position switch 8 interlock $8
Y1DE8		Position switch 9 interlock $8
Y1DE9		Position switch 10 interlock $8
Y1DEA		Position switch 11 interlock $8
Y1DEB		Position switch 12 interlock $8
Y1DEC		Position switch 13 interlock $8
Y1DED		Position switch 14 interlock $8
Y1DEE		Position switch 15 interlock $8
Y1DEF		Position switch 16 interlock $8
Y1DF0		Position switch 17 interlock $8
Y1DF1		Position switch 18 interlock $8
Y1DF2		Position switch 19 interlock $8
Y1DF3		Position switch 20 interlock $8
Y1DF4		Position switch 21 interlock $8
Y1DF5		Position switch 22 interlock $8
Y1DF6		Position switch 23 interlock $8
Y1DF7		Position switch 24 interlock $8

4 PLC Output Signals (Data type: R***)

(Note) Signals marked with " ▲ " are prepared for a specific machine tool builder.

Device	Abbrev.	Signal name
R200	AO1	Analog output 1
R201	AO2	Analog output 2
R202	AO3	Analog output 3
R203	AO4	Analog output 4
R210		Displayed screen No.
R212		KEY OUT 1
R215		Power OFF indication Y device No.
R216		Detailed screen No.
R224		User sequence program version code A [M8]
R225		User sequence program version code B [M8]
R226		User sequence program version code C [M8]
R227		User sequence program version code D [M8]
R232		User sequence program version code 2 A [M8]
R233		User sequence program version code 2 B [M8]
R234		User sequence program version code 2 C [M8]
R235		User sequence program version code 2 D [M8]
R236		User sequence program version code 2 E [M8]
R237		User sequence program version code 2 F [M8]
R238		User sequence program version code 2 G [M8]
R239		User sequence program version code 2 H [M8]
R240		APLC version A
R241		APLC version B
R242		APLC version C
R243		APLC version D
R248		OT ignored (Axis 1 to 8 for part system 1,2)
R249		OT ignored (Axis 1 to 8 for part system 3,4)
R255		PLC axis OT ignored
R272		Near-point dog ignored (Axis 1 to 8 for part system 1,2)
R273		Near-point dog ignored (Axis 1 to 8 for part system 3,4)
R279		PLC axis near-point dog ignored
R296	SOMD	Speed monitor mode
R297		Handy terminal Data area top address [M8]
R298		Handy terminal Data valid number of registers [M8]
R299		Handy terminal Cause of communication error [M8]
R304	NDPC	Power consumption computation: Consumption of devices other than drive system(L)
R305		Power consumption computation: Consumption of devices other than drive system(H)
R306	DFPCC	Power consumption computation: Drive system's fixed consumption correction(L)
R307		Power consumption computation: Drive system's fixed consumption correction(H)
R308		Operator message I/F 1
R309		Operator message I/F 2
R310		Operator message I/F 3
R311		Operator message I/F 4
R336		Tool I/D R/W pot No. designation ▲
R337		Large diameter tool information ▲
R338		Tool weight (spindle tool) ▲
R339		Tool weight (standby tool) ▲
R340		Unset tool information ▲
R342		Specified shape interference Shape No. designation
R347		Skip retract valid
R348		Skip retract amount (L) [M]
R349		Skip retract amount (H) [M]
R350		Skip retract speed (L) [M]
R351		Skip retract speed (H) [M]
R352		Remote program input No. (L) ▲
R353		Remote program input No. (H) ▲
R354		Machine manufacturer macro password No. (L)
R355		Machine manufacturer macro password No. (H)
R356		Direct screen selection A
R357		Direct screen selection B
R358		Direct screen selection C
R359		Direct screen selection D
R361		User level-based data protection: Operation level
R364		Machine Parameter Lock I/F [M8]
R365		Measures against tool setter chattering Movement amount
R372		High-speed simple program check: Time measurement output (L)
R373		High-speed simple program check: Time measurement output (H)
R375		Manual arbitrary reverse run handle selection
R378		High-speed simple program check: Time reduction coefficient
R379		Manual arbitrary reverse run speed multiplier
R390		G/B spindle synchronization: position error compensation scale, and the number of times of compensations
R391		Optimum acceleration/deceleration parameter switching axis (spindle and bit selection) ▲
R396		User PLC info program format info
R400		Ball screw thermal displacement compensation Offset amount 1st axis [M]
R401		Ball screw thermal displacement compensation Max. compensation amount 1st axis [M]

Device	Abbrev.	Signal name
R402		Ball screw thermal displacement compensation Part-system, axis No. 1st axis
R403		Ball screw thermal displacement compensation Offset amount 2nd axis [M]
R404		Ball screw thermal displacement compensation Max. compensation amount 2nd axis [M]
R405		Ball screw thermal displacement compensation Part-system, axis No. 2nd axis
R406		Ball screw thermal displacement compensation Offset amount 3rd axis [M]
R407		Ball screw thermal displacement compensation Max. compensation amount 3rd axis [M]
R408		Ball screw thermal displacement compensation Part-system, axis No. 3rd axis
R409		Ball screw thermal displacement compensation Offset amount 4th axis [M]
R410		Ball screw thermal displacement compensation Max. compensation amount 3rd axis [M]
R411		Ball screw thermal displacement compensation Part-system, axis No. 4th axis
R424		PLC window Reading start R register 1
R425		PLC window Number of read windows 1
R426		PLC window Writing start R register 1
R427		PLC window Number of write windows 1
R428		PLC window Reading start R register 2
R429		PLC window Number of read windows 2
R430		PLC window Writing start R register 2
R431		PLC window Number of write windows 2
R432		PLC window Reading start R register 3
R433		PLC window Number of read windows 3
R434		PLC window Writing start R register 3
R435		PLC window Number of write windows 3
R440		PLC axis control information address 1st axis
R441		PLC axis control information address 2nd axis
R442		PLC axis control information address 3rd axis
R443		PLC axis control information address 4th axis
R444		PLC axis control information address 5th axis
R445		PLC axis control information address 6th axis
R448		PLC axis control buffering mode information address
R449		PLC axis control: droop cancel invalid axis [C80]
R456		Encoder 1 arbitrary pulse 1
R457		Encoder 1 arbitrary pulse 2
R458		Encoder 2 arbitrary pulse 1
R459		Encoder 2 arbitrary pulse 2
R460		G/B spindle synchronization: maximum range of the relative position error
R461		G/B spindle synchronization: maximum value of the relative position error
R462		G/B spindle synchronization: average value of the relative position error during the steady state
R463		G/B spindle synchronization: maximum range of the relative position error during the steady state
R464		G/B spindle synchronization: maximum value of the relative position error during the steady state
R465		G/B spindle synchronization: position error compensation amount
R466		G/B spindle synchronization: phase shift amount
R468		Interference check between part systems: Data address [M8]
R469	SKPIGN	Skip signal ignore ▲
R470		Modbus block 1 transfer position ▲
R471		Modbus block 1 number of transfer ▲
R472		Modbus block 2 transfer position ▲
R473		Modbus block 2 number of transfers ▲
R474		Modbus block 3 transfer position ▲
R475		Modbus block 3 number of transfers ▲
R476		Modbus block 4 transfer position ▲
R477		Modbus block 4 number of transfers ▲
R478		Modbus transfer cycle ▲
R479		Modbus time-out period ▲
R2500		1st cutting feedrate override $1
R2501		2nd cutting feedrate override $1
R2502		Rapid traverse override $1
R2503	CHPOV1	Chopping override $1
R2504		Manual feedrate (L) $1 [M]
R2505		Manual feedrate (H) $1 [M]
R2506		Manual feedrate B (L) $1 [M]
R2507		Manual feedrate B (H) $1 [M]
R2508		1st handle/incremental feed magnification (L) $1
R2509		1st handle/incremental feed magnification (H) $1
R2510		2nd handle feed magnification (L) $1
R2511		2nd handle feed magnification (H) $1
R2512		3rd handle feed magnification (L) $1
R2513		3rd handle feed magnification (H) $1
R2518		PLC interrupt program number (L) $1
R2519		PLC interrupt program number (H) $1
R2524		Manual feedrate B override $1
R2525		External search device No. $1
R2526		External search program No. (L) $1
R2527		External search program No. (H) $1
R2528		External search sequence No. (L) $1
R2529		External search sequence No. (H) $1
R2530		External search block No. (L) $1
R2531		External search block No. (H) $1
R2540		Handle polarity $1 [M8]

Device	Abbrev.	Signal name
R2544		Manual arbitrary feed 1st axis travel amount (L) $1 [M]
R2545		Manual arbitrary feed 1st axis travel amount (H) $1 [M]
R2548		Manual arbitrary feed 2nd axis travel amount (L) $1 [M]
R2549		Manual arbitrary feed 2nd axis travel amount (H) $1 [M]
R2552		Manual arbitrary feed 3rd axis travel amount (L) $1 [M]
R2553		Manual arbitrary feed 3rd axis travel amount (H) $1 [M]
R2556		Alarm message I/F 1 $1
R2557		Alarm message I/F 2 $1
R2558		Alarm message I/F 3 $1
R2559		Alarm message I/F 4 $1
R2560		Operator message I/F $1
R2562		Search & start program No. (L) $1
R2563		Search & start program No. (H) $1
R2564		Manual skip I/F 1 (Manual skip control) $1 ▲
R2565		Manual skip I/F 2 (Manual skip axis stop/read request) $1 ▲
R2566		Manual skip I/F 3 (Manual skip axis stop mode) $1 ▲
R2567		Encoder selection $1
R2568		C axis selection $1
R2580		Load monitor I : Axis selection $1 [M8]
R2581		Load monitor I : Load change rate detection axis $1 ▲
R2582		Load monitor I : Teaching data sub-No. $1 ▲
R2583		Load monitor I : Adaptive control basic axis selection $1 ▲
R2584		Each axis reference position selection $1
R2587		Chopping control data address $1
R2588		Tool life management data sort $1
R2589		Synchronous control operation method $1
R2590		Tool group No. designation (L) $1
R2591		Tool group No. designation (H) $1
R2592		Reference position adjustment completion $1
R2593		Current limit changeover $1
R2594		Wear compensation No. (tool presetter) $1
R2596		Turret interference object tool No. designation $1
R2599		Workpiece coordinate selection $1 ▲
R2600		Workpiece coordinate offset Measurement tool compensation No./ Selected compensation tool No.(main) (L) $1
R2601		Workpiece coordinate offset Measurement tool compen. No./ Selected compen. tool No.(main) (H) $1
R2602		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (L) $1
R2603		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (H) $1
R2604		Selected tool compensation No.(sub) (L) $1
R2605		Selected tool compensation No.(sub) (H) $1
R2606		Selected tool wear No. (sub) (L) $1
R2607		Selected tool wear No. (sub) (H) $1
R2608		Tool mounting information 1-16 $1
R2609		Tool mounting information 17-32 $1
R2610		Tool mounting information 33-48 $1
R2611		Tool mounting information 49-64 $1
R2612		Tool mounting information (65 - 80) $1
R2613	MTAPn1	n-th spindle synchronous tapping valid $1 [C80]
R2614	SLSPNO1	Multiple-spindle control I: Selected spindle No. $1
R2615	RPARCHG1	Rotary axis configuration parameter switch $1
R2616		Ext. machine coordinate: compensation No. $1 ▲
R2617		Optimum acceleration/deceleration parameter switching axis (axis and bit selection) $1 ▲
R2618		Tool length measurement 2 Tool No. (L) $1
R2619		Tool length measurement 2 Tool No. (H) $1
R2620		Constant torque control: Constant torque/proportional torque stopper control request axis $1
R2621		Constant torque control: Constant torque droop cancel request axis $1
R2625		Servo ready completion output designation $1
R2626		Thread recutting command $1
R2627		Thread recutting execution operation $1
R2628		Mechanical axis specifications 1st rotary axis angle (L) $1
R2629		Mechanical axis specifications 1st rotary axis angle (H) $1
R2630		Mechanical axis specifications 2nd rotary axis angle (L) $1
R2631		Mechanical axis specifications 2nd rotary axis angle (H) $1
R2634	TANGOFS1	Simple inclined surface machining command:
R2635		Tool axis rotation angle compensation amount $1 [M8]
R2636		Circular feed in manual mode Operation mode data (L) $1
R2637		Circular feed in manual mode Operation mode data (H) $1
R2638		Circular feed in manual mode Part system designation $1
R2640		Circular feed in manual mode Horizontal axis designation $1
R2641		Circular feed in manual mode Vertical axis designation $1
R2644		Circular feed in manual mode Basic point X data (L) $1
R2645		Circular feed in manual mode Basic point X data (H) $1
R2648		Circular feed in manual mode Basic point Y data (L) $1
R2649		Circular feed in manual mode Basic point Y data (H) $1
R2652		Circular feed in manual mode Travel range X+ data (L) $1
R2653		Circular feed in manual mode Travel range X+ data (H) $1
R2656		Circular feed in manual mode Travel range X- data (L) $1
R2657		Circular feed in manual mode Travel range X- data (H) $1
R2660		Circular feed in manual mode Travel range Y+ data (L) $1

Device	Abbrev.	Signal name
R2661		Circular feed in manual mode Travel range Y+ data (H) $1
R2664		Circular feed in manual mode Travel range Y- data (L) $1
R2665		Circular feed in manual mode Travel range Y- data (H) $1
R2668		Circular feed in manual mode Gradient/arc center X data (L) $1
R2669		Circular feed in manual mode Gradient/arc center X data (H) $1
R2672		Circular feed in manual mode Gradient/arc center Y data (L) $1
R2673		Circular feed in manual mode Gradient/arc center Y data (H) $1
R2680	CAXSVF1	Spindle position control (spindle/C axis control): Servo OFF request during Spindle/C axis mode $1 ▲
R2681	SPGNCO1	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $1 ▲
R2682	UAC1	U-axis tool control: U-axis tool zero point reaching request $1 ▲
R2684		For specific users NC control signal 1 $1 ▲
R2688		Specific users Manual skip motion direction (-) $1 ▲
R2689		Specific users Manual skip motion direction (+) $1 ▲
R2700		1st cutting feedrate override $2
R2701		2nd cutting feedrate override $2
R2702		Rapid traverse override $2
R2703	CHPOV2	Chopping override $2
R2704		Manual feedrate (L) $2 [M]
R2705		Manual feedrate (H) $2 [M]
R2706		Manual feedrate B (L) $2 [M]
R2707		Manual feedrate B (H) $2 [M]
R2708		1st handle/incremental feed magnification (L) $2
R2709		1st handle/incremental feed magnification (H) $2
R2710		2nd handle feed magnification (L) $2
R2711		2nd handle feed magnification (H) $2
R2712		3rd handle feed magnification (L) $2
R2713		3rd handle feed magnification (H) $2
R2718		PLC interrupt program number (L) $2
R2719		PLC interrupt program number (H) $2
R2724		Manual feedrate B override $2
R2725		External search device No. $2
R2726		External search program No. (L) $2
R2727		External search program No. (H) $2
R2728		External search sequence No. (L) $2
R2729		External search sequence No. (H) $2
R2730		External search block No. (L) $2
R2731		External search block No. (H) $2
R2740		Handle polarity $2 [M8]
R2744		Manual arbitrary feed 1st axis travel amount (L) $2 [M]
R2745		Manual arbitrary feed 1st axis travel amount (H) $2 [M]
R2748		Manual arbitrary feed 2nd axis travel amount (L) $2 [M]
R2749		Manual arbitrary feed 2nd axis travel amount (H) $2 [M]
R2752		Manual arbitrary feed 3rd axis travel amount (L) $2 [M]
R2753		Manual arbitrary feed 3rd axis travel amount (H) $2 [M]
R2756		Alarm message I/F 1 $2
R2757		Alarm message I/F 2 $2
R2758		Alarm message I/F 3 $2
R2759		Alarm message I/F 4 $2
R2760		Operator message I/F $2
R2762		Search & start program No. (L) $2
R2763		Search & start program No. (H) $2
R2764		Manual skip I/F 1 (Manual skip control) $2 ▲
R2765		Manual skip I/F 2 (Manual skip axis stop/read request) $2 ▲
R2766		Manual skip I/F 3 (Manual skip axis stop mode) $2 ▲
R2767		Encoder selection $2
R2768		C axis selection $2
R2780		Load monitor I : Axis selection $2 [M8]
R2781		Load monitor I : Load change rate detection axis $2 ▲
R2782		Load monitor I : Teaching data sub-No. $2 ▲
R2783		Load monitor I : Adaptive control basic axis selection $2 ▲
R2784		Each axis reference position selection $2
R2787		Chopping control data address $2
R2788		Tool life management data sort $2
R2789		Synchronous control operation method $2
R2790		Tool group No. designation (L) $2
R2791		Tool group No. designation (H) $2
R2792		Reference position adjustment completion $2
R2793		Current limit changeover $2
R2794		Wear compensation No. (tool presetter) $2
R2796		Turret interference object tool No. designation $2
R2799		Workpiece coordinate selection $2 ▲
R2800		Workpiece coordinate offset Measurement tool compensation No./ Selected compensation tool No.(main) (L) $2
R2801		Workpiece coordinate offset Measurement tool compen. No./ Selected compen. tool No.(main) (H) $2
R2802		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (L) $2
R2803		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (H) $2
R2804		Selected tool compensation No.(sub) (L) $2
R2805		Selected tool compensation No.(sub) (H) $2
R2806		Selected tool wear No. (sub) (L) $2

Device	Abbrev.	Signal name
R2807		Selected tool wear No. (sub) (H) $2
R2808		Tool mounting information 1-16 $2
R2809		Tool mounting information 17-32 $2
R2810		Tool mounting information 33-48 $2
R2811		Tool mounting information 49-64 $2
R2812		Tool mounting information (65 - 80) $2
R2813	MTAPn2	n-th spindle synchronous tapping valid $2 [C80]
R2814	SLSPNO2	Multiple-spindle control I: Selected spindle No. $2
R2815	RPARCHG2	Rotary axis configuration parameter switch $2
R2816		Ext. machine coordinate: compensation No. $2 ▲
R2817		Optimum acceleration/deceleration parameter switching axis (axis and bit selection) $2 ▲
R2818		Tool length measurement 2 Tool No. (L) $2
R2819		Tool length measurement 2 Tool No. (H) $2
R2820		Constant torque control: Constant torque/proportional torque stopper control request axis $2
R2821		Constant torque control: Constant torque droop cancel request axis $2
R2825		Servo ready completion output designation $2
R2826		Thread recutting command $2
R2827		Thread recutting execution operation $2
R2828		Mechanical axis specifications 1st rotary axis angle (L) $2
R2829		Mechanical axis specifications 1st rotary axis angle (H) $2
R2830		Mechanical axis specifications 2nd rotary axis angle (L) $2
R2831		Mechanical axis specifications 2nd rotary axis angle (H) $2
R2834	TANGOFS2	Simple inclined surface machining command:
R2835		Tool axis rotation angle compensation amount $2 [M8]
R2836		Circular feed in manual mode Operation mode data (L) $2
R2837		Circular feed in manual mode Operation mode data (H) $2
R2838		Circular feed in manual mode Part system designation $2
R2840		Circular feed in manual mode Horizontal axis designation $2
R2841		Circular feed in manual mode Vertical axis designation $2
R2844		Circular feed in manual mode Basic point X data (L) $2
R2845		Circular feed in manual mode Basic point X data (H) $2
R2848		Circular feed in manual mode Basic point Y data (L) $2
R2849		Circular feed in manual mode Basic point Y data (H) $2
R2852		Circular feed in manual mode Travel range X+ data (L) $2
R2853		Circular feed in manual mode Travel range X+ data (H) $2
R2856		Circular feed in manual mode Travel range X- data (L) $2
R2857		Circular feed in manual mode Travel range X- data (H) $2
R2860		Circular feed in manual mode Travel range Y+ data (L) $2
R2861		Circular feed in manual mode Travel range Y+ data (H) $2
R2864		Circular feed in manual mode Travel range Y- data (L) $2
R2865		Circular feed in manual mode Travel range Y- data (H) $2
R2868		Circular feed in manual mode Gradient/arc center X data (L) $2
R2869		Circular feed in manual mode Gradient/arc center X data (H) $2
R2872		Circular feed in manual mode Gradient/arc center Y data (L) $2
R2873		Circular feed in manual mode Gradient/arc center Y data (H) $2
R2880	CAXSVF2	Spindle position control (spindle/C axis control): Servo OFF request during Spindle/C axis mode $2 ▲
R2881	SPGNCO2	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $2 ▲
R2882	UAC2	U-axis tool control: U-axis tool zero point reaching request $2 ▲
R2884		For specific users NC control signal 1 $2 ▲
R2888		Specific users Manual skip motion direction (-) $2 ▲
R2889		Specific users Manual skip motion direction (+) $2 ▲
R2900		1st cutting feedrate override $3
R2901		2nd cutting feedrate override $3
R2902		Rapid traverse override $3
R2903	CHPOV3	Chopping override $3
R2904		Manual feedrate (L) $3 [M]
R2905		Manual feedrate (H) $3 [M]
R2906		Manual feedrate B (L) $3 [M]
R2907		Manual feedrate B (H) $3 [M]
R2908		1st handle/incremental feed magnification (L) $3
R2909		1st handle/incremental feed magnification (H) $3
R2910		2nd handle feed magnification (L) $3
R2911		2nd handle feed magnification (H) $3
R2912		3rd handle feed magnification (L) $3
R2913		3rd handle feed magnification (H) $3
R2918		PLC interrupt program number (L) $3
R2919		PLC interrupt program number (H) $3
R2924		Manual feedrate B override $3
R2925		External search device No. $3
R2926		External search program No. (L) $3
R2927		External search program No. (H) $3
R2928		External search sequence No. (L) $3
R2929		External search sequence No. (H) $3
R2930		External search block No. (L) $3
R2931		External search block No. (H) $3
R2940		Handle polarity $3 [M8]
R2944		Manual arbitrary feed 1st axis travel amount (L) $3 [M]
R2945		Manual arbitrary feed 1st axis travel amount (H) $3 [M]
R2948		Manual arbitrary feed 2nd axis travel amount (L) $3 [M]

Device	Abbrev.	Signal name
R2949		Manual arbitrary feed 2nd axis travel amount (H) $3 [M]
R2952		Manual arbitrary feed 3rd axis travel amount (L) $3 [M]
R2953		Manual arbitrary feed 3rd axis travel amount (H) $3 [M]
R2956		Alarm message I/F 1 $3
R2957		Alarm message I/F 2 $3
R2958		Alarm message I/F 3 $3
R2959		Alarm message I/F 4 $3
R2960		Operator message I/F $3
R2962		Search & start program No. (L) $3
R2963		Search & start program No. (H) $3
R2964		Manual skip I/F 1 (Manual skip control) $3 ▲
R2965		Manual skip I/F 2 (Manual skip axis stop/read request) $3 ▲
R2966		Manual skip I/F 3 (Manual skip axis stop mode) $3 ▲
R2967		Encoder selection $3
R2968		C axis selection $3
R2980		Load monitor I : Axis selection $3 [M8]
R2981		Load monitor I : Load change rate detection axis $3 ▲
R2982		Load monitor I : Teaching data sub-No. $3 ▲
R2983		Load monitor I : Adaptive control basic axis selection $3 ▲
R2984		Each axis reference position selection $3
R2987		Chopping control data address $3
R2988		Tool life management data sort $3
R2989		Synchronous control operation method $3
R2990		Tool group No. designation (L) $3
R2991		Tool group No. designation (H) $3
R2992		Reference position adjustment completion $3
R2993		Current limit changeover $3
R2994		Wear compensation No. (tool presetter) $3
R2996		Turret interference object tool No. designation $3
R2999		Workpiece coordinate selection $3 ▲
R3000		Workpiece coordinate offset Measurement tool compensation No./ Selected compensation tool No.(main) (L) $3
R3001		Workpiece coordinate offset Measurement tool compen. No./ Selected compen. tool No.(main) (H) $3
R3002		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (L) $3
R3003		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (H) $3
R3004		Selected tool compensation No.(sub) (L) $3
R3005		Selected tool compensation No.(sub) (H) $3
R3006		Selected tool wear No. (sub) (L) $3
R3007		Selected tool wear No. (sub) (H) $3
R3008		Tool mounting information 1-16 $3
R3009		Tool mounting information 17-32 $3
R3010		Tool mounting information 33-48 $3
R3011		Tool mounting information 49-64 $3
R3012		Tool mounting information (65 - 80) $3
R3013	MTAPn3	n-th spindle synchronous tapping valid $3 [C80]
R3014	SLSPNO3	Multiple-spindle control I: Selected spindle No. $3
R3015	RPARCHG3	Rotary axis configuration parameter switch $3
R3016		Ext. machine coordinate: compensation No. $3 ▲
R3017		Optimum acceleration/deceleration parameter switching axis (axis and bit selection) $3 ▲
R3018		Tool length measurement 2 Tool No. (L) $3
R3019		Tool length measurement 2 Tool No. (H) $3
R3020		Constant torque control: Constant torque/proportional torque stopper control request axis $3
R3021		Constant torque control: Constant torque droop cancel request axis $3
R3025		Servo ready completion output designation $3
R3026		Thread recutting command $3
R3027		Thread recutting execution operation $3
R3028		Mechanical axis specifications 1st rotary axis angle (L) $3
R3029		Mechanical axis specifications 1st rotary axis angle (H) $3
R3030		Mechanical axis specifications 2nd rotary axis angle (L) $3
R3031		Mechanical axis specifications 2nd rotary axis angle (H) $3
R3034 R3035	TANGOFS3	Simple inclined surface machining command: Tool axis rotation angle compensation amount $3 [M8]
R3036		Circular feed in manual mode Operation mode data (L) $3
R3037		Circular feed in manual mode Operation mode data (H) $3
R3038		Circular feed in manual mode Part system designation $3
R3040		Circular feed in manual mode Horizontal axis designation $3
R3041		Circular feed in manual mode Vertical axis designation $3
R3044		Circular feed in manual mode Basic point X data (L) $3
R3045		Circular feed in manual mode Basic point X data (H) $3
R3048		Circular feed in manual mode Basic point Y data (L) $3
R3049		Circular feed in manual mode Basic point Y data (H) $3
R3052		Circular feed in manual mode Travel range X+ data (L) $3
R3053		Circular feed in manual mode Travel range X+ data (H) $3
R3056		Circular feed in manual mode Travel range X- data (L) $3
R3057		Circular feed in manual mode Travel range X- data (H) $3
R3060		Circular feed in manual mode Travel range Y+ data (L) $3
R3061		Circular feed in manual mode Travel range Y+ data (H) $3
R3064		Circular feed in manual mode Travel range Y- data (L) $3
R3065		Circular feed in manual mode Travel range Y- data (H) $3

Device	Abbrev.	Signal name
R3068		Circular feed in manual mode Gradient/arc center X data (L) $3
R3069		Circular feed in manual mode Gradient/arc center X data (H) $3
R3072		Circular feed in manual mode Gradient/arc center Y data (L) $3
R3073		Circular feed in manual mode Gradient/arc center Y data (H) $3
R3080	CAXSVF3	Spindle position control (spindle/C axis control): Servo OFF request during Spindle/C axis mode $3 ▲
R3081	SPGNCO3	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $3 ▲
R3082	UAC3	U-axis tool control: U-axis tool zero point reaching request $3 ▲
R3084		For specific users NC control signal 1 $3 ▲
R3088		Specific users Manual skip motion direction (-) $3 ▲
R3089		Specific users Manual skip motion direction (+) $3 ▲
R3100		1st cutting feedrate override $4
R3101		2nd cutting feedrate override $4
R3102		Rapid traverse override $4
R3103	CHPOV4	Chopping override $4
R3104		Manual feedrate (L) $4 [M]
R3105		Manual feedrate (H) $4 [M]
R3106		Manual feedrate B (L) $4 [M]
R3107		Manual feedrate B (H) $4 [M]
R3108		1st handle/incremental feed magnification (L) $4
R3109		1st handle/incremental feed magnification (H) $4
R3110		2nd handle feed magnification (L) $4
R3111		2nd handle feed magnification (H) $4
R3112		3rd handle feed magnification (L) $4
R3113		3rd handle feed magnification (H) $4
R3118		PLC interrupt program number (L) $4
R3119		PLC interrupt program number (H) $4
R3124		Manual feedrate B override $4
R3125		External search device No. $4
R3126		External search program No. (L) $4
R3127		External search program No. (H) $4
R3128		External search sequence No. (L) $4
R3129		External search sequence No. (H) $4
R3130		External search block No. (L) $4
R3131		External search block No. (H) $4
R3140		Handle polarity $4 [M8]
R3144		Manual arbitrary feed 1st axis travel amount (L) $4 [M]
R3145		Manual arbitrary feed 1st axis travel amount (H) $4 [M]
R3148		Manual arbitrary feed 2nd axis travel amount (L) $4 [M]
R3149		Manual arbitrary feed 2nd axis travel amount (H) $4 [M]
R3152		Manual arbitrary feed 3rd axis travel amount (L) $4 [M]
R3153		Manual arbitrary feed 3rd axis travel amount (H) $4 [M]
R3156		Alarm message I/F 1 $4
R3157		Alarm message I/F 2 $4
R3158		Alarm message I/F 3 $4
R3159		Alarm message I/F 4 $4
R3160		Operator message I/F $4
R3162		Search & start program No. (L) $4
R3163		Search & start program No. (H) $4
R3164		Manual skip I/F 1 (Manual skip control) $4 ▲
R3165		Manual skip I/F 2 (Manual skip axis stop/read request) $4 ▲
R3166		Manual skip I/F 3 (Manual skip axis stop mode) $4 ▲
R3167		Encoder selection $4
R3168		C axis selection $4
R3180		Load monitor I : Axis selection $4 [M8]
R3181		Load monitor I : Load change rate detection axis $4 ▲
R3182		Load monitor I : Teaching data sub-No. $4 ▲
R3183		Load monitor I : Adaptive control basic axis selection $4 ▲
R3184		Each axis reference position selection $4
R3187		Chopping control data address $4
R3188		Tool life management data sort $4
R3189		Synchronous control operation method $4
R3190		Tool group No. designation (L) $4
R3191		Tool group No. designation (H) $4
R3192		Reference position adjustment completion $4
R3193		Current limit changeover $4
R3194		Wear compensation No. (tool presetter) $4
R3196		Turret interference object tool No. designation $4
R3199		Workpiece coordinate selection $4 ▲
R3200		Workpiece coordinate offset Measurement tool compensation No./ Selected compensation tool No.(main) (L) $4
R3201		Workpiece coordinate offset Measurement tool compen. No./ Selected compen. tool No.(main) (H) $4
R3202		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (L) $4
R3203		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (H) $4
R3204		Selected tool compensation No.(sub) (L) $4
R3205		Selected tool compensation No.(sub) (H) $4
R3206		Selected tool wear No. (sub) (L) $4
R3207		Selected tool wear No. (sub) (H) $4
R3208		Tool mounting information 1-16 $4
R3209		Tool mounting information 17-32 $4

Device	Abbrev.	Signal name
R3210		Tool mounting information 33-48 $4
R3211		Tool mounting information 49-64 $4
R3212		Tool mounting information (65 - 80) $4
R3213	MTAPn4	n-th spindle synchronous tapping valid $4 [C80]
R3214	SLSPNO4	Multiple-spindle control I: Selected spindle No. $4
R3215	RPARCHG4	Rotary axis configuration parameter switch $4
R3216		Ext. machine coordinate: compensation No. $4 ▲
R3217		Optimum acceleration/deceleration parameter switching axis (axis and bit selection) $4 ▲
R3218		Tool length measurement 2 Tool No. (L) $4
R3219		Tool length measurement 2 Tool No. (H) $4
R3220		Constant torque control: Constant torque/proportional torque stopper control request axis $4
R3221		Constant torque control: Constant torque droop cancel request axis $4
R3225		Servo ready completion output designation $4
R3226		Thread recutting command $4
R3227		Thread recutting execution operation $4
R3228		Mechanical axis specifications 1st rotary axis angle (L) $4
R3229		Mechanical axis specifications 1st rotary axis angle (H) $4
R3230		Mechanical axis specifications 2nd rotary axis angle (L) $4
R3231		Mechanical axis specifications 2nd rotary axis angle (H) $4
R3234	TANGOFS4	Simple inclined surface machining command: Tool axis rotation angle compensation amount $4 [M8]
R3235		
R3236		Circular feed in manual mode Operation mode data (L) $4
R3237		Circular feed in manual mode Operation mode data (H) $4
R3238		Circular feed in manual mode Part system designation $4
R3240		Circular feed in manual mode Horizontal axis designation $4
R3241		Circular feed in manual mode Vertical axis designation $4
R3244		Circular feed in manual mode Basic point X data (L) $4
R3245		Circular feed in manual mode Basic point X data (H) $4
R3248		Circular feed in manual mode Basic point Y data (L) $4
R3249		Circular feed in manual mode Basic point Y data (H) $4
R3252		Circular feed in manual mode Travel range X+ data (L) $4
R3253		Circular feed in manual mode Travel range X+ data (H) $4
R3256		Circular feed in manual mode Travel range X- data (L) $4
R3257		Circular feed in manual mode Travel range X- data (H) $4
R3260		Circular feed in manual mode Travel range Y+ data (L) $4
R3261		Circular feed in manual mode Travel range Y+ data (H) $4
R3264		Circular feed in manual mode Travel range Y- data (L) $4
R3265		Circular feed in manual mode Travel range Y- data (H) $4
R3268		Circular feed in manual mode Gradient/arc center X data (L) $4
R3269		Circular feed in manual mode Gradient/arc center X data (H) $4
R3272		Circular feed in manual mode Gradient/arc center Y data (L) $4
R3273		Circular feed in manual mode Gradient/arc center Y data (H) $4
R3280	CAXSVF4	Spindle position control (spindle/C axis control): Servo OFF request during Spindle/C axis mode $4 ▲
R3281	SPGNCO4	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $4 ▲
R3282	UAC4	U-axis tool control: U-axis tool zero point reaching request $4 ▲
R3284		For specific users NC control signal 1 $4 ▲
R3288		Specific users Manual skip motion direction (-) $4 ▲
R3289		Specific users Manual skip motion direction (+) $4 ▲
R3300		1st cutting feedrate override $5
R3301		2nd cutting feedrate override $5
R3302		Rapid traverse override $5
R3303	CHPOV5	Chopping override $5
R3304		Manual feedrate (L) $5 [M]
R3305		Manual feedrate (H) $5 [M]
R3306		Manual feedrate B (L) $5 [M]
R3307		Manual feedrate B (H) $5 [M]
R3308		1st handle/incremental feed magnification (L) $5
R3309		1st handle/incremental feed magnification (H) $5
R3310		2nd handle feed magnification (L) $5
R3311		2nd handle feed magnification (H) $5
R3312		3rd handle feed magnification (L) $5
R3313		3rd handle feed magnification (H) $5
R3318		PLC interrupt program number (L) $5
R3319		PLC interrupt program number (H) $5
R3324		Manual feedrate B override $5
R3325		External search device No. $5
R3326		External search program No. (L) $5
R3327		External search program No. (H) $5
R3328		External search sequence No. (L) $5
R3329		External search sequence No. (H) $5
R3330		External search block No. (L) $5
R3331		External search block No. (H) $5
R3340		Handle polarity $5 [M8]
R3344		Manual arbitrary feed 1st axis travel amount (L) $5 [M]
R3345		Manual arbitrary feed 1st axis travel amount (H) $5 [M]
R3348		Manual arbitrary feed 2nd axis travel amount (L) $5 [M]
R3349		Manual arbitrary feed 2nd axis travel amount (H) $5 [M]
R3352		Manual arbitrary feed 3rd axis travel amount (L) $5 [M]
R3353		Manual arbitrary feed 3rd axis travel amount (H) $5 [M]

Device	Abbrev.	Signal name
R3356		Alarm message I/F 1 $5
R3357		Alarm message I/F 2 $5
R3358		Alarm message I/F 3 $5
R3359		Alarm message I/F 4 $5
R3360		Operator message I/F $5
R3362		Search & start program No. (L) $5
R3363		Search & start program No. (H) $5
R3364		Manual skip I/F 1 (Manual skip control) $5 ▲
R3365		Manual skip I/F 2 (Manual skip axis stop/read request) $5 ▲
R3366		Manual skip I/F 3 (Manual skip axis stop mode) $5 ▲
R3367		Encoder selection $5
R3368		C axis selection $5
R3380		Load monitor I : Axis selection $5 [M8]
R3381		Load monitor I : Load change rate detection axis $5 ▲
R3382		Load monitor I : Teaching data sub-No. $5 ▲
R3383		Load monitor I : Adaptive control basic axis selection $5 ▲
R3384		Each axis reference position selection $5
R3387		Chopping control data address $5
R3388		Tool life management data sort $5
R3389		Synchronous control operation method $5
R3390		Tool group No. designation (L) $5
R3391		Tool group No. designation (H) $5
R3392		Reference position adjustment completion $5
R3393		Current limit changeover $5
R3394		Wear compensation No. (tool presetter) $5
R3396		Turret interference object tool No. designation $5
R3399		Workpiece coordinate selection $5 ▲
R3400		Workpiece coordinate offset Measurement tool compensation No./ Selected compensation tool No.(main) (L) $5
R3401		Workpiece coordinate offset Measurement tool compen. No./ Selected compen. tool No.(main) (H) $5
R3402		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (L) $5
R3403		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (H) $5
R3404		Selected tool compensation No.(sub) (L) $5
R3405		Selected tool compensation No.(sub) (H) $5
R3406		Selected tool wear No. (sub) (L) $5
R3407		Selected tool wear No. (sub) (H) $5
R3408		Tool mounting information 1-16 $5
R3409		Tool mounting information 17-32 $5
R3410		Tool mounting information 33-48 $5
R3411		Tool mounting information 49-64 $5
R3412		Tool mounting information (65 - 80) $5
R3413	MTAPn5	n-th spindle synchronous tapping valid $5 [C80]
R3414	SLSPNO5	Multiple-spindle control I: Selected spindle No. $5
R3415	RPARCHG5	Rotary axis configuration parameter switch $5
R3416		Ext. machine coordinate: compensation No. $5 ▲
R3417		Optimum acceleration/deceleration parameter switching axis (axis and bit selection) $5 ▲
R3418		Tool length measurement 2 Tool No. (L) $5
R3419		Tool length measurement 2 Tool No. (H) $5
R3420		Constant torque control: Constant torque/proportional torque stopper control request axis $5
R3421		Constant torque control: Constant torque droop cancel request axis $5
R3425		Servo ready completion output designation $5
R3426		Thread recutting command $5
R3427		Thread recutting execution operation $5
R3428		Mechanical axis specifications 1st rotary axis angle (L) $5
R3429		Mechanical axis specifications 1st rotary axis angle (H) $5
R3430		Mechanical axis specifications 2nd rotary axis angle (L) $5
R3431		Mechanical axis specifications 2nd rotary axis angle (H) $5
R3434	TANGOFS5	Simple inclined surface machining command: Tool axis rotation angle compensation amount $5 [M8]
R3435		
R3436		Circular feed in manual mode Operation mode data (L) $5
R3437		Circular feed in manual mode Operation mode data (H) $5
R3438		Circular feed in manual mode Part system designation $5
R3440		Circular feed in manual mode Horizontal axis designation $5
R3441		Circular feed in manual mode Vertical axis designation $5
R3444		Circular feed in manual mode Basic point X data (L) $5
R3445		Circular feed in manual mode Basic point X data (H) $5
R3448		Circular feed in manual mode Basic point Y data (L) $5
R3449		Circular feed in manual mode Basic point Y data (H) $5
R3452		Circular feed in manual mode Travel range X+ data (L) $5
R3453		Circular feed in manual mode Travel range X+ data (H) $5
R3456		Circular feed in manual mode Travel range X- data (L) $5
R3457		Circular feed in manual mode Travel range X- data (H) $5
R3460		Circular feed in manual mode Travel range Y+ data (L) $5
R3461		Circular feed in manual mode Travel range Y+ data (H) $5
R3464		Circular feed in manual mode Travel range Y- data (L) $5
R3465		Circular feed in manual mode Travel range Y- data (H) $5
R3468		Circular feed in manual mode Gradient/arc center X data (L) $5
R3469		Circular feed in manual mode Gradient/arc center X data (H) $5
R3472		Circular feed in manual mode Gradient/arc center Y data (L) $5

Device	Abbrev.	Signal name
R3473		Circular feed in manual mode Gradient/arc center Y data (H) $5
R3480	CAXSVF5	Spindle position control (spindle/C axis control): Servo OFF request during Spindle/C axis mode $5 ▲
R3481	SPGNCO5	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $5 ▲
R3482	UAC5	U-axis tool control: U-axis tool zero point reaching request $5 ▲
R3484		For specific users NC control signal 1 $5 ▲
R3488		Specific users Manual skip motion direction (-) $5 ▲
R3489		Specific users Manual skip motion direction (+) $5 ▲
R3500		1st cutting feedrate override $6
R3501		2nd cutting feedrate override $6
R3502		Rapid traverse override $6
R3503	CHPOV6	Chopping override $6
R3504		Manual feedrate (L) $6 [M]
R3505		Manual feedrate (H) $6 [M]
R3506		Manual feedrate B (L) $6 [M]
R3507		Manual feedrate B (H) $6 [M]
R3508		1st handle/incremental feed magnification (L) $6
R3509		1st handle/incremental feed magnification (H) $6
R3510		2nd handle feed magnification (L) $6
R3511		2nd handle feed magnification (H) $6
R3512		3rd handle feed magnification (L) $6
R3513		3rd handle feed magnification (H) $6
R3518		PLC interrupt program number (L) $6
R3519		PLC interrupt program number (H) $6
R3524		Manual feedrate B override $6
R3525		External search device No. $6
R3526		External search program No. (L) $6
R3527		External search program No. (H) $6
R3528		External search sequence No. (L) $6
R3529		External search sequence No. (H) $6
R3530		External search block No. (L) $6
R3531		External search block No. (H) $6
R3540		Handle polarity $6 [M8]
R3544		Manual arbitrary feed 1st axis travel amount (L) $6 [M]
R3545		Manual arbitrary feed 1st axis travel amount (H) $6 [M]
R3548		Manual arbitrary feed 2nd axis travel amount (L) $6 [M]
R3549		Manual arbitrary feed 2nd axis travel amount (H) $6 [M]
R3552		Manual arbitrary feed 3rd axis travel amount (L) $6 [M]
R3553		Manual arbitrary feed 3rd axis travel amount (H) $6 [M]
R3556		Alarm message I/F 1 $6
R3557		Alarm message I/F 2 $6
R3558		Alarm message I/F 3 $6
R3559		Alarm message I/F 4 $6
R3560		Operator message I/F $6
R3562		Search & start program No. (L) $6
R3563		Search & start program No. (H) $6
R3564		Manual skip I/F 1 (Manual skip control) $6 ▲
R3565		Manual skip I/F 2 (Manual skip axis stop/read request) $6 ▲
R3566		Manual skip I/F 3 (Manual skip axis stop mode) $6 ▲
R3567		Encoder selection $6
R3568		C axis selection $6
R3580		Load monitor I : Axis selection $6 [M8]
R3581		Load monitor I : Load change rate detection axis $6 ▲
R3582		Load monitor I : Teaching data sub-No. $6 ▲
R3583		Load monitor I : Adaptive control basic axis selection $6 ▲
R3584		Each axis reference position selection $6
R3587		Chopping control data address $6
R3588		Tool life management data sort $6
R3589		Synchronous control operation method $6
R3590		Tool group No. designation (L) $6
R3591		Tool group No. designation (H) $6
R3592		Reference position adjustment completion $6
R3593		Current limit changeover $6
R3594		Wear compensation No. (tool presetter) $6
R3596		Turret interference object tool No. designation $6
R3599		Workpiece coordinate selection $6 ▲
R3600		Workpiece coordinate offset Measurement tool compensation No./ Selected compensation tool No.(main) (L) $6
R3601		Workpiece coordinate offset Measurement tool compen. No./ Selected compen. tool No.(main) (H) $6
R3602		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (L) $6
R3603		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (H) $6
R3604		Selected tool compensation No.(sub) (L) $6
R3605		Selected tool compensation No.(sub) (H) $6
R3606		Selected tool wear No. (sub) (L) $6
R3607		Selected tool wear No. (sub) (H) $6
R3608		Tool mounting information 1-16 $6
R3609		Tool mounting information 17-32 $6
R3610		Tool mounting information 33-48 $6
R3611		Tool mounting information 49-64 $6
R3612		Tool mounting information (65 - 80) $6

Device	Abbrev.	Signal name
R3613	MTAPn6	n-th spindle synchronous tapping valid $6 [C80]
R3614	SLSPNO6	Multiple-spindle control I: Selected spindle No. $6
R3615	RPARCHG6	Rotary axis configuration parameter switch $6
R3616		Ext. machine coordinate: compensation No. $6 ▲
R3617		Optimum acceleration/deceleration parameter switching axis (axis and bit selection) $6 ▲
R3618		Tool length measurement 2 Tool No. (L) $6
R3619		Tool length measurement 2 Tool No. (H) $6
R3620		Constant torque control: Constant torque/proportional torque stopper control request axis $6
R3621		Constant torque control: Constant torque droop cancel request axis $6
R3625		Servo ready completion output designation $6
R3626		Thread recutting command $6
R3627		Thread recutting execution operation $6
R3628		Mechanical axis specifications 1st rotary axis angle (L) $6
R3629		Mechanical axis specifications 1st rotary axis angle (H) $6
R3630		Mechanical axis specifications 2nd rotary axis angle (L) $6
R3631		Mechanical axis specifications 2nd rotary axis angle (H) $6
R3634	TANGOFS6	Simple inclined surface machining command:
R3635		Tool axis rotation angle compensation amount $6 [M8]
R3636		Circular feed in manual mode Operation mode data (L) $6
R3637		Circular feed in manual mode Operation mode data (H) $6
R3638		Circular feed in manual mode Part system designation $6
R3640		Circular feed in manual mode Horizontal axis designation $6
R3641		Circular feed in manual mode Vertical axis designation $6
R3644		Circular feed in manual mode Basic point X data (L) $6
R3645		Circular feed in manual mode Basic point X data (H) $6
R3648		Circular feed in manual mode Basic point Y data (L) $6
R3649		Circular feed in manual mode Basic point Y data (H) $6
R3652		Circular feed in manual mode Travel range X+ data (L) $6
R3653		Circular feed in manual mode Travel range X+ data (H) $6
R3656		Circular feed in manual mode Travel range X- data (L) $6
R3657		Circular feed in manual mode Travel range X- data (H) $6
R3660		Circular feed in manual mode Travel range Y+ data (L) $6
R3661		Circular feed in manual mode Travel range Y+ data (H) $6
R3664		Circular feed in manual mode Travel range Y- data (L) $6
R3665		Circular feed in manual mode Travel range Y- data (H) $6
R3668		Circular feed in manual mode Gradient/arc center X data (L) $6
R3669		Circular feed in manual mode Gradient/arc center X data (H) $6
R3672		Circular feed in manual mode Gradient/arc center Y data (L) $6
R3673		Circular feed in manual mode Gradient/arc center Y data (H) $6
R3680	CAXSVF6	Spindle position control (spindle/C axis control): Servo OFF request during Spindle/C axis mode $6 ▲
R3681	SPGNCO6	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $6 ▲
R3682	UAC6	U-axis tool control: U-axis tool zero point reaching request $6 ▲
R3684		For specific users NC control signal 1 $6 ▲
R3688		Specific users Manual skip motion direction (-) $6 ▲
R3689		Specific users Manual skip motion direction (+) $6 ▲
R3700		1st cutting feedrate override $7
R3701		2nd cutting feedrate override $7
R3702		Rapid traverse override $7
R3703	CHPOV7	Chopping override $7
R3704		Manual feedrate (L) $7 [M]
R3705		Manual feedrate (H) $7 [M]
R3706		Manual feedrate B (L) $7 [M]
R3707		Manual feedrate B (H) $7 [M]
R3708		1st handle/incremental feed magnification (L) $7
R3709		1st handle/incremental feed magnification (H) $7
R3710		2nd handle feed magnification (L) $7
R3711		2nd handle feed magnification (H) $7
R3712		3rd handle feed magnification (L) $7
R3713		3rd handle feed magnification (H) $7
R3718		PLC interrupt program number (L) $7
R3719		PLC interrupt program number (H) $7
R3724		Manual feedrate B override $7
R3725		External search device No. $7
R3726		External search program No. (L) $7
R3727		External search program No. (H) $7
R3728		External search sequence No. (L) $7
R3729		External search sequence No. (H) $7
R3730		External search block No. (L) $7
R3731		External search block No. (H) $7
R3740		Handle polarity $7 [M8]
R3744		Manual arbitrary feed 1st axis travel amount (L) $7 [M]
R3745		Manual arbitrary feed 1st axis travel amount (H) $7 [M]
R3748		Manual arbitrary feed 2nd axis travel amount (L) $7 [M]
R3749		Manual arbitrary feed 2nd axis travel amount (H) $7 [M]
R3752		Manual arbitrary feed 3rd axis travel amount (L) $7 [M]
R3753		Manual arbitrary feed 3rd axis travel amount (H) $7 [M]
R3756		Alarm message I/F 1 $7
R3757		Alarm message I/F 2 $7
R3758		Alarm message I/F 3 $7

Device	Abbrev.	Signal name
R3759		Alarm message I/F 4 $7
R3760		Operator message I/F $7
R3762		Search & start program No. (L) $7
R3763		Search & start program No. (H) $7
R3764		Manual skip I/F 1 (Manual skip control) $7 ▲
R3765		Manual skip I/F 2 (Manual skip axis stop/read request) $7 ▲
R3766		Manual skip I/F 3 (Manual skip axis stop mode) $7 ▲
R3767		Encoder selection $7
R3768		C axis selection $7
R3780		Load monitor I : Axis selection $7 [M8]
R3781		Load monitor I : Load change rate detection axis $7 ▲
R3782		Load monitor I : Teaching data sub-No. $7 ▲
R3783		Load monitor I : Adaptive control basic axis selection $7 ▲
R3784		Each axis reference position selection $7
R3787		Chopping control data address $7
R3788		Tool life management data sort $7
R3789		Synchronous control operation method $7
R3790		Tool group No. designation (L) $7
R3791		Tool group No. designation (H) $7
R3792		Reference position adjustment completion $7
R3793		Current limit changeover $7
R3794		Wear compensation No. (tool presetter) $7
R3796		Turret interference object tool No. designation $7
R3799		Workpiece coordinate selection $7 ▲
R3800		Workpiece coordinate offset Measurement tool compensation No./ Selected compensation tool No.(main) (L) $7
R3801		Workpiece coordinate offset Measurement tool compen. No./ Selected compen. tool No.(main) (H) $7
R3802		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (L) $7
R3803		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (H) $7
R3804		Selected tool compensation No.(sub) (L) $7
R3805		Selected tool compensation No.(sub) (H) $7
R3806		Selected tool wear No. (sub) (L) $7
R3807		Selected tool wear No. (sub) (H) $7
R3808		Tool mounting information 1-16 $7
R3809		Tool mounting information 17-32 $7
R3810		Tool mounting information 33-48 $7
R3811		Tool mounting information 49-64 $7
R3812		Tool mounting information (65 - 80) $7
R3813	MTAPn7	n-th spindle synchronous tapping valid $7 [C80]
R3814	SLSPNO7	Multiple-spindle control I: Selected spindle No. $7
R3815	RPARCHG7	Rotary axis configuration parameter switch $7
R3816		Ext. machine coordinate: compensation No. $7 ▲
R3817		Optimum acceleration/deceleration parameter switching axis (axis and bit selection) $7 ▲
R3818		Tool length measurement 2 Tool No. (L) $7
R3819		Tool length measurement 2 Tool No. (H) $7
R3820		Constant torque control: Constant torque/proportional torque stopper control request axis $7
R3821		Constant torque control: Constant torque droop cancel request axis $7
R3825		Servo ready completion output designation $7
R3826		Thread recutting command $7
R3827		Thread recutting execution operation $7
R3828		Mechanical axis specifications 1st rotary axis angle (L) $7
R3829		Mechanical axis specifications 1st rotary axis angle (H) $7
R3830		Mechanical axis specifications 2nd rotary axis angle (L) $7
R3831		Mechanical axis specifications 2nd rotary axis angle (H) $7
R3834	TANGOFS7	Simple inclined surface machining command: Tool axis rotation angle compensation amount $7 [M8]
R3835		
R3836		Circular feed in manual mode Operation mode data (L) $7
R3837		Circular feed in manual mode Operation mode data (H) $7
R3838		Circular feed in manual mode Part system designation $7
R3840		Circular feed in manual mode Horizontal axis designation $7
R3841		Circular feed in manual mode Vertical axis designation $7
R3844		Circular feed in manual mode Basic point X data (L) $7
R3845		Circular feed in manual mode Basic point X data (H) $7
R3848		Circular feed in manual mode Basic point Y data (L) $7
R3849		Circular feed in manual mode Basic point Y data (H) $7
R3852		Circular feed in manual mode Travel range X+ data (L) $7
R3853		Circular feed in manual mode Travel range X+ data (H) $7
R3856		Circular feed in manual mode Travel range X- data (L) $7
R3857		Circular feed in manual mode Travel range X- data (H) $7
R3860		Circular feed in manual mode Travel range Y+ data (L) $7
R3861		Circular feed in manual mode Travel range Y+ data (H) $7
R3864		Circular feed in manual mode Travel range Y- data (L) $7
R3865		Circular feed in manual mode Travel range Y- data (H) $7
R3868		Circular feed in manual mode Gradient/arc center X data (L) $7
R3869		Circular feed in manual mode Gradient/arc center X data (H) $7
R3872		Circular feed in manual mode Gradient/arc center Y data (L) $7
R3873		Circular feed in manual mode Gradient/arc center Y data (H) $7
R3880	CAXSVF7	Spindle position control (spindle/C axis control): Servo OFF request during Spindle/C axis mode $7 ▲

Device	Abbrev.	Signal name
R3881	SPGNCO7	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $7 ▲
R3882	UAC7	U-axis tool control: U-axis tool zero point reaching request $7 ▲
R3884		For specific users NC control signal 1 $7 ▲
R3888		Specific users Manual skip motion direction (-) $7 ▲
R3889		Specific users Manual skip motion direction (+) $7 ▲
R3900		1st cutting feedrate override $8
R3901		2nd cutting feedrate override $8
R3902		Rapid traverse override $8
R3903	CHPOV8	Chopping override $8
R3904		Manual feedrate (L) $8 [M]
R3905		Manual feedrate (H) $8 [M]
R3906		Manual feedrate B (L) $8 [M]
R3907		Manual feedrate B (H) $8 [M]
R3908		1st handle/incremental feed magnification (L) $8
R3909		1st handle/incremental feed magnification (H) $8
R3910		2nd handle feed magnification (L) $8
R3911		2nd handle feed magnification (H) $8
R3912		3rd handle feed magnification (L) $8
R3913		3rd handle feed magnification (H) $8
R3918		PLC interrupt program number (L) $8
R3919		PLC interrupt program number (H) $8
R3924		Manual feedrate B override $8
R3925		External search device No. $8
R3926		External search program No. (L) $8
R3927		External search program No. (H) $8
R3928		External search sequence No. (L) $8
R3929		External search sequence No. (H) $8
R3930		External search block No. (L) $8
R3931		External search block No. (H) $8
R3940		Handle polarity $8 [M8]
R3944		Manual arbitrary feed 1st axis travel amount (L) $8 [M]
R3945		Manual arbitrary feed 1st axis travel amount (H) $8 [M]
R3948		Manual arbitrary feed 2nd axis travel amount (L) $8 [M]
R3949		Manual arbitrary feed 2nd axis travel amount (H) $8 [M]
R3952		Manual arbitrary feed 3rd axis travel amount (L) $8 [M]
R3953		Manual arbitrary feed 3rd axis travel amount (H) $8 [M]
R3956		Alarm message I/F 1 $8
R3957		Alarm message I/F 2 $8
R3958		Alarm message I/F 3 $8
R3959		Alarm message I/F 4 $8
R3960		Operator message I/F $8
R3962		Search & start program No. (L) $8
R3963		Search & start program No. (H) $8
R3964		Manual skip I/F 1 (Manual skip control) $8 ▲
R3965		Manual skip I/F 2 (Manual skip axis stop/read request) $8 ▲
R3966		Manual skip I/F 3 (Manual skip axis stop mode) $8 ▲
R3967		Encoder selection $8
R3968		C axis selection $8
R3980		Load monitor I : Axis selection $8 [M8]
R3981		Load monitor I : Load change rate detection axis $8 ▲
R3982		Load monitor I : Teaching data sub-No. $8 ▲
R3983		Load monitor I : Adaptive control basic axis selection $8 ▲
R3984		Each axis reference position selection $8
R3987		Chopping control data address $8
R3988		Tool life management data sort $8
R3989		Synchronous control operation method $8
R3990		Tool group No. designation (L) $8
R3991		Tool group No. designation (H) $8
R3992		Reference position adjustment completion $8
R3993		Current limit changeover $8
R3994		Wear compensation No. (tool presetter) $8
R3996		Turret interference object tool No. designation $8
R3999		Workpiece coordinate selection $8 ▲
R4000		Workpiece coordinate offset Measurement tool compensation No./ Selected compensation tool No.(main) (L) $8
R4001		Workpiece coordinate offset Measurement tool compen. No./ Selected compen. tool No.(main) (H) $8
R4002		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (L) $8
R4003		Workpiece coordinate offset Measurement tool No./ Selected tool No.(main) (H) $8
R4004		Selected tool compensation No.(sub) (L) $8
R4005		Selected tool compensation No.(sub) (H) $8
R4006		Selected tool wear No. (sub) (L) $8
R4007		Selected tool wear No. (sub) (H) $8
R4008		Tool mounting information 1-16 $8
R4009		Tool mounting information 17-32 $8
R4010		Tool mounting information 33-48 $8
R4011		Tool mounting information 49-64 $8
R4012		Tool mounting information (65 - 80) $8
R4013	MTAPn8	n-th spindle synchronous tapping valid $8 [C80]
R4014	SLSPNO8	Multiple-spindle control I: Selected spindle No. $8

Device	Abbrev.	Signal name
R4015	RPARCHG8	Rotary axis configuration parameter switch $8
R4016		Ext. machine coordinate: compensation No. $8 ▲
R4017		Optimum acceleration/deceleration parameter switching axis (axis and bit selection) $8 ▲
R4018		Tool length measurement 2 Tool No. (L) $8
R4019		Tool length measurement 2 Tool No. (H) $8
R4020		Constant torque control: Constant torque/proportional torque stopper control request axis $8
R4021		Constant torque control: Constant torque droop cancel request axis $8
R4025		Servo ready completion output designation $8
R4026		Thread recutting command $8
R4027		Thread recutting execution operation $8
R4028		Mechanical axis specifications 1st rotary axis angle (L) $8
R4029		Mechanical axis specifications 1st rotary axis angle (H) $8
R4030		Mechanical axis specifications 2nd rotary axis angle (L) $8
R4031		Mechanical axis specifications 2nd rotary axis angle (H) $8
R4034	TANGOFS8	Simple inclined surface machining command:
R4035		Tool axis rotation angle compensation amount $8 [M8]
R4036		Circular feed in manual mode Operation mode data (L) $8
R4037		Circular feed in manual mode Operation mode data (H) $8
R4038		Circular feed in manual mode Part system designation $8
R4040		Circular feed in manual mode Horizontal axis designation $8
R4041		Circular feed in manual mode Vertical axis designation $8
R4044		Circular feed in manual mode Basic point X data (L) $8
R4045		Circular feed in manual mode Basic point X data (H) $8
R4048		Circular feed in manual mode Basic point Y data (L) $8
R4049		Circular feed in manual mode Basic point Y data (H) $8
R4052		Circular feed in manual mode Travel range X+ data (L) $8
R4053		Circular feed in manual mode Travel range X+ data (H) $8
R4056		Circular feed in manual mode Travel range X- data (L) $8
R4057		Circular feed in manual mode Travel range X- data (H) $8
R4060		Circular feed in manual mode Travel range Y+ data (L) $8
R4061		Circular feed in manual mode Travel range Y+ data (H) $8
R4064		Circular feed in manual mode Travel range Y- data (L) $8
R4065		Circular feed in manual mode Travel range Y- data (H) $8
R4068		Circular feed in manual mode Gradient/arc center X data (L) $8
R4069		Circular feed in manual mode Gradient/arc center X data (H) $8
R4072		Circular feed in manual mode Gradient/arc center Y data (L) $8
R4073		Circular feed in manual mode Gradient/arc center Y data (H) $8
R4080	CAXSVF8	Spindle position control (spindle/C axis control): Servo OFF request during Spindle/C axis mode $8 ▲
R4081	SPGNCO8	Spindle position control (spindle/C axis control): Position loop gain switch at C axis mode in progress $8 ▲
R4082	UAC8	U-axis tool control: U-axis tool zero point reaching request $8 ▲
R4084		For specific users NC control signal 1 $8 ▲
R4088		Specific users Manual skip motion direction (-) $8 ▲
R4089		Specific users Manual skip motion direction (+) $8 ▲
R4400		3D Machine Interference Check : Enabled shape group No.1
R4401		3D Machine Interference Check : Enabled shape group No.2
R4402		3D Machine Interference Check : Enabled shape group No.3
R4403		3D Machine Interference Check : Enabled shape group No.4
R5700		Ext. machine coordinate system offset data 1st axis (L) $1 [M]
R5701		Ext. machine coordinate system offset data 1st axis (H) $1 [M]
R5702		Ext. machine coordinate system offset data 2nd axis (L) $1 [M]
R5703		Ext. machine coordinate system offset data 2nd axis (H) $1 [M]
R5704		Ext. machine coordinate system offset data 3rd axis (L) $1 [M]
R5705		Ext. machine coordinate system offset data 3rd axis (H) $1 [M]
R5706		Ext. machine coordinate system offset data 4th axis (L) $1 [M]
R5707		Ext. machine coordinate system offset data 4th axis (H) $1 [M]
R5708		Ext. machine coordinate system offset data 5th axis (L) $1 [M]
R5709		Ext. machine coordinate system offset data 5th axis (H) $1 [M]
R5710		Ext. machine coordinate system offset data 6th axis (L) $1 [M]
R5711		Ext. machine coordinate system offset data 6th axis (H) $1 [M]
R5712		Ext. machine coordinate system offset data 7th axis (L) $1 [M]
R5713		Ext. machine coordinate system offset data 7th axis (H) $1 [M]
R5714		Ext. machine coordinate system offset data 8th axis (L) $1 [M]
R5715		Ext. machine coordinate system offset data 8th axis (H) $1 [M]
R5716		Ext. machine coordinate system offset data 1st axis (L) $2 [M]
R5717		Ext. machine coordinate system offset data 1st axis (H) $2 [M]
R5718		Ext. machine coordinate system offset data 2nd axis (L) $2 [M]
R5719		Ext. machine coordinate system offset data 2nd axis (H) $2 [M]
R5720		Ext. machine coordinate system offset data 3rd axis (L) $2 [M]
R5721		Ext. machine coordinate system offset data 3rd axis (H) $2 [M]
R5722		Ext. machine coordinate system offset data 4th axis (L) $2 [M]
R5723		Ext. machine coordinate system offset data 4th axis (H) $2 [M]
R5724		Ext. machine coordinate system offset data 5th axis (L) $2 [M]
R5725		Ext. machine coordinate system offset data 5th axis (H) $2 [M]
R5726		Ext. machine coordinate system offset data 6th axis (L) $2 [M]
R5727		Ext. machine coordinate system offset data 6th axis (H) $2 [M]
R5728		Ext. machine coordinate system offset data 7th axis (L) $2 [M]
R5729		Ext. machine coordinate system offset data 7th axis (H) $2 [M]
R5730		Ext. machine coordinate system offset data 8th axis (L) $2 [M]
R5731		Ext. machine coordinate system offset data 8th axis (H) $2 [M]

Device	Abbrev.	Signal name
R5732		Ext. machine coordinate system offset data 1st axis (L) $3 [M]
R5733		Ext. machine coordinate system offset data 1st axis (H) $3 [M]
R5734		Ext. machine coordinate system offset data 2nd axis (L) $3 [M]
R5735		Ext. machine coordinate system offset data 2nd axis (H) $3 [M]
R5736		Ext. machine coordinate system offset data 3rd axis (L) $3 [M]
R5737		Ext. machine coordinate system offset data 3rd axis (H) $3 [M]
R5738		Ext. machine coordinate system offset data 4th axis (L) $3 [M]
R5739		Ext. machine coordinate system offset data 4th axis (H) $3 [M]
R5740		Ext. machine coordinate system offset data 5th axis (L) $3 [M]
R5741		Ext. machine coordinate system offset data 5th axis (H) $3 [M]
R5742		Ext. machine coordinate system offset data 6th axis (L) $3 [M]
R5743		Ext. machine coordinate system offset data 6th axis (H) $3 [M]
R5744		Ext. machine coordinate system offset data 7th axis (L) $3 [M]
R5745		Ext. machine coordinate system offset data 7th axis (H) $3 [M]
R5746		Ext. machine coordinate system offset data 8th axis (L) $3 [M]
R5747		Ext. machine coordinate system offset data 8th axis (H) $3 [M]
R5748		Ext. machine coordinate system offset data 1st axis (L) $4 [M]
R5749		Ext. machine coordinate system offset data 1st axis (H) $4 [M]
R5750		Ext. machine coordinate system offset data 2nd axis (L) $4 [M]
R5751		Ext. machine coordinate system offset data 2nd axis (H) $4 [M]
R5752		Ext. machine coordinate system offset data 3rd axis (L) $4 [M]
R5753		Ext. machine coordinate system offset data 3rd axis (H) $4 [M]
R5754		Ext. machine coordinate system offset data 4th axis (L) $4 [M]
R5755		Ext. machine coordinate system offset data 4th axis (H) $4 [M]
R5756		Ext. machine coordinate system offset data 5th axis (L) $4 [M]
R5757		Ext. machine coordinate system offset data 5th axis (H) $4 [M]
R5758		Ext. machine coordinate system offset data 6th axis (L) $4 [M]
R5759		Ext. machine coordinate system offset data 6th axis (H) $4 [M]
R5760		Ext. machine coordinate system offset data 7th axis (L) $4 [M]
R5761		Ext. machine coordinate system offset data 7th axis (H) $4 [M]
R5762		Ext. machine coordinate system offset data 8th axis (L) $4 [M]
R5763		Ext. machine coordinate system offset data 8th axis (H) $4 [M]
R5764		Each axis manual feedrate B 1st axis (L) $1 [M]
R5765		Each axis manual feedrate B 1st axis (H) $1 [M]
R5766		Each axis manual feedrate B 2nd axis (L) $1 [M]
R5767		Each axis manual feedrate B 2nd axis (H) $1 [M]
R5768		Each axis manual feedrate B 3rd axis (L) $1 [M]
R5769		Each axis manual feedrate B 3rd axis (H) $1 [M]
R5770		Each axis manual feedrate B 4th axis (L) $1 [M]
R5771		Each axis manual feedrate B 4th axis (H) $1 [M]
R5772		Each axis manual feedrate B 5th axis (L) $1 [M]
R5773		Each axis manual feedrate B 5th axis (H) $1 [M]
R5774		Each axis manual feedrate B 6th axis (L) $1 [M]
R5775		Each axis manual feedrate B 6th axis (H) $1 [M]
R5776		Each axis manual feedrate B 7th axis (L) $1 [M]
R5777		Each axis manual feedrate B 7th axis (H) $1 [M]
R5778		Each axis manual feedrate B 8th axis (L) $1 [M]
R5779		Each axis manual feedrate B 8th axis (H) $1 [M]
R5780		Each axis manual feedrate B 1st axis (L) $2 [M]
R5781		Each axis manual feedrate B 1st axis (H) $2 [M]
R5782		Each axis manual feedrate B 2nd axis (L) $2 [M]
R5783		Each axis manual feedrate B 2nd axis (H) $2 [M]
R5784		Each axis manual feedrate B 3rd axis (L) $2 [M]
R5785		Each axis manual feedrate B 3rd axis (H) $2 [M]
R5786		Each axis manual feedrate B 4th axis (L) $2 [M]
R5787		Each axis manual feedrate B 4th axis (H) $2 [M]
R5788		Each axis manual feedrate B 5th axis (L) $2 [M]
R5789		Each axis manual feedrate B 5th axis (H) $2 [M]
R5790		Each axis manual feedrate B 6th axis (L) $2 [M]
R5791		Each axis manual feedrate B 6th axis (H) $2 [M]
R5792		Each axis manual feedrate B 7th axis (L) $2 [M]
R5793		Each axis manual feedrate B 7th axis (H) $2 [M]
R5794		Each axis manual feedrate B 8th axis (L) $2 [M]
R5795		Each axis manual feedrate B 8th axis (H) $2 [M]
R5796		Each axis manual feedrate B 1st axis (L) $3 [M]
R5797		Each axis manual feedrate B 1st axis (H) $3 [M]
R5798		Each axis manual feedrate B 2nd axis (L) $3 [M]
R5799		Each axis manual feedrate B 2nd axis (H) $3 [M]
R5800		Each axis manual feedrate B 3rd axis (L) $3 [M]
R5801		Each axis manual feedrate B 3rd axis (H) $3 [M]
R5802		Each axis manual feedrate B 4th axis (L) $3 [M]
R5803		Each axis manual feedrate B 4th axis (H) $3 [M]
R5804		Each axis manual feedrate B 5th axis (L) $3 [M]
R5805		Each axis manual feedrate B 5th axis (H) $3 [M]
R5806		Each axis manual feedrate B 6th axis (L) $3 [M]
R5807		Each axis manual feedrate B 6th axis (H) $3 [M]
R5808		Each axis manual feedrate B 7th axis (L) $3 [M]
R5809		Each axis manual feedrate B 7th axis (H) $3 [M]
R5810		Each axis manual feedrate B 8th axis (L) $3 [M]
R5811		Each axis manual feedrate B 8th axis (H) $3 [M]
R5812		Each axis manual feedrate B 1st axis (L) $4 [M]
R5813		Each axis manual feedrate B 1st axis (H) $4 [M]

Device	Abbrev.	Signal name
R5814		Each axis manual feedrate B 2nd axis (L) $4 [M]
R5815		Each axis manual feedrate B 2nd axis (H) $4 [M]
R5816		Each axis manual feedrate B 3rd axis (L) $4 [M]
R5817		Each axis manual feedrate B 3rd axis (H) $4 [M]
R5818		Each axis manual feedrate B 4th axis (L) $4 [M]
R5819		Each axis manual feedrate B 4th axis (H) $4 [M]
R5820		Each axis manual feedrate B 5th axis (L) $4 [M]
R5821		Each axis manual feedrate B 5th axis (H) $4 [M]
R5822		Each axis manual feedrate B 6th axis (L) $4 [M]
R5823		Each axis manual feedrate B 6th axis (H) $4 [M]
R5824		Each axis manual feedrate B 7th axis (L) $4 [M]
R5825		Each axis manual feedrate B 7th axis (H) $4 [M]
R5826		Each axis manual feedrate B 8th axis (L) $4 [M]
R5827		Each axis manual feedrate B 8th axis (H) $4 [M]
R6052		External deceleration speed selection 1st axis $1 [C80]
R6053		External deceleration speed selection 2nd axis $1 [C80]
R6054		External deceleration speed selection 3rd axis $1 [C80]
R6055		External deceleration speed selection 4th axis $1 [C80]
R6056		External deceleration speed selection 5th axis $1 [C80]
R6057		External deceleration speed selection 6th axis $1 [C80]
R6058		External deceleration speed selection 7th axis $1 [C80]
R6059		External deceleration speed selection 8th axis $1 [C80]
R6060		External deceleration speed selection 1st axis $2 [C80]
R6061		External deceleration speed selection 2nd axis $2 [C80]
R6062		External deceleration speed selection 3rd axis $2 [C80]
R6063		External deceleration speed selection 4th axis $2 [C80]
R6064		External deceleration speed selection 5th axis $2 [C80]
R6065		External deceleration speed selection 6th axis $2 [C80]
R6066		External deceleration speed selection 7th axis $2 [C80]
R6067		External deceleration speed selection 8th axis $2 [C80]
R6068		External deceleration speed selection 1st axis $3 [C80]
R6069		External deceleration speed selection 2nd axis $3 [C80]
R6070		External deceleration speed selection 3rd axis $3 [C80]
R6071		External deceleration speed selection 4th axis $3 [C80]
R6072		External deceleration speed selection 5th axis $3 [C80]
R6073		External deceleration speed selection 6th axis $3 [C80]
R6074		External deceleration speed selection 7th axis $3 [C80]
R6075		External deceleration speed selection 8th axis $3 [C80]
R6076		External deceleration speed selection 1st axis $4 [C80]
R6077		External deceleration speed selection 2nd axis $4 [C80]
R6078		External deceleration speed selection 3rd axis $4 [C80]
R6079		External deceleration speed selection 4th axis $4 [C80]
R6080		External deceleration speed selection 5th axis $4 [C80]
R6081		External deceleration speed selection 6th axis $4 [C80]
R6082		External deceleration speed selection 7th axis $4 [C80]
R6083		External deceleration speed selection 8th axis $4 [C80]
R6084		Optimum acceleration/deceleration parameter group selection 1st axis $1 ▲
R6085		Optimum acceleration/deceleration parameter group selection 2nd axis $1 ▲
R6086		Optimum acceleration/deceleration parameter group selection 3rd axis $1 ▲
R6087		Optimum acceleration/deceleration parameter group selection 4th axis $1 ▲
R6088		Optimum acceleration/deceleration parameter group selection 5th axis $1 ▲
R6089		Optimum acceleration/deceleration parameter group selection 6th axis $1 ▲
R6090		Optimum acceleration/deceleration parameter group selection 7th axis $1 ▲
R6091		Optimum acceleration/deceleration parameter group selection 8th axis $1 ▲
R6092		Optimum acceleration/deceleration parameter group selection 1st axis $2 ▲
R6093		Optimum acceleration/deceleration parameter group selection 2nd axis $2 ▲
R6094		Optimum acceleration/deceleration parameter group selection 3rd axis $2 ▲
R6095		Optimum acceleration/deceleration parameter group selection 4th axis $2 ▲
R6096		Optimum acceleration/deceleration parameter group selection 5th axis $2 ▲
R6097		Optimum acceleration/deceleration parameter group selection 6th axis $2 ▲
R6098		Optimum acceleration/deceleration parameter group selection 7th axis $2 ▲
R6099		Optimum acceleration/deceleration parameter group selection 8th axis $2 ▲
R6100		Optimum acceleration/deceleration parameter group selection 1st axis $3 ▲
R6101		Optimum acceleration/deceleration parameter group selection 2nd axis $3 ▲
R6102		Optimum acceleration/deceleration parameter group selection 3rd axis $3 ▲
R6103		Optimum acceleration/deceleration parameter group selection 4th axis $3 ▲
R6104		Optimum acceleration/deceleration parameter group selection 5th axis $3 ▲
R6105		Optimum acceleration/deceleration parameter group selection 6th axis $3 ▲
R6106		Optimum acceleration/deceleration parameter group selection 7th axis $3 ▲
R6107		Optimum acceleration/deceleration parameter group selection 8th axis $3 ▲
R6108		Optimum acceleration/deceleration parameter group selection 1st axis $4 ▲
R6109		Optimum acceleration/deceleration parameter group selection 2nd axis $4 ▲
R6110		Optimum acceleration/deceleration parameter group selection 3rd axis $4 ▲
R6111		Optimum acceleration/deceleration parameter group selection 4th axis $4 ▲
R6112		Optimum acceleration/deceleration parameter group selection 5th axis $4 ▲
R6113		Optimum acceleration/deceleration parameter group selection 6th axis $4 ▲
R6114		Optimum acceleration/deceleration parameter group selection 7th axis $4 ▲
R6115		Optimum acceleration/deceleration parameter group selection 8th axis $4 ▲
R6116		Target machining time 1st axis $1 ▲
R6117		Target machining time 2nd axis $1 ▲
R6118		Target machining time 3rd axis $1 ▲
R6119		Target machining time 4th axis $1 ▲

Device	Abbrev.	Signal name
R6120		Target machining time 5th axis $1 ▲
R6121		Target machining time 6th axis $1 ▲
R6122		Target machining time 7th axis $1 ▲
R6123		Target machining time 8th axis $1 ▲
R6124		Target machining time 1st axis $2 ▲
R6125		Target machining time 2nd axis $2 ▲
R6126		Target machining time 3rd axis $2 ▲
R6127		Target machining time 4th axis $2 ▲
R6128		Target machining time 5th axis $2 ▲
R6129		Target machining time 6th axis $2 ▲
R6130		Target machining time 7th axis $2 ▲
R6131		Target machining time 8th axis $2 ▲
R6132		Target machining time 1st axis $3 ▲
R6133		Target machining time 2nd axis $3 ▲
R6134		Target machining time 3rd axis $3 ▲
R6135		Target machining time 4th axis $3 ▲
R6136		Target machining time 5th axis $3 ▲
R6137		Target machining time 6th axis $3 ▲
R6138		Target machining time 7th axis $3 ▲
R6139		Target machining time 8th axis $3 ▲
R6140		Target machining time 1st axis $4 ▲
R6141		Target machining time 2nd axis $4 ▲
R6142		Target machining time 3rd axis $4 ▲
R6143		Target machining time 4th axis $4 ▲
R6144		Target machining time 5th axis $4 ▲
R6145		Target machining time 6th axis $4 ▲
R6146		Target machining time 7th axis $4 ▲
R6147		Target machining time 8th axis $4 ▲
R6436		User macro input #1032 (PLC -> NC) (L) $1
R6437		User macro input #1032 (PLC -> NC) (H) $1
R6438		User macro input #1033 (PLC -> NC) (L) $1
R6439		User macro input #1033 (PLC -> NC) (H) $1
R6440		User macro input #1034 (PLC -> NC) (L) $1
R6441		User macro input #1034 (PLC -> NC) (H) $1
R6442		User macro input #1035 (PLC -> NC) (L) $1
R6443		User macro input #1035 (PLC -> NC) (H) $1
R6444		User macro input #1032 (PLC -> NC) (L) $2
R6445		User macro input #1032 (PLC -> NC) (H) $2
R6446		User macro input #1033 (PLC -> NC) (L) $2
R6447		User macro input #1033 (PLC -> NC) (H) $2
R6448		User macro input #1034 (PLC -> NC) (L) $2
R6449		User macro input #1034 (PLC -> NC) (H) $2
R6450		User macro input #1035 (PLC -> NC) (L) $2
R6451		User macro input #1035 (PLC -> NC) (H) $2
R6452		User macro input #1032 (PLC -> NC) (L) $3
R6453		User macro input #1032 (PLC -> NC) (H) $3
R6454		User macro input #1033 (PLC -> NC) (L) $3
R6455		User macro input #1033 (PLC -> NC) (H) $3
R6456		User macro input #1034 (PLC -> NC) (L) $3
R6457		User macro input #1034 (PLC -> NC) (H) $3
R6458		User macro input #1035 (PLC -> NC) (L) $3
R6459		User macro input #1035 (PLC -> NC) (H) $3
R6460		User macro input #1032 (PLC -> NC) (L) $4
R6461		User macro input #1032 (PLC -> NC) (H) $4
R6462		User macro input #1033 (PLC -> NC) (L) $4
R6463		User macro input #1033 (PLC -> NC) (H) $4
R6464		User macro input #1034 (PLC -> NC) (L) $4
R6465		User macro input #1034 (PLC -> NC) (H) $4
R6466		User macro input #1035 (PLC -> NC) (L) $4
R6467		User macro input #1035 (PLC -> NC) (H) $4
R6468		User macro input #1032 (PLC -> NC) (L) $5
R6469		User macro input #1032 (PLC -> NC) (H) $5
R6470		User macro input #1033 (PLC -> NC) (L) $5
R6471		User macro input #1033 (PLC -> NC) (H) $5
R6472		User macro input #1034 (PLC -> NC) (L) $5
R6473		User macro input #1034 (PLC -> NC) (H) $5
R6474		User macro input #1035 (PLC -> NC) (L) $5
R6475		User macro input #1035 (PLC -> NC) (H) $5
R6476		User macro input #1032 (PLC -> NC) (L) $6
R6477		User macro input #1032 (PLC -> NC) (H) $6
R6478		User macro input #1033 (PLC -> NC) (L) $6
R6479		User macro input #1033 (PLC -> NC) (H) $6
R6480		User macro input #1034 (PLC -> NC) (L) $6
R6481		User macro input #1034 (PLC -> NC) (H) $6
R6482		User macro input #1035 (PLC -> NC) (L) $6
R6483		User macro input #1035 (PLC -> NC) (H) $6
R6484		User macro input #1032 (PLC -> NC) (L) $7
R6485		User macro input #1032 (PLC -> NC) (H) $7
R6486		User macro input #1033 (PLC -> NC) (L) $7
R6487		User macro input #1033 (PLC -> NC) (H) $7
R6488		User macro input #1034 (PLC -> NC) (L) $7
R6489		User macro input #1034 (PLC -> NC) (H) $7

Device	Abbrev.	Signal name
R6490		User macro input #1035 (PLC -> NC) (L) $7
R6491		User macro input #1035 (PLC -> NC) (H) $7
R6492		User macro input #1032 (PLC -> NC) (L) $8
R6493		User macro input #1032 (PLC -> NC) (H) $8
R6494		User macro input #1033 (PLC -> NC) (L) $8
R6495		User macro input #1033 (PLC -> NC) (H) $8
R6496		User macro input #1034 (PLC -> NC) (L) $8
R6497		User macro input #1034 (PLC -> NC) (H) $8
R6498		User macro input #1035 (PLC -> NC) (L) $8
R6499		User macro input #1035 (PLC -> NC) (H) $8
R7000		Spindle command rotation speed output (L) 1stSP
R7001		Spindle command rotation speed output (H) 1stSP
R7002	SLSP1	Spindle command selection 1stSP
R7003		Optimum acceleration/deceleration parameter group selection [spindle] 1stSP ▲
R7004		Spindle target machining time 1stSP ▲
R7008		S command override 1stSP
R7009		Multi-point orientation position data 1stSP
R7010	ORDIR1	Orientation rotation direction 1stSP ▲
R7016		Spindle synchronization reference spindle selection 1stSP
R7017		Spindle synchronization Synchronized spindle selection 1stSP
R7018		Spindle synchronization Phase shift amount 1stSP
R7019		Spindle synchronization Phase error tolerance 1stSP
R7020		Spindle oscillation amplitude 1stSP
R7021		Spindle oscillation frequency 1stSP
R7050		Spindle command rotation speed output (L) 2ndSP
R7051		Spindle command rotation speed output (H) 2ndSP
R7052	SLSP2	Spindle command selection 2ndSP
R7053		Optimum acceleration/deceleration parameter group selection [spindle] 2ndSP ▲
R7054		Spindle target machining time 2ndSP ▲
R7058		S command override 2ndSP
R7059		Multi-point orientation position data 2ndSP
R7060	ORDIR2	Orientation rotation direction 2ndSP ▲
R7066		Spindle synchronization reference spindle selection 2ndSP
R7067		Spindle synchronization Synchronized spindle selection 2ndSP
R7068		Spindle synchronization Phase shift amount 2ndSP
R7069		Spindle synchronization Phase error tolerance 2ndSP
R7070		Spindle oscillation amplitude 2ndSP
R7071		Spindle oscillation frequency 2ndSP
R7100		Spindle command rotation speed output (L) 3rdSP
R7101		Spindle command rotation speed output (H) 3rdSP
R7102	SLSP3	Spindle command selection 3rdSP
R7103		Optimum acceleration/deceleration parameter group selection [spindle] 3rdSP ▲
R7104		Spindle target machining time 3rdSP ▲
R7108		S command override 3rdSP
R7109		Multi-point orientation position data 3rdSP
R7110	ORDIR3	Orientation rotation direction 3rdSP ▲
R7116		Spindle synchronization reference spindle selection 3rdSP
R7117		Spindle synchronization Synchronized spindle selection 3rdSP
R7118		Spindle synchronization Phase shift amount 3rdSP
R7119		Spindle synchronization Phase error tolerance 3rdSP
R7120		Spindle oscillation amplitude 3rdSP
R7121		Spindle oscillation frequency 3rdSP
R7150		Spindle command rotation speed output (L) 4thSP
R7151		Spindle command rotation speed output (H) 4thSP
R7152	SLSP4	Spindle command selection 4thSP
R7153		Optimum acceleration/deceleration parameter group selection [spindle] 4thSP ▲
R7154		Spindle target machining time 4thSP ▲
R7158		S command override 4thSP
R7159		Multi-point orientation position data 4thSP
R7160	ORDIR4	Orientation rotation direction 4thSP ▲
R7166		Spindle synchronization reference spindle selection 4thSP
R7167		Spindle synchronization Synchronized spindle selection 4thSP
R7168		Spindle synchronization Phase shift amount 4thSP
R7169		Spindle synchronization Phase error tolerance 4thSP
R7170		Spindle oscillation amplitude 4thSP
R7171		Spindle oscillation frequency 4thSP
R7200		Spindle command rotation speed output (L) 5thSP
R7201		Spindle command rotation speed output (H) 5thSP
R7202	SLSP5	Spindle command selection 5thSP
R7203		Optimum acceleration/deceleration parameter group selection [spindle] 5thSP ▲
R7204		Spindle target machining time 5thSP ▲
R7208		S command override 5thSP
R7209		Multi-point orientation position data 5thSP
R7210	ORDIR5	Orientation rotation direction 5thSP ▲
R7216		Spindle synchronization reference spindle selection 5thSP
R7217		Spindle synchronization Synchronized spindle selection 5thSP
R7218		Spindle synchronization Phase shift amount 5thSP
R7219		Spindle synchronization Phase error tolerance 5thSP

Device	Abbrev.	Signal name
R7220		Spindle oscillation amplitude 5thSP
R7221		Spindle oscillation frequency 5thSP
R7250		Spindle command rotation speed output (L) 6thSP
R7251		Spindle command rotation speed output (H) 6thSP
R7252	SLSP6	Spindle command selection 6thSP
R7253		Optimum acceleration/deceleration parameter group selection [spindle] 6thSP ▲
R7254		Spindle target machining time 6thSP ▲
R7258		S command override 6thSP
R7259		Multi-point orientation position data 6thSP
R7260	ORDIR6	Orientation rotation direction 6thSP ▲
R7266		Spindle synchronization reference spindle selection 6thSP
R7267		Spindle synchronization Synchronized spindle selection 6thSP
R7268		Spindle synchronization Phase shift amount 6thSP
R7269		Spindle synchronization Phase error tolerance 6thSP
R7270		Spindle oscillation amplitude 6thSP
R7271		Spindle oscillation frequency 6thSP
R7300		Spindle command rotation speed output (L) 7thSP
R7301		Spindle command rotation speed output (H) 7thSP
R7302	SLSP7	Spindle command selection 7thSP
R7303		Optimum acceleration/deceleration parameter group selection [spindle] 7thSP ▲
R7304		Spindle target machining time 7thSP ▲
R7308		S command override 7thSP
R7309		Multi-point orientation position data 7thSP
R7310	ORDIR7	Orientation rotation direction 7thSP ▲
R7316		Spindle synchronization reference spindle selection 7thSP
R7317		Spindle synchronization Synchronized spindle selection 7thSP
R7318		Spindle synchronization Phase shift amount 7thSP
R7319		Spindle synchronization Phase error tolerance 7thSP
R7320		Spindle oscillation amplitude 7thSP
R7321		Spindle oscillation frequency 7thSP
R7350		Spindle command rotation speed output (L) 8thSP
R7351		Spindle command rotation speed output (H) 8thSP
R7352	SLSP8	Spindle command selection 8thSP
R7353		Optimum acceleration/deceleration parameter group selection [spindle] 8thSP ▲
R7354		Spindle target machining time 8thSP ▲
R7358		S command override 8thSP
R7359		Multi-point orientation position data 8thSP
R7360	ORDIR8	Orientation rotation direction 8thSP ▲
R7366		Spindle synchronization reference spindle selection 8thSP
R7367		Spindle synchronization Synchronized spindle selection 8thSP
R7368		Spindle synchronization Phase shift amount 8thSP
R7369		Spindle synchronization Phase error tolerance 8thSP
R7370		Spindle oscillation amplitude 8thSP
R7371		Spindle oscillation frequency 8thSP
R10600		ATC control parameter
R10603		Display tool selection parameter
R10604		AUX data
R10610		No.1 magazine number of magazines designation
R10611		No.2 magazine number of magazines designation
R10612		No.3 magazine number of magazines designation
R10613		No.4 magazine number of magazines designation
R10614		No.5 magazine number of magazines designation
R10615		No.1 magazine pointer designation
R10616		No.2 magazine pointer designation
R10617		No.3 magazine pointer designation
R10618		No.4 magazine pointer designation
R10619		No.5 magazine pointer designation
R10620		No.1 magazine spindle tool
R10621		No.1 magazine standby 1 tool (T4-digit)/No.1 magazine spindle tool (T8-digit)
R10622		No.1 magazine standby 2 tool (T4-digit)/No.1 magazine standby 1 tool (T8-digit)
R10623		No.1 magazine standby 3 tool (T4-digit)/No.1 magazine standby 1 tool (T8-digit)
R10624		No.1 magazine standby 4 tool (T4-digit)/No.1 magazine standby 2 tool (T8-digit)
R10625		No.1 magazine standby 2 tool (T8-digit)
R10626		No.1 magazine standby 3 tool (T8-digit)
R10627		No.1 magazine standby 3 tool (T8-digit)
R10628		No.1 magazine standby 4 tool (T8-digit)
R10629		No.1 magazine standby 4 tool (T8-digit)
R10630		No.2 magazine spindle tool
R10631		No.2 magazine standby 1 tool (T4-digit)/No.2 magazine spindle tool (T8-digit)
R10632		No.2 magazine standby 2 tool (T4-digit)/No.2 magazine standby 1 tool (T8-digit)
R10633		No.2 magazine standby 3 tool (T4-digit)/No.2 magazine standby 1 tool (T8-digit)
R10634		No.2 magazine standby 4 tool (T4-digit)/No.2 magazine standby 2 tool (T8-digit)
R10635		No.2 magazine standby 2 tool (T8-digit)
R10636		No.2 magazine standby 3 tool (T8-digit)
R10637		No.2 magazine standby 3 tool (T8-digit)
R10638		No.2 magazine standby 4 tool (T8-digit)
R10639		No.2 magazine standby 4 tool (T8-digit)
R10640		No.3 magazine spindle tool
R10641		No.3 magazine standby 1 tool (T4-digit)/No.3 magazine spindle tool (T8-digit)
R10642		No.3 magazine standby 2 tool (T4-digit)/No.3 magazine standby 1 tool (T8-digit)

Device	Abbrev.	Signal name
R10643		No.3 magazine standby 3 tool (T4-digit)/No.3 magazine standby 1 tool (T8-digit)
R10644		No.3 magazine standby 4 tool (T4-digit)/No.3 magazine standby 2 tool (T8-digit)
R10645		No.3 magazine standby 2 tool (T8-digit)
R10646		No.3 magazine standby 3 tool (T8-digit)
R10647		No.3 magazine standby 3 tool (T8-digit)
R10648		No.3 magazine standby 4 tool (T8-digit)
R10649		No.3 magazine standby 4 tool (T8-digit)
R10650		No.4 magazine spindle tool
R10651		No.4 magazine standby 1 tool (T4-digit)/No.4 magazine spindle tool (T8-digit)
R10652		No.4 magazine standby 2 tool (T4-digit)/No.4 magazine standby 1 tool (T8-digit)
R10653		No.4 magazine standby 3 tool (T4-digit)/No.4 magazine standby 1 tool (T8-digit)
R10654		No.4 magazine standby 4 tool (T4-digit)/No.4 magazine standby 2 tool (T8-digit)
R10655		No.4 magazine standby 2 tool (T8-digit)
R10656		No.4 magazine standby 3 tool (T8-digit)
R10657		No.4 magazine standby 3 tool (T8-digit)
R10658		No.4 magazine standby 4 tool (T8-digit)
R10659		No.4 magazine standby 4 tool (T8-digit)
R10660		No.5 magazine spindle tool
R10661		No.5 magazine standby 1 tool (T4-digit)/No.5 magazine spindle tool (T8-digit)
R10662		No.5 magazine standby 2 tool (T4-digit)/No.5 magazine standby 1 tool (T8-digit)
R10663		No.5 magazine standby 3 tool (T4-digit)/No.5 magazine standby 1 tool (T8-digit)
R10664		No.5 magazine standby 4 tool (T4-digit)/No.5 magazine standby 2 tool (T8-digit)
R10665		No.5 magazine standby 2 tool (T8-digit)
R10666		No.5 magazine standby 3 tool (T8-digit)
R10667		No.5 magazine standby 3 tool (T8-digit)
R10668		No.5 magazine standby 4 tool (T8-digit)
R10669		No.5 magazine standby 4 tool (T8-digit)
R10670		No.1 magazine spindle tool D
R10671		No.1 magazine standby 1 tool D
R10672		No.1 magazine standby 2 tool D
R10673		No.1 magazine standby 3 tool D
R10674		No.1 magazine standby 4 tool D
R10675		No.2 magazine spindle tool D
R10676		No.2 magazine standby 1 tool D
R10677		No.2 magazine standby 2 tool D
R10678		No.2 magazine standby 3 tool D
R10679		No.2 magazine standby 4 tool D
R10680		No.3 magazine spindle tool D
R10681		No.3 magazine standby 1 tool D
R10682		No.3 magazine standby 2 tool D
R10683		No.3 magazine standby 3 tool D
R10684		No.3 magazine standby 4 tool D
R10685		No.4 magazine spindle tool D
R10686		No.4 magazine standby 1 tool D
R10687		No.4 magazine standby 2 tool D
R10688		No.4 magazine standby 3 tool D
R10689		No.4 magazine standby 4 tool D
R10690		No.5 magazine spindle tool D
R10691		No.5 magazine standby 1 tool D
R10692		No.5 magazine standby 2 tool D
R10693		No.5 magazine standby 3 tool D
R10694		No.5 magazine standby 4 tool D
R10695		No.1 magazine pot head No.
R10696		No.2 magazine pot head No.
R10697		No.3 magazine pot head No.
R10698		No.4 magazine pot head No.
R10699		No.5 magazine pot head No.
R10700		No.1 magazine tool data pot 1
R10701		No.1 magazine tool data pot 2 (T4-digit)/pot 1 (T8-digit)
R10702		No.1 magazine tool data pot 3 (T4-digit)/pot 2 (T8-digit)
R10703		No.1 magazine tool data pot 4 (T4-digit)/pot 2 (T8-digit)
R10704		No.1 magazine tool data pot 5 (T4-digit)/pot 3 (T8-digit)
R10705		No.1 magazine tool data pot 6 (T4-digit)/pot 3 (T8-digit)
R10706		No.1 magazine tool data pot 7 (T4-digit)/pot 4 (T8-digit)
R10707		No.1 magazine tool data pot 8 (T4-digit)/pot 4 (T8-digit)
R10708		No.1 magazine tool data pot 9 (T4-digit)/pot 5 (T8-digit)
R10709		No.1 magazine tool data pot 10 (T4-digit)/pot 5 (T8-digit)
R10710		No.1 magazine tool data pot 11 (T4-digit)/pot 6 (T8-digit)
R10711		No.1 magazine tool data pot 12 (T4-digit)/pot 6 (T8-digit)
R10712		No.1 magazine tool data pot 13 (T4-digit)/pot 7 (T8-digit)
R10713		No.1 magazine tool data pot 14 (T4-digit)/pot 7 (T8-digit)
R10714		No.1 magazine tool data pot 15 (T4-digit)/pot 8 (T8-digit)
R10715		No.1 magazine tool data pot 16 (T4-digit)/pot 8 (T8-digit)
R10716		No.1 magazine tool data pot 17 (T4-digit)/pot 9 (T8-digit)
R10717		No.1 magazine tool data pot 18 (T4-digit)/pot 9 (T8-digit)
R10718		No.1 magazine tool data pot 19 (T4-digit)/pot 10 (T8-digit)
R10719		No.1 magazine tool data pot 20 (T4-digit)/pot 10 (T8-digit)
R10720		No.1 magazine tool data pot 21 (T4-digit)/pot 11 (T8-digit)
R10721		No.1 magazine tool data pot 22 (T4-digit)/pot 11 (T8-digit)
R10722		No.1 magazine tool data pot 23 (T4-digit)/pot 12 (T8-digit)
R10723		No.1 magazine tool data pot 24 (T4-digit)/pot 12 (T8-digit)
R10724		No.1 magazine tool data pot 25 (T4-digit)/pot 13 (T8-digit)

Device	Abbrev.	Signal name
R10725		No.1 magazine tool data pot 26 (T4-digit)/pot 13 (T8-digit)
R10726		No.1 magazine tool data pot 27 (T4-digit)/pot 14 (T8-digit)
R10727		No.1 magazine tool data pot 28 (T4-digit)/pot 14 (T8-digit)
R10728		No.1 magazine tool data pot 29 (T4-digit)/pot 15 (T8-digit)
R10729		No.1 magazine tool data pot 30 (T4-digit)/pot 15 (T8-digit)
R10730		No.1 magazine tool data pot 31 (T4-digit)/pot 16 (T8-digit)
R10731		No.1 magazine tool data pot 32 (T4-digit)/pot 16 (T8-digit)
R10732		No.1 magazine tool data pot 33 (T4-digit)/pot 17 (T8-digit)
R10733		No.1 magazine tool data pot 34 (T4-digit)/pot 17 (T8-digit)
R10734		No.1 magazine tool data pot 35 (T4-digit)/pot 18 (T8-digit)
R10735		No.1 magazine tool data pot 36 (T4-digit)/pot 18 (T8-digit)
R10736		No.1 magazine tool data pot 37 (T4-digit)/pot 19 (T8-digit)
R10737		No.1 magazine tool data pot 38 (T4-digit)/pot 19 (T8-digit)
R10738		No.1 magazine tool data pot 39 (T4-digit)/pot 20 (T8-digit)
R10739		No.1 magazine tool data pot 40 (T4-digit)/pot 20 (T8-digit)
R10740		No.1 magazine tool data pot 41 (T4-digit)/pot 21 (T8-digit)
R10741		No.1 magazine tool data pot 42 (T4-digit)/pot 21 (T8-digit)
R10742		No.1 magazine tool data pot 43 (T4-digit)/pot 22 (T8-digit)
R10743		No.1 magazine tool data pot 44 (T4-digit)/pot 22 (T8-digit)
R10744		No.1 magazine tool data pot 45 (T4-digit)/pot 23 (T8-digit)
R10745		No.1 magazine tool data pot 46 (T4-digit)/pot 23 (T8-digit)
R10746		No.1 magazine tool data pot 47 (T4-digit)/pot 24 (T8-digit)
R10747		No.1 magazine tool data pot 48 (T4-digit)/pot 24 (T8-digit)
R10748		No.1 magazine tool data pot 49 (T4-digit)/pot 25 (T8-digit)
R10749		No.1 magazine tool data pot 50 (T4-digit)/pot 25 (T8-digit)
R10750		No.1 magazine tool data pot 51 (T4-digit)/pot 26 (T8-digit)
R10751		No.1 magazine tool data pot 52 (T4-digit)/pot 26 (T8-digit)
R10752		No.1 magazine tool data pot 53 (T4-digit)/pot 27 (T8-digit)
R10753		No.1 magazine tool data pot 54 (T4-digit)/pot 27 (T8-digit)
R10754		No.1 magazine tool data pot 55 (T4-digit)/pot 28 (T8-digit)
R10755		No.1 magazine tool data pot 56 (T4-digit)/pot 28 (T8-digit)
R10756		No.1 magazine tool data pot 57 (T4-digit)/pot 29 (T8-digit)
R10757		No.1 magazine tool data pot 58 (T4-digit)/pot 29 (T8-digit)
R10758		No.1 magazine tool data pot 59 (T4-digit)/pot 30 (T8-digit)
R10759		No.1 magazine tool data pot 60 (T4-digit)/pot 30 (T8-digit)
R10760		No.1 magazine tool data pot 61 (T4-digit)/pot 31 (T8-digit)
R10761		No.1 magazine tool data pot 62 (T4-digit)/pot 31 (T8-digit)
R10762		No.1 magazine tool data pot 63 (T4-digit)/pot 32 (T8-digit)
R10763		No.1 magazine tool data pot 64 (T4-digit)/pot 32 (T8-digit)
R10764		No.1 magazine tool data pot 65 (T4-digit)/pot 33 (T8-digit)
R10765		No.1 magazine tool data pot 66 (T4-digit)/pot 33 (T8-digit)
R10766		No.1 magazine tool data pot 67 (T4-digit)/pot 34 (T8-digit)
R10767		No.1 magazine tool data pot 68 (T4-digit)/pot 34 (T8-digit)
R10768		No.1 magazine tool data pot 69 (T4-digit)/pot 35 (T8-digit)
R10769		No.1 magazine tool data pot 70 (T4-digit)/pot 35 (T8-digit)
R10770		No.1 magazine tool data pot 71 (T4-digit)/pot 36 (T8-digit)
R10771		No.1 magazine tool data pot 72 (T4-digit)/pot 36 (T8-digit)
R10772		No.1 magazine tool data pot 73 (T4-digit)/pot 37 (T8-digit)
R10773		No.1 magazine tool data pot 74 (T4-digit)/pot 37 (T8-digit)
R10774		No.1 magazine tool data pot 75 (T4-digit)/pot 38 (T8-digit)
R10775		No.1 magazine tool data pot 76 (T4-digit)/pot 38 (T8-digit)
R10776		No.1 magazine tool data pot 77 (T4-digit)/pot 39 (T8-digit)
R10777		No.1 magazine tool data pot 78 (T4-digit)/pot 39 (T8-digit)
R10778		No.1 magazine tool data pot 79 (T4-digit)/pot 40 (T8-digit)
R10779		No.1 magazine tool data pot 80 (T4-digit)/pot 40 (T8-digit)
R10780		No.1 magazine tool data pot 81 (T4-digit)/pot 41 (T8-digit)
R10781		No.1 magazine tool data pot 82 (T4-digit)/pot 41 (T8-digit)
R10782		No.1 magazine tool data pot 83 (T4-digit)/pot 42 (T8-digit)
R10783		No.1 magazine tool data pot 84 (T4-digit)/pot 42 (T8-digit)
R10784		No.1 magazine tool data pot 85 (T4-digit)/pot 43 (T8-digit)
R10785		No.1 magazine tool data pot 86 (T4-digit)/pot 43 (T8-digit)
R10786		No.1 magazine tool data pot 87 (T4-digit)/pot 44 (T8-digit)
R10787		No.1 magazine tool data pot 88 (T4-digit)/pot 44 (T8-digit)
R10788		No.1 magazine tool data pot 89 (T4-digit)/pot 45 (T8-digit)
R10789		No.1 magazine tool data pot 90 (T4-digit)/pot 45 (T8-digit)
R10790		No.1 magazine tool data pot 91 (T4-digit)/pot 46 (T8-digit)
R10791		No.1 magazine tool data pot 92 (T4-digit)/pot 46 (T8-digit)
R10792		No.1 magazine tool data pot 93 (T4-digit)/pot 47 (T8-digit)
R10793		No.1 magazine tool data pot 94 (T4-digit)/pot 47 (T8-digit)
R10794		No.1 magazine tool data pot 95 (T4-digit)/pot 48 (T8-digit)
R10795		No.1 magazine tool data pot 96 (T4-digit)/pot 48 (T8-digit)
R10796		No.1 magazine tool data pot 97 (T4-digit)/pot 49 (T8-digit)
R10797		No.1 magazine tool data pot 98 (T4-digit)/pot 49 (T8-digit)
R10798		No.1 magazine tool data pot 99 (T4-digit)/pot 50 (T8-digit)
R10799		No.1 magazine tool data pot 100 (T4-digit)/pot 50 (T8-digit)
R10800		No.1 magazine tool data pot 101 (T4-digit)/pot 51 (T8-digit)
R10801		No.1 magazine tool data pot 102 (T4-digit)/pot 51 (T8-digit)
R10802		No.1 magazine tool data pot 103 (T4-digit)/pot 52 (T8-digit)
R10803		No.1 magazine tool data pot 104 (T4-digit)/pot 52 (T8-digit)
R10804		No.1 magazine tool data pot 105 (T4-digit)/pot 53 (T8-digit)
R10805		No.1 magazine tool data pot 106 (T4-digit)/pot 53 (T8-digit)
R10806		No.1 magazine tool data pot 107 (T4-digit)/pot 54 (T8-digit)

Device	Abbrev.	Signal name
R10807		No.1 magazine tool data pot 108 (T4-digit)/pot 54 (T8-digit)
R10808		No.1 magazine tool data pot 109 (T4-digit)/pot 55 (T8-digit)
R10809		No.1 magazine tool data pot 110 (T4-digit)/pot 55 (T8-digit)
R10810		No.1 magazine tool data pot 111 (T4-digit)/pot 56 (T8-digit)
R10811		No.1 magazine tool data pot 112 (T4-digit)/pot 56 (T8-digit)
R10812		No.1 magazine tool data pot 113 (T4-digit)/pot 57 (T8-digit)
R10813		No.1 magazine tool data pot 114 (T4-digit)/pot 57 (T8-digit)
R10814		No.1 magazine tool data pot 115 (T4-digit)/pot 58 (T8-digit)
R10815		No.1 magazine tool data pot 116 (T4-digit)/pot 58 (T8-digit)
R10816		No.1 magazine tool data pot 117 (T4-digit)/pot 59 (T8-digit)
R10817		No.1 magazine tool data pot 118 (T4-digit)/pot 59 (T8-digit)
R10818		No.1 magazine tool data pot 119 (T4-digit)/pot 60 (T8-digit)
R10819		No.1 magazine tool data pot 120 (T4-digit)/pot 60 (T8-digit)
R10820		No.1 magazine tool data pot 61 (T8-digit)
R10821		No.1 magazine tool data pot 61 (T8-digit)
R10822		No.1 magazine tool data pot 62 (T8-digit)
R10823		No.1 magazine tool data pot 62 (T8-digit)
R10824		No.1 magazine tool data pot 63 (T8-digit)
R10825		No.1 magazine tool data pot 63 (T8-digit)
R10826		No.1 magazine tool data pot 64 (T8-digit)
R10827		No.1 magazine tool data pot 64 (T8-digit)
R10828		No.1 magazine tool data pot 65 (T8-digit)
R10829		No.1 magazine tool data pot 65 (T8-digit)
R10830		No.1 magazine tool data pot 66 (T8-digit)
R10831		No.1 magazine tool data pot 66 (T8-digit)
R10832		No.1 magazine tool data pot 67 (T8-digit)
R10833		No.1 magazine tool data pot 67 (T8-digit)
R10834		No.1 magazine tool data pot 68 (T8-digit)
R10835		No.1 magazine tool data pot 68 (T8-digit)
R10836		No.1 magazine tool data pot 69 (T8-digit)
R10837		No.1 magazine tool data pot 69 (T8-digit)
R10838		No.1 magazine tool data pot 70 (T8-digit)
R10839		No.1 magazine tool data pot 70 (T8-digit)
R10840		No.1 magazine tool data pot 71 (T8-digit)
R10841		No.1 magazine tool data pot 71 (T8-digit)
R10842		No.1 magazine tool data pot 72 (T8-digit)
R10843		No.1 magazine tool data pot 72 (T8-digit)
R10844		No.1 magazine tool data pot 73 (T8-digit)
R10845		No.1 magazine tool data pot 73 (T8-digit)
R10846		No.1 magazine tool data pot 74 (T8-digit)
R10847		No.1 magazine tool data pot 74 (T8-digit)
R10848		No.1 magazine tool data pot 75 (T8-digit)
R10849		No.1 magazine tool data pot 75 (T8-digit)
R10850		No.1 magazine tool data pot 76 (T8-digit)
R10851		No.1 magazine tool data pot 76 (T8-digit)
R10852		No.1 magazine tool data pot 77 (T8-digit)
R10853		No.1 magazine tool data pot 77 (T8-digit)
R10854		No.1 magazine tool data pot 78 (T8-digit)
R10855		No.1 magazine tool data pot 78 (T8-digit)
R10856		No.1 magazine tool data pot 79 (T8-digit)
R10857		No.1 magazine tool data pot 79 (T8-digit)
R10858		No.1 magazine tool data pot 80 (T8-digit)
R10859		No.1 magazine tool data pot 80 (T8-digit)
R10860		No.1 magazine tool data pot 81 (T8-digit)
R10861		No.1 magazine tool data pot 81 (T8-digit)
R10862		No.1 magazine tool data pot 82 (T8-digit)
R10863		No.1 magazine tool data pot 82 (T8-digit)
R10864		No.1 magazine tool data pot 83 (T8-digit)
R10865		No.1 magazine tool data pot 83 (T8-digit)
R10866		No.1 magazine tool data pot 84 (T8-digit)
R10867		No.1 magazine tool data pot 84 (T8-digit)
R10868		No.1 magazine tool data pot 85 (T8-digit)
R10869		No.1 magazine tool data pot 85 (T8-digit)
R10870		No.1 magazine tool data pot 86 (T8-digit)
R10871		No.1 magazine tool data pot 86 (T8-digit)
R10872		No.1 magazine tool data pot 87 (T8-digit)
R10873		No.1 magazine tool data pot 87 (T8-digit)
R10874		No.1 magazine tool data pot 88 (T8-digit)
R10875		No.1 magazine tool data pot 88 (T8-digit)
R10876		No.1 magazine tool data pot 89 (T8-digit)
R10877		No.1 magazine tool data pot 89 (T8-digit)
R10878		No.1 magazine tool data pot 90 (T8-digit)
R10879		No.1 magazine tool data pot 90 (T8-digit)
R10880		No.1 magazine tool data pot 91 (T8-digit)
R10881		No.1 magazine tool data pot 91 (T8-digit)
R10882		No.1 magazine tool data pot 92 (T8-digit)
R10883		No.1 magazine tool data pot 92 (T8-digit)
R10884		No.1 magazine tool data pot 93 (T8-digit)
R10885		No.1 magazine tool data pot 93 (T8-digit)
R10886		No.1 magazine tool data pot 94 (T8-digit)
R10887		No.1 magazine tool data pot 94 (T8-digit)
R10888		No.1 magazine tool data pot 95 (T8-digit)

Device	Abbrev.	Signal name
R10889		No.1 magazine tool data pot 95 (T8-digit)
R10890		No.1 magazine tool data pot 96 (T8-digit)
R10891		No.1 magazine tool data pot 96 (T8-digit)
R10892		No.1 magazine tool data pot 97 (T8-digit)
R10893		No.1 magazine tool data pot 97 (T8-digit)
R10894		No.1 magazine tool data pot 98 (T8-digit)
R10895		No.1 magazine tool data pot 98 (T8-digit)
R10896		No.1 magazine tool data pot 99 (T8-digit)
R10897		No.1 magazine tool data pot 99 (T8-digit)
R10898		No.1 magazine tool data pot 100 (T8-digit)
R10899		No.1 magazine tool data pot 100 (T8-digit)
R10900		No.1 magazine tool data pot 101 (T8-digit)
R10901		No.1 magazine tool data pot 101 (T8-digit)
R10902		No.1 magazine tool data pot 102 (T8-digit)
R10903		No.1 magazine tool data pot 102 (T8-digit)
R10904		No.1 magazine tool data pot 103 (T8-digit)
R10905		No.1 magazine tool data pot 103 (T8-digit)
R10906		No.1 magazine tool data pot 104 (T8-digit)
R10907		No.1 magazine tool data pot 104 (T8-digit)
R10908		No.1 magazine tool data pot 105 (T8-digit)
R10909		No.1 magazine tool data pot 105 (T8-digit)
R10910		No.1 magazine tool data pot 106 (T8-digit)
R10911		No.1 magazine tool data pot 106 (T8-digit)
R10912		No.1 magazine tool data pot 107 (T8-digit)
R10913		No.1 magazine tool data pot 107 (T8-digit)
R10914		No.1 magazine tool data pot 108 (T8-digit)
R10915		No.1 magazine tool data pot 108 (T8-digit)
R10916		No.1 magazine tool data pot 109 (T8-digit)
R10917		No.1 magazine tool data pot 109 (T8-digit)
R10918		No.1 magazine tool data pot 110 (T8-digit)
R10919		No.1 magazine tool data pot 110 (T8-digit)
R10920		No.1 magazine tool data pot 111 (T8-digit)
R10921		No.1 magazine tool data pot 111 (T8-digit)
R10922		No.1 magazine tool data pot 112 (T8-digit)
R10923		No.1 magazine tool data pot 112 (T8-digit)
R10924		No.1 magazine tool data pot 113 (T8-digit)
R10925		No.1 magazine tool data pot 113 (T8-digit)
R10926		No.1 magazine tool data pot 114 (T8-digit)
R10927		No.1 magazine tool data pot 114 (T8-digit)
R10928		No.1 magazine tool data pot 115 (T8-digit)
R10929		No.1 magazine tool data pot 115 (T8-digit)
R10930		No.1 magazine tool data pot 116 (T8-digit)
R10931		No.1 magazine tool data pot 116 (T8-digit)
R10932		No.1 magazine tool data pot 117 (T8-digit)
R10933		No.1 magazine tool data pot 117 (T8-digit)
R10934		No.1 magazine tool data pot 118 (T8-digit)
R10935		No.1 magazine tool data pot 118 (T8-digit)
R10936		No.1 magazine tool data pot 119 (T8-digit)
R10937		No.1 magazine tool data pot 119 (T8-digit)
R10938		No.1 magazine tool data pot 120 (T8-digit)
R10939		No.1 magazine tool data pot 120 (T8-digit)
R10940		No.1 magazine tool data (Aux.D) pot 1
R10941		No.1 magazine tool data (Aux.D) pot 2
R10942		No.1 magazine tool data (Aux.D) pot 3
R10943		No.1 magazine tool data (Aux.D) pot 4
R10944		No.1 magazine tool data (Aux.D) pot 5
R10945		No.1 magazine tool data (Aux.D) pot 6
R10946		No.1 magazine tool data (Aux.D) pot 7
R10947		No.1 magazine tool data (Aux.D) pot 8
R10948		No.1 magazine tool data (Aux.D) pot 9
R10949		No.1 magazine tool data (Aux.D) pot 10
R10950		No.1 magazine tool data (Aux.D) pot 11
R10951		No.1 magazine tool data (Aux.D) pot 12
R10952		No.1 magazine tool data (Aux.D) pot 13
R10953		No.1 magazine tool data (Aux.D) pot 14
R10954		No.1 magazine tool data (Aux.D) pot 15
R10955		No.1 magazine tool data (Aux.D) pot 16
R10956		No.1 magazine tool data (Aux.D) pot 17
R10957		No.1 magazine tool data (Aux.D) pot 18
R10958		No.1 magazine tool data (Aux.D) pot 19
R10959		No.1 magazine tool data (Aux.D) pot 20
R10960		No.1 magazine tool data (Aux.D) pot 21
R10961		No.1 magazine tool data (Aux.D) pot 22
R10962		No.1 magazine tool data (Aux.D) pot 23
R10963		No.1 magazine tool data (Aux.D) pot 24
R10964		No.1 magazine tool data (Aux.D) pot 25
R10965		No.1 magazine tool data (Aux.D) pot 26
R10966		No.1 magazine tool data (Aux.D) pot 27
R10967		No.1 magazine tool data (Aux.D) pot 28
R10968		No.1 magazine tool data (Aux.D) pot 29
R10969		No.1 magazine tool data (Aux.D) pot 30
R10970		No.1 magazine tool data (Aux.D) pot 31

Device	Abbrev.	Signal name
R10971		No.1 magazine tool data (Aux.D) pot 32
R10972		No.1 magazine tool data (Aux.D) pot 33
R10973		No.1 magazine tool data (Aux.D) pot 34
R10974		No.1 magazine tool data (Aux.D) pot 35
R10975		No.1 magazine tool data (Aux.D) pot 36
R10976		No.1 magazine tool data (Aux.D) pot 37
R10977		No.1 magazine tool data (Aux.D) pot 38
R10978		No.1 magazine tool data (Aux.D) pot 39
R10979		No.1 magazine tool data (Aux.D) pot 40
R10980		No.1 magazine tool data (Aux.D) pot 41
R10981		No.1 magazine tool data (Aux.D) pot 42
R10982		No.1 magazine tool data (Aux.D) pot 43
R10983		No.1 magazine tool data (Aux.D) pot 44
R10984		No.1 magazine tool data (Aux.D) pot 45
R10985		No.1 magazine tool data (Aux.D) pot 46
R10986		No.1 magazine tool data (Aux.D) pot 47
R10987		No.1 magazine tool data (Aux.D) pot 48
R10988		No.1 magazine tool data (Aux.D) pot 49
R10989		No.1 magazine tool data (Aux.D) pot 50
R10990		No.1 magazine tool data (Aux.D) pot 51
R10991		No.1 magazine tool data (Aux.D) pot 52
R10992		No.1 magazine tool data (Aux.D) pot 53
R10993		No.1 magazine tool data (Aux.D) pot 54
R10994		No.1 magazine tool data (Aux.D) pot 55
R10995		No.1 magazine tool data (Aux.D) pot 56
R10996		No.1 magazine tool data (Aux.D) pot 57
R10997		No.1 magazine tool data (Aux.D) pot 58
R10998		No.1 magazine tool data (Aux.D) pot 59
R10999		No.1 magazine tool data (Aux.D) pot 60
R11000		No.1 magazine tool data (Aux.D) pot 61
R11001		No.1 magazine tool data (Aux.D) pot 62
R11002		No.1 magazine tool data (Aux.D) pot 63
R11003		No.1 magazine tool data (Aux.D) pot 64
R11004		No.1 magazine tool data (Aux.D) pot 65
R11005		No.1 magazine tool data (Aux.D) pot 66
R11006		No.1 magazine tool data (Aux.D) pot 67
R11007		No.1 magazine tool data (Aux.D) pot 68
R11008		No.1 magazine tool data (Aux.D) pot 69
R11009		No.1 magazine tool data (Aux.D) pot 70
R11010		No.1 magazine tool data (Aux.D) pot 71
R11011		No.1 magazine tool data (Aux.D) pot 72
R11012		No.1 magazine tool data (Aux.D) pot 73
R11013		No.1 magazine tool data (Aux.D) pot 74
R11014		No.1 magazine tool data (Aux.D) pot 75
R11015		No.1 magazine tool data (Aux.D) pot 76
R11016		No.1 magazine tool data (Aux.D) pot 77
R11017		No.1 magazine tool data (Aux.D) pot 78
R11018		No.1 magazine tool data (Aux.D) pot 79
R11019		No.1 magazine tool data (Aux.D) pot 80
R11020		No.1 magazine tool data (Aux.D) pot 81
R11021		No.1 magazine tool data (Aux.D) pot 82
R11022		No.1 magazine tool data (Aux.D) pot 83
R11023		No.1 magazine tool data (Aux.D) pot 84
R11024		No.1 magazine tool data (Aux.D) pot 85
R11025		No.1 magazine tool data (Aux.D) pot 86
R11026		No.1 magazine tool data (Aux.D) pot 87
R11027		No.1 magazine tool data (Aux.D) pot 88
R11028		No.1 magazine tool data (Aux.D) pot 89
R11029		No.1 magazine tool data (Aux.D) pot 90
R11030		No.1 magazine tool data (Aux.D) pot 91
R11031		No.1 magazine tool data (Aux.D) pot 92
R11032		No.1 magazine tool data (Aux.D) pot 93
R11033		No.1 magazine tool data (Aux.D) pot 94
R11034		No.1 magazine tool data (Aux.D) pot 95
R11035		No.1 magazine tool data (Aux.D) pot 96
R11036		No.1 magazine tool data (Aux.D) pot 97
R11037		No.1 magazine tool data (Aux.D) pot 98
R11038		No.1 magazine tool data (Aux.D) pot 99
R11039		No.1 magazine tool data (Aux.D) pot 100
R11040		No.1 magazine tool data (Aux.D) pot 101
R11041		No.1 magazine tool data (Aux.D) pot 102
R11042		No.1 magazine tool data (Aux.D) pot 103
R11043		No.1 magazine tool data (Aux.D) pot 104
R11044		No.1 magazine tool data (Aux.D) pot 105
R11045		No.1 magazine tool data (Aux.D) pot 106
R11046		No.1 magazine tool data (Aux.D) pot 107
R11047		No.1 magazine tool data (Aux.D) pot 108
R11048		No.1 magazine tool data (Aux.D) pot 109
R11049		No.1 magazine tool data (Aux.D) pot 110
R11050		No.1 magazine tool data (Aux.D) pot 111
R11051		No.1 magazine tool data (Aux.D) pot 112
R11052		No.1 magazine tool data (Aux.D) pot 113

Device	Abbrev.	Signal name
R11053		No.1 magazine tool data (Aux.D) pot 114
R11054		No.1 magazine tool data (Aux.D) pot 115
R11055		No.1 magazine tool data (Aux.D) pot 116
R11056		No.1 magazine tool data (Aux.D) pot 117
R11057		No.1 magazine tool data (Aux.D) pot 118
R11058		No.1 magazine tool data (Aux.D) pot 119
R11059		No.1 magazine tool data (Aux.D) pot 120
R11060		No.2 magazine tool data pot 1
R11061		No.2 magazine tool data pot 2 (T4-digit)/pot 1 (T8-digit)
R11062		No.2 magazine tool data pot 3 (T4-digit)/pot 2 (T8-digit)
R11063		No.2 magazine tool data pot 4 (T4-digit)/pot 2 (T8-digit)
R11064		No.2 magazine tool data pot 5 (T4-digit)/pot 3 (T8-digit)
R11065		No.2 magazine tool data pot 6 (T4-digit)/pot 3 (T8-digit)
R11066		No.2 magazine tool data pot 7 (T4-digit)/pot 4 (T8-digit)
R11067		No.2 magazine tool data pot 8 (T4-digit)/pot 4 (T8-digit)
R11068		No.2 magazine tool data pot 9 (T4-digit)/pot 5 (T8-digit)
R11069		No.2 magazine tool data pot 10 (T4-digit)/pot 5 (T8-digit)
R11070		No.2 magazine tool data pot 11 (T4-digit)/pot 6 (T8-digit)
R11071		No.2 magazine tool data pot 12 (T4-digit)/pot 6 (T8-digit)
R11072		No.2 magazine tool data pot 13 (T4-digit)/pot 7 (T8-digit)
R11073		No.2 magazine tool data pot 14 (T4-digit)/pot 7 (T8-digit)
R11074		No.2 magazine tool data pot 15 (T4-digit)/pot 8 (T8-digit)
R11075		No.2 magazine tool data pot 16 (T4-digit)/pot 8 (T8-digit)
R11076		No.2 magazine tool data pot 17 (T4-digit)/pot 9 (T8-digit)
R11077		No.2 magazine tool data pot 18 (T4-digit)/pot 9 (T8-digit)
R11078		No.2 magazine tool data pot 19 (T4-digit)/pot 10 (T8-digit)
R11079		No.2 magazine tool data pot 20 (T4-digit)/pot 10 (T8-digit)
R11080		No.2 magazine tool data pot 21 (T4-digit)/pot 11 (T8-digit)
R11081		No.2 magazine tool data pot 22 (T4-digit)/pot 11 (T8-digit)
R11082		No.2 magazine tool data pot 23 (T4-digit)/pot 12 (T8-digit)
R11083		No.2 magazine tool data pot 24 (T4-digit)/pot 12 (T8-digit)
R11084		No.2 magazine tool data pot 25 (T4-digit)/pot 13 (T8-digit)
R11085		No.2 magazine tool data pot 26 (T4-digit)/pot 13 (T8-digit)
R11086		No.2 magazine tool data pot 27 (T4-digit)/pot 14 (T8-digit)
R11087		No.2 magazine tool data pot 28 (T4-digit)/pot 14 (T8-digit)
R11088		No.2 magazine tool data pot 29 (T4-digit)/pot 15 (T8-digit)
R11089		No.2 magazine tool data pot 30 (T4-digit)/pot 15 (T8-digit)
R11090		No.2 magazine tool data pot 31 (T4-digit)/pot 16 (T8-digit)
R11091		No.2 magazine tool data pot 32 (T4-digit)/pot 16 (T8-digit)
R11092		No.2 magazine tool data pot 33 (T4-digit)/pot 17 (T8-digit)
R11093		No.2 magazine tool data pot 34 (T4-digit)/pot 17 (T8-digit)
R11094		No.2 magazine tool data pot 35 (T4-digit)/pot 18 (T8-digit)
R11095		No.2 magazine tool data pot 36 (T4-digit)/pot 18 (T8-digit)
R11096		No.2 magazine tool data pot 37 (T4-digit)/pot 19 (T8-digit)
R11097		No.2 magazine tool data pot 38 (T4-digit)/pot 19 (T8-digit)
R11098		No.2 magazine tool data pot 39 (T4-digit)/pot 20 (T8-digit)
R11099		No.2 magazine tool data pot 40 (T4-digit)/pot 20 (T8-digit)
R11100		No.2 magazine tool data pot 41 (T4-digit)/pot 21 (T8-digit)
R11101		No.2 magazine tool data pot 42 (T4-digit)/pot 21 (T8-digit)
R11102		No.2 magazine tool data pot 43 (T4-digit)/pot 22 (T8-digit)
R11103		No.2 magazine tool data pot 44 (T4-digit)/pot 22 (T8-digit)
R11104		No.2 magazine tool data pot 45 (T4-digit)/pot 23 (T8-digit)
R11105		No.2 magazine tool data pot 46 (T4-digit)/pot 23 (T8-digit)
R11106		No.2 magazine tool data pot 47 (T4-digit)/pot 24 (T8-digit)
R11107		No.2 magazine tool data pot 48 (T4-digit)/pot 24 (T8-digit)
R11108		No.2 magazine tool data pot 49 (T4-digit)/pot 25 (T8-digit)
R11109		No.2 magazine tool data pot 50 (T4-digit)/pot 25 (T8-digit)
R11110		No.2 magazine tool data pot 51 (T4-digit)/pot 26 (T8-digit)
R11111		No.2 magazine tool data pot 52 (T4-digit)/pot 26 (T8-digit)
R11112		No.2 magazine tool data pot 53 (T4-digit)/pot 27 (T8-digit)
R11113		No.2 magazine tool data pot 54 (T4-digit)/pot 27 (T8-digit)
R11114		No.2 magazine tool data pot 55 (T4-digit)/pot 28 (T8-digit)
R11115		No.2 magazine tool data pot 56 (T4-digit)/pot 28 (T8-digit)
R11116		No.2 magazine tool data pot 57 (T4-digit)/pot 29 (T8-digit)
R11117		No.2 magazine tool data pot 58 (T4-digit)/pot 29 (T8-digit)
R11118		No.2 magazine tool data pot 59 (T4-digit)/pot 30 (T8-digit)
R11119		No.2 magazine tool data pot 60 (T4-digit)/pot 30 (T8-digit)
R11120		No.2 magazine tool data pot 61 (T4-digit)/pot 31 (T8-digit)
R11121		No.2 magazine tool data pot 62 (T4-digit)/pot 31 (T8-digit)
R11122		No.2 magazine tool data pot 63 (T4-digit)/pot 32 (T8-digit)
R11123		No.2 magazine tool data pot 64 (T4-digit)/pot 32 (T8-digit)
R11124		No.2 magazine tool data pot 65 (T4-digit)/pot 33 (T8-digit)
R11125		No.2 magazine tool data pot 66 (T4-digit)/pot 33 (T8-digit)
R11126		No.2 magazine tool data pot 67 (T4-digit)/pot 34 (T8-digit)
R11127		No.2 magazine tool data pot 68 (T4-digit)/pot 34 (T8-digit)
R11128		No.2 magazine tool data pot 69 (T4-digit)/pot 35 (T8-digit)
R11129		No.2 magazine tool data pot 70 (T4-digit)/pot 35 (T8-digit)
R11130		No.2 magazine tool data pot 71 (T4-digit)/pot 36 (T8-digit)
R11131		No.2 magazine tool data pot 72 (T4-digit)/pot 36 (T8-digit)
R11132		No.2 magazine tool data pot 73 (T4-digit)/pot 37 (T8-digit)
R11133		No.2 magazine tool data pot 74 (T4-digit)/pot 37 (T8-digit)
R11134		No.2 magazine tool data pot 75 (T4-digit)/pot 38 (T8-digit)

Device	Abbrev.	Signal name
R11135		No.2 magazine tool data pot 76 (T4-digit)/pot 38 (T8-digit)
R11136		No.2 magazine tool data pot 77 (T4-digit)/pot 39 (T8-digit)
R11137		No.2 magazine tool data pot 78 (T4-digit)/pot 39 (T8-digit)
R11138		No.2 magazine tool data pot 79 (T4-digit)/pot 40 (T8-digit)
R11139		No.2 magazine tool data pot 80 (T4-digit)/pot 40 (T8-digit)
R11140		No.2 magazine tool data pot 81 (T4-digit)/pot 41 (T8-digit)
R11141		No.2 magazine tool data pot 82 (T4-digit)/pot 41 (T8-digit)
R11142		No.2 magazine tool data pot 83 (T4-digit)/pot 42 (T8-digit)
R11143		No.2 magazine tool data pot 84 (T4-digit)/pot 42 (T8-digit)
R11144		No.2 magazine tool data pot 85 (T4-digit)/pot 43 (T8-digit)
R11145		No.2 magazine tool data pot 86 (T4-digit)/pot 43 (T8-digit)
R11146		No.2 magazine tool data pot 87 (T4-digit)/pot 44 (T8-digit)
R11147		No.2 magazine tool data pot 88 (T4-digit)/pot 44 (T8-digit)
R11148		No.2 magazine tool data pot 89 (T4-digit)/pot 45 (T8-digit)
R11149		No.2 magazine tool data pot 90 (T4-digit)/pot 45 (T8-digit)
R11150		No.2 magazine tool data pot 91 (T4-digit)/pot 46 (T8-digit)
R11151		No.2 magazine tool data pot 92 (T4-digit)/pot 46 (T8-digit)
R11152		No.2 magazine tool data pot 93 (T4-digit)/pot 47 (T8-digit)
R11153		No.2 magazine tool data pot 94 (T4-digit)/pot 47 (T8-digit)
R11154		No.2 magazine tool data pot 95 (T4-digit)/pot 48 (T8-digit)
R11155		No.2 magazine tool data pot 96 (T4-digit)/pot 48 (T8-digit)
R11156		No.2 magazine tool data pot 97 (T4-digit)/pot 49 (T8-digit)
R11157		No.2 magazine tool data pot 98 (T4-digit)/pot 49 (T8-digit)
R11158		No.2 magazine tool data pot 99 (T4-digit)/pot 50 (T8-digit)
R11159		No.2 magazine tool data pot 100 (T4-digit)/pot 50 (T8-digit)
R11160		No.2 magazine tool data pot 101 (T4-digit)/pot 51 (T8-digit)
R11161		No.2 magazine tool data pot 102 (T4-digit)/pot 51 (T8-digit)
R11162		No.2 magazine tool data pot 103 (T4-digit)/pot 52 (T8-digit)
R11163		No.2 magazine tool data pot 104 (T4-digit)/pot 52 (T8-digit)
R11164		No.2 magazine tool data pot 105 (T4-digit)/pot 53 (T8-digit)
R11165		No.2 magazine tool data pot 106 (T4-digit)/pot 53 (T8-digit)
R11166		No.2 magazine tool data pot 107 (T4-digit)/pot 54 (T8-digit)
R11167		No.2 magazine tool data pot 108 (T4-digit)/pot 54 (T8-digit)
R11168		No.2 magazine tool data pot 109 (T4-digit)/pot 55 (T8-digit)
R11169		No.2 magazine tool data pot 110 (T4-digit)/pot 55 (T8-digit)
R11170		No.2 magazine tool data pot 111 (T4-digit)/pot 56 (T8-digit)
R11171		No.2 magazine tool data pot 112 (T4-digit)/pot 56 (T8-digit)
R11172		No.2 magazine tool data pot 113 (T4-digit)/pot 57 (T8-digit)
R11173		No.2 magazine tool data pot 114 (T4-digit)/pot 57 (T8-digit)
R11174		No.2 magazine tool data pot 115 (T4-digit)/pot 58 (T8-digit)
R11175		No.2 magazine tool data pot 116 (T4-digit)/pot 58 (T8-digit)
R11176		No.2 magazine tool data pot 117 (T4-digit)/pot 59 (T8-digit)
R11177		No.2 magazine tool data pot 118 (T4-digit)/pot 59 (T8-digit)
R11178		No.2 magazine tool data pot 119 (T4-digit)/pot 60 (T8-digit)
R11179		No.2 magazine tool data pot 120 (T4-digit)/pot 60 (T8-digit)
R11180		No.2 magazine tool data pot 61 (T8-digit)
R11181		No.2 magazine tool data pot 61 (T8-digit)
R11182		No.2 magazine tool data pot 62 (T8-digit)
R11183		No.2 magazine tool data pot 62 (T8-digit)
R11184		No.2 magazine tool data pot 63 (T8-digit)
R11185		No.2 magazine tool data pot 63 (T8-digit)
R11186		No.2 magazine tool data pot 64 (T8-digit)
R11187		No.2 magazine tool data pot 64 (T8-digit)
R11188		No.2 magazine tool data pot 65 (T8-digit)
R11189		No.2 magazine tool data pot 65 (T8-digit)
R11190		No.2 magazine tool data pot 66 (T8-digit)
R11191		No.2 magazine tool data pot 66 (T8-digit)
R11192		No.2 magazine tool data pot 67 (T8-digit)
R11193		No.2 magazine tool data pot 67 (T8-digit)
R11194		No.2 magazine tool data pot 68 (T8-digit)
R11195		No.2 magazine tool data pot 68 (T8-digit)
R11196		No.2 magazine tool data pot 69 (T8-digit)
R11197		No.2 magazine tool data pot 69 (T8-digit)
R11198		No.2 magazine tool data pot 70 (T8-digit)
R11199		No.2 magazine tool data pot 70 (T8-digit)
R11200		No.2 magazine tool data pot 71 (T8-digit)
R11201		No.2 magazine tool data pot 71 (T8-digit)
R11202		No.2 magazine tool data pot 72 (T8-digit)
R11203		No.2 magazine tool data pot 72 (T8-digit)
R11204		No.2 magazine tool data pot 73 (T8-digit)
R11205		No.2 magazine tool data pot 73 (T8-digit)
R11206		No.2 magazine tool data pot 74 (T8-digit)
R11207		No.2 magazine tool data pot 74 (T8-digit)
R11208		No.2 magazine tool data pot 75 (T8-digit)
R11209		No.2 magazine tool data pot 75 (T8-digit)
R11210		No.2 magazine tool data pot 76 (T8-digit)
R11211		No.2 magazine tool data pot 76 (T8-digit)
R11212		No.2 magazine tool data pot 77 (T8-digit)
R11213		No.2 magazine tool data pot 77 (T8-digit)
R11214		No.2 magazine tool data pot 78 (T8-digit)
R11215		No.2 magazine tool data pot 78 (T8-digit)
R11216		No.2 magazine tool data pot 79 (T8-digit)

Device	Abbrev.	Signal name
R11217		No.2 magazine tool data pot 79 (T8-digit)
R11218		No.2 magazine tool data pot 80 (T8-digit)
R11219		No.2 magazine tool data pot 80 (T8-digit)
R11220		No.2 magazine tool data pot 81 (T8-digit)
R11221		No.2 magazine tool data pot 81 (T8-digit)
R11222		No.2 magazine tool data pot 82 (T8-digit)
R11223		No.2 magazine tool data pot 82 (T8-digit)
R11224		No.2 magazine tool data pot 83 (T8-digit)
R11225		No.2 magazine tool data pot 83 (T8-digit)
R11226		No.2 magazine tool data pot 84 (T8-digit)
R11227		No.2 magazine tool data pot 84 (T8-digit)
R11228		No.2 magazine tool data pot 85 (T8-digit)
R11229		No.2 magazine tool data pot 85 (T8-digit)
R11230		No.2 magazine tool data pot 86 (T8-digit)
R11231		No.2 magazine tool data pot 86 (T8-digit)
R11232		No.2 magazine tool data pot 87 (T8-digit)
R11233		No.2 magazine tool data pot 87 (T8-digit)
R11234		No.2 magazine tool data pot 88 (T8-digit)
R11235		No.2 magazine tool data pot 88 (T8-digit)
R11236		No.2 magazine tool data pot 89 (T8-digit)
R11237		No.2 magazine tool data pot 89 (T8-digit)
R11238		No.2 magazine tool data pot 90 (T8-digit)
R11239		No.2 magazine tool data pot 90 (T8-digit)
R11240		No.2 magazine tool data pot 91 (T8-digit)
R11241		No.2 magazine tool data pot 91 (T8-digit)
R11242		No.2 magazine tool data pot 92 (T8-digit)
R11243		No.2 magazine tool data pot 92 (T8-digit)
R11244		No.2 magazine tool data pot 93 (T8-digit)
R11245		No.2 magazine tool data pot 93 (T8-digit)
R11246		No.2 magazine tool data pot 94 (T8-digit)
R11247		No.2 magazine tool data pot 94 (T8-digit)
R11248		No.2 magazine tool data pot 95 (T8-digit)
R11249		No.2 magazine tool data pot 95 (T8-digit)
R11250		No.2 magazine tool data pot 96 (T8-digit)
R11251		No.2 magazine tool data pot 96 (T8-digit)
R11252		No.2 magazine tool data pot 97 (T8-digit)
R11253		No.2 magazine tool data pot 97 (T8-digit)
R11254		No.2 magazine tool data pot 98 (T8-digit)
R11255		No.2 magazine tool data pot 98 (T8-digit)
R11256		No.2 magazine tool data pot 99 (T8-digit)
R11257		No.2 magazine tool data pot 99 (T8-digit)
R11258		No.2 magazine tool data pot 100 (T8-digit)
R11259		No.2 magazine tool data pot 100 (T8-digit)
R11260		No.2 magazine tool data pot 101 (T8-digit)
R11261		No.2 magazine tool data pot 101 (T8-digit)
R11262		No.2 magazine tool data pot 102 (T8-digit)
R11263		No.2 magazine tool data pot 102 (T8-digit)
R11264		No.2 magazine tool data pot 103 (T8-digit)
R11265		No.2 magazine tool data pot 103 (T8-digit)
R11266		No.2 magazine tool data pot 104 (T8-digit)
R11267		No.2 magazine tool data pot 104 (T8-digit)
R11268		No.2 magazine tool data pot 105 (T8-digit)
R11269		No.2 magazine tool data pot 105 (T8-digit)
R11270		No.2 magazine tool data pot 106 (T8-digit)
R11271		No.2 magazine tool data pot 106 (T8-digit)
R11272		No.2 magazine tool data pot 107 (T8-digit)
R11273		No.2 magazine tool data pot 107 (T8-digit)
R11274		No.2 magazine tool data pot 108 (T8-digit)
R11275		No.2 magazine tool data pot 108 (T8-digit)
R11276		No.2 magazine tool data pot 109 (T8-digit)
R11277		No.2 magazine tool data pot 109 (T8-digit)
R11278		No.2 magazine tool data pot 110 (T8-digit)
R11279		No.2 magazine tool data pot 110 (T8-digit)
R11280		No.2 magazine tool data pot 111 (T8-digit)
R11281		No.2 magazine tool data pot 111 (T8-digit)
R11282		No.2 magazine tool data pot 112 (T8-digit)
R11283		No.2 magazine tool data pot 112 (T8-digit)
R11284		No.2 magazine tool data pot 113 (T8-digit)
R11285		No.2 magazine tool data pot 113 (T8-digit)
R11286		No.2 magazine tool data pot 114 (T8-digit)
R11287		No.2 magazine tool data pot 114 (T8-digit)
R11288		No.2 magazine tool data pot 115 (T8-digit)
R11289		No.2 magazine tool data pot 115 (T8-digit)
R11290		No.2 magazine tool data pot 116 (T8-digit)
R11291		No.2 magazine tool data pot 116 (T8-digit)
R11292		No.2 magazine tool data pot 117 (T8-digit)
R11293		No.2 magazine tool data pot 117 (T8-digit)
R11294		No.2 magazine tool data pot 118 (T8-digit)
R11295		No.2 magazine tool data pot 118 (T8-digit)
R11296		No.2 magazine tool data pot 119 (T8-digit)
R11297		No.2 magazine tool data pot 119 (T8-digit)
R11298		No.2 magazine tool data pot 120 (T8-digit)

Device	Abbrev.	Signal name
R11299		No.2 magazine tool data pot 120 (T8-digit)
R11300		No.2 magazine tool data (Aux.D) pot 1
R11301		No.2 magazine tool data (Aux.D) pot 2
R11302		No.2 magazine tool data (Aux.D) pot 3
R11303		No.2 magazine tool data (Aux.D) pot 4
R11304		No.2 magazine tool data (Aux.D) pot 5
R11305		No.2 magazine tool data (Aux.D) pot 6
R11306		No.2 magazine tool data (Aux.D) pot 7
R11307		No.2 magazine tool data (Aux.D) pot 8
R11308		No.2 magazine tool data (Aux.D) pot 9
R11309		No.2 magazine tool data (Aux.D) pot 10
R11310		No.2 magazine tool data (Aux.D) pot 11
R11311		No.2 magazine tool data (Aux.D) pot 12
R11312		No.2 magazine tool data (Aux.D) pot 13
R11313		No.2 magazine tool data (Aux.D) pot 14
R11314		No.2 magazine tool data (Aux.D) pot 15
R11315		No.2 magazine tool data (Aux.D) pot 16
R11316		No.2 magazine tool data (Aux.D) pot 17
R11317		No.2 magazine tool data (Aux.D) pot 18
R11318		No.2 magazine tool data (Aux.D) pot 19
R11319		No.2 magazine tool data (Aux.D) pot 20
R11320		No.2 magazine tool data (Aux.D) pot 21
R11321		No.2 magazine tool data (Aux.D) pot 22
R11322		No.2 magazine tool data (Aux.D) pot 23
R11323		No.2 magazine tool data (Aux.D) pot 24
R11324		No.2 magazine tool data (Aux.D) pot 25
R11325		No.2 magazine tool data (Aux.D) pot 26
R11326		No.2 magazine tool data (Aux.D) pot 27
R11327		No.2 magazine tool data (Aux.D) pot 28
R11328		No.2 magazine tool data (Aux.D) pot 29
R11329		No.2 magazine tool data (Aux.D) pot 30
R11330		No.2 magazine tool data (Aux.D) pot 31
R11331		No.2 magazine tool data (Aux.D) pot 32
R11332		No.2 magazine tool data (Aux.D) pot 33
R11333		No.2 magazine tool data (Aux.D) pot 34
R11334		No.2 magazine tool data (Aux.D) pot 35
R11335		No.2 magazine tool data (Aux.D) pot 36
R11336		No.2 magazine tool data (Aux.D) pot 37
R11337		No.2 magazine tool data (Aux.D) pot 38
R11338		No.2 magazine tool data (Aux.D) pot 39
R11339		No.2 magazine tool data (Aux.D) pot 40
R11340		No.2 magazine tool data (Aux.D) pot 41
R11341		No.2 magazine tool data (Aux.D) pot 42
R11342		No.2 magazine tool data (Aux.D) pot 43
R11343		No.2 magazine tool data (Aux.D) pot 44
R11344		No.2 magazine tool data (Aux.D) pot 45
R11345		No.2 magazine tool data (Aux.D) pot 46
R11346		No.2 magazine tool data (Aux.D) pot 47
R11347		No.2 magazine tool data (Aux.D) pot 48
R11348		No.2 magazine tool data (Aux.D) pot 49
R11349		No.2 magazine tool data (Aux.D) pot 50
R11350		No.2 magazine tool data (Aux.D) pot 51
R11351		No.2 magazine tool data (Aux.D) pot 52
R11352		No.2 magazine tool data (Aux.D) pot 53
R11353		No.2 magazine tool data (Aux.D) pot 54
R11354		No.2 magazine tool data (Aux.D) pot 55
R11355		No.2 magazine tool data (Aux.D) pot 56
R11356		No.2 magazine tool data (Aux.D) pot 57
R11357		No.2 magazine tool data (Aux.D) pot 58
R11358		No.2 magazine tool data (Aux.D) pot 59
R11359		No.2 magazine tool data (Aux.D) pot 60
R11360		No.2 magazine tool data (Aux.D) pot 61
R11361		No.2 magazine tool data (Aux.D) pot 62
R11362		No.2 magazine tool data (Aux.D) pot 63
R11363		No.2 magazine tool data (Aux.D) pot 64
R11364		No.2 magazine tool data (Aux.D) pot 65
R11365		No.2 magazine tool data (Aux.D) pot 66
R11366		No.2 magazine tool data (Aux.D) pot 67
R11367		No.2 magazine tool data (Aux.D) pot 68
R11368		No.2 magazine tool data (Aux.D) pot 69
R11369		No.2 magazine tool data (Aux.D) pot 70
R11370		No.2 magazine tool data (Aux.D) pot 71
R11371		No.2 magazine tool data (Aux.D) pot 72
R11372		No.2 magazine tool data (Aux.D) pot 73
R11373		No.2 magazine tool data (Aux.D) pot 74
R11374		No.2 magazine tool data (Aux.D) pot 75
R11375		No.2 magazine tool data (Aux.D) pot 76
R11376		No.2 magazine tool data (Aux.D) pot 77
R11377		No.2 magazine tool data (Aux.D) pot 78
R11378		No.2 magazine tool data (Aux.D) pot 79
R11379		No.2 magazine tool data (Aux.D) pot 80
R11380		No.2 magazine tool data (Aux.D) pot 81

Device	Abbrev.	Signal name
R11381		No.2 magazine tool data (Aux.D) pot 82
R11382		No.2 magazine tool data (Aux.D) pot 83
R11383		No.2 magazine tool data (Aux.D) pot 84
R11384		No.2 magazine tool data (Aux.D) pot 85
R11385		No.2 magazine tool data (Aux.D) pot 86
R11386		No.2 magazine tool data (Aux.D) pot 87
R11387		No.2 magazine tool data (Aux.D) pot 88
R11388		No.2 magazine tool data (Aux.D) pot 89
R11389		No.2 magazine tool data (Aux.D) pot 90
R11390		No.2 magazine tool data (Aux.D) pot 91
R11391		No.2 magazine tool data (Aux.D) pot 92
R11392		No.2 magazine tool data (Aux.D) pot 93
R11393		No.2 magazine tool data (Aux.D) pot 94
R11394		No.2 magazine tool data (Aux.D) pot 95
R11395		No.2 magazine tool data (Aux.D) pot 96
R11396		No.2 magazine tool data (Aux.D) pot 97
R11397		No.2 magazine tool data (Aux.D) pot 98
R11398		No.2 magazine tool data (Aux.D) pot 99
R11399		No.2 magazine tool data (Aux.D) pot 100
R11400		No.2 magazine tool data (Aux.D) pot 101
R11401		No.2 magazine tool data (Aux.D) pot 102
R11402		No.2 magazine tool data (Aux.D) pot 103
R11403		No.2 magazine tool data (Aux.D) pot 104
R11404		No.2 magazine tool data (Aux.D) pot 105
R11405		No.2 magazine tool data (Aux.D) pot 106
R11406		No.2 magazine tool data (Aux.D) pot 107
R11407		No.2 magazine tool data (Aux.D) pot 108
R11408		No.2 magazine tool data (Aux.D) pot 109
R11409		No.2 magazine tool data (Aux.D) pot 110
R11410		No.2 magazine tool data (Aux.D) pot 111
R11411		No.2 magazine tool data (Aux.D) pot 112
R11412		No.2 magazine tool data (Aux.D) pot 113
R11413		No.2 magazine tool data (Aux.D) pot 114
R11414		No.2 magazine tool data (Aux.D) pot 115
R11415		No.2 magazine tool data (Aux.D) pot 116
R11416		No.2 magazine tool data (Aux.D) pot 117
R11417		No.2 magazine tool data (Aux.D) pot 118
R11418		No.2 magazine tool data (Aux.D) pot 119
R11419		No.2 magazine tool data (Aux.D) pot 120
R11420		No.3 magazine tool data pot 1
R11421		No.3 magazine tool data pot 2 (T4-digit)/pot 1 (T8-digit)
R11422		No.3 magazine tool data pot 3 (T4-digit)/pot 2 (T8-digit)
R11423		No.3 magazine tool data pot 4 (T4-digit)/pot 2 (T8-digit)
R11424		No.3 magazine tool data pot 5 (T4-digit)/pot 3 (T8-digit)
R11425		No.3 magazine tool data pot 6 (T4-digit)/pot 3 (T8-digit)
R11426		No.3 magazine tool data pot 7 (T4-digit)/pot 4 (T8-digit)
R11427		No.3 magazine tool data pot 8 (T4-digit)/pot 4 (T8-digit)
R11428		No.3 magazine tool data pot 9 (T4-digit)/pot 5 (T8-digit)
R11429		No.3 magazine tool data pot 10 (T4-digit)/pot 5 (T8-digit)
R11430		No.3 magazine tool data pot 11 (T4-digit)/pot 6 (T8-digit)
R11431		No.3 magazine tool data pot 12 (T4-digit)/pot 6 (T8-digit)
R11432		No.3 magazine tool data pot 13 (T4-digit)/pot 7 (T8-digit)
R11433		No.3 magazine tool data pot 14 (T4-digit)/pot 7 (T8-digit)
R11434		No.3 magazine tool data pot 15 (T4-digit)/pot 8 (T8-digit)
R11435		No.3 magazine tool data pot 16 (T4-digit)/pot 8 (T8-digit)
R11436		No.3 magazine tool data pot 17 (T4-digit)/pot 9 (T8-digit)
R11437		No.3 magazine tool data pot 18 (T4-digit)/pot 9 (T8-digit)
R11438		No.3 magazine tool data pot 19 (T4-digit)/pot 10 (T8-digit)
R11439		No.3 magazine tool data pot 20 (T4-digit)/pot 10 (T8-digit)
R11440		No.3 magazine tool data pot 21 (T4-digit)/pot 11 (T8-digit)
R11441		No.3 magazine tool data pot 22 (T4-digit)/pot 11 (T8-digit)
R11442		No.3 magazine tool data pot 23 (T4-digit)/pot 12 (T8-digit)
R11443		No.3 magazine tool data pot 24 (T4-digit)/pot 12 (T8-digit)
R11444		No.3 magazine tool data pot 25 (T4-digit)/pot 13 (T8-digit)
R11445		No.3 magazine tool data pot 26 (T4-digit)/pot 13 (T8-digit)
R11446		No.3 magazine tool data pot 27 (T4-digit)/pot 14 (T8-digit)
R11447		No.3 magazine tool data pot 28 (T4-digit)/pot 14 (T8-digit)
R11448		No.3 magazine tool data pot 29 (T4-digit)/pot 15 (T8-digit)
R11449		No.3 magazine tool data pot 30 (T4-digit)/pot 15 (T8-digit)
R11450		No.3 magazine tool data pot 31 (T4-digit)/pot 16 (T8-digit)
R11451		No.3 magazine tool data pot 32 (T4-digit)/pot 16 (T8-digit)
R11452		No.3 magazine tool data pot 33 (T4-digit)/pot 17 (T8-digit)
R11453		No.3 magazine tool data pot 34 (T4-digit)/pot 17 (T8-digit)
R11454		No.3 magazine tool data pot 35 (T4-digit)/pot 18 (T8-digit)
R11455		No.3 magazine tool data pot 36 (T4-digit)/pot 18 (T8-digit)
R11456		No.3 magazine tool data pot 37 (T4-digit)/pot 19 (T8-digit)
R11457		No.3 magazine tool data pot 38 (T4-digit)/pot 19 (T8-digit)
R11458		No.3 magazine tool data pot 39 (T4-digit)/pot 20 (T8-digit)
R11459		No.3 magazine tool data pot 40 (T4-digit)/pot 20 (T8-digit)
R11460		No.3 magazine tool data pot 41 (T4-digit)/pot 21 (T8-digit)
R11461		No.3 magazine tool data pot 42 (T4-digit)/pot 21 (T8-digit)
R11462		No.3 magazine tool data pot 43 (T4-digit)/pot 22 (T8-digit)

Device	Abbrev.	Signal name
R11463		No.3 magazine tool data pot 44 (T4-digit)/pot 22 (T8-digit)
R11464		No.3 magazine tool data pot 45 (T4-digit)/pot 23 (T8-digit)
R11465		No.3 magazine tool data pot 46 (T4-digit)/pot 23 (T8-digit)
R11466		No.3 magazine tool data pot 47 (T4-digit)/pot 24 (T8-digit)
R11467		No.3 magazine tool data pot 48 (T4-digit)/pot 24 (T8-digit)
R11468		No.3 magazine tool data pot 49 (T4-digit)/pot 25 (T8-digit)
R11469		No.3 magazine tool data pot 50 (T4-digit)/pot 25 (T8-digit)
R11470		No.3 magazine tool data pot 51 (T4-digit)/pot 26 (T8-digit)
R11471		No.3 magazine tool data pot 52 (T4-digit)/pot 26 (T8-digit)
R11472		No.3 magazine tool data pot 53 (T4-digit)/pot 27 (T8-digit)
R11473		No.3 magazine tool data pot 54 (T4-digit)/pot 27 (T8-digit)
R11474		No.3 magazine tool data pot 55 (T4-digit)/pot 28 (T8-digit)
R11475		No.3 magazine tool data pot 56 (T4-digit)/pot 28 (T8-digit)
R11476		No.3 magazine tool data pot 57 (T4-digit)/pot 29 (T8-digit)
R11477		No.3 magazine tool data pot 58 (T4-digit)/pot 29 (T8-digit)
R11478		No.3 magazine tool data pot 59 (T4-digit)/pot 30 (T8-digit)
R11479		No.3 magazine tool data pot 60 (T4-digit)/pot 30 (T8-digit)
R11480		No.3 magazine tool data pot 61 (T4-digit)/pot 31 (T8-digit)
R11481		No.3 magazine tool data pot 62 (T4-digit)/pot 31 (T8-digit)
R11482		No.3 magazine tool data pot 63 (T4-digit)/pot 32 (T8-digit)
R11483		No.3 magazine tool data pot 64 (T4-digit)/pot 32 (T8-digit)
R11484		No.3 magazine tool data pot 65 (T4-digit)/pot 33 (T8-digit)
R11485		No.3 magazine tool data pot 66 (T4-digit)/pot 33 (T8-digit)
R11486		No.3 magazine tool data pot 67 (T4-digit)/pot 34 (T8-digit)
R11487		No.3 magazine tool data pot 68 (T4-digit)/pot 34 (T8-digit)
R11488		No.3 magazine tool data pot 69 (T4-digit)/pot 35 (T8-digit)
R11489		No.3 magazine tool data pot 70 (T4-digit)/pot 35 (T8-digit)
R11490		No.3 magazine tool data pot 71 (T4-digit)/pot 36 (T8-digit)
R11491		No.3 magazine tool data pot 72 (T4-digit)/pot 36 (T8-digit)
R11492		No.3 magazine tool data pot 73 (T4-digit)/pot 37 (T8-digit)
R11493		No.3 magazine tool data pot 74 (T4-digit)/pot 37 (T8-digit)
R11494		No.3 magazine tool data pot 75 (T4-digit)/pot 38 (T8-digit)
R11495		No.3 magazine tool data pot 76 (T4-digit)/pot 38 (T8-digit)
R11496		No.3 magazine tool data pot 77 (T4-digit)/pot 39 (T8-digit)
R11497		No.3 magazine tool data pot 78 (T4-digit)/pot 39 (T8-digit)
R11498		No.3 magazine tool data pot 79 (T4-digit)/pot 40 (T8-digit)
R11499		No.3 magazine tool data pot 80 (T4-digit)/pot 40 (T8-digit)
R11500		No.3 magazine tool data pot 81 (T4-digit)/pot 41 (T8-digit)
R11501		No.3 magazine tool data pot 82 (T4-digit)/pot 41 (T8-digit)
R11502		No.3 magazine tool data pot 83 (T4-digit)/pot 42 (T8-digit)
R11503		No.3 magazine tool data pot 84 (T4-digit)/pot 42 (T8-digit)
R11504		No.3 magazine tool data pot 85 (T4-digit)/pot 43 (T8-digit)
R11505		No.3 magazine tool data pot 86 (T4-digit)/pot 43 (T8-digit)
R11506		No.3 magazine tool data pot 87 (T4-digit)/pot 44 (T8-digit)
R11507		No.3 magazine tool data pot 88 (T4-digit)/pot 44 (T8-digit)
R11508		No.3 magazine tool data pot 89 (T4-digit)/pot 45 (T8-digit)
R11509		No.3 magazine tool data pot 90 (T4-digit)/pot 45 (T8-digit)
R11510		No.3 magazine tool data pot 91 (T4-digit)/pot 46 (T8-digit)
R11511		No.3 magazine tool data pot 92 (T4-digit)/pot 46 (T8-digit)
R11512		No.3 magazine tool data pot 93 (T4-digit)/pot 47 (T8-digit)
R11513		No.3 magazine tool data pot 94 (T4-digit)/pot 47 (T8-digit)
R11514		No.3 magazine tool data pot 95 (T4-digit)/pot 48 (T8-digit)
R11515		No.3 magazine tool data pot 96 (T4-digit)/pot 48 (T8-digit)
R11516		No.3 magazine tool data pot 97 (T4-digit)/pot 49 (T8-digit)
R11517		No.3 magazine tool data pot 98 (T4-digit)/pot 49 (T8-digit)
R11518		No.3 magazine tool data pot 99 (T4-digit)/pot 50 (T8-digit)
R11519		No.3 magazine tool data pot 100 (T4-digit)/pot 50 (T8-digit)
R11520		No.3 magazine tool data pot 101 (T4-digit)/pot 51 (T8-digit)
R11521		No.3 magazine tool data pot 102 (T4-digit)/pot 51 (T8-digit)
R11522		No.3 magazine tool data pot 103 (T4-digit)/pot 52 (T8-digit)
R11523		No.3 magazine tool data pot 104 (T4-digit)/pot 52 (T8-digit)
R11524		No.3 magazine tool data pot 105 (T4-digit)/pot 53 (T8-digit)
R11525		No.3 magazine tool data pot 106 (T4-digit)/pot 53 (T8-digit)
R11526		No.3 magazine tool data pot 107 (T4-digit)/pot 54 (T8-digit)
R11527		No.3 magazine tool data pot 108 (T4-digit)/pot 54 (T8-digit)
R11528		No.3 magazine tool data pot 109 (T4-digit)/pot 55 (T8-digit)
R11529		No.3 magazine tool data pot 110 (T4-digit)/pot 55 (T8-digit)
R11530		No.3 magazine tool data pot 111 (T4-digit)/pot 56 (T8-digit)
R11531		No.3 magazine tool data pot 112 (T4-digit)/pot 56 (T8-digit)
R11532		No.3 magazine tool data pot 113 (T4-digit)/pot 57 (T8-digit)
R11533		No.3 magazine tool data pot 114 (T4-digit)/pot 57 (T8-digit)
R11534		No.3 magazine tool data pot 115 (T4-digit)/pot 58 (T8-digit)
R11535		No.3 magazine tool data pot 116 (T4-digit)/pot 58 (T8-digit)
R11536		No.3 magazine tool data pot 117 (T4-digit)/pot 59 (T8-digit)
R11537		No.3 magazine tool data pot 118 (T4-digit)/pot 59 (T8-digit)
R11538		No.3 magazine tool data pot 119 (T4-digit)/pot 60 (T8-digit)
R11539		No.3 magazine tool data pot 120 (T4-digit)/pot 60 (T8-digit)
R11540		No.3 magazine tool data pot 61 (T8-digit)
R11541		No.3 magazine tool data pot 61 (T8-digit)
R11542		No.3 magazine tool data pot 62 (T8-digit)
R11543		No.3 magazine tool data pot 62 (T8-digit)
R11544		No.3 magazine tool data pot 63 (T8-digit)

Device	Abbrev.	Signal name
R11545		No.3 magazine tool data pot 63 (T8-digit)
R11546		No.3 magazine tool data pot 64 (T8-digit)
R11547		No.3 magazine tool data pot 64 (T8-digit)
R11548		No.3 magazine tool data pot 65 (T8-digit)
R11549		No.3 magazine tool data pot 65 (T8-digit)
R11550		No.3 magazine tool data pot 66 (T8-digit)
R11551		No.3 magazine tool data pot 66 (T8-digit)
R11552		No.3 magazine tool data pot 67 (T8-digit)
R11553		No.3 magazine tool data pot 67 (T8-digit)
R11554		No.3 magazine tool data pot 68 (T8-digit)
R11555		No.3 magazine tool data pot 68 (T8-digit)
R11556		No.3 magazine tool data pot 69 (T8-digit)
R11557		No.3 magazine tool data pot 69 (T8-digit)
R11558		No.3 magazine tool data pot 70 (T8-digit)
R11559		No.3 magazine tool data pot 70 (T8-digit)
R11560		No.3 magazine tool data pot 71 (T8-digit)
R11561		No.3 magazine tool data pot 71 (T8-digit)
R11562		No.3 magazine tool data pot 72 (T8-digit)
R11563		No.3 magazine tool data pot 72 (T8-digit)
R11564		No.3 magazine tool data pot 73 (T8-digit)
R11565		No.3 magazine tool data pot 73 (T8-digit)
R11566		No.3 magazine tool data pot 74 (T8-digit)
R11567		No.3 magazine tool data pot 74 (T8-digit)
R11568		No.3 magazine tool data pot 75 (T8-digit)
R11569		No.3 magazine tool data pot 75 (T8-digit)
R11570		No.3 magazine tool data pot 76 (T8-digit)
R11571		No.3 magazine tool data pot 76 (T8-digit)
R11572		No.3 magazine tool data pot 77 (T8-digit)
R11573		No.3 magazine tool data pot 77 (T8-digit)
R11574		No.3 magazine tool data pot 78 (T8-digit)
R11575		No.3 magazine tool data pot 78 (T8-digit)
R11576		No.3 magazine tool data pot 79 (T8-digit)
R11577		No.3 magazine tool data pot 79 (T8-digit)
R11578		No.3 magazine tool data pot 80 (T8-digit)
R11579		No.3 magazine tool data pot 80 (T8-digit)
R11580		No.3 magazine tool data pot 81 (T8-digit)
R11581		No.3 magazine tool data pot 81 (T8-digit)
R11582		No.3 magazine tool data pot 82 (T8-digit)
R11583		No.3 magazine tool data pot 82 (T8-digit)
R11584		No.3 magazine tool data pot 83 (T8-digit)
R11585		No.3 magazine tool data pot 83 (T8-digit)
R11586		No.3 magazine tool data pot 84 (T8-digit)
R11587		No.3 magazine tool data pot 84 (T8-digit)
R11588		No.3 magazine tool data pot 85 (T8-digit)
R11589		No.3 magazine tool data pot 85 (T8-digit)
R11590		No.3 magazine tool data pot 86 (T8-digit)
R11591		No.3 magazine tool data pot 86 (T8-digit)
R11592		No.3 magazine tool data pot 87 (T8-digit)
R11593		No.3 magazine tool data pot 87 (T8-digit)
R11594		No.3 magazine tool data pot 88 (T8-digit)
R11595		No.3 magazine tool data pot 88 (T8-digit)
R11596		No.3 magazine tool data pot 89 (T8-digit)
R11597		No.3 magazine tool data pot 89 (T8-digit)
R11598		No.3 magazine tool data pot 90 (T8-digit)
R11599		No.3 magazine tool data pot 90 (T8-digit)
R11600		No.3 magazine tool data pot 91 (T8-digit)
R11601		No.3 magazine tool data pot 91 (T8-digit)
R11602		No.3 magazine tool data pot 92 (T8-digit)
R11603		No.3 magazine tool data pot 92 (T8-digit)
R11604		No.3 magazine tool data pot 93 (T8-digit)
R11605		No.3 magazine tool data pot 93 (T8-digit)
R11606		No.3 magazine tool data pot 94 (T8-digit)
R11607		No.3 magazine tool data pot 94 (T8-digit)
R11608		No.3 magazine tool data pot 95 (T8-digit)
R11609		No.3 magazine tool data pot 95 (T8-digit)
R11610		No.3 magazine tool data pot 96 (T8-digit)
R11611		No.3 magazine tool data pot 96 (T8-digit)
R11612		No.3 magazine tool data pot 97 (T8-digit)
R11613		No.3 magazine tool data pot 97 (T8-digit)
R11614		No.3 magazine tool data pot 98 (T8-digit)
R11615		No.3 magazine tool data pot 98 (T8-digit)
R11616		No.3 magazine tool data pot 99 (T8-digit)
R11617		No.3 magazine tool data pot 99 (T8-digit)
R11618		No.3 magazine tool data pot 100 (T8-digit)
R11619		No.3 magazine tool data pot 100 (T8-digit)
R11620		No.3 magazine tool data pot 101 (T8-digit)
R11621		No.3 magazine tool data pot 101 (T8-digit)
R11622		No.3 magazine tool data pot 102 (T8-digit)
R11623		No.3 magazine tool data pot 102 (T8-digit)
R11624		No.3 magazine tool data pot 103 (T8-digit)
R11625		No.3 magazine tool data pot 103 (T8-digit)
R11626		No.3 magazine tool data pot 104 (T8-digit)

Device	Abbrev.	Signal name
R11627		No.3 magazine tool data pot 104 (T8-digit)
R11628		No.3 magazine tool data pot 105 (T8-digit)
R11629		No.3 magazine tool data pot 105 (T8-digit)
R11630		No.3 magazine tool data pot 106 (T8-digit)
R11631		No.3 magazine tool data pot 106 (T8-digit)
R11632		No.3 magazine tool data pot 107 (T8-digit)
R11633		No.3 magazine tool data pot 107 (T8-digit)
R11634		No.3 magazine tool data pot 108 (T8-digit)
R11635		No.3 magazine tool data pot 108 (T8-digit)
R11636		No.3 magazine tool data pot 109 (T8-digit)
R11637		No.3 magazine tool data pot 109 (T8-digit)
R11638		No.3 magazine tool data pot 110 (T8-digit)
R11639		No.3 magazine tool data pot 110 (T8-digit)
R11640		No.3 magazine tool data pot 111 (T8-digit)
R11641		No.3 magazine tool data pot 111 (T8-digit)
R11642		No.3 magazine tool data pot 112 (T8-digit)
R11643		No.3 magazine tool data pot 112 (T8-digit)
R11644		No.3 magazine tool data pot 113 (T8-digit)
R11645		No.3 magazine tool data pot 113 (T8-digit)
R11646		No.3 magazine tool data pot 114 (T8-digit)
R11647		No.3 magazine tool data pot 114 (T8-digit)
R11648		No.3 magazine tool data pot 115 (T8-digit)
R11649		No.3 magazine tool data pot 115 (T8-digit)
R11650		No.3 magazine tool data pot 116 (T8-digit)
R11651		No.3 magazine tool data pot 116 (T8-digit)
R11652		No.3 magazine tool data pot 117 (T8-digit)
R11653		No.3 magazine tool data pot 117 (T8-digit)
R11654		No.3 magazine tool data pot 118 (T8-digit)
R11655		No.3 magazine tool data pot 118 (T8-digit)
R11656		No.3 magazine tool data pot 119 (T8-digit)
R11657		No.3 magazine tool data pot 119 (T8-digit)
R11658		No.3 magazine tool data pot 120 (T8-digit)
R11659		No.3 magazine tool data pot 120 (T8-digit)
R11660		No.3 magazine tool data (Aux.D) pot 1
R11661		No.3 magazine tool data (Aux.D) pot 2
R11662		No.3 magazine tool data (Aux.D) pot 3
R11663		No.3 magazine tool data (Aux.D) pot 4
R11664		No.3 magazine tool data (Aux.D) pot 5
R11665		No.3 magazine tool data (Aux.D) pot 6
R11666		No.3 magazine tool data (Aux.D) pot 7
R11667		No.3 magazine tool data (Aux.D) pot 8
R11668		No.3 magazine tool data (Aux.D) pot 9
R11669		No.3 magazine tool data (Aux.D) pot 10
R11670		No.3 magazine tool data (Aux.D) pot 11
R11671		No.3 magazine tool data (Aux.D) pot 12
R11672		No.3 magazine tool data (Aux.D) pot 13
R11673		No.3 magazine tool data (Aux.D) pot 14
R11674		No.3 magazine tool data (Aux.D) pot 15
R11675		No.3 magazine tool data (Aux.D) pot 16
R11676		No.3 magazine tool data (Aux.D) pot 17
R11677		No.3 magazine tool data (Aux.D) pot 18
R11678		No.3 magazine tool data (Aux.D) pot 19
R11679		No.3 magazine tool data (Aux.D) pot 20
R11680		No.3 magazine tool data (Aux.D) pot 21
R11681		No.3 magazine tool data (Aux.D) pot 22
R11682		No.3 magazine tool data (Aux.D) pot 23
R11683		No.3 magazine tool data (Aux.D) pot 24
R11684		No.3 magazine tool data (Aux.D) pot 25
R11685		No.3 magazine tool data (Aux.D) pot 26
R11686		No.3 magazine tool data (Aux.D) pot 27
R11687		No.3 magazine tool data (Aux.D) pot 28
R11688		No.3 magazine tool data (Aux.D) pot 29
R11689		No.3 magazine tool data (Aux.D) pot 30
R11690		No.3 magazine tool data (Aux.D) pot 31
R11691		No.3 magazine tool data (Aux.D) pot 32
R11692		No.3 magazine tool data (Aux.D) pot 33
R11693		No.3 magazine tool data (Aux.D) pot 34
R11694		No.3 magazine tool data (Aux.D) pot 35
R11695		No.3 magazine tool data (Aux.D) pot 36
R11696		No.3 magazine tool data (Aux.D) pot 37
R11697		No.3 magazine tool data (Aux.D) pot 38
R11698		No.3 magazine tool data (Aux.D) pot 39
R11699		No.3 magazine tool data (Aux.D) pot 40
R11700		No.3 magazine tool data (Aux.D) pot 41
R11701		No.3 magazine tool data (Aux.D) pot 42
R11702		No.3 magazine tool data (Aux.D) pot 43
R11703		No.3 magazine tool data (Aux.D) pot 44
R11704		No.3 magazine tool data (Aux.D) pot 45
R11705		No.3 magazine tool data (Aux.D) pot 46
R11706		No.3 magazine tool data (Aux.D) pot 47
R11707		No.3 magazine tool data (Aux.D) pot 48
R11708		No.3 magazine tool data (Aux.D) pot 49

Device	Abbrev.	Signal name
R11709		No.3 magazine tool data (Aux.D) pot 50
R11710		No.3 magazine tool data (Aux.D) pot 51
R11711		No.3 magazine tool data (Aux.D) pot 52
R11712		No.3 magazine tool data (Aux.D) pot 53
R11713		No.3 magazine tool data (Aux.D) pot 54
R11714		No.3 magazine tool data (Aux.D) pot 55
R11715		No.3 magazine tool data (Aux.D) pot 56
R11716		No.3 magazine tool data (Aux.D) pot 57
R11717		No.3 magazine tool data (Aux.D) pot 58
R11718		No.3 magazine tool data (Aux.D) pot 59
R11719		No.3 magazine tool data (Aux.D) pot 60
R11720		No.3 magazine tool data (Aux.D) pot 61
R11721		No.3 magazine tool data (Aux.D) pot 62
R11722		No.3 magazine tool data (Aux.D) pot 63
R11723		No.3 magazine tool data (Aux.D) pot 64
R11724		No.3 magazine tool data (Aux.D) pot 65
R11725		No.3 magazine tool data (Aux.D) pot 66
R11726		No.3 magazine tool data (Aux.D) pot 67
R11727		No.3 magazine tool data (Aux.D) pot 68
R11728		No.3 magazine tool data (Aux.D) pot 69
R11729		No.3 magazine tool data (Aux.D) pot 70
R11730		No.3 magazine tool data (Aux.D) pot 71
R11731		No.3 magazine tool data (Aux.D) pot 72
R11732		No.3 magazine tool data (Aux.D) pot 73
R11733		No.3 magazine tool data (Aux.D) pot 74
R11734		No.3 magazine tool data (Aux.D) pot 75
R11735		No.3 magazine tool data (Aux.D) pot 76
R11736		No.3 magazine tool data (Aux.D) pot 77
R11737		No.3 magazine tool data (Aux.D) pot 78
R11738		No.3 magazine tool data (Aux.D) pot 79
R11739		No.3 magazine tool data (Aux.D) pot 80
R11740		No.3 magazine tool data (Aux.D) pot 81
R11741		No.3 magazine tool data (Aux.D) pot 82
R11742		No.3 magazine tool data (Aux.D) pot 83
R11743		No.3 magazine tool data (Aux.D) pot 84
R11744		No.3 magazine tool data (Aux.D) pot 85
R11745		No.3 magazine tool data (Aux.D) pot 86
R11746		No.3 magazine tool data (Aux.D) pot 87
R11747		No.3 magazine tool data (Aux.D) pot 88
R11748		No.3 magazine tool data (Aux.D) pot 89
R11749		No.3 magazine tool data (Aux.D) pot 90
R11750		No.3 magazine tool data (Aux.D) pot 91
R11751		No.3 magazine tool data (Aux.D) pot 92
R11752		No.3 magazine tool data (Aux.D) pot 93
R11753		No.3 magazine tool data (Aux.D) pot 94
R11754		No.3 magazine tool data (Aux.D) pot 95
R11755		No.3 magazine tool data (Aux.D) pot 96
R11756		No.3 magazine tool data (Aux.D) pot 97
R11757		No.3 magazine tool data (Aux.D) pot 98
R11758		No.3 magazine tool data (Aux.D) pot 99
R11759		No.3 magazine tool data (Aux.D) pot 100
R11760		No.3 magazine tool data (Aux.D) pot 101
R11761		No.3 magazine tool data (Aux.D) pot 102
R11762		No.3 magazine tool data (Aux.D) pot 103
R11763		No.3 magazine tool data (Aux.D) pot 104
R11764		No.3 magazine tool data (Aux.D) pot 105
R11765		No.3 magazine tool data (Aux.D) pot 106
R11766		No.3 magazine tool data (Aux.D) pot 107
R11767		No.3 magazine tool data (Aux.D) pot 108
R11768		No.3 magazine tool data (Aux.D) pot 109
R11769		No.3 magazine tool data (Aux.D) pot 110
R11770		No.3 magazine tool data (Aux.D) pot 111
R11771		No.3 magazine tool data (Aux.D) pot 112
R11772		No.3 magazine tool data (Aux.D) pot 113
R11773		No.3 magazine tool data (Aux.D) pot 114
R11774		No.3 magazine tool data (Aux.D) pot 115
R11775		No.3 magazine tool data (Aux.D) pot 116
R11776		No.3 magazine tool data (Aux.D) pot 117
R11777		No.3 magazine tool data (Aux.D) pot 118
R11778		No.3 magazine tool data (Aux.D) pot 119
R11779		No.3 magazine tool data (Aux.D) pot 120
R12200		Spindle tool No. (L) $1
R12201		Spindle tool No. (H) $1
R12202		Standby tool No. (L) $1
R12203		Standby tool No. (H) $1
R12210		Spindle tool No. (L) $2
R12211		Spindle tool No. (H) $2
R12212		Standby tool No. (L) $2
R12213		Standby tool No. (H) $2
R12220		Spindle tool No. (L) $3
R12221		Spindle tool No. (H) $3
R12222		Standby tool No. (L) $3

Device	Abbrev.	Signal name
R12223		Standby tool No. (H) $3
R12230		Spindle tool No. (L) $4
R12231		Spindle tool No. (H) $4
R12232		Standby tool No. (L) $4
R12233		Standby tool No. (H) $4
R12240		Spindle tool No. (L) $5
R12241		Spindle tool No. (H) $5
R12242		Standby tool No. (L) $5
R12243		Standby tool No. (H) $5
R12250		Spindle tool No. (L) $6
R12251		Spindle tool No. (H) $6
R12252		Standby tool No. (L) $6
R12253		Standby tool No. (H) $6
R12260		Spindle tool No. (L) $7
R12261		Spindle tool No. (H) $7
R12262		Standby tool No. (L) $7
R12263		Standby tool No. (H) $7
R12270		Spindle tool No. (L) $8
R12271		Spindle tool No. (H) $8
R12272		Standby tool No. (L) $8
R12273		Standby tool No. (H) $8
R14700		MES interface library: Machining start time $1 [M8]
R14701		
R14702		MES interface library: Machining end time $1 [M8]
R14703		
R14704		MES interface library: Cycle time $1 [M8]
R14705		
R14706		MES interface library: Program number at machining start $1 [M8]
R14707		
R14708		
R14709		
R14710		
R14711		
R14712		
R14713		
R14714		
R14715		
R14716		
R14717		
R14718		
R14719		
R14720		
R14721		
R14722		MES interface library: N number at machining start $1 [M8]
R14723		
R14724		MES interface library: B number at machining start $1 [M8]
R14725		
R14726		MES interface library: Spindle 1 maximum load $1 [M8]
R14727		MES interface library: Spindle 2 maximum load $1 [M8]
R14728		MES interface library: Power consumption amount $1 [M8]
R14729		
R14730		MES interface library: Power regeneration amount $1 [M8]
R14731		
R14732		MES interface library: Tool number 1 $1 [M8]
R14733		
R14734		MES interface library: Tool number 2 $1 [M8]
R14735		
R14736		MES interface library: Tool number 3 $1 [M8]
R14737		
R14738		MES interface library: Tool number 4 $1 [M8]
R14739		
R14740		MES interface library: Tool number 5 $1 [M8]
R14741		
R14742		MES interface library: Tool offset number 1 $1 [M8]
R14743		MES interface library: Tool offset number 2 $1 [M8]
R14744		MES interface library: Tool offset number 3 $1 [M8]
R14745		MES interface library: Tool offset number 4 $1 [M8]
R14746		MES interface library: Tool offset number 5 $1 [M8]
R14748		MES interface library: Tool length offset 1 $1 [M8]
R14749		
R14750		MES interface library: Tool length offset 2 $1 [M8]
R14751		
R14752		MES interface library: Tool length offset 3 $1 [M8]
R14753		
R14754		MES interface library: Tool length offset 4 $1 [M8]
R14755		
R14756		MES interface library: Tool length offset 5 $1 [M8]
R14757		
R14758		MES interface library: Tool radius offset 1 $1 [M8]
R14759		
R14760		MES interface library: Tool radius offset 2 $1 [M8]
R14761		

Device	Abbrev.	Signal name
R14762		MES interface library: Tool radius offset 3 $1 [M8]
R14763		
R14764		MES interface library: Tool radius offset 4 $1 [M8]
R14765		
R14766		MES interface library: Tool radius offset 5 $1 [M8]
R14767		
R14768		MES interface library: Tool length wear amount 1 $1 [M8]
R14769		
R14770		MES interface library: Tool length wear amount 2 $1 [M8]
R14771		
R14772		MES interface library: Tool length wear amount 3 $1 [M8]
R14773		
R14774		MES interface library: Tool length wear amount 4 $1 [M8]
R14775		
R14776		MES interface library: Tool length wear amount 5 $1 [M8]
R14777		
R14778		MES interface library: Tool radius wear amount 1 $1 [M8]
R14779		
R14780		MES interface library: Tool radius wear amount 2 $1 [M8]
R14781		
R14782		MES interface library: Tool radius wear amount 3 $1 [M8]
R14783		
R14784		MES interface library: Tool radius wear amount 4 $1 [M8]
R14785		
R14786		MES interface library: Tool radius wear amount 5 $1 [M8]
R14787		
R14788		MES interface library: Tool life 1 $1 [M8]
R14789		
R14790		MES interface library: Tool life 2 $1 [M8]
R14791		
R14792		MES interface library: Tool life 3 $1 [M8]
R14793		
R14794		MES interface library: Tool life 4 $1 [M8]
R14795		
R14796		MES interface library: Tool life 5 $1 [M8]
R14797		
R14798		MES interface library: Time of alarm occurrence $1 [M8]
R14799		
R14800		MES interface library: Alarm number 1 $1 [M8]
R14801		
R14802		
R14803		
R14804		
R14805		
R14806		
R14807		
R14808		
R14809		
R14810		
R14811		
R14812		
R14813		
R14814		
R14815		
R14816		MES interface library: Alarm number 2 $1 [M8]
R14817		
R14818		
R14819		
R14820		
R14821		
R14822		
R14823		
R14824		
R14825		
R14826		
R14827		
R14828		
R14829		
R14830		
R14831		

Device	Abbrev.	Signal name
R14832		MES interface library: Alarm number 3 $1 [M8]
R14833		
R14834		
R14835		
R14836		
R14837		
R14838		
R14839		
R14840		
R14841		
R14842		
R14843		
R14844		
R14845		
R14846		
R14847		
R14848		MES interface library: Alarm number 4 $1 [M8]
R14849		
R14850		
R14851		
R14852		
R14853		
R14854		
R14855		
R14856		
R14857		
R14858		
R14859		
R14860		
R14861		
R14862		
R14863		
R14864		MES interface library: Power ON time $1 [M8]
R14865		
R14866		MES interface library: Program number at alarm $1 [M8]
R14867		
R14868		
R14869		
R14870		
R14871		
R14872		
R14873		
R14874		
R14875		
R14876		
R14877		
R14878		
R14879		
R14880		
R14881		
R14882		MES interface library: Subprogram number at alarm $1 [M8]
R14883		
R14884		
R14885		
R14886		
R14887		
R14888		
R14889		
R14890		
R14891		
R14892		
R14893		
R14894		
R14895		
R14896		
R14897		
R14898		MES interface library: N number at alarm $1 [M8]
R14899		
R14900		MES interface library: B number at alarm $1 [M8]
R14901		

Device	Abbrev.	Signal name
R14902		MES interface library: G code modal status $1 [M8]
R14903		
R14904		
R14905		
R14906		
R14907		
R14908		
R14909		
R14910		
R14911		
R14912		
R14913		
R14914		
R14915		
R14916		
R14917		
R14918		
R14919		
R14920		
R14921		
R14922		
R14923		
R14924		
R14925		
R14926		
R14927		
R14928		
R14929		
R14930		
R14931		
R14932		
R14933		
R14934		MES interface library: Spindle load value $1 [M8]
R14935		MES interface library: Spindle 2 load value $1 [M8]
R14936		MES interface library: Tool number $1 [M8]
R14937		
R14938		MES interface library: Tool offset number $1 [M8]
R14940		MES interface library: Tool length offset $1 [M8]
R14941		
R14942		MES interface library: Tool radius offset $1 [M8]
R14943		
R14944		MES interface library: Tool length wear amount $1 [M8]
R14945		
R14946		MES interface library: Tool radius wear amount $1 [M8]
R14947		
R14948		MES interface library: Tool life $1 [M8]
R14949		
R14950		MES interface library: Machining start time $2 [M8]
R14951		
R14952		MES interface library: Machining end time $2 [M8]
R14953		
R14954		MES interface library: Cycle time $2 [M8]
R14955		
R14956		MES interface library: Program number at machining start $2 [M8]
R14957		
R14958		
R14959		
R14960		
R14961		
R14962		
R14963		
R14964		
R14965		
R14966		
R14967		
R14968		
R14969		
R14970		
R14971		
R14972		MES interface library: N number at machining start $2 [M8]
R14973		
R14974		MES interface library: B number at machining start $2 [M8]
R14975		
R14976		MES interface library: Spindle 1 maximum load $2 [M8]
R14977		MES interface library: Spindle 2 maximum load $2 [M8]
R14978		MES interface library: Power consumption amount $2 [M8]
R14979		
R14980		MES interface library: Power regeneration amount $2 [M8]
R14981		
R14982		MES interface library: Tool number 1 $2 [M8]
R14983		

Device	Abbrev.	Signal name
R14984		MES interface library: Tool number 2 $2 [M8]
R14985		
R14986		MES interface library: Tool number 3 $2 [M8]
R14987		
R14988		MES interface library: Tool number 4 $2 [M8]
R14989		
R14990		MES interface library: Tool number 5 $2 [M8]
R14991		
R14992		MES interface library: Tool offset number 1 $2 [M8]
R14993		MES interface library: Tool offset number 2 $2 [M8]
R14994		MES interface library: Tool offset number 3 $2 [M8]
R14995		MES interface library: Tool offset number 4 $2 [M8]
R14996		MES interface library: Tool offset number 5 $2 [M8]
R14998		MES interface library: Tool length offset 1 $2 [M8]
R14999		
R15000		MES interface library: Tool length offset 2 $2 [M8]
R15001		
R15002		MES interface library: Tool length offset 3 $2 [M8]
R15003		
R15004		MES interface library: Tool length offset 4 $2 [M8]
R15005		
R15006		MES interface library: Tool length offset 5 $2 [M8]
R15007		
R15008		MES interface library: Tool radius offset 1 $2 [M8]
R15009		
R15010		MES interface library: Tool radius offset 2 $2 [M8]
R15011		
R15012		MES interface library: Tool radius offset 3 $2 [M8]
R15013		
R15014		MES interface library: Tool radius offset 4 $2 [M8]
R15015		
R15016		MES interface library: Tool radius offset 5 $2 [M8]
R15017		
R15018		MES interface library: Tool length wear amount 1 $2 [M8]
R15019		
R15020		MES interface library: Tool length wear amount 2 $2 [M8]
R15021		
R15022		MES interface library: Tool length wear amount 3 $2 [M8]
R15023		
R15024		MES interface library: Tool length wear amount 4 $2 [M8]
R15025		
R15026		MES interface library: Tool length wear amount 5 $2 [M8]
R15027		
R15028		MES interface library: Tool radius wear amount 1 $2 [M8]
R15029		
R15030		MES interface library: Tool radius wear amount 2 $2 [M8]
R15031		
R15032		MES interface library: Tool radius wear amount 3 $2 [M8]
R15033		
R15034		MES interface library: Tool radius wear amount 4 $2 [M8]
R15035		
R15036		MES interface library: Tool radius wear amount 5 $2 [M8]
R15037		
R15038		MES interface library: Tool life 1 $2 [M8]
R15039		
R15040		MES interface library: Tool life 2 $2 [M8]
R15041		
R15042		MES interface library: Tool life 3 $2 [M8]
R15043		
R15044		MES interface library: Tool life 4 $2 [M8]
R15045		
R15046		MES interface library: Tool life 5 $2 [M8]
R15047		
R15048		MES interface library: Time of alarm occurrence $2 [M8]
R15049		
R15050		MES interface library: Alarm number 1 $2 [M8]
R15051		
R15052		
R15053		
R15054		
R15055		
R15056		
R15057		
R15058		
R15059		
R15060		
R15061		
R15062		
R15063		
R15064		
R15065		

Device	Abbrev.	Signal name
R15066		MES interface library: Alarm number 2 $2 [M8]
R15067		
R15068		
R15069		
R15070		
R15071		
R15072		
R15073		
R15074		
R15075		
R15076		
R15077		
R15078		
R15079		
R15080		
R15081		
R15082		MES interface library: Alarm number 3 $2 [M8]
R15083		
R15084		
R15085		
R15086		
R15087		
R15088		
R15089		
R15090		
R15091		
R15092		
R15093		
R15094		
R15095		
R15096		
R15097		
R15098		MES interface library: Alarm number 4 $2 [M8]
R15099		
R15100		
R15101		
R15102		
R15103		
R15104		
R15105		
R15106		
R15107		
R15108		
R15109		
R15110		
R15111		
R15112		
R15113		
R15114		MES interface library: Power ON time $2 [M8]
R15115		
R15116		MES interface library: Program number at alarm $2 [M8]
R15117		
R15118		
R15119		
R15120		
R15121		
R15122		
R15123		
R15124		
R15125		
R15126		
R15127		
R15128		
R15129		
R15130		
R15131		
R15132		MES interface library: Subprogram number at alarm $2 [M8]
R15133		
R15134		
R15135		
R15136		
R15137		
R15138		
R15139		
R15140		
R15141		
R15142		
R15143		
R15144		
R15145		
R15146		
R15147		

Device	Abbrev.	Signal name
R15148		MES interface library: N number at alarm $2 [M8]
R15149		
R15150		MES interface library: B number at alarm $2 [M8]
R15151		
R15152		MES interface library: G code modal status $2 [M8]
R15153		
R15154		
R15155		
R15156		
R15157		
R15158		
R15159		
R15160		
R15161		
R15162		
R15163		
R15164		
R15165		
R15166		
R15167		
R15168		
R15169		
R15170		
R15171		
R15172		
R15173		
R15174		
R15175		
R15176		
R15177		
R15178		
R15179		
R15180		
R15181		
R15182		
R15183		
R15184		MES interface library: Spindle load value $2 [M8]
R15185		MES interface library: Spindle 2 load value $2 [M8]
R15186		MES interface library: Tool number $2 [M8]
R15187		
R15188		MES interface library: Tool offset number $2 [M8]
R15190		MES interface library: Tool length offset $2 [M8]
R15191		
R15192		MES interface library: Tool radius offset $2 [M8]
R15193		
R15194		MES interface library: Tool length wear amount $2 [M8]
R15195		
R15196		MES interface library: Tool radius wear amount $2 [M8]
R15197		
R15198		MES interface library: Tool life $2 [M8]
R15199		
R15200		MES interface library: Machining start time $3 [M8]
R15201		
R15202		MES interface library: Machining end time $3 [M8]
R15203		
R15204		MES interface library: Cycle time $3 [M8]
R15205		
R15206		MES interface library: Program number at machining start $3 [M8]
R15207		
R15208		
R15209		
R15210		
R15211		
R15212		
R15213		
R15214		
R15215		
R15216		
R15217		
R15218		
R15219		
R15220		
R15221		
R15222		MES interface library: N number at machining start $3 [M8]
R15223		
R15224		MES interface library: B number at machining start $3 [M8]
R15225		
R15226		MES interface library: Spindle 1 maximum load $3 [M8]
R15227		MES interface library: Spindle 2 maximum load $3 [M8]
R15228		MES interface library: Power consumption amount $3 [M8]
R15229		

Device	Abbrev.	Signal name
R15230		MES interface library: Power regeneration amount $3 [M8]
R15231		
R15232		MES interface library: Tool number 1 $3 [M8]
R15233		
R15234		MES interface library: Tool number 2 $3 [M8]
R15235		
R15236		MES interface library: Tool number 3 $3 [M8]
R15237		
R15238		MES interface library: Tool number 4 $3 [M8]
R15239		
R15240		MES interface library: Tool number 5 $3 [M8]
R15241		
R15242		MES interface library: Tool offset number 1 $3 [M8]
R15243		MES interface library: Tool offset number 2 $3 [M8]
R15244		MES interface library: Tool offset number 3 $3 [M8]
R15245		MES interface library: Tool offset number 4 $3 [M8]
R15246		MES interface library: Tool offset number 5 $3 [M8]
R15248		MES interface library: Tool length offset 1 $3 [M8]
R15249		
R15250		MES interface library: Tool length offset 2 $3 [M8]
R15251		
R15252		MES interface library: Tool length offset 3 $3 [M8]
R15253		
R15254		MES interface library: Tool length offset 4 $3 [M8]
R15255		
R15256		MES interface library: Tool length offset 5 $3 [M8]
R15257		
R15258		MES interface library: Tool radius offset 1 $3 [M8]
R15259		
R15260		MES interface library: Tool radius offset 2 $3 [M8]
R15261		
R15262		MES interface library: Tool radius offset 3 $3 [M8]
R15263		
R15264		MES interface library: Tool radius offset 4 $3 [M8]
R15265		
R15266		MES interface library: Tool radius offset 5 $3 [M8]
R15267		
R15268		MES interface library: Tool length wear amount 1 $3 [M8]
R15269		
R15270		MES interface library: Tool length wear amount 2 $3 [M8]
R15271		
R15272		MES interface library: Tool length wear amount 3 $3 [M8]
R15273		
R15274		MES interface library: Tool length wear amount 4 $3 [M8]
R15275		
R15276		MES interface library: Tool length wear amount 5 $3 [M8]
R15277		
R15278		MES interface library: Tool radius wear amount 1 $3 [M8]
R15279		
R15280		MES interface library: Tool radius wear amount 2 $3 [M8]
R15281		
R15282		MES interface library: Tool radius wear amount 3 $3 [M8]
R15283		
R15284		MES interface library: Tool radius wear amount 4 $3 [M8]
R15285		
R15286		MES interface library: Tool radius wear amount 5 $3 [M8]
R15287		
R15288		MES interface library: Tool life 1 $3 [M8]
R15289		
R15290		MES interface library: Tool life 2 $3 [M8]
R15291		
R15292		MES interface library: Tool life 3 $3 [M8]
R15293		
R15294		MES interface library: Tool life 4 $3 [M8]
R15295		
R15296		MES interface library: Tool life 5 $3 [M8]
R15297		
R15298		MES interface library: Time of alarm occurrence $3 [M8]
R15299		

Device	Abbrev.	Signal name
R15300		MES interface library: Alarm number 1 $3 [M8]
R15301		
R15302		
R15303		
R15304		
R15305		
R15306		
R15307		
R15308		
R15309		
R15310		
R15311		
R15312		
R15313		
R15314		
R15315		
R15316		MES interface library: Alarm number 2 $3 [M8]
R15317		
R15318		
R15319		
R15320		
R15321		
R15322		
R15323		
R15324		
R15325		
R15326		
R15327		
R15328		
R15329		
R15330		
R15331		
R15332		MES interface library: Alarm number 3 $3 [M8]
R15333		
R15334		
R15335		
R15336		
R15337		
R15338		
R15339		
R15340		
R15341		
R15342		
R15343		
R15344		
R15345		
R15346		
R15347		
R15348		MES interface library: Alarm number 4 $3 [M8]
R15349		
R15350		
R15351		
R15352		
R15353		
R15354		
R15355		
R15356		
R15357		
R15358		
R15359		
R15360		
R15361		
R15362		
R15363		
R15364		MES interface library: Power ON time $3 [M8]
R15365		
R15366		MES interface library: Program number at alarm $3 [M8]
R15367		
R15368		
R15369		
R15370		
R15371		
R15372		
R15373		
R15374		
R15375		
R15376		
R15377		
R15378		
R15379		
R15380		
R15381		

Device	Abbrev.	Signal name
R15382		MES interface library: Subprogram number at alarm $3 [M8]
R15383		
R15384		
R15385		
R15386		
R15387		
R15388		
R15389		
R15390		
R15391		
R15392		
R15393		
R15394		
R15395		
R15396		
R15397		
R15398		MES interface library: N number at alarm $3 [M8]
R15399		
R15400		MES interface library: B number at alarm $3 [M8]
R15401		
R15402		MES interface library: G code modal status $3 [M8]
R15403		
R15404		
R15405		
R15406		
R15407		
R15408		
R15409		
R15410		
R15411		
R15412		
R15413		
R15414		
R15415		
R15416		
R15417		
R15418		
R15419		
R15420		
R15421		
R15422		
R15423		
R15424		
R15425		
R15426		
R15427		
R15428		
R15429		
R15430		
R15431		
R15432		
R15433		
R15434		MES interface library: Spindle load value $3 [M8]
R15435		MES interface library: Spindle 2 load value $3 [M8]
R15436		MES interface library: Tool number $3 [M8]
R15437		
R15438		MES interface library: Tool offset number $3 [M8]
R15440		MES interface library: Tool length offset $3 [M8]
R15441		
R15442		MES interface library: Tool radius offset $3 [M8]
R15443		
R15444		MES interface library: Tool length wear amount $3 [M8]
R15445		
R15446		MES interface library: Tool radius wear amount $3 [M8]
R15447		
R15448		MES interface library: Tool life $3 [M8]
R15449		
R15450		MES interface library: Machining start time $4 [M8]
R15451		
R15452		MES interface library: Machining end time $4 [M8]
R15453		
R15454		MES interface library: Cycle time $4 [M8]
R15455		

Device	Abbrev.	Signal name
R15456		MES interface library: Program number at machining start $4 [M8]
R15457		
R15458		
R15459		
R15460		
R15461		
R15462		
R15463		
R15464		
R15465		
R15466		
R15467		
R15468		
R15469		
R15470		
R15471		
R15472		MES interface library: N number at machining start $4 [M8]
R15473		
R15474		MES interface library: B number at machining start $4 [M8]
R15475		
R15476		MES interface library: Spindle 1 maximum load $4 [M8]
R15477		MES interface library: Spindle 2 maximum load $4 [M8]
R15478		MES interface library: Power consumption amount $4 [M8]
R15479		
R15480		MES interface library: Power regeneration amount $4 [M8]
R15481		
R15482		MES interface library: Tool number 1 $4 [M8]
R15483		
R15484		MES interface library: Tool number 2 $4 [M8]
R15485		
R15486		MES interface library: Tool number 3 $4 [M8]
R15487		
R15488		MES interface library: Tool number 4 $4 [M8]
R15489		
R15490		MES interface library: Tool number 5 $4 [M8]
R15491		
R15492		MES interface library: Tool offset number 1 $4 [M8]
R15493		MES interface library: Tool offset number 2 $4 [M8]
R15494		MES interface library: Tool offset number 3 $4 [M8]
R15495		MES interface library: Tool offset number 4 $4 [M8]
R15496		MES interface library: Tool offset number 5 $4 [M8]
R15498		MES interface library: Tool length offset 1 $4 [M8]
R15499		
R15500		MES interface library: Tool length offset 2 $4 [M8]
R15501		
R15502		MES interface library: Tool length offset 3 $4 [M8]
R15503		
R15504		MES interface library: Tool length offset 4 $4 [M8]
R15505		
R15506		MES interface library: Tool length offset 5 $4 [M8]
R15507		
R15508		MES interface library: Tool radius offset 1 $4 [M8]
R15509		
R15510		MES interface library: Tool radius offset 2 $4 [M8]
R15511		
R15512		MES interface library: Tool radius offset 3 $4 [M8]
R15513		
R15514		MES interface library: Tool radius offset 4 $4 [M8]
R15515		
R15516		MES interface library: Tool radius offset 5 $4 [M8]
R15517		
R15518		MES interface library: Tool length wear amount 1 $4 [M8]
R15519		
R15520		MES interface library: Tool length wear amount 2 $4 [M8]
R15521		
R15522		MES interface library: Tool length wear amount 3 $4 [M8]
R15523		
R15524		MES interface library: Tool length wear amount 4 $4 [M8]
R15525		
R15526		MES interface library: Tool length wear amount 5 $4 [M8]
R15527		
R15528		MES interface library: Tool radius wear amount 1 $4 [M8]
R15529		
R15530		MES interface library: Tool radius wear amount 2 $4 [M8]
R15531		
R15532		MES interface library: Tool radius wear amount 3 $4 [M8]
R15533		
R15534		MES interface library: Tool radius wear amount 4 $4 [M8]
R15535		
R15536		MES interface library: Tool radius wear amount 5 $4 [M8]
R15537		

Device	Abbrev.	Signal name
R15538		MES interface library: Tool life 1 $4 [M8]
R15539		
R15540		MES interface library: Tool life 2 $4 [M8]
R15541		
R15542		MES interface library: Tool life 3 $4 [M8]
R15543		
R15544		MES interface library: Tool life 4 $4 [M8]
R15545		
R15546		MES interface library: Tool life 5 $4 [M8]
R15547		
R15548		MES interface library: Time of alarm occurrence $4 [M8]
R15549		
R15550		MES interface library: Alarm number 1 $4 [M8]
R15551		
R15552		
R15553		
R15554		
R15555		
R15556		
R15557		
R15558		
R15559		
R15560		
R15561		
R15562		
R15563		
R15564		
R15565		
R15566		MES interface library: Alarm number 2 $4 [M8]
R15567		
R15568		
R15569		
R15570		
R15571		
R15572		
R15573		
R15574		
R15575		
R15576		
R15577		
R15578		
R15579		
R15580		
R15581		
R15582		MES interface library: Alarm number 3 $4 [M8]
R15583		
R15584		
R15585		
R15586		
R15587		
R15588		
R15589		
R15590		
R15591		
R15592		
R15593		
R15594		
R15595		
R15596		
R15597		
R15598		MES interface library: Alarm number 4 $4 [M8]
R15599		
R15600		
R15601		
R15602		
R15603		
R15604		
R15605		
R15606		
R15607		
R15608		
R15609		
R15610		
R15611		
R15612		
R15613		
R15614		MES interface library: Power ON time $4 [M8]
R15615		

Device	Abbrev.	Signal name
R15616		MES interface library: Program number at alarm $4 [M8]
R15617		
R15618		
R15619		
R15620		
R15621		
R15622		
R15623		
R15624		
R15625		
R15626		
R15627		
R15628		
R15629		
R15630		
R15631		
R15632		MES interface library: Subprogram number at alarm $4 [M8]
R15633		
R15634		
R15635		
R15636		
R15637		
R15638		
R15639		
R15640		
R15641		
R15642		
R15643		
R15644		
R15645		
R15646		
R15647		
R15648		MES interface library: N number at alarm $4 [M8]
R15649		
R15650		MES interface library: B number at alarm $4 [M8]
R15651		
R15652		MES interface library: G code modal status $4 [M8]
R15653		
R15654		
R15655		
R15656		
R15657		
R15658		
R15659		
R15660		
R15661		
R15662		
R15663		
R15664		
R15665		
R15666		
R15667		
R15668		
R15669		
R15670		
R15671		
R15672		
R15673		
R15674		
R15675		
R15676		
R15677		
R15678		
R15679		
R15680		
R15681		
R15682		
R15683		
R15684		MES interface library: Spindle load value $4 [M8]
R15685		MES interface library: Spindle 2 load value $4 [M8]
R15686		MES interface library: Tool number $4 [M8]
R15687		
R15688		MES interface library: Tool offset number $4 [M8]
R15690		MES interface library: Tool length offset $4 [M8]
R15691		
R15692		MES interface library: Tool radius offset $4 [M8]
R15693		
R15694		MES interface library: Tool length wear amount $4 [M8]
R15695		
R15696		MES interface library: Tool radius wear amount $4 [M8]
R15697		

Device	Abbrev.	Signal name
R15698		MES interface library: Tool life $4 [M8]
R15699		
R15700		MES interface library: Machining start time $5 [M8]
R15701		
R15702		MES interface library: Machining end time $5 [M8]
R15703		
R15704		MES interface library: Cycle time $5 [M8]
R15705		
R15706		MES interface library: Program number at machining start $5 [M8]
R15707		
R15708		
R15709		
R15710		
R15711		
R15712		
R15713		
R15714		
R15715		
R15716		
R15717		
R15718		
R15719		
R15720		
R15721		
R15722		MES interface library: N number at machining start $5 [M8]
R15723		
R15724		MES interface library: B number at machining start $5 [M8]
R15725		
R15726		MES interface library: Spindle 1 maximum load $5 [M8]
R15727		MES interface library: Spindle 2 maximum load $5 [M8]
R15728		MES interface library: Power consumption amount $5 [M8]
R15729		
R15730		MES interface library: Power regeneration amount $5 [M8]
R15731		
R15732		MES interface library: Tool number 1 $5 [M8]
R15733		
R15734		MES interface library: Tool number 2 $5 [M8]
R15735		
R15736		MES interface library: Tool number 3 $5 [M8]
R15737		
R15738		MES interface library: Tool number 4 $5 [M8]
R15739		
R15740		MES interface library: Tool number 5 $5 [M8]
R15741		
R15742		MES interface library: Tool offset number 1 $5 [M8]
R15743		MES interface library: Tool offset number 2 $5 [M8]
R15744		MES interface library: Tool offset number 3 $5 [M8]
R15745		MES interface library: Tool offset number 4 $5 [M8]
R15746		MES interface library: Tool offset number 5 $5 [M8]
R15748		MES interface library: Tool length offset 1 $5 [M8]
R15749		
R15750		MES interface library: Tool length offset 2 $5 [M8]
R15751		
R15752		MES interface library: Tool length offset 3 $5 [M8]
R15753		
R15754		MES interface library: Tool length offset 4 $5 [M8]
R15755		
R15756		MES interface library: Tool length offset 5 $5 [M8]
R15757		
R15758		MES interface library: Tool radius offset 1 $5 [M8]
R15759		
R15760		MES interface library: Tool radius offset 2 $5 [M8]
R15761		
R15762		MES interface library: Tool radius offset 3 $5 [M8]
R15763		
R15764		MES interface library: Tool radius offset 4 $5 [M8]
R15765		
R15766		MES interface library: Tool radius offset 5 $5 [M8]
R15767		
R15768		MES interface library: Tool length wear amount 1 $5 [M8]
R15769		
R15770		MES interface library: Tool length wear amount 2 $5 [M8]
R15771		
R15772		MES interface library: Tool length wear amount 3 $5 [M8]
R15773		
R15774		MES interface library: Tool length wear amount 4 $5 [M8]
R15775		
R15776		MES interface library: Tool length wear amount 5 $5 [M8]
R15777		
R15778		MES interface library: Tool radius wear amount 1 $5 [M8]
R15779		

Device	Abbrev.	Signal name
R15780		MES interface library: Tool radius wear amount 2 $5 [M8]
R15781		
R15782		MES interface library: Tool radius wear amount 3 $5 [M8]
R15783		
R15784		MES interface library: Tool radius wear amount 4 $5 [M8]
R15785		
R15786		MES interface library: Tool radius wear amount 5 $5 [M8]
R15787		
R15788		MES interface library: Tool life 1 $5 [M8]
R15789		
R15790		MES interface library: Tool life 2 $5 [M8]
R15791		
R15792		MES interface library: Tool life 3 $5 [M8]
R15793		
R15794		MES interface library: Tool life 4 $5 [M8]
R15795		
R15796		MES interface library: Tool life 5 $5 [M8]
R15797		
R15798		MES interface library: Time of alarm occurrence $5 [M8]
R15799		
R15800		MES interface library: Alarm number 1 $5 [M8]
R15801		
R15802		
R15803		
R15804		
R15805		
R15806		
R15807		
R15808		
R15809		
R15810		
R15811		
R15812		
R15813		
R15814		
R15815		
R15816		MES interface library: Alarm number 2 $5 [M8]
R15817		
R15818		
R15819		
R15820		
R15821		
R15822		
R15823		
R15824		
R15825		
R15826		
R15827		
R15828		
R15829		
R15830		
R15831		
R15832		MES interface library: Alarm number 3 $5 [M8]
R15833		
R15834		
R15835		
R15836		
R15837		
R15838		
R15839		
R15840		
R15841		
R15842		
R15843		
R15844		
R15845		
R15846		
R15847		

Device	Abbrev.	Signal name
R15848		MES interface library: Alarm number 4 $5 [M8]
R15849		
R15850		
R15851		
R15852		
R15853		
R15854		
R15855		
R15856		
R15857		
R15858		
R15859		
R15860		
R15861		
R15862		
R15863		
R15864		MES interface library: Power ON time $5 [M8]
R15865		
R15866		MES interface library: Program number at alarm $5 [M8]
R15867		
R15868		
R15869		
R15870		
R15871		
R15872		
R15873		
R15874		
R15875		
R15876		
R15877		
R15878		
R15879		
R15880		
R15881		
R15882		MES interface library: Subprogram number at alarm $5 [M8]
R15883		
R15884		
R15885		
R15886		
R15887		
R15888		
R15889		
R15890		
R15891		
R15892		
R15893		
R15894		
R15895		
R15896		
R15897		
R15898		MES interface library: N number at alarm $5 [M8]
R15899		
R15900		MES interface library: B number at alarm $5 [M8]
R15901		

Device	Abbrev.	Signal name
R15902		MES interface library: G code modal status $5 [M8]
R15903		
R15904		
R15905		
R15906		
R15907		
R15908		
R15909		
R15910		
R15911		
R15912		
R15913		
R15914		
R15915		
R15916		
R15917		
R15918		
R15919		
R15920		
R15921		
R15922		
R15923		
R15924		
R15925		
R15926		
R15927		
R15928		
R15929		
R15930		
R15931		
R15932		
R15933		
R15934		MES interface library: Spindle load value $5 [M8]
R15935		MES interface library: Spindle 2 load value $5 [M8]
R15936		MES interface library: Tool number $5 [M8]
R15937		
R15938		MES interface library: Tool offset number $5 [M8]
R15940		MES interface library: Tool length offset $5 [M8]
R15941		
R15942		MES interface library: Tool radius offset $5 [M8]
R15943		
R15944		MES interface library: Tool length wear amount $5 [M8]
R15945		
R15946		MES interface library: Tool radius wear amount $5 [M8]
R15947		
R15948		MES interface library: Tool life $5 [M8]
R15949		
R15950		MES interface library: Machining start time $6 [M8]
R15951		
R15952		MES interface library: Machining end time $6 [M8]
R15953		
R15954		MES interface library: Cycle time $6 [M8]
R15955		
R15956		MES interface library: Program number at machining start $6 [M8]
R15957		
R15958		
R15959		
R15960		
R15961		
R15962		
R15963		
R15964		
R15965		
R15966		
R15967		
R15968		
R15969		
R15970		
R15971		
R15972		MES interface library: N number at machining start $6 [M8]
R15973		
R15974		MES interface library: B number at machining start $6 [M8]
R15975		
R15976		MES interface library: Spindle 1 maximum load $6 [M8]
R15977		MES interface library: Spindle 2 maximum load $6 [M8]
R15978		MES interface library: Power consumption amount $6 [M8]
R15979		
R15980		MES interface library: Power regeneration amount $6 [M8]
R15981		
R15982		MES interface library: Tool number 1 $6 [M8]
R15983		

Device	Abbrev.	Signal name
R15984		MES interface library: Tool number 2 $6 [M8]
R15985		
R15986		MES interface library: Tool number 3 $6 [M8]
R15987		
R15988		MES interface library: Tool number 4 $6 [M8]
R15989		
R15990		MES interface library: Tool number 5 $6 [M8]
R15991		
R15992		MES interface library: Tool offset number 1 $6 [M8]
R15993		MES interface library: Tool offset number 2 $6 [M8]
R15994		MES interface library: Tool offset number 3 $6 [M8]
R15995		MES interface library: Tool offset number 4 $6 [M8]
R15996		MES interface library: Tool offset number 5 $6 [M8]
R15998		MES interface library: Tool length offset 1 $6 [M8]
R15999		
R16000		MES interface library: Tool length offset 2 $6 [M8]
R16001		
R16002		MES interface library: Tool length offset 3 $6 [M8]
R16003		
R16004		MES interface library: Tool length offset 4 $6 [M8]
R16005		
R16006		MES interface library: Tool length offset 5 $6 [M8]
R16007		
R16008		MES interface library: Tool radius offset 1 $6 [M8]
R16009		
R16010		MES interface library: Tool radius offset 2 $6 [M8]
R16011		
R16012		MES interface library: Tool radius offset 3 $6 [M8]
R16013		
R16014		MES interface library: Tool radius offset 4 $6 [M8]
R16015		
R16016		MES interface library: Tool radius offset 5 $6 [M8]
R16017		
R16018		MES interface library: Tool length wear amount 1 $6 [M8]
R16019		
R16020		MES interface library: Tool length wear amount 2 $6 [M8]
R16021		
R16022		MES interface library: Tool length wear amount 3 $6 [M8]
R16023		
R16024		MES interface library: Tool length wear amount 4 $6 [M8]
R16025		
R16026		MES interface library: Tool length wear amount 5 $6 [M8]
R16027		
R16028		MES interface library: Tool radius wear amount 1 $6 [M8]
R16029		
R16030		MES interface library: Tool radius wear amount 2 $6 [M8]
R16031		
R16032		MES interface library: Tool radius wear amount 3 $6 [M8]
R16033		
R16034		MES interface library: Tool radius wear amount 4 $6 [M8]
R16035		
R16036		MES interface library: Tool radius wear amount 5 $6 [M8]
R16037		
R16038		MES interface library: Tool life 1 $6 [M8]
R16039		
R16040		MES interface library: Tool life 2 $6 [M8]
R16041		
R16042		MES interface library: Tool life 3 $6 [M8]
R16043		
R16044		MES interface library: Tool life 4 $6 [M8]
R16045		
R16046		MES interface library: Tool life 5 $6 [M8]
R16047		
R16048		MES interface library: Time of alarm occurrence $6 [M8]
R16049		
R16050		MES interface library: Alarm number 1 $6 [M8]
R16051		
R16052		
R16053		
R16054		
R16055		
R16056		
R16057		
R16058		
R16059		
R16060		
R16061		
R16062		
R16063		
R16064		
R16065		

Device	Abbrev.	Signal name
R16066		MES interface library: Alarm number 2 $6 [M8]
R16067		
R16068		
R16069		
R16070		
R16071		
R16072		
R16073		
R16074		
R16075		
R16076		
R16077		
R16078		
R16079		
R16080		
R16081		
R16082		MES interface library: Alarm number 3 $6 [M8]
R16083		
R16084		
R16085		
R16086		
R16087		
R16088		
R16089		
R16090		
R16091		
R16092		
R16093		
R16094		
R16095		
R16096		
R16097		
R16098		MES interface library: Alarm number 4 $6 [M8]
R16099		
R16100		
R16101		
R16102		
R16103		
R16104		
R16105		
R16106		
R16107		
R16108		
R16109		
R16110		
R16111		
R16112		
R16113		
R16114		MES interface library: Power ON time $6 [M8]
R16115		
R16116		MES interface library: Program number at alarm $6 [M8]
R16117		
R16118		
R16119		
R16120		
R16121		
R16122		
R16123		
R16124		
R16125		
R16126		
R16127		
R16128		
R16129		
R16130		
R16131		
R16132		MES interface library: Subprogram number at alarm $6 [M8]
R16133		
R16134		
R16135		
R16136		
R16137		
R16138		
R16139		
R16140		
R16141		
R16142		
R16143		
R16144		
R16145		
R16146		
R16147		

Device	Abbrev.	Signal name
R16148		MES interface library: N number at alarm $6 [M8]
R16149		
R16150		MES interface library: B number at alarm $6 [M8]
R16151		
R16152		MES interface library: G code modal status $6 [M8]
R16153		
R16154		
R16155		
R16156		
R16157		
R16158		
R16159		
R16160		
R16161		
R16162		
R16163		
R16164		
R16165		
R16166		
R16167		
R16168		
R16169		
R16170		
R16171		
R16172		
R16173		
R16174		
R16175		
R16176		
R16177		
R16178		
R16179		
R16180		
R16181		
R16182		
R16183		
R16184		MES interface library: Spindle load value $6 [M8]
R16185		MES interface library: Spindle 2 load value $6 [M8]
R16186		MES interface library: Tool number $6 [M8]
R16187		
R16188		MES interface library: Tool offset number $6 [M8]
R16190		MES interface library: Tool length offset $6 [M8]
R16191		
R16192		MES interface library: Tool radius offset $6 [M8]
R16193		
R16194		MES interface library: Tool length wear amount $6 [M8]
R16195		
R16196		MES interface library: Tool radius wear amount $6 [M8]
R16197		
R16198		MES interface library: Tool life $6 [M8]
R16199		
R16200		MES interface library: Machining start time $7 [M8]
R16201		
R16202		MES interface library: Machining end time $7 [M8]
R16203		
R16204		MES interface library: Cycle time $7 [M8]
R16205		
R16206		MES interface library: Program number at machining start $7 [M8]
R16207		
R16208		
R16209		
R16210		
R16211		
R16212		
R16213		
R16214		
R16215		
R16216		
R16217		
R16218		
R16219		
R16220		
R16221		
R16222		MES interface library: N number at machining start $7 [M8]
R16223		
R16224		MES interface library: B number at machining start $7 [M8]
R16225		
R16226		MES interface library: Spindle 1 maximum load $7 [M8]
R16227		MES interface library: Spindle 2 maximum load $7 [M8]
R16228		MES interface library: Power consumption amount $7 [M8]
R16229		

Device	Abbrev.	Signal name
R16230		MES interface library: Power regeneration amount $7 [M8]
R16231		
R16232		MES interface library: Tool number 1 $7 [M8]
R16233		
R16234		MES interface library: Tool number 2 $7 [M8]
R16235		
R16236		MES interface library: Tool number 3 $7 [M8]
R16237		
R16238		MES interface library: Tool number 4 $7 [M8]
R16239		
R16240		MES interface library: Tool number 5 $7 [M8]
R16241		
R16242		MES interface library: Tool offset number 1 $7 [M8]
R16243		MES interface library: Tool offset number 2 $7 [M8]
R16244		MES interface library: Tool offset number 3 $7 [M8]
R16245		MES interface library: Tool offset number 4 $7 [M8]
R16246		MES interface library: Tool offset number 5 $7 [M8]
R16248		MES interface library: Tool length offset 1 $7 [M8]
R16249		
R16250		MES interface library: Tool length offset 2 $7 [M8]
R16251		
R16252		MES interface library: Tool length offset 3 $7 [M8]
R16253		
R16254		MES interface library: Tool length offset 4 $7 [M8]
R16255		
R16256		MES interface library: Tool length offset 5 $7 [M8]
R16257		
R16258		MES interface library: Tool radius offset 1 $7 [M8]
R16259		
R16260		MES interface library: Tool radius offset 2 $7 [M8]
R16261		
R16262		MES interface library: Tool radius offset 3 $7 [M8]
R16263		
R16264		MES interface library: Tool radius offset 4 $7 [M8]
R16265		
R16266		MES interface library: Tool radius offset 5 $7 [M8]
R16267		
R16268		MES interface library: Tool length wear amount 1 $7 [M8]
R16269		
R16270		MES interface library: Tool length wear amount 2 $7 [M8]
R16271		
R16272		MES interface library: Tool length wear amount 3 $7 [M8]
R16273		
R16274		MES interface library: Tool length wear amount 4 $7 [M8]
R16275		
R16276		MES interface library: Tool length wear amount 5 $7 [M8]
R16277		
R16278		MES interface library: Tool radius wear amount 1 $7 [M8]
R16279		
R16280		MES interface library: Tool radius wear amount 2 $7 [M8]
R16281		
R16282		MES interface library: Tool radius wear amount 3 $7 [M8]
R16283		
R16284		MES interface library: Tool radius wear amount 4 $7 [M8]
R16285		
R16286		MES interface library: Tool radius wear amount 5 $7 [M8]
R16287		
R16288		MES interface library: Tool life 1 $7 [M8]
R16289		
R16290		MES interface library: Tool life 2 $7 [M8]
R16291		
R16292		MES interface library: Tool life 3 $7 [M8]
R16293		
R16294		MES interface library: Tool life 4 $7 [M8]
R16295		
R16296		MES interface library: Tool life 5 $7 [M8]
R16297		
R16298		MES interface library: Time of alarm occurrence $7 [M8]
R16299		

Device	Abbrev.	Signal name
R16300		MES interface library: Alarm number 1 $7 [M8]
R16301		
R16302		
R16303		
R16304		
R16305		
R16306		
R16307		
R16308		
R16309		
R16310		
R16311		
R16312		
R16313		
R16314		
R16315		
R16316		MES interface library: Alarm number 2 $7 [M8]
R16317		
R16318		
R16319		
R16320		
R16321		
R16322		
R16323		
R16324		
R16325		
R16326		
R16327		
R16328		
R16329		
R16330		
R16331		
R16332		MES interface library: Alarm number 3 $7 [M8]
R16333		
R16334		
R16335		
R16336		
R16337		
R16338		
R16339		
R16340		
R16341		
R16342		
R16343		
R16344		
R16345		
R16346		
R16347		
R16348		MES interface library: Alarm number 4 $7 [M8]
R16349		
R16350		
R16351		
R16352		
R16353		
R16354		
R16355		
R16356		
R16357		
R16358		
R16359		
R16360		
R16361		
R16362		
R16363		
R16364		MES interface library: Power ON time $7 [M8]
R16365		
R16366		MES interface library: Program number at alarm $7 [M8]
R16367		
R16368		
R16369		
R16370		
R16371		
R16372		
R16373		
R16374		
R16375		
R16376		
R16377		
R16378		
R16379		
R16380		
R16381		

Device	Abbrev.	Signal name
R16382		MES interface library: Subprogram number at alarm $7 [M8]
R16383		
R16384		
R16385		
R16386		
R16387		
R16388		
R16389		
R16390		
R16391		
R16392		
R16393		
R16394		
R16395		
R16396		
R16397		
R16398		MES interface library: N number at alarm $7 [M8]
R16399		
R16400		MES interface library: B number at alarm $7 [M8]
R16401		
R16402		MES interface library: G code modal status $7 [M8]
R16403		
R16404		
R16405		
R16406		
R16407		
R16408		
R16409		
R16410		
R16411		
R16412		
R16413		
R16414		
R16415		
R16416		
R16417		
R16418		
R16419		
R16420		
R16421		
R16422		
R16423		
R16424		
R16425		
R16426		
R16427		
R16428		
R16429		
R16430		
R16431		
R16432		
R16433		
R16434		MES interface library: Spindle load value $7 [M8]
R16435		MES interface library: Spindle 2 load value $7 [M8]
R16436		MES interface library: Tool number $7 [M8]
R16437		
R16438		MES interface library: Tool offset number $7 [M8]
R16440		MES interface library: Tool length offset $7 [M8]
R16441		
R16442		MES interface library: Tool radius offset $7 [M8]
R16443		
R16444		MES interface library: Tool length wear amount $7 [M8]
R16445		
R16446		MES interface library: Tool radius wear amount $7 [M8]
R16447		
R16448		MES interface library: Tool life $7 [M8]
R16449		
R16450		MES interface library: Machining start time $8 [M8]
R16451		
R16452		MES interface library: Machining end time $8 [M8]
R16453		
R16454		MES interface library: Cycle time $8 [M8]
R16455		

Device	Abbrev.	Signal name
R16456		MES interface library: Program number at machining start $8 [M8]
R16457		
R16458		
R16459		
R16460		
R16461		
R16462		
R16463		
R16464		
R16465		
R16466		
R16467		
R16468		
R16469		
R16470		
R16471		
R16472		MES interface library: N number at machining start $8 [M8]
R16473		
R16474		MES interface library: B number at machining start $8 [M8]
R16475		
R16476		MES interface library: Spindle 1 maximum load $8 [M8]
R16477		MES interface library: Spindle 2 maximum load $8 [M8]
R16478		MES interface library: Power consumption amount $8 [M8]
R16479		
R16480		MES interface library: Power regeneration amount $8 [M8]
R16481		
R16482		MES interface library: Tool number 1 $8 [M8]
R16483		
R16484		MES interface library: Tool number 2 $8 [M8]
R16485		
R16486		MES interface library: Tool number 3 $8 [M8]
R16487		
R16488		MES interface library: Tool number 4 $8 [M8]
R16489		
R16490		MES interface library: Tool number 5 $8 [M8]
R16491		
R16492		MES interface library: Tool offset number 1 $8 [M8]
R16493		MES interface library: Tool offset number 2 $8 [M8]
R16494		MES interface library: Tool offset number 3 $8 [M8]
R16495		MES interface library: Tool offset number 4 $8 [M8]
R16496		MES interface library: Tool offset number 5 $8 [M8]
R16498		MES interface library: Tool length offset 1 $8 [M8]
R16499		
R16500		MES interface library: Tool length offset 2 $8 [M8]
R16501		
R16502		MES interface library: Tool length offset 3 $8 [M8]
R16503		
R16504		MES interface library: Tool length offset 4 $8 [M8]
R16505		
R16506		MES interface library: Tool length offset 5 $8 [M8]
R16507		
R16508		MES interface library: Tool radius offset 1 $8 [M8]
R16509		
R16510		MES interface library: Tool radius offset 2 $8 [M8]
R16511		
R16512		MES interface library: Tool radius offset 3 $8 [M8]
R16513		
R16514		MES interface library: Tool radius offset 4 $8 [M8]
R16515		
R16516		MES interface library: Tool radius offset 5 $8 [M8]
R16517		
R16518		MES interface library: Tool length wear amount 1 $8 [M8]
R16519		
R16520		MES interface library: Tool length wear amount 2 $8 [M8]
R16521		
R16522		MES interface library: Tool length wear amount 3 $8 [M8]
R16523		
R16524		MES interface library: Tool length wear amount 4 $8 [M8]
R16525		
R16526		MES interface library: Tool length wear amount 5 $8 [M8]
R16527		
R16528		MES interface library: Tool radius wear amount 1 $8 [M8]
R16529		
R16530		MES interface library: Tool radius wear amount 2 $8 [M8]
R16531		
R16532		MES interface library: Tool radius wear amount 3 $8 [M8]
R16533		
R16534		MES interface library: Tool radius wear amount 4 $8 [M8]
R16535		
R16536		MES interface library: Tool radius wear amount 5 $8 [M8]
R16537		

Device	Abbrev.	Signal name
R16538		MES interface library: Tool life 1 $8 [M8]
R16539		
R16540		MES interface library: Tool life 2 $8 [M8]
R16541		
R16542		MES interface library: Tool life 3 $8 [M8]
R16543		
R16544		MES interface library: Tool life 4 $8 [M8]
R16545		
R16546		MES interface library: Tool life 5 $8 [M8]
R16547		
R16548		MES interface library: Time of alarm occurrence $8 [M8]
R16549		
R16550		MES interface library: Alarm number 1 $8 [M8]
R16551		
R16552		
R16553		
R16554		
R16555		
R16556		
R16557		
R16558		
R16559		
R16560		
R16561		
R16562		
R16563		
R16564		
R16565		
R16566		MES interface library: Alarm number 2 $8 [M8]
R16567		
R16568		
R16569		
R16570		
R16571		
R16572		
R16573		
R16574		
R16575		
R16576		
R16577		
R16578		
R16579		
R16580		
R16581		
R16582		MES interface library: Alarm number 3 $8 [M8]
R16583		
R16584		
R16585		
R16586		
R16587		
R16588		
R16589		
R16590		
R16591		
R16592		
R16593		
R16594		
R16595		
R16596		
R16597		
R16598		MES interface library: Alarm number 4 $8 [M8]
R16599		
R16600		
R16601		
R16602		
R16603		
R16604		
R16605		
R16606		
R16607		
R16608		
R16609		
R16610		
R16611		
R16612		
R16613		
R16614		MES interface library: Power ON time $8 [M8]
R16615		

Device	Abbrev.	Signal name
R16616		MES interface library: Program number at alarm $8 [M8]
R16617		
R16618		
R16619		
R16620		
R16621		
R16622		
R16623		
R16624		
R16625		
R16626		
R16627		
R16628		
R16629		
R16630		
R16631		
R16632		MES interface library: Subprogram number at alarm $8 [M8]
R16633		
R16634		
R16635		
R16636		
R16637		
R16638		
R16639		
R16640		
R16641		
R16642		
R16643		
R16644		
R16645		
R16646		
R16647		
R16648		MES interface library: N number at alarm $8 [M8]
R16649		
R16650		MES interface library: B number at alarm $8 [M8]
R16651		
R16652		MES interface library: G code modal status $8 [M8]
R16653		
R16654		
R16655		
R16656		
R16657		
R16658		
R16659		
R16660		
R16661		
R16662		
R16663		
R16664		
R16665		
R16666		
R16667		
R16668		
R16669		
R16670		
R16671		
R16672		
R16673		
R16674		
R16675		
R16676		
R16677		
R16678		
R16679		
R16680		
R16681		
R16682		
R16683		
R16684		MES interface library: Spindle load value $8 [M8]
R16685		MES interface library: Spindle 2 load value $8 [M8]
R16686		MES interface library: Tool number $8 [M8]
R16687		
R16688		MES interface library: Tool offset number $8 [M8]
R16690		MES interface library: Tool length offset $8 [M8]
R16691		
R16692		MES interface library: Tool radius offset $8 [M8]
R16693		
R16694		MES interface library: Tool length wear amount $8 [M8]
R16695		
R16696		MES interface library: Tool radius wear amount $8 [M8]
R16697		

Device	Abbrev.	Signal name
R16698		MES interface library: Tool life $8 [M8]
R16699		
R20200		Skip coordinate (PLC axis 1st axis) ▲
R20204		Skip coordinate (PLC axis 2nd axis) ▲
R20208		Skip coordinate (PLC axis 3rd axis) ▲
R20212		Skip coordinate (PLC axis 4th axis) ▲
R20216		Skip coordinate (PLC axis 5th axis) ▲
R20220		Skip coordinate (PLC axis 6th axis) ▲
R20232		Feedback machine position axis (PLC axis 1st axis) ▲
R20236		Feedback machine position axis (PLC axis 2nd axis) ▲
R20240		Feedback machine position axis (PLC axis 3rd axis) ▲
R20244		Feedback machine position axis (PLC axis 4th axis) ▲
R20248		Feedback machine position axis (PLC axis 5th axis) ▲
R20252		Feedback machine position axis (PLC axis 6th axis) ▲
R20264		Servo deflection amount (PLC axis 1st axis) ▲
R20266		Servo deflection amount (PLC axis 2nd axis) ▲
R20268		Servo deflection amount (PLC axis 3rd axis) ▲
R20270		Servo deflection amount (PLC axis 4th axis) ▲
R20272		Servo deflection amount (PLC axis 5th axis) ▲
R20274		Servo deflection amount (PLC axis 6th axis) ▲
R20280	RNASP	FL-net : Reference node address designation ▲
R20281	PNASP	FL-net : Participating node top address designation ▲
R20288		EcoMonitorLight connection: Read start bit
R20289		EcoMonitorLight connection: Station No.
R20290		EcoMonitorLight connection: Register address
R20291		EcoMonitorLight connection: Size of data to read
R20304		Interference check III: Interfering object enable/disable designation
R20305		Spare
R20306		Interference check III: 1st interfering object selection
R20307		Interference check III: 1st interfering object specification
R20308		Interference check III: 1st interfering model coordinate system I axis offset 1 (L)
R20309		Interference check III: 1st interfering model coordinate system I axis offset 1 (H)
R20310		Interference check III: 1st interfering model coordinate system J axis offset 1 (L)
R20311		Interference check III: 1st interfering model coordinate system J axis offset 1 (H)
R20312		Interference check III: 1st interfering model coordinate system K axis offset 1 (L)
R20313		Interference check III: 1st interfering model coordinate system K axis offset 1 (H)
R20314		Interference check III: 2nd interfering object selection
R20315		Interference check III: 2nd interfering object specification
R20316		Interference check III: 2nd interfering model coordinate system I axis offset 1 (L)
R20317		Interference check III: 2nd interfering model coordinate system I axis offset 1 (H)
R20318		Interference check III: 2nd interfering model coordinate system J axis offset 1 (L)
R20319		Interference check III: 2nd interfering model coordinate system J axis offset 1 (H)
R20320		Interference check III: 2nd interfering model coordinate system K axis offset 1 (L)
R20321		Interference check III: 2nd interfering model coordinate system K axis offset 1 (H)
R20322		Interference check III: 3rd interfering object selection
R20323		Interference check III: 3rd interfering object specification
R20324		Interference check III: 3rd interfering model coordinate system I axis offset 1 (L)
R20325		Interference check III: 3rd interfering model coordinate system I axis offset 1 (H)
R20326		Interference check III: 3rd interfering model coordinate system J axis offset 1 (L)
R20327		Interference check III: 3rd interfering model coordinate system J axis offset 1 (H)
R20328		Interference check III: 3rd interfering model coordinate system K axis offset 1 (L)
R20329		Interference check III: 3rd interfering model coordinate system K axis offset 1 (H)
R20330		Interference check III: 4th interfering object selection
R20331		Interference check III: 4th interfering object specification
R20332		Interference check III: 4th interfering model coordinate system I axis offset 1 (L)
R20333		Interference check III: 4th interfering model coordinate system I axis offset 1 (H)
R20334		Interference check III: 4th interfering model coordinate system J axis offset 1 (L)
R20335		Interference check III: 4th interfering model coordinate system J axis offset 1 (H)
R20336		Interference check III: 4th interfering model coordinate system K axis offset 1 (L)
R20337		Interference check III: 4th interfering model coordinate system K axis offset 1 (H)
R20338		Interference check III: 5th interfering object selection
R20339		Interference check III: 5th interfering object specification
R20340		Interference check III: 5th interfering model coordinate system I axis offset 1 (L)
R20341		Interference check III: 5th interfering model coordinate system I axis offset 1 (H)
R20342		Interference check III: 5th interfering model coordinate system J axis offset 1 (L)
R20343		Interference check III: 5th interfering model coordinate system J axis offset 1 (H)
R20344		Interference check III: 5th interfering model coordinate system K axis offset 1 (L)
R20345		Interference check III: 5th interfering model coordinate system K axis offset 1 (H)
R20346		Interference check III: 6th interfering object selection
R20347		Interference check III: 6th interfering object specification
R20348		Interference check III: 6th interfering model coordinate system I axis offset 1 (L)
R20349		Interference check III: 6th interfering model coordinate system I axis offset 1 (H)
R20350		Interference check III: 6th interfering model coordinate system J axis offset 1 (L)
R20351		Interference check III: 6th interfering model coordinate system J axis offset 1 (H)
R20352		Interference check III: 6th interfering model coordinate system K axis offset 1 (L)

Device	Abbrev.	Signal name
R20353		Interference check III: 6th interfering model coordinate system K axis offset 1 (H)
R20354		Interference check III: 7th interfering object selection
R20355		Interference check III: 7th interfering object specification
R20356		Interference check III: 7th interfering model coordinate system I axis offset 1 (L)
R20357		Interference check III: 7th interfering model coordinate system I axis offset 1 (H)
R20358		Interference check III: 7th interfering model coordinate system J axis offset 1 (L)
R20359		Interference check III: 7th interfering model coordinate system J axis offset 1 (H)
R20360		Interference check III: 7th interfering model coordinate system K axis offset 1 (L)
R20361		Interference check III: 7th interfering model coordinate system K axis offset 1 (H)
R20362		Interference check III: 8th interfering object selection
R20363		Interference check III: 8th interfering object specification
R20364		Interference check III: 8th interfering model coordinate system I axis offset 1 (L)
R20365		Interference check III: 8th interfering model coordinate system I axis offset 1 (H)
R20366		Interference check III: 8th interfering model coordinate system J axis offset 1 (L)
R20367		Interference check III: 8th interfering model coordinate system J axis offset 1 (H)
R20368		Interference check III: 8th interfering model coordinate system K axis offset 1 (L)
R20369		Interference check III: 8th interfering model coordinate system K axis offset 1 (H)
R20370		Interference check III: 9th interfering object selection
R20371		Interference check III: 9th interfering object specification
R20372		Interference check III: 9th interfering model coordinate system I axis offset 1 (L)
R20373		Interference check III: 9th interfering model coordinate system I axis offset 1 (H)
R20374		Interference check III: 9th interfering model coordinate system J axis offset 1 (L)
R20375		Interference check III: 9th interfering model coordinate system J axis offset 1 (H)
R20376		Interference check III: 9th interfering model coordinate system K axis offset 1 (L)
R20377		Interference check III: 9th interfering model coordinate system K axis offset 1 (H)
R20378		Interference check III: 10th interfering object selection
R20379		Interference check III: 10th interfering object specification
R20380		Interference check III: 10th interfering model coordinate system I axis offset 1 (L)
R20381		Interference check III: 10th interfering model coordinate system I axis offset 1 (H)
R20382		Interference check III: 10th interfering model coordinate system J axis offset 1 (L)
R20383		Interference check III: 10th interfering model coordinate system J axis offset 1 (H)
R20384		Interference check III: 10th interfering model coordinate system K axis offset 1 (L)
R20385		Interference check III: 10th interfering model coordinate system K axis offset 1 (H)
R20386		Interference check III: 11th interfering object selection
R20387		Interference check III: 11th interfering object specification
R20388		Interference check III: 11th interfering model coordinate system I axis offset 1 (L)
R20389		Interference check III: 11th interfering model coordinate system I axis offset 1 (H)
R20390		Interference check III: 11th interfering model coordinate system J axis offset 1 (L)
R20391		Interference check III: 11th interfering model coordinate system J axis offset 1 (H)
R20392		Interference check III: 11th interfering model coordinate system K axis offset 1 (L)
R20393		Interference check III: 11th interfering model coordinate system K axis offset 1 (H)
R20394		Interference check III: 12th interfering object selection
R20395		Interference check III: 12th interfering object specification
R20396		Interference check III: 12th interfering model coordinate system I axis offset 1 (L)
R20397		Interference check III: 12th interfering model coordinate system I axis offset 1 (H)
R20398		Interference check III: 12th interfering model coordinate system J axis offset 1 (L)
R20399		Interference check III: 12th interfering model coordinate system J axis offset 1 (H)
R20400		Interference check III: 12th interfering model coordinate system K axis offset 1 (L)
R20401		Interference check III: 12th interfering model coordinate system K axis offset 1 (H)
R20402		Interference check III: 13th interfering object selection
R20403		Interference check III: 13th interfering object specification
R20404		Interference check III: 13th interfering model coordinate system I axis offset 1 (L)
R20405		Interference check III: 13th interfering model coordinate system I axis offset 1 (H)
R20406		Interference check III: 13th interfering model coordinate system J axis offset 1 (L)
R20407		Interference check III: 13th interfering model coordinate system J axis offset 1 (H)
R20408		Interference check III: 13th interfering model coordinate system K axis offset 1 (L)
R20409		Interference check III: 13th interfering model coordinate system K axis offset 1 (H)
R20410		Interference check III: 14th interfering object selection
R20411		Interference check III: 14th interfering object specification

Device	Abbrev.	Signal name
R20412		Interference check III: 14th interfering model coordinate system I axis offset 1 (L)
R20413		Interference check III: 14th interfering model coordinate system I axis offset 1 (H)
R20414		Interference check III: 14th interfering model coordinate system J axis offset 1 (L)
R20415		Interference check III: 14th interfering model coordinate system J axis offset 1 (H)
R20416		Interference check III: 14th interfering model coordinate system K axis offset 1 (L)
R20417		Interference check III: 14th interfering model coordinate system K axis offset 1 (H)
R20418		Interference check III: 15th interfering object selection
R20419		Interference check III: 15th interfering object specification
R20420		Interference check III: 15th interfering model coordinate system I axis offset 1 (L)
R20421		Interference check III: 15th interfering model coordinate system I axis offset 1 (H)
R20422		Interference check III: 15th interfering model coordinate system J axis offset 1 (L)
R20423		Interference check III: 15th interfering model coordinate system J axis offset 1 (H)
R20424		Interference check III: 15th interfering model coordinate system K axis offset 1 (L)
R20425		Interference check III: 15th interfering model coordinate system K axis offset 1 (H)
R20426		Interference check III: 16th interfering object selection
R20427		Interference check III: 16th interfering object specification
R20428		Interference check III: 16th interfering model coordinate system I axis offset 1 (L)
R20429		Interference check III: 16th interfering model coordinate system I axis offset 1 (H)
R20430		Interference check III: 16th interfering model coordinate system J axis offset 1 (L)
R20431		Interference check III: 16th interfering model coordinate system J axis offset 1 (H)
R20432		Interference check III: 16th interfering model coordinate system K axis offset 1 (L)
R20433		Interference check III: 16th interfering model coordinate system K axis offset 1 (H)
R20434		1st interfering object Interference check III: Specifying disabled interfering object
R20435		2nd interfering object Interference check III: Specifying disabled interfering object
R20436		3rd interfering object Interference check III: Specifying disabled interfering object
R20437		4th interfering object Interference check III: Specifying disabled interfering object
R20438		5th interfering object Interference check III: Specifying disabled interfering object
R20439		6th interfering object Interference check III: Specifying disabled interfering object
R20440		7th interfering object Interference check III: Specifying disabled interfering object
R20441		8th interfering object Interference check III: Specifying disabled interfering object
R20442		9th interfering object Interference check III: Specifying disabled interfering object
R20443		10th interfering object Interference check III: Specifying disabled interfering object
R20444		11th interfering object Interference check III: Specifying disabled interfering object
R20445		12th interfering object Interference check III: Specifying disabled interfering object
R20446		13th interfering object Interference check III: Specifying disabled interfering object
R20447		14th interfering object Interference check III: Specifying disabled interfering object
R20448		15th interfering object Interference check III: Specifying disabled interfering object
R20449		16th interfering object Interference check III: Specifying disabled interfering object
R20450	SVIDDDAX	Diagnosis data output: Select axis for servomotor insulation degradation detection (PLC axis) [M8]
R20451	SPIDDDAX	Diagnosis data output: Select spindle for motor insulation degradation detection [M8]
R20480	TP_INVALID	Touchscreen operation disabled
R20481	IDDD	Diagnosis data output: Motor insulation degradation detection request [M8]
R22500		Program restart : Restart position return check invalid $1
R22501	SVIDDDAX1	Diagnosis data output: Select axis for servomotor insulation degradation detection $1 [M8]
R22692		Load monitor I : Cutting torque estimation target axis $1 [M8]
R22693		Hob machining: work piece axis selection $1 ▲
R22694	SPPWS1	Tool spindle synchronization IB : Spindle-spindle polygon cut workpiece axis selection $1 ▲
R22700		Program restart : Restart position return check invalid $2
R22701	SVIDDDAX2	Diagnosis data output: Select axis for servomotor insulation degradation detection $2 [M8]
R22892		Load monitor I : Cutting torque estimation target axis $2 [M8]
R22893		Hob machining: work piece axis selection $2 ▲

Device	Abbrev.	Signal name
R22894	SPPWS2	Tool spindle synchronization IB : Spindle-spindle polygon cut workpiece axis selection $2 ▲
R22900		Program restart : Restart position return check invalid $3
R22901	SVIDDDAX3	Diagnosis data output: Select axis for servomotor insulation degradation detection $3 [M8]
R23092		Load monitor I : Cutting torque estimation target axis $3 [M8]
R23093		Hob machining: work piece axis selection $3 ▲
R23094	SPPWS3	Tool spindle synchronization IB : Spindle-spindle polygon cut workpiece axis selection $3 ▲
R23100		Program restart : Restart position return check invalid $4
R23101	SVIDDDAX4	Diagnosis data output: Select axis for servomotor insulation degradation detection $4 [M8]
R23292		Load monitor I : Cutting torque estimation target axis $4 [M8]
R23293		Hob machining: work piece axis selection $4 ▲
R23294	SPPWS4	Tool spindle synchronization IB : Spindle-spindle polygon cut workpiece axis selection $4 ▲
R23300		Program restart : Restart position return check invalid $5
R23301	SVIDDDAX5	Diagnosis data output: Select axis for servomotor insulation degradation detection $5 [M8]
R23492		Load monitor I : Cutting torque estimation target axis $5 [M8]
R23493		Hob machining: work piece axis selection $5 ▲
R23494	SPPWS5	Tool spindle synchronization IB : Spindle-spindle polygon cut workpiece axis selection $5 ▲
R23500		Program restart : Restart position return check invalid $6
R23501	SVIDDDAX6	Diagnosis data output: Select axis for servomotor insulation degradation detection $6 [M8]
R23692		Load monitor I : Cutting torque estimation target axis $6 [M8]
R23693		Hob machining: work piece axis selection $6 ▲
R23694	SPPWS6	Tool spindle synchronization IB : Spindle-spindle polygon cut workpiece axis selection $6 ▲
R23700		Program restart : Restart position return check invalid $7
R23701	SVIDDDAX7	Diagnosis data output: Select axis for servomotor insulation degradation detection $7 [M8]
R23892		Load monitor I : Cutting torque estimation target axis $7 [M8]
R23893		Hob machining: work piece axis selection $7 ▲
R23894	SPPWS7	Tool spindle synchronization IB : Spindle-spindle polygon cut workpiece axis selection $7 ▲
R23900		Program restart : Restart position return check invalid $8
R23901	SVIDDDAX8	Diagnosis data output: Select axis for servomotor insulation degradation detection $8 [M8]
R24092		Load monitor I : Cutting torque estimation target axis $8 [M8]
R24093		Hob machining: work piece axis selection $8 ▲
R24094	SPPWS8	Tool spindle synchronization IB : Spindle-spindle polygon cut workpiece axis selection $8 ▲

5 Special Relay/Register

Device	Abbrev.	Signal name
SM16		Temperature rise

6 ZR Devices

(1) Smart safety observation
PLC -> CNC

Device [M8]	Device [C80]	Abbrev.	Signal name
ZR256	ZR128	*SLSRm	SLS OBSERVATION REQUEST (CONTROL AXIS) 1st axis to 16th axis
ZR257	ZR129	*SLSRm	SLS OBSERVATION REQUEST (CONTROL AXIS) 17th axis to 32nd axis
ZR258	ZR130	*SLPRm	SLP OBSERVATION REQUEST (CONTROL AXIS) 1st axis to 16th axis
ZR259	ZR131	*SLPRm	SLP OBSERVATION REQUEST (CONTROL AXIS) 17th axis to 32nd axis
ZR260	ZR132	*SSMRm	SSM REQUEST (CONTROL AXIS) 1st axis to 16th axis
ZR261	ZR133	*SSMRm	SSM REQUEST (CONTROL AXIS) 17th axis to 32nd axis
ZR262	ZR134	*SCARm	SAFE CAM REQUEST (CONTROL AXIS) 1st axis to 16th axis
ZR263	ZR135	*SCARm	SAFE CAM REQUEST (CONTROL AXIS) 17th axis to 32nd axis
ZR264	ZR136	*SOSRm	SOS OBSERVATION REQUEST (CONTROL AXIS) 1st axis to 16th axis
ZR265	ZR137	*SOSRm	SOS OBSERVATION REQUEST (CONTROL AXIS) 17th axis to 32nd axis
ZR266	ZR138	*SS1Rm	SAFE STOP 1 REQUEST (CONTROL AXIS) 1st axis to 16th axis
ZR267	ZR139	*SS1Rm	SAFE STOP 1 REQUEST (CONTROL AXIS) 17th axis to 32nd axis
ZR268	ZR140	*SS2Rm	SAFE STOP 2 REQUEST (CONTROL AXIS) 1st axis to 16th axis
ZR269	ZR141	*SS2Rm	SAFE STOP 2 REQUEST (CONTROL AXIS) 17th axis to 32nd axis
ZR270	ZR142	*STORm	SAFE TORQUE OFF REQUEST (CONTROL AXIS) 1st axis to 16th axis
ZR271	ZR143	*STORm	SAFE TORQUE OFF REQUEST (CONTROL AXIS) 17th axis to 32nd axis
ZR272	ZR144	*SBCRm	SBC MOTOR BRAKE STARTING REQUEST (CONTROL AXIS) 1st axis to 16th axis
ZR273	ZR145	*SBCRm	SBC MOTOR BRAKE STARTING REQUEST (CONTROL AXIS) 17th axis to 32nd axis
ZR274	ZR146	SBTSTEXm	EXTERNAL BRAKE SBT START (CONTROL AXIS) 1st axis to 16th axis
ZR275	ZR147	SBTSTEXm	EXTERNAL BRAKE SBT START (CONTROL AXIS) 17th axis to 32nd axis
ZR276	ZR148	SBTSTMOm	MOTOR BRAKE SBT START (CONTROL AXIS) 1st axis to 16th axis
ZR277	ZR149	SBTSTMOm	MOTOR BRAKE SBT START (CONTROL AXIS) 17th axis to 32nd axis
ZR278	ZR150	SFABSPFXm	SAFETY ABSOLUTE POSITION CONFIRM (CONTROL AXIS) 1st axis to 16th axis
ZR279	ZR151	SFABSPFXm	SAFETY ABSOLUTE POSITION CONFIRM (CONTROL AXIS) 17th axis to 32nd axis
ZR280	ZR152	SRSTm	SAFETY RESET (CONTROL AXIS) 1st axis to 16th axis
ZR281	ZR153	SRSTm	SAFETY RESET (CONTROL AXIS) 17th axis to 32nd axis

Device [M8]	Device [C80]	Abbrev.	bit	Signal name
ZR312 to ZR343	ZR184 to ZR215	SLSMImn	bit0	SLS SPEED CHANGE INPUT (CONTROL AXIS) 1st axis to 32nd axis
		SLSMImn	bit1	SLS SPEED CHANGE INPUT (CONTROL AXIS) 1st axis to 32nd axis
			bit2	vacant
			bit3	vacant
		SLSOVRImn	bit4	SLS SPEED OVERRIDE INPUT (CONTROL AXIS) 1st axis to 32nd axis
		SLSOVRImn	bit5	SLS SPEED OVERRIDE INPUT (CONTROL AXIS) 1st axis to 32nd axis
		SLSOVRImn	bit6	SLS SPEED OVERRIDE INPUT (CONTROL AXIS) 1st axis to 32nd axis
		SLSOVRImn	bit7	SLS SPEED OVERRIDE INPUT (CONTROL AXIS) 1st axis to 32nd axis
			bit8	vacant
			bit9	vacant
			bitA	vacant
			bitB	vacant
			bitC	vacant
			bitD	vacant
			bitE	vacant
			bitF	vacant

Device [M8]	Device [C80]	Abbrev.	bit	Signal name
ZR344 to ZR375	ZR216 to ZR247	SLPMImn	bit0	SLP POSITION CHANGE INPUT (CONTROL AXIS) 1st axis to 32nd axis
		SLPMImn	bit1	SLP POSITION CHANGE INPUT (CONTROL AXIS) 1st axis to 32nd axis
			bit2	vacant
			bit3	vacant
			bit4	vacant
			bit5	vacant
			bit6	vacant
			bit7	vacant
			bit8	vacant
			bit9	vacant
			bitA	vacant
			bitB	vacant
			bitC	vacant
			bitD	vacant
			bitE	vacant
			bitF	vacant

Device [M8]	Device [C80]	Abbrev.	Signal name
ZR440	ZR312	*SLSSRm	SLS OBSERVATION REQUEST (SPINDLE) 1st SP to 8th SP
ZR442	ZR314	*SSMSRm	SSM REQUEST (SPINDLE) 1st SP to 8th SP
ZR444	ZR316	*SOSSRm	SOS OBSERVATION REQUEST (SPINDLE) 1st SP to 8th SP
ZR445	ZR317	*SS1SRm	SAFE STOP 1 REQUEST (SPINDLE) 1st SP to 8th SP
ZR446	ZR318	*SS2SRm	SAFE STOP 2 REQUEST (SPINDLE) 1st SP to 8th SP
ZR447	ZR319	*STOSRm	SAFE TORQUE OFF REQUEST (SPINDLE) 1st SP to 8th SP
ZR452	ZR324	SRSTSm	SAFETY REQUEST (SPINDLE) 1st SP to 8th SP

Device [M8]	Device [C80]	Abbrev.	bit	Signal name
ZR468 to ZR475	ZR340 to ZR347	SLSSMImn	bit0	SLS SPEED CHANGE INPUT (SPINDLE) 1st SP to 8th SP
		SLSSMImn	bit1	SLS SPEED CHANGE INPUT (SPINDLE) 1st SP to 8th SP
			bit2	vacant
			bit3	vacant
		SLSSOVRImn	bit4	SLS SPEED OVERRIDE INPUT (SPINDLE) 1st SP to 8th SP
		SLSSOVRImn	bit5	SLS SPEED OVERRIDE INPUT (SPINDLE) 1st SP to 8th SP
		SLSSOVRImn	bit6	SLS SPEED OVERRIDE INPUT (SPINDLE) 1st SP to 8th SP
		SLSSOVRImn	bit7	SLS SPEED OVERRIDE INPUT (SPINDLE) 1st SP to 8th SP
			bit8	vacant
			bit9	vacant
			bitA	vacant
			bitB	vacant
			bitC	vacant
			bitD	vacant
			bitE	vacant
			bitF	vacant

Device [M8]	Device [C80]	Abbrev.	Signal name
ZR532	ZR404	SARLS	SPECIAL SAFETY ALARM CANCEL (SYSTEM COMMON)
ZR1280	-	SIOOFFCHK	OUTPUT OFF CHECK REQUEST
-	ZR416	SIOREQ	SAFETY I/O OBSERVATION REQUEST

CNC -> PLC

Device [M8]	Device [C80]	Abbrev.	Signal name
ZR544	ZR1664	SLSEm	SLS OBSERVATION IS ACTIVE (CONTROL AXIS) 1st axis to 16th axis
ZR545	ZR1665	SLSEm	SLS OBSERVATION IS ACTIVE (CONTROL AXIS) 17th axis to 32nd axis
ZR546	ZR1666	SLSSm	UNDER SLS LIMIT (CONTROL AXIS) 1st axis to 16th axis
ZR547	ZR1667	SLSSm	UNDER SLS LIMIT (CONTROL AXIS) 17th axis to 32nd axis
ZR548	ZR1668	SLPEm	SLP OBSERVATION IS ACTIVE (CONTROL AXIS) 1st axis to 16th axis
ZR549	ZR1669	SLPEm	SLP OBSERVATION IS ACTIVE (CONTROL AXIS) 17th axis to 32nd axis
ZR550	ZR1670	SLPSm	IN SLP RANGE (CONTROL AXIS) 1st axis to 16th axis
ZR551	ZR1671	SLPSm	IN SLP RANGE (CONTROL AXIS) 17th axis to 32nd axis
ZR552	ZR1672	SSMEm	SSM IS ACTIVE (CONTROL AXIS) 1st axis to 16th axis
ZR553	ZR1673	SSMEm	SSM IS ACTIVE (CONTROL AXIS) 17th axis to 32nd axis
ZR554	ZR1674	SCAEm	SAFE CAM IS ACTIVE (CONTROL AXIS) 1st axis to 16th axis
ZR555	ZR1675	SCAEm	SAFE CAM IS ACTIVE (CONTROL AXIS) 17th axis to 32nd axis
ZR556	ZR1676	SOSEm	SOS IS ACTIVE (CONTROL AXIS) 1st axis to 16th axis
ZR557	ZR1677	SOSEm	SOS IS ACTIVE (CONTROL AXIS) 17th axis to 32nd axis
ZR558	ZR1678	SOSSm	IN SOS STOP (CONTROL AXIS) 1st axis to 16th axis
ZR559	ZR1679	SOSSm	IN SOS STOP (CONTROL AXIS) 17th axis to 32nd axis
ZR560	ZR1680	SS1Em	SS1 IS ACTIVE (CONTROL AXIS) 1st axis to 16th axis
ZR561	ZR1681	SS1Em	SS1 IS ACTIVE (CONTROL AXIS) 17th axis to 32nd axis
ZR562	ZR1682	SS1Sm	IN SAFE STOP 1 (CONTROL AXIS) 1st axis to 16th axis
ZR563	ZR1683	SS1Sm	IN SAFE STOP 1 (CONTROL AXIS) 17th axis to 32nd axis
ZR564	ZR1684	SS2Em	SS2 IS ACTIVE (CONTROL AXIS) 1st axis to 16th axis

Device [M8]	Device [C80]	Abbrev.	Signal name
ZR565	ZR1685	SS2Em	SS2 IS ACTIVE (CONTROL AXIS) 17th axis to 32nd axis
ZR566	ZR1686	STOEm	STO IS ACTIVE (CONTROL AXIS) 1st axis to 16th axis
ZR567	ZR1687	STOEm	STO IS ACTIVE (CONTROL AXIS) 17th axis to 32nd axis
ZR568	ZR1688	STOSm	IN SAFE TORQUE OFF (CONTROL AXIS) 1st axis to 16th axis
ZR569	ZR1689	STOSm	IN SAFE TORQUE OFF (CONTROL AXIS) 17th axis to 32nd axis
ZR570	ZR1690	SBCEm	IN SBC MOTOR BRAKE ENABLED (CONTROL AXIS) 1st axis to 16th axis
ZR571	ZR1691	SBCEm	IN SBC MOTOR BRAKE ENABLED (CONTROL AXIS) 17th axis to 32nd axis
ZR572	ZR1692	SBCSm	IN SBC MOTOR BRAKE START SIGNAL (CONTROL AXIS) 1st axis to 16th axis
ZR573	ZR1693	SBCSm	IN SBC MOTOR BRAKE START SIGNAL (CONTROL AXIS) 17th axis to 32nd axis
ZR574	ZR1694	SBTNFEXm	EXTERNAL BRAKE SBT INCOMPLETE (CONTROL AXIS) 1st axis to 16th axis
ZR575	ZR1695	SBTNFEXm	EXTERNAL BRAKE SBT INCOMPLETE (CONTROL AXIS) 17th axis to 32nd axis
ZR576	ZR1696	SBTEXBRm	IN SBT EXTERNAL BRAKE TEST (CONTROL AXIS) 1st axis to 16th axis
ZR577	ZR1697	SBTEXBRm	IN SBT EXTERNAL BRAKE TEST (CONTROL AXIS) 17th axis to 32nd axis
ZR578	ZR1698	SBTNFMOm	MOTOR BRAKE SBT INCOMPLETE (CONTROL AXIS) 1st axis to 16th axis
ZR579	ZR1699	SBTNFMOm	MOTOR BRAKE SBT INCOMPLETE (CONTROL AXIS) 17th axis to 32nd axis
ZR580	ZR1700	SFABSPESTm	IN SAFETY ABSOLUTE POSITION ESTABLISHING (CONTROL AXIS) 1st axis to 16th axis
ZR581	ZR1701	SFABSPESTm	IN SAFETY ABSOLUTE POSITION ESTABLISHING (CONTROL AXIS) 17th axis to 32nd axis
ZR582	ZR1702	SFERR_SVm	SMART SAFETY OBSERVATION ERROR OCCURING SERVO AXIS (CONTROL AXIS) 1st axis to 16th axis
ZR583	ZR1703	SFERR_SVm	SMART SAFETY OBSERVATION ERROR OCCURING SERVO AXIS (CONTROL AXIS) 17th axis to 32nd axis
ZR584	ZR1704	SFWRG_SVm	SMART SAFETY OBSERVATION WARNING OCCURING SERVO AXIS (CONTROL AXIS) 1st axis to 16th axis
ZR585	ZR1705	SFWRG_SVm	SMART SAFETY OBSERVATION WARNING OCCURING SERVO AXIS (CONTROL AXIS) 17th axis to 32nd axis

Device [M8]	Device [C80]	Abbrev.	bit	Signal name
ZR608 to ZR639	ZR1728 to ZR1759	SLSMOmn	bit0	SLS SPEED CHANGE OUTPUT (CONTROL AXIS) 1st axis to 32nd axis
		SLSMOmn	bit1	SLS SPEED CHANGE OUTPUT (CONTROL AXIS) 1st axis to 32nd axis
			bit2	vacant
			bit3	vacant
		SLSOVROmn	bit4	SLS SPEED OVERRIDE OUTPUT (CONTROL AXIS) 1st axis to 32nd axis
		SLSOVROmn	bit5	SLS SPEED OVERRIDE OUTPUT (CONTROL AXIS) 1st axis to 32nd axis
		SLSOVROmn	bit6	SLS SPEED OVERRIDE OUTPUT (CONTROL AXIS) 1st axis to 32nd axis
		SLSOVROmn	bit7	SLS SPEED OVERRIDE OUTPUT (CONTROL AXIS) 1st axis to 32nd axis
			bit8	vacant
			bit9	vacant
			bitA	vacant
			bitB	vacant
			bitC	vacant
			bitD	vacant
			bitE	vacant
			bitF	vacant

Device [M8]	Device [C80]	Abbrev.	Signal name
ZR640 to ZR671	ZR1760 to ZR1791	SLPMOmn	SLP POSITION CHANGE OUTPUT (CONTROL AXIS) 1st axis to 32nd axis
ZR672 to ZR703	ZR1792 to ZR1823	SSMSmn	UNDER SSM SAFE SPEED (CONTROL AXIS) 1st axis to 32nd axis
ZR704 to ZR767	ZR1824 to ZR1887	SCASmn	SAFE CAM POSITION (CONTROL AXIS) 1st axis to 32nd axis
ZR768 to ZR893	ZR1888 to ZR2013	SBTPOSm	SBT START POSITION (CONTROL AXIS) 1st axis to 32nd axis
ZR1024	ZR2144	SLSSEm	SLS OBSERVATION IS ACTIVE (SPINDLE) 1st SP to 8th SP
ZR1025	ZR2145	SLSSSm	UNDER SLS LIMIT (SPINDLE) 1st SP to 8th SP
ZR1028	ZR2148	SSMSEm	SSM IS ACTIVE (SPINDLE) 1st SP to 8th SP
ZR1030	ZR2150	SOSSEm	SOS IS ACTIVE (SPINDLE) 1st SP to 8th SP
ZR1031	ZR2151	SOSSSm	IN SOS STOP (SPINDLE) 1st SP to 8th SP
ZR1032	ZR2152	SS1SEm	SS1 IS ACTIVE (SPINDLE) 1st SP to 8th SP
ZR1033	ZR2153	SS1SSm	IN SAFE STOP (SPINDLE) 1st SP to 8th SP
ZR1034	ZR2154	SS2SEm	SS2 IS ACTIVE (SPINDLE) 1st SP to 8th SP
ZR1035	ZR2155	STOSEm	STO IS ACTIVE (SPINDLE) 1st SP to 8th SP
ZR1036	ZR2156	STOSSm	IN SAFE TORQUE OFF (SPINDLE) 1st SP to 8th SP
ZR1043	ZR2163	SFERR_SPm	SMART SAFETY OBSERVATION ERROR OCCURING SPINDLE (SPINDLE) 1st SP to 8th SP
ZR1044	ZR2164	SFWRG_SPm	SMART SAFETY OBSERVATION WARNING OCCURING SPINDLE (SPINDLE) 1st SP to 8th SP

Device [M8]	Device [C80]	Abbrev.	bit	Signal name
ZR1056 to ZR1063	ZR2176 to ZR2183	SLSSMOmn	bit0	SLS SPEED CHANGE OUTPUT (SPINDLE) 1st SP to 8th SP
		SLSSMOmn	bit1	SLS SPEED CHANGE OUTPUT (SPINDLE) 1st SP to 8th SP
			bit2	vacant
			bit3	vacant
		SLSSOVROmn	bit4	SLS SPEED OVERRIDE OUTPUT (SPINDLE) 1st SP to 8th SP
		SLSSOVROmn	bit5	SLS SPEED OVERRIDE OUTPUT (SPINDLE) 1st SP to 8th SP
		SLSSOVROmn	bit6	SLS SPEED OVERRIDE OUTPUT (SPINDLE) 1st SP to 8th SP
		SLSSOVROmn	bit7	SLS SPEED OVERRIDE OUTPUT (SPINDLE) 1st SP to 8th SP
			bit8	vacant
			bit9	vacant
			bitA	vacant
			bitB	vacant
			bitC	vacant
			bitD	vacant
			bitE	vacant
			bitF	vacant

Device [M8]	Device [C80]	Abbrev.	Signal name
ZR1088 to ZR1095	ZR2208 to ZR2215	SSMSSmn	UNDER SSM SAFE SPEED (SPINDLE) 1st SP to 8th SP
ZR1264	ZR2384	SEXTEMG	IN SAFETY EXTERNAL EMERGENCY STOP (SYSTEM COMMON)
ZR1268	ZR2388	SFERR_VNO	V NUMBER OF SMART SAFETY OBSERVATION ERROR (SYSTEM COMMON)
ZR1269	ZR2389	SFERR_ENO	E NUMBER OF SMART SAFETY OBSERVATION ERROR (SYSTEM COMMON)
ZR1270	ZR2390	SFWRG_VNO	V NUMBER OF SMART SAFETY OBSERVATION WARNING (SYSTEM COMMON)
ZR1271	ZR2391	SFWRG_ENO	W NUMBER OF SMART SAFETY OBSERVATION WARNING (SYSTEM COMMON)
ZR1536	ZR2400	SIOERRSTS	SAFETY I/O OBSERVATION STATE
ZR1538	ZR2402	SIOERRUNIT	SAFETY I/O UNIT OBSERVATION STATE
ZR1540	ZR2404	SIOERRUNITSTS1n	SAFETY I/O UNIT OBSERVATION ERROR DETAILS Unit1
ZR1541	ZR2405	SIOERRUNITSTS2n	SAFETY I/O UNIT OBSERVATION ERROR DETAILS Unit2
ZR1542	ZR2406	SIOERRUNITSTS3n	SAFETY I/O UNIT OBSERVATION ERROR DETAILS Unit3
ZR1543	-	SIOERRUNITSTS4n	SAFETY I/O UNIT OBSERVATION ERROR DETAILS Unit4
ZR1544	-	SIOERRUNITSTS5n	SAFETY I/O UNIT OBSERVATION ERROR DETAILS Unit5
ZR1545	-	SIOERRUNITSTS6n	SAFETY I/O UNIT OBSERVATION ERROR DETAILS Unit6
ZR1546	-	SIOERRUNITSTS7n	SAFETY I/O UNIT OBSERVATION ERROR DETAILS Unit7
ZR1547	-	SIOERRUNITSTS8n	SAFETY I/O UNIT OBSERVATION ERROR DETAILS Unit8
-	ZR2412, ZR2413	SIOERRUNITSIG	Safety I/O device observation error signal Unit1
-	ZR2414, ZR2415	SIOERRUNITSIG	Safety I/O device observation error signal Unit2
-	ZR2416, ZR2417	SIOERRUNITSIG	Safety I/O device observation error signal Unit3
-	ZR2420	SIOWRGUNIT	Safety I/O device observation warning status
-	ZR2422	SIOWRGUNITSTS	Safety I/O device observation warning details Unit1
-	ZR2423	SIOWRGUNITSTS	Safety I/O device observation warning details Unit2
-	ZR2424	SIOWRGUNITSTS	Safety I/O device observation warning details Unit3
-	ZR2430, ZR2431	SIOWRGUNITSIG	Safety I/O device observation warning signal Unit1
-	ZR2432, ZR2433	SIOWRGUNITSIG	Safety I/O device observation warning signal Unit2
-	ZR2434, ZR2435	SIOWRGUNITSIG	Safety I/O device observation warning signal Unit3

(2) Memory switch (PLC switch)

Device	Signal name
ZR3200 to ZR3205	PLC switch non-display

(3) MES interface library [M8]

Device	Signal name
ZR10000 to ZR10031	MES interface library: Common user area C1
ZR10032 to ZR10051	MES interface library: Common user area L1 to L10
ZR10054	MES interface library: Condition register (Extract sort condition)
ZR10055	MES interface library: Condition register (Combination condition)
ZR10056	MES interface library: Condition register (Field value) 1st set
ZR10057	MES interface library: Condition register (Comparison condition) 1st set
ZR10058 to ZR10089	MES interface library: Condition register (Condition value) 1st set
ZR10090	MES interface library: Condition register (Field value) 2nd set
ZR10091	MES interface library: Condition register (Comparison condition) 2nd set
ZR10092 to ZR10123	MES interface library: Condition register (Condition value) 2nd set
ZR10330 to ZR10913	Data I/O register for MES interface library (For update/extract)
ZR10940 to ZR10971	MES interface library: User area C1 at machining end
ZR10972 to ZR10991	MES interface library: User area L1 to L10 at machining end
ZR10994 to ZR11025	MES interface library: User area C1 at alarm
ZR11026 to ZR11045	MES interface library: User area L1 to L10 at alarm
ZR11048 to ZR11079	MES interface library: Arbitrary user area C1
ZR11080 to ZR11099	MES interface library: Arbitrary user area S1 to S20
ZR11100 to ZR11119	MES interface library: Arbitrary user area L1 to L10

(4) Diagnosis data output

Device	Signal name
ZR12404,ZR12405	Diagnosis data output: Battery exchange
ZR12608,ZR12609 to ZR12670,ZR12671	Diagnosis data output: Battery exchange (drive)(servo)
ZR12688,ZR12689 to ZR12702,ZR12703	Diagnosis data output: Battery exchange (drive)(spindle)
ZR12784,ZR12785 to ZR12846,ZR12847	Diagnosis data output: Motor insulation resistance (motor)(servo)
ZR12848,ZR12849 to ZR12862,ZR12863	Diagnosis data output: Motor insulation resistance (motor)(spindle)
ZR12945	Diagnosis data output: Automatic log clear time
ZR12946,ZR12947 to ZR13008,ZR13009	Diagnosis data output: Accumulated travel distance (motor)(servo)

(5) Spindle protection [M8]

Device	Abbrev.	Signal name
ZR13010	SPEQLD	Spindle protection: Motor equivalent load factor
ZR13018	PRSPERR	Spindle protection: Number of times log output error occurred

(6) External encoder position output I/F [M8]

Device	Abbrev.	Signal name
ZR13020	ENC1POS	External encoder 1: Position output

(7) Machine contact input/output I/F [M8]

Device	Abbrev.	Signal name
ZR13028 to ZR13039	TIn	Thermistor input n
ZR13040	TIOPN	Thermistor disconnection
ZR13041	TISRT	Thermistor short-circuit
ZR13050 to ZR13065	MAn	Multi-analog input ch n
ZR13066 to ZR13081	MASTSn	Multi-analog input status ch n

(8) Common variable [C80]

Device	Signal name
ZR81000 to ZR97999	Assignment to common variable

(9) GOT window [C80]

Manual setting window

Device	Signal name
ZR20000	[PLC -> CNC] Data changeover request
ZR20002	[CNC -> PLC] Data changeover completion

[PLC -> CNC] Command area

Device	Signal name
ZR20020 to ZR20083	Window command 1
ZR20084 to ZR20147	Window command 2
ZR20148 to ZR20211	Window command 3
ZR20212 to ZR20275	Window command 4
ZR20276 to ZR20339	Window command 5
ZR20340 to ZR20403	Window command 6
ZR20404 to ZR20467	Window command 7
ZR20468 to ZR20531	Window command 8
ZR20532 to ZR20595	Window command 9
ZR20596 to ZR20659	Window command 10

[CNC -> PLC] Response area

Device	Signal name
ZR21300 to ZR21427	Window result 1
ZR21428 to ZR21555	Window result 2
ZR21556 to ZR21683	Window result 3
ZR21684 to ZR21811	Window result 4
ZR21812 to ZR21939	Window result 5
ZR21940 to ZR22067	Window result 6
ZR22068 to ZR22195	Window result 7
ZR22196 to ZR22323	Window result 8
ZR22324 to ZR22451	Window result 9
ZR22452 to ZR22579	Window result 10

Automatic setting window

Device	Signal name
ZR20001	[PLC -> CNC] Automatic setting modification request (for changing from the PLC)
ZR20003	[CNC -> PLC] Automatic setting modification completion (for changing from the PLC)

[PLC -> CNC] Automatic setting modification information (for changing from the PLC)

Device	Signal name
ZR20004	Type of coordinate value (Target window No. 1 and 6)
ZR20005	Coordinate value type (Target window No. 1, 2, 6 and 7)
ZR20006	Number of programs to output (Target window No. 4 and 9)
ZR20007	Number of characters in one line of the program (Target window No. 4 and 9)
ZR20008	Number of alarm messages to be output (Target window No. 5 and 10)
ZR20009	Type of message (Target window 5 and 10)

[GOT <--> CNC] Automatic setting modification request (for changing from GOT)

Device	Signal name
ZR20016	Automatic setting modification request

[GOT -> CNC] Automatic setting modification information (for changing from GOT)

Device	Signal name
ZR20010	Type of coordinate value (Target window No. 1 and 6)
ZR20011	Coordinate value type (Target window No. 1, 2, 6 and 7)
ZR20012	Number of programs to output (Target window No. 4 and 9)
ZR20013	Number of characters in one line of the program (Target window No. 4 and 9)
ZR20014	Number of alarm messages to be output (Target window No. 5 and 10)
ZR20015	Type of message (Target window 5 and 10)

[CNC -> PLC] Automatic setting window response area

Device	Signal name
ZR22580 to ZR22707	Window result 1
ZR22708 to ZR22835	Window result 2
ZR22836 to ZR22963	Window result 3
ZR22964 to ZR23091	Window result 4
ZR23092 to ZR23219	Window result 5
ZR23220 to ZR23347	Window result 6
ZR23348 to ZR23475	Window result 7
ZR23476 to ZR23603	Window result 8
ZR23604 to ZR23731	Window result 9
ZR23732 to ZR23859	Window result 10

(10) PROFIBUS-DP[M8]
PLC -> CNC

Device	Abbrev.	Signal name
ZR3613		PROFIBUS-DP:Diagnosis data acquisition request start/end flag
ZR3614		PROFIBUS-DP:Station No. of slave requesting diagnosis data acquisition
ZR3615		PROFIBUS-DP:Diagnosis data acquisition request command No.
ZR3616		PROFIBUS-DP:Diagnosis data-storing device type
ZR3617		PROFIBUS-DP:Top device No. for storing diagnosis data
ZR3623		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Request start/end flag
ZR3624		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Request command No.
ZR3625		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Request source slave station No.
ZR3626		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Request source slave station slot No.
ZR3627		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Request source slave station index
ZR3628		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Request source data length
ZR3629		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Send time-out
ZR3630		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Features supported
ZR3631		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Features supported 2
ZR3632		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Profile features supported
ZR3633		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Profile features supported 2
ZR3634		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Profile ID number
ZR3635		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): S_Type
ZR3636		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): S_Len
ZR3637		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): D_Type
ZR3638		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): D_Len
ZR3639		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Destination connection No.
ZR3642		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Type of device for storing data to write
ZR3643		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Top device No. for storing data to write
ZR3644		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Type of device for storing additional address parameter table
ZR3645		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Top device No. for storing additional address parameter table
ZR3646		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Subnet
ZR3647		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Instance
ZR3648		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): ReasonCode
ZR3664		PROFIBUS-DP:Alarm data acquisition request start/end flag
ZR3665		PROFIBUS-DP:Alarm data acquisition request command No.
ZR3666		PROFIBUS-DP:Station No. of slave requesting alarm data acquisition
ZR3667		PROFIBUS-DP:Alarm data-storing device type
ZR3668		PROFIBUS-DP:Top device No. for storing alarm data
ZR3673		PROFIBUS-DP:ACK send request start/end flag
ZR3674		PROFIBUS-DP:ACK send request command No.
ZR3675		PROFIBUS-DP:ACK send request destination slave station No.
ZR3676		PROFIBUS-DP:Type of alarm occurring on ACK send request destination slave station
ZR3677		PROFIBUS-DP:Slot No. of ACK send request destination slave station
ZR3678		PROFIBUS-DP:Alarm specifier of ACK send request destination slave station

CNC -> PLC

Device	Abbrev.	Signal name
ZR3600		PROFIBUS-DP:Startup complete
ZR3601		PROFIBUS-DP:Diagnosis data acquisition in progress
ZR3602		PROFIBUS-DP:Aperiodic data communication (Acyclic communication) in progress
ZR3603		PROFIBUS-DP:Alarm data acquisition active flag
ZR3604		PROFIBUS-DP:Alarm ACK send active flag
ZR3605		PROFIBUS-DP: Error occurrence state in the slave station (Station No. 0 to 15)
ZR3606		PROFIBUS-DP: Error occurrence state in the slave station (Station No. 16 to 31)
ZR3607		PROFIBUS-DP: Error occurrence state in the slave station (Station No. 32 to 47)
ZR3608		PROFIBUS-DP: Error occurrence state in the slave station (Station No. 48 to 63)
ZR3609		PROFIBUS-DP: Error occurrence state in the slave station (Station No. 64 to 79)
ZR3610		PROFIBUS-DP: Error occurrence state in the slave station (Station No. 80 to 95)
ZR3611		PROFIBUS-DP: Error occurrence state in the slave station (Station No. 96 to 111)
ZR3612		PROFIBUS-DP: Error occurrence state in the slave station (Station No. 112 to 125)
ZR3618		PROFIBUS-DP:Diagnosis data acquisition response command No.
ZR3619		PROFIBUS-DP:Diagnosis data acquisition status (H)
ZR3620		PROFIBUS-DP:Diagnosis data acquisition status (L)
ZR3621		PROFIBUS-DP:Station No. of slave that acquired diagnosis data

Device	Abbrev.	Signal name
ZR3622		PROFIBUS-DP:Diagnosis data length
ZR3630		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Features supported
ZR3631		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Features supported 2
ZR3632		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Profile features supported
ZR3633		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Profile features supported 2
ZR3634		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Profile ID number
ZR3635		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): S_Type
ZR3636		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): S_Len
ZR3637		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): D_Type
ZR3638		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): D_Len
ZR3640		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Type of devices for storing read data
ZR3641		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Top device No. for storing read data
ZR3649		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Response command No.
ZR3650		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Execution status (H)
ZR3651		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Execution status (L)
ZR3652		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Execution station No.
ZR3653		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Execution slot
ZR3654		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Execution index
ZR3655		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Execution data length
ZR3656		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Connection-established connection No.
ZR3657		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Maximum data unit length
ZR3658		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Connection reference value
ZR3659		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Error decode
ZR3660		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Error code 1
ZR3661		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Error code 2
ZR3662		PROFIBUS-DP:Aperiodic data communication (Acyclic communication): Additional error data
ZR3663		PROFIBUS-DP:Alarm-occurring station No.
ZR3669		PROFIBUS-DP:Alarm data acquisition response command No.
ZR3670		PROFIBUS-DP:Alarm data acquisition status(H)
ZR3671		PROFIBUS-DP:Alarm data acquisition status(L)
ZR3672		PROFIBUS-DP:Acquired alarm data length
ZR3679		PROFIBUS-DP:ACK send response command No.
ZR3680		PROFIBUS-DP:ACK send status (H)
ZR3681		PROFIBUS-DP:ACK send status (L)
ZR3682		PROFIBUS-DP:ACK send execution station No.
ZR3683		PROFIBUS-DP:ACK send execution alarm type
ZR3684		PROFIBUS-DP:ACK send execution slot No.
ZR3685		PROFIBUS-DP:ACK send execution alarm specifier
ZR3686		PROFIBUS-DP:ACK send error decode
ZR3687		PROFIBUS-DP:ACK send error code 1
ZR3688		PROFIBUS-DP:ACK send error code 2

7 Classified for Each Application

(1) PLC axis indexing interfaces

Device	Abbrev.	Signal name
R8000	AUXST41	PLC axis indexing control status 4 1st axis
R8001	AUXST31	PLC axis indexing control status 3 1st axis
R8002	AUXST21	PLC axis indexing control status 2 1st axis
R8003	AUXST11	PLC axis indexing control status 1 1st axis
R8004		PLC axis indexing control machine position (L) 1st axis
R8005		PLC axis indexing control machine position (H) 1st axis
R8006	AUXST42	PLC axis indexing control status 4 2nd axis
R8007	AUXST32	PLC axis indexing control status 3 2nd axis
R8008	AUXST22	PLC axis indexing control status 2 2nd axis
R8009	AUXST12	PLC axis indexing control status 1 2nd axis
R8010		PLC axis indexing control machine position (L) 2nd axis
R8011		PLC axis indexing control machine position (H) 2nd axis
R8012	AUXST43	PLC axis indexing control status 4 3rd axis
R8013	AUXST33	PLC axis indexing control status 3 3rd axis
R8014	AUXST23	PLC axis indexing control status 2 3rd axis
R8015	AUXST13	PLC axis indexing control status 1 3rd axis
R8016		PLC axis indexing control machine position (L) 3rd axis
R8017		PLC axis indexing control machine position (H) 3rd axis
R8018	AUXST44	PLC axis indexing control status 4 4th axis
R8019	AUXST34	PLC axis indexing control status 3 4th axis
R8020	AUXST24	PLC axis indexing control status 2 4th axis
R8021	AUXST14	PLC axis indexing control status 1 4th axis
R8022		PLC axis indexing control machine position (L) 4th axis
R8023		PLC axis indexing control machine position (H) 4th axis
R8024	AUXST45	PLC axis indexing control status 4 5th axis
R8025	AUXST35	PLC axis indexing control status 3 5th axis
R8026	AUXST25	PLC axis indexing control status 2 5th axis
R8027	AUXST15	PLC axis indexing control status 1 5th axis
R8028		PLC axis indexing control machine position (L) 5th axis
R8029		PLC axis indexing control machine position (H) 5th axis
R8030	AUXST46	PLC axis indexing control status 4 6th axis
R8031	AUXST36	PLC axis indexing control status 3 6th axis
R8032	AUXST26	PLC axis indexing control status 2 6th axis
R8033	AUXST16	PLC axis indexing control status 1 6th axis
R8034		PLC axis indexing control machine position (L) 6th axis
R8035		PLC axis indexing control machine position (H) 6th axis
R8036	AUXST47	PLC axis indexing control status 4 7th axis
R8037	AUXST37	PLC axis indexing control status 3 7th axis
R8038	AUXST27	PLC axis indexing control status 2 7th axis
R8039	AUXST17	PLC axis indexing control status 1 7th axis
R8040		PLC axis indexing control machine position (L) 7th axis
R8041		PLC axis indexing control machine position (H) 7th axis
R8042	AUXST48	PLC axis indexing control status 4 8th axis
R8043	AUXST38	PLC axis indexing control status 3 8th axis
R8044	AUXST28	PLC axis indexing control status 2 8th axis
R8045	AUXST18	PLC axis indexing control status 1 8th axis
R8046		PLC axis indexing control machine position (L) 8th axis
R8047		PLC axis indexing control machine position (H) 8th axis

Device	Abbrev.	bit	Signal name
R8048		bit0	PLC indexing axis in operation adjustment mode 1st axis
		bit1	PLC indexing axis in operation adjustment mode 2nd axis
		bit2	PLC indexing axis in operation adjustment mode 3rd axis
		bit3	PLC indexing axis in operation adjustment mode 4th axis
		bit4	PLC indexing axis in operation adjustment mode 5th axis
		bit5	PLC indexing axis in operation adjustment mode 6th axis

Device	Abbrev.	Signal name
R8050	AUXCM41	PLC axis indexing control command 4 1st axis
R8051	AUXCM31	PLC axis indexing control command 3 1st axis
R8052	AUXCM21	PLC axis indexing control command 2 1st axis
R8053	AUXCM11	PLC axis indexing control command 1 1st axis
R8054		PLC axis indexing control command position (L) 1st axis
R8055		PLC axis indexing control command position (H) 1st axis
R8056	AUXCM42	PLC axis indexing control command 4 2nd axis
R8057	AUXCM32	PLC axis indexing control command 3 2nd axis
R8058	AUXCM22	PLC axis indexing control command 2 2nd axis
R8059	AUXCM12	PLC axis indexing control command 1 2nd axis
R8060		PLC axis indexing control command position (L) 2nd axis
R8061		PLC axis indexing control command position (H) 2nd axis
R8062	AUXCM43	PLC axis indexing control command 4 3rd axis
R8063	AUXCM33	PLC axis indexing control command 3 3rd axis
R8064	AUXCM23	PLC axis indexing control command 2 3rd axis
R8065	AUXCM13	PLC axis indexing control command 1 3rd axis
R8066		PLC axis indexing control command position (L) 3rd axis
R8067		PLC axis indexing control command position (H) 3rd axis
R8068	AUXCM44	PLC axis indexing control command 4 4th axis
R8069	AUXCM34	PLC axis indexing control command 3 4th axis
R8070	AUXCM24	PLC axis indexing control command 2 4th axis

Device	Abbrev.	Signal name
R8071	AUXCM14	PLC axis indexing control command 1 4th axis
R8072		PLC axis indexing control command position (L) 4th axis
R8073		PLC axis indexing control command position (H) 4th axis
R8074	AUXCM45	PLC axis indexing control command 4 5th axis
R8075	AUXCM35	PLC axis indexing control command 3 5th axis
R8076	AUXCM25	PLC axis indexing control command 2 5th axis
R8077	AUXCM15	PLC axis indexing control command 1 5th axis
R8078		PLC axis indexing control command position (L) 5th axis
R8079		PLC axis indexing control command position (H) 5th axis
R8080	AUXCM46	PLC axis indexing control command 4 6th axis
R8081	AUXCM36	PLC axis indexing control command 3 6th axis
R8082	AUXCM26	PLC axis indexing control command 2 6th axis
R8083	AUXCM16	PLC axis indexing control command 1 6th axis
R8084		PLC axis indexing control command position (L) 6th axis
R8085		PLC axis indexing control command position (H) 6th axis
R8086	AUXCM47	PLC axis indexing control command 4 7th axis
R8087	AUXCM37	PLC axis indexing control command 3 7th axis
R8088	AUXCM27	PLC axis indexing control command 2 7th axis
R8089	AUXCM17	PLC axis indexing control command 1 7th axis
R8090		PLC axis indexing control command position (L) 7th axis
R8091		PLC axis indexing control command position (H) 7th axis
R8092	AUXCM48	PLC axis indexing control command 4 8th axis
R8093	AUXCM38	PLC axis indexing control command 3 8th axis
R8094	AUXCM28	PLC axis indexing control command 2 8th axis
R8095	AUXCM18	PLC axis indexing control command 1 8th axis
R8096		PLC axis indexing control command position (L) 8th axis
R8097		PLC axis indexing control command position (H) 8th axis

Device	Abbrev.	bit	Signal name
R8098		bit0	PLC indexing axis operation adjustment mode valid (common for all axes)

(2) Other file registers (R)

Device	Signal name
R2100 to R2397	Pallet program data (Drive unit -> PLC)
R4100 to R4103	Pallet program data (PLC -> Drive unit)
R7500 to R7799	PLC constant parameters (corresponds to parameters #18001 to #18150)
R7800 to R7897	PLC bit selection parameters (corresponds to parameters #6401 to #6596) *
R7898 to R7947	PLC bit selection parameters (corresponds to parameters #59001 to #59100) ▲
R8290 to R8299	Optimum acceleration/deceleration estimated inertia level (spindle) ▲
R12800 to R13099	Computer link interfaces
R13200 to R13299	Special table interfaces
R17300 to R18299	Modbus input/outpu device ▲
R10600 to R11779	ATC command control information (M system)
R11800 and later	Tool life management interfaces (M system)
R10600 and later	Tool life management interfaces I, II (L system)
R27500 to R28099	PLC constant parameters (corresponds to parameters #59301 to #59600) ▲

* Some bits are used only for C80. Refer to Alarm/Parameter Manual.

(3) Memory switch (PLC switch)

Device	Signal name
X680 to X6BF	PLC switch #1 to 64
X1C40 to X1C5F	PLC switch #65 to 96
X6F8 to X6FF	Skip input 1 to 8 for monitor
Y680 to Y6BF	PLC switch reversed display #1 to 64
Y1C40 to Y1C5F	PLC switch reversed display #65 to 96
Y6C0 to Y6FF	PLC switch for reverse #1 to 64
Y1C60 to Y1C7F	PLC switch for reverse #65 to 96
ZR3200 to ZR3205	PLC switch non-display

(4) Fixed (semi-fixed) devices

Device	Signal name
X18 to X1B	Reference position return near-point detection 1 to 4
X20 to X23	Stroke end (-) 1 to 4
X28 to X2B	Stroke end (+) 1 to 4
X5C to X5F	Reference position return near-point detection 5 to 8
X64 to X67	Stroke end (-) 5 to 8
X6C to X6F	Stroke end (+) 5 to 8

(5) Maintenance

Device	Signal name
R13170	CRC count (servo #1)
R13171	CRC count (servo #2)
R13172	Address illegal (servo #1)
R13173	Address illegal (servo #2)
R13174	CRC count (display unit)
R13175	Address illegal (display unit)
R13176	CRC count (servo #3)
R13177	Address illegal (servo #3)

Revision History

Date of revision	Manual No.	Revision details
Jun. 2018	IB(NA)1501280-B	First edition created.

Notice

Every effort has been made to keep up with software and hardware revisions in the contents described in this manual. However, please understand that in some unavoidable cases simultaneous revision is not possible.
Please contact your Mitsubishi Electric dealer with any questions or comments regarding the use of this product.

MITSUBISHI CNC

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