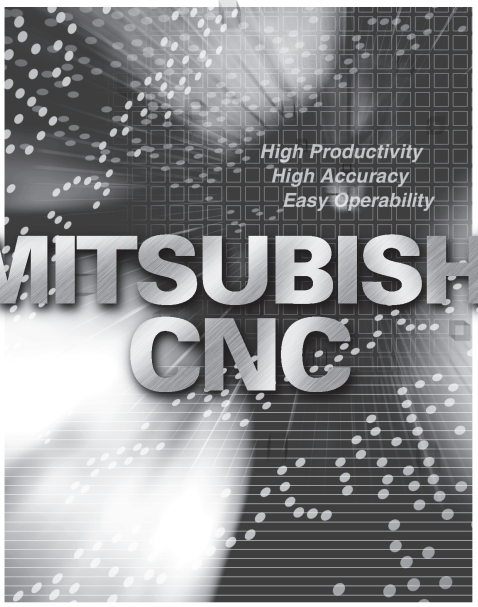
Changes for the Better

MITSUBISHI ELECTRIC

MITSUBISHI CNC

HANDBOOK

C70



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I Alarms

II Parameters

III PLC Devices

Remedy and measure after a report of error

IMPORTANT
1. Take a detailed note of the operations applied just before the error occurrence.
2. Operation history is regularly updated. Therefore, interruption should be carried out just after the error occurrence.

<Preparation>

- Confirm that the operation history of alarm diagnosis is set to "P: Execute" so that the error data can be collected. Error data can be kept in this state. The back ground of "P: Execute" is reversed in white.
- After having collected error data, return the operation history to "P: Execute".

<Sequence of remedy and measure>

(1) Select [HISTORY] in the alarm diagnosis. Set [I] in #( ) and press enter. The operation history will be interrupted.

Display 1 shows the stop state. The back ground of the operation history is turned white.

(2) Select [COORDI] on monitor. Note down value of coordinates, programming number under the operation, etc.

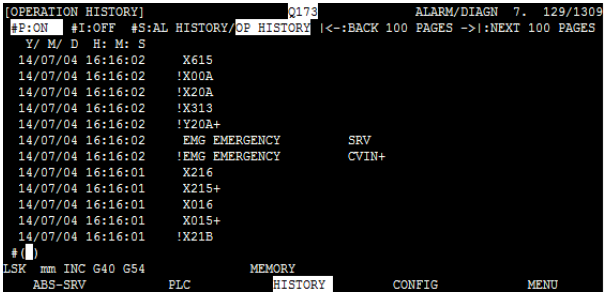
Note down the information on display 2.

(3) Collect SRAM.BIN data in CNC data input function.

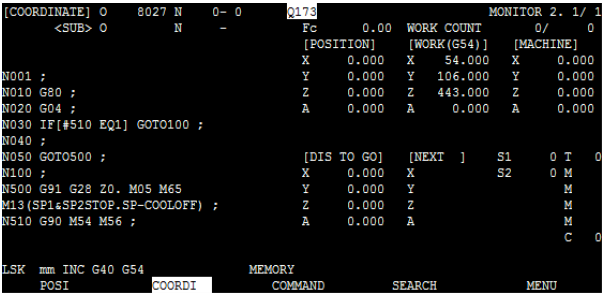
Refer to display 3
(a) Function: Select "COPY"
(b) Device: Select "CNC"
(c) Directory: Select "Mainte data"
(d) File name: Select "SRAM.BIN"
(e) Scroll down to under the arrow.
(f) Device: Select the output destination for the above data.
(g) Press [Exec] on the bottom right.

(4) Select ""Backup function (Device->GOT)" to collect PC CPU data and CNC CPU data with the restored backup function.

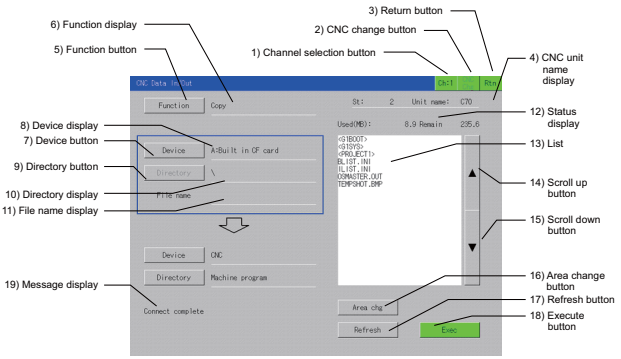
(5) Provide us with the SRAM.BIN and the restored backup data.



Display 1 :Alarm diagnosis [OPERATION HISTORY]



Display 2: Monitor [COORDINATE]



Display 3:CNC Data In/Out

I Alarms

1. Operation Errors (M)

(Note) "M01" alarms are displayed as "M01 Operation error" with the error number. Error number is four digit number displayed after error name (such as 0001). "M01" alarms are listed in ascending order in this manual.

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.
- In NC/PLC axes switch function, the manual feed was commanded from NC during PLC axis control.

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.
- In NC/PLC axes switch function, switch to NC axis control and then command the manual feed from NC.

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 Ref point retract invalid 0020

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

Remedy
- Execute reference position return.

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 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 primary and secondary 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.
- Increase "#2024 synerr(allowable value)" or set "0" to disable error check.
- When using simple C-axis synchronous control, set "0" for "synchronous control operation method".

M01 Wait for tap retract 0057

Details The axis travel command is interlocked in the part system where the "Tap retract possible" signal is ON.

Remedy - If tap retract is necessary, perform it before issuing an axis travel command.
- If tap retract is not necessary, cancel the tap retract enabled state.

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))

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

M01 Hypothetical axis high-accuracy control: Non-interpolation error 0090

Details High-accuracy control was commanded in hypothetical axis command mode in the hypothetical linear axis control. Otherwise, non-interpolation mode is selected.

Remedy - Correct "#1086 G0Intp (G00 non-interpolation)" and "#1205 G0bdcc (Acceleration and deceleration before G0 interpolation)" settings.

M01 Hypothetical linear axis control: Commanded axis illegal 0091

Details Under hypothetical linear axis control, a command was issued to an actual axis on hypothetical plane in hypothetical axis command mode or issued to a hypothetical axis in actual axis command mode.

Remedy - Change the commanded axis or command mode.

M01 Hypothetical axis movable range exceeded 0092

Details A hypothetical axis is being moved outside the movable range.

Remedy - Correct the following parameter setting:
"#12015 v_dist (Hypothetical axis tool length)",
"#12016 v_ori (Hypothetical axis machine zero point)",
"#12020 r_lim+ (Actual axis movable range (+))",
"#12021 r_lim- (Actual axis movable range (-))"

M01 No operation mode 0101

Details No operation mode

Remedy - Check for any broken wires in the input mode signal line.
- Check for any failure of the MODE SELECT switch.
- Correct the sequence program.

M01 Cutting override zero 0102

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

Remedy - Set the "cutting feed override" switch or the "rapid traverse override" switch to a value other than "0" to clear the error.
- If the "cutting feed override" switch or the "rapid traverse override" switch has been set to a value other than "0", check for any short circuit in the signal line.
- Correct the sequence program.
- When using the cutting feedrate override method selection or the rapid traverse override method selection, check if the override ratio is not zero.

M01 External feed rate zero 0103

Details 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.

Remedy
- 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.
- Correct the external deceleration parameters as follows:
  When "#1239 set11/bit6" is set to "0", set a non-zero value in "#1216 extdcc".
  When "#1239 set11/bit6" is set to "1", set a non-zero value in "#2086 exdcax1" or "#2161 exdcax2" - "#2165 exdcax6" referring to the value set in the external deceleration speed selection signal.

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 (from "#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.

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.

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 automatic start button was pressed during program check or in program check mode.

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

M01 Auto start in buffer correct 0113

Details The automatic start button was pressed during buffer correction.

Remedy
- Press the automatic start button after the buffer correction is completed.

M01 In reset process 0115

Details The automatic 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 automatic 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:
"#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 "#8041 C-rot. R" is larger than the arc radius.

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

M01 Illegal operation mode for synchronous correction mode 0120

Details While synchronization correction mode is ON, operation mode is illegally set to a mode other than handle or manual arbitrary feed.

Remedy - Select the handle or manual arbitrary feed mode.
- Cancel the synchronous correction mode.

M01 No synchronous control option 0121

Details A value was entered to the synchronous control operation method register when multi-secondary-axis synchronous control and synchronous control options are not provided.

Remedy - Set "0" for the synchronous control operation method register.

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 Zero point return interruption 0131

Details Automatic operation was started after a zero point return interruption.

Remedy - Reset and start the automatic operation.

M01 Chopping override zero 0150

Details The override became "0" in the chopping operation.

Remedy - Correct the setting of "chopping override" (R2503).
- Correct the setting of "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 No speed set out of soft limit 0160

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

Remedy - Correct the "#2021 out_f (Maximum speed outside soft limit range)" setting.
- Correct the soft limit range (with "#2013 OT- (Soft limit I-)" and "#2014 OT+ (Soft limit I+)").

M01 APLC password mismatch 0280

Details The APLC authentication password is inconsistent.

Remedy - Contact the machine tool builder.

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.

Remedy
- Command G113 to cancel the operation.
- Turn ON the "spindle synchronization cancel" signal to cancel the operation.
- Command G50.2 to cancel the operation.
- Turn ON the "spindle-spindle polygon cancel" signal to cancel the operation.

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.

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

M01 External spindle speed clamp speed zero 1039

Details External spindle speed clamp signal has been turned ON while the clamp speed has not been set.

Remedy
- Set the external spindle speed clamp feedrate parameter.
- Turn OFF the external spindle speed clamp signal.

M01 No spindle speed clamp 1043

Details 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.

Remedy
Press the reset key and carry out the remedy below.
- Select the spindle before commanding G92/G50.

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 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.

M90 Parameter set mode

Details The lock for setup parameters has been released. Setting the setup parameters is enabled while automatic start is disabled.

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

2. Stop Codes (T)

T01 Cycle start prohibit
Automatic start is not available in stop state.
T02 Feed hold
Feed hold is actuated during automatic operation for some reason.
T03 Block stop
Block stop is actuated during automatic operation for some reason.

(Note 1) "T01" stop codes are displayed as "T01 Cycle start prohibit" with the error number. Error number is four digit number displayed after error name (start from 0101). "T01" stop codes are listed in ascending order in this manual.

(Note 2) "T02" stop codes are displayed as "T02 Feed hold" with the error number. Error number is four digit number displayed after error name (start from 0201). "T02" stop codes are listed in ascending order in this manual.

(Note 3) "T03" stop codes are displayed as "T03 Block stop" with the error number. Error number is four digit number displayed after error name (start from 0301). "T03" stop codes are listed in ascending order in this manual.

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, FTP, 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, FTP, 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 Restart search in execution 0111

Details Automatic start is disabled because restart search is in execution.

Remedy - Execute automatic start after the restart search is completed.

T01 Restart pos. return incomplete 0112

Details Automatic start is not possible as the axis has not been returned to the restart position.

Remedy
- Manually return the axis to the restart position.
- Turn ON the automatic restart valid parameter, and then execute the automatic start.
- Return to the restart position, and execute the automatic start in MDI mode.

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(Battery alm) 0116

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

Remedy
- Replace the battery of the NC control unit.
- Replace the battery of the servo drive units.
- Contact the service center.

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 Start during MDI operation at other part system disable 0141

Details In multi-part system, a start signal was input for MDI mode while the MDI operation was being carried out in another part system.

Remedy - End the other part system's operation before starting.

T01 APLC password mismatch 0160

Details Automatic start is disabled because the APLC authentication password does not match.

Remedy - Contact the machine tool builder.

T01 Cycle start prohibit 0180

Details Automatic start became disabled while servo auto turning is enabled.

Remedy - Set "#1164 ATS" to "0" when the servo auto turning is not executed.

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.

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.

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 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.

T10 Fin wait 0ooo

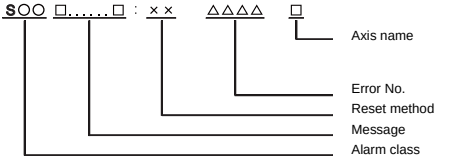
Details The following Nos. are shown during the operation of the corresponding completion wait factor. The numbers will disappear when the operation is completed.
The completion wait factor is indicated with four digits (in hexadecimal).
Bit allocation of the 4-digit hexadecimal message is as follows.
bit F:
bit E:
bit D:
bit C: Waiting for high-speed synchronous tapping preparation to be completed (Note 1)
bit B: Unclamp signal wait (Note 2)
bit A: Waiting for synchronous tap hole bottom in-position check to be completed. (Note 4)
bit 9:
bit 8: In dwell execution
bit 7: Door open (Note 3)
bit 6:
bit 5:
bit 4: Waiting for spindle position to be looped
bit 3: Waiting for spindle orientation to be completed
bit 2: Waiting for cutting speed deceleration
bit 1: Waiting for rapid traverse deceleration
bit 0: Waiting for MSTB completion
(Note 1) In case high-speed synchronous tapping won't turn ready while MS Configurator is in use, reset the NC to release the alarm. If MS Configurator is not in use and still high-speed tapping preparation won't be completed, contact the service center.
(Note 2) This shows the wait state for the unclamp signal's ON/OFF for the index table indexing.
(Note 3) This shows the door open state caused by the door interlock function.
(Note 4) There may be a case that this operation does not complete because the high-speed synchronous tapping is enabled and the hole bottom in-position width is extremely small. In this case, reset to cancel the alarm.
Avoid setting the hole bottom width to extremely small value (e.g. 0.001) during the high-speed synchronous tapping.

3. Servo/Spindle Alarms (S)

Axis names are expressed with a letter in the following manner:
- NC axis: axis name defined by the parameter
- Spindle: "S" = the 1st spindle, "T" = the 2nd spindle, "M" = the 3rd spindle, "N" = the 4th spindle, "P" = the 5th spindle, "Q" = the 6th spindle, "R" = the 7th spindle

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 drive unit power ON again.

Error No. consists of four digits (0010 to). Servo alarms are explained in ascending order of the error No. The four digits on the left part of each alarm indicate the error No.

(Note 1) For the details of servo alarms, refer to your drive unit's instruction manual.

(Note 2) PR alarms 005B, 005D, and 005E can be released by pressing the reset button. Upon completion of releasing a safety observation alarm by pressing the reset button, the alarm of the highest priority of the remaining will be displayed.

Drive unit alarms

0010 Insufficient voltage

Details A drop of bus voltage was detected in main circuit.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0011 Axis selection error

Details The axis selection rotary switch has been incorrectly set.
- Servo stop method: Initial error
- Spindle stop method: Initial error

0012 Memory error 1

Details A hardware error was detected during the power ON self-check.
- Servo stop method: Initial error
- Spindle stop method: Initial error

0013 Software processing error 1

Details An error was detected for the software execution state.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0014 Software processing error 2

Details The current processing processor does not operate correctly.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0016 Init mag pole pos detect err

Details In the built-in motor which uses the absolute position detector, 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.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0017 A/D converter error

Details A current feedback error was detected.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0018 Motor side dtc: Init commu err

Details An error was detected in the initial communication with the motor side detector.
- Servo stop method: Initial error
- Spindle stop method: Initial error

0019 Detector commu err in syn cont

Details An error of the shared detector on the machine side was detected on the secondary axis of the speed command synchronization control.
- Servo stop method: Dynamic stop

001A Machine side dtc: Init comu er

Details An error was detected in the initial communication with the machine side detector.
- Servo stop method: Initial error
- Spindle stop method: Initial error

001B Machine side dtc: Error 1

Details An error was detected by the detector connected to the machine side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- OSA105, OSA105ET2A, OSA166, OSA166ET2NA(MITSUBISHI) Memory alarm
- OSA18() CPU alarm
- MDS-B-HR() Memory error
- MBA405W(MITSUBISHI) CPU error
- AT343, AT543, AT545(Mitsutoyo) Initialization error
- LC193M, LC493M, LC195M, LC495M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Initialization error
- MPRZ Scale(MHI) Installation accuracy fault
- SR75, SR85, SR77, SR87, RU77(Magnescale) Laser diode error
- RL40N Series(Renishaw) Initialization error

[Detector alarm (Spindle drive unit)]
- TS5690, TS5691(MITSUBISHI) Memory error
- MDS-B-HR() Initialization error
- OSA18() CPU error
- MBE405W(MITSUBISHI) CPU error
- EIB Series(HEIDENHAIN) Initialization error
- MPCI scale(MHI) Installation accuracy fault

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

001C Machine side dtc: Error 2

Details An error was detected by the detector connected to the machine side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- OSA105, OSA105ET2A, OSA166, OSA166ET2NA(MITSUBISHI) LED alarm
- MBA405W(MITSUBISHI) Waveform error
- AT343, AT543, AT545(Mitsutoyo) EEPROM error
- LC193M, LC493M, LC195M, LC495M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) EEPROM error
- SR75, SR85, SR77, SR87, RU77(Magnescale) System memory error

[Detector alarm (Spindle drive unit)]
- TS5690, TS5691(MITSUBISHI) Waveform error
- MBE405W(MITSUBISHI) Waveform error
- EIB Series(HEIDENHAIN) EEPROM error

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

001D Machine side dtc: Error 3

Details An error was detected by the detector connected to the machine side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- OSA105, OSA105ET2A, OSA166, OSA166ET2NA(MITSUBISHI) Data alarm
- OSA18() Data alarm
- MDS-B-HR() Data error
- MBA405W(MITSUBISHI) Data error
- AT343, AT543, AT545(Mitsutoyo) Photoelectric type, static capacity type data mismatch
- LC193M, LC493M, LC195M, LC495M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Relative/ absolute position data mismatch
- MPRZ Scale(MHI) Detection position deviance
- SR75, SR85, SR77, SR87, RU77(Magnescale) Encoder mismatch error
- SAM/SVAM/GAM/LAN Series (FAGOR) Absolute position detection error
- RL40N Series (Renishaw) Absolute position data error

[Detector alarm (Spindle drive unit)]
- MDS-B-HR() Data error
- OSA18() Data error
- MBE405W(MITSUBISHI) Data error
- MPCI scale(MHI) Detection position deviance

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

001E Machine side dtc: Error 4

Details An error was detected by the detector connected to the machine side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- AT343, AT543, AT545(Mitsutoyo) ROM/RAM error
- LC193M, LC493M, LC195M, LC495M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) ROM/RAM error
- MPRZ Scale(MHI) Scale breaking
- SAM/SVAM/GAM/LAM Series (FAGOR) H/W error

[Detector alarm (Spindle drive unit)]
- MPCI scale(MHI) Scale breaking

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

001F Machine side dtc: Commu error

Details An error was detected in the communication with the machine side detector.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0021 Machine side dtc: No signal

Details In the machine side detector, ABZ-phase feedback cannot be returned even when the motor moves.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0022 Detector data error

Details An error was detected in the feedback data from the position detector.
- Servo stop method: Dynamic stop

0023 Excessive speed error

Details The state that there is a difference between the actual speed and command speed continued for longer than the excessive speed deviation timer setting.
- Spindle stop method: Coast to a stop

0024 Grounding

Details The motor power cable is in contact with FG (Frame Ground).
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0025 Absolute position data lost

Details The absolute position data was lost in the detector.
- Servo stop method: Initial error

0026 Unused axis error

Details In the multi-axis drive unit, there is an axis set to free, and the other axis detected a power module error.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0027 Machine side dtc: Error 5

Details An error was detected by the detector connected to the machine side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop
[Detector alarm (Servo drive unit)]
- MDS-B-HR() Scale not connected
- AT343, AT543, AT545(Mitsutoyo) CPU error
- LC193M, LC493M, LC195M, LC495M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) CPU error
- MPRZ Scale(MHI) Absolute value detection fault
- SAM/SVAM/GAM/LAN Series (FAGOR) CPU error
[Detector alarm (Spindle drive unit)]
- MDS-B-HR() Connection error
- EIB Series(HEIDENHAIN) CPU error
(Note) A driver processes all reset types of alarms as "PR". However, "AR" will be applied according to the detector.

0028 Machine side dtc: Error 6

Details An error was detected by the detector connected to the machine side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop
[Detector alarm (Servo drive unit)]
- AT343, AT543, AT545(Mitsutoyo) Photoelectric type overspeed
- LC193M, LC493M, LC195M, LC495M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Overspeed
- SR75, SR85, SR77, SR87, RU77(Magnescale) Over speed
- RL40N Series (Renishaw) Overspeed error
[Detector alarm (Spindle drive unit)]
- TS5690, TS5691(MITSUBISHI) Overspeed
- EIB Series(HEIDENHAIN) Overspeed
(Note) A driver processes all reset types of alarms as "PR". However, "AR" will be applied according to the detector.

0029 Machine side dtc: Error 7

Details An error was detected by the detector connected to the machine side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop
[Detector alarm (Servo drive unit)]
- AT343, AT543, AT545(Mitsutoyo) Static capacity type error
- LC193M, LC493M, LC195M, LC495M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Absolute position data error
- MPRZ Scale(MHI) Gain fault
- SR75, SR85, SR77, SR87, RU77(Magnescale) Absolute position data error
[Detector alarm (Spindle drive unit)]
- MPCI scale(MHI) Gain fault
(Note) A driver processes all reset types of alarms as "PR". However, "AR" will be applied according to the detector.

002A Machine side dtc: Error 8

Details An error was detected by the detector connected to the machine side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop
[Detector alarm (Servo drive unit)]
- MBA405W(MITSUBISHI) Count error
- AT343, AT543, AT545(Mitsutoyo) Photoelectric type error
- LC193M, LC493M, LC195M, LC495M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Relative position data error
- MPRZ Scale(MHI) Phase fault
- SR75, SR85, SR77, SR87, RU77(Magnescale) Relative position data error
[Detector alarm (Spindle drive unit)]
- TS5690, TS5691(MITSUBISHI) Relative position data error
- MBE405W(MITSUBISHI) Count error
- EIB Series(HEIDENHAIN) Relative position data error
- MPCI scale(MHI) Phase fault
(Note) A driver processes all reset types of alarms as "PR". However, "AR" will be applied according to the detector.

002B Motor side dtc: Error 1

Details An error was detected by the detector connected to the motor side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- OSA105, OSA105ET2A, OSA166, OSA166ET2NA(MITSUBISHI) Memory alarm
- OSA18() CPU alarm
- MDS-B-HR() Memory error
- AT343, AT543, AT545(Mitsutoyo) Initialization error
- LC193M, LC493M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Initialization error
- MPRZ Series(MHI) Installation accuracy fault
- SR75, SR85, SR77, SR87, RU77(Magnescale) Laser diode error

[Detector alarm (Spindle drive unit)]
- TS5690, TS5691(MITSUBISHI) Memory error
- MDS-B-HR() Initialization error
- OSA18() CPU error
- EIB Series(HEIDENHAIN) Initialization error
- MPCI scale(MHI) Installation accuracy fault

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

002C Motor side dtc: Error 2

Details An error was detected by the detector connected to the motor side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- OSA105, OSA105ET2A, OSA166, OSA166ET2NA(MITSUBISHI) LED alarm
- AT343, AT543, AT545(Mitsutoyo) EEPROM error
- LC193M, LC493M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) EEPROM error
- SR75, SR85, SR77, SR87, RU77(Magnescale) System memory error

[Detector alarm (Spindle drive unit)]
- TS5690, TS5691(MITSUBISHI) Waveform error
- EIB Series(HEIDENHAIN) EEPROM error

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

002D Motor side dtc: Error 3

Details An error was detected by the detector connected to the motor side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- OSA105, OSA105ET2A, OSA166, OSA166ET2NA(MITSUBISHI) Data alarm
- OSA18() Data alarm
- MDS-B-HR() Data error
- AT343, AT543, AT545(Mitsutoyo) Photoelectric type, static capacity type data mismatch
- LC193M, LC493M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Relative/ absolute position data mismatch
- MPRZ Series(MHI) Detection position deviance
- SR75, SR85, SR77, SR87, RU77(Magnescale) Encoder mismatch error
- SAM/SVAM/GAM/LAN Series (FAGOR) Absolute position detection error

[Detector alarm (Spindle drive unit)]
- MDS-B-HR() Data error
- OSA18() Data error
- MPCI scale(MHI) Detection position deviance

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

002E Motor side dtc: Error 4

Details An error was detected by the detector connected to the motor side.
The error details are different according to the detector type.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- AT343, AT543, AT545(Mitsutoyo) ROM/RAM error
- LC193M, LC493M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) ROM/RAM error
- MPRZ Series(MHI) Scale breaking
- SAM/SVAM/GAM/LAM Series (FAGOR) H/W error

[Detector alarm (Spindle drive unit)]
- MPCI scale(MHI) Scale breaking

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

002F Motor side dtc: Commu error

Details An error was detected in the communication with the motor side detector.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0030 Over regeneration

Details Over-regeneration level exceeded 100%. The regenerative resistor is overloaded.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0031 Overspeed

Details The motor speed exceeded the allowable speed.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

0032 Power module overcurrent

Details The power module detected the overcurrent.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0033 Overvoltage

Details The bus voltage in main circuit exceeded the allowable value.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0034 NC-DRV commu: CRC error

Details The data received from the NC was outside the setting range.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

0035 NC command error

Details The travel command data received from the NC was excessive.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

0036 NC-DRV commu: Commu error

Details The communication with the NC was interrupted.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

0037 Initial parameter error

Details 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.
- Servo stop method: Initial error
- Spindle stop method: Initial error

0038 NC-DRV commu: Protocol error 1

Details 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.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

0039 NC-DRV commu: Protocol error 2

Details 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.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

003A Overcurrent

Details Excessive motor drive current was detected.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

003B Power module overheat

Details The power module detected an overheat.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

003C Regeneration circuit error

Details An error was detected in the regenerative transistor or in the regenerative resistor.
- Servo stop method: Dynamic stop

003D Pw sply volt err acc/dec

Details A motor control error during acceleration/deceleration, due to a power voltage failure, was detected.
- Servo stop method: Dynamic stop

003E Magnet pole pos detect err

Details The magnetic pole position, detected in the magnetic pole position detection control, is not correctly detected.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0041 Feedback error 3

Details Either a missed feedback pulse in the motor side detector or an error in the Z-phase was detected in the full closed loop system.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0042 Feedback error 1

Details 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.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0043 Feedback error 2

Details An excessive difference in feedback was detected between the machine side detector and the motor side detector.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0045 Fan stop

Details An overheat of the power module was detected during the cooling fan stopping.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0046 Motor overheat

Details Either the motor or the motor side detector detected an overheat.
Or, the thermistor signal receiving circuit of the linear motor or DD motor was disconnected.
Or, the thermistor signal receiving circuit was short-circuited.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

0048 Motor side dtc: Error 5

Details An error was detected by the detector connected to the main side.
The error details are different according to the connected detector.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- MDS-B-HR() Scale not connected
- AT343, AT543, AT545(Mitsutoyo) CPU error
- LC193M, LC493M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) CPU error
- MPRZ Series(MHI) Absolute value detection fault
- SAM/SVAM/GAM/LAM Series (FAGOR) CPU error

[Detector alarm (Spindle drive unit)]
- MDS-B-HR() Connection error
- EIB Series(HEIDENHAIN) CPU error

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

0049 Motor side dtc: Error 6

Details An error was detected by the detector connected to the main side.
The error details are different according to the connected detector.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- AT343, AT543, AT545(Mitsutoyo) Photoelectric type overspeed
- LC193M, LC493M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Overspeed
- SR75, SR85, SR77, SR87, RU77(Magnescale) Over speed

[Detector alarm (Spindle drive unit)]
- TS5690, TS5691(MITSUBISHI) Overspeed
- EIB Series(HEIDENHAIN) Overspeed

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

004A Motor side dtc: Error 7

Details An error was detected by the detector connected to the main side.
The error details are different according to the connected detector.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- AT343, AT543, AT545(Mitsutoyo) Static capacity type error
- LC193M, LC493M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Absolute position data error
- MPRZ Series(MHI) Gain fault
- SR75, SR85, SR77, SR87, RU77(Magnescale) Absolute position data error

[Detector alarm (Spindle drive unit)]
- MPCI scale(MHI) Gain fault

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

004B Motor side dtc: Error 8

Details An error was detected by the detector connected to the main side.
The error details are different according to the connected detector.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

[Detector alarm (Servo drive unit)]
- AT343, AT543, AT545(Mitsutoyo) Photoelectric type error
- LC193M, LC493M, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Relative position data error
- MPRZ Series(MHI) Phase fault
- SR75, SR85, SR77, SR87, RU77(Magnescale) Relative position data error

[Detector alarm (Spindle drive unit)]
- TS5690, TS5691(MITSUBISHI) Relative position data error
- EIB Series(HEIDENHAIN) Relative position data error
- MPCI scale(MHI) Phase fault

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

004C Current err mag pole estim

Details Current detection failed at the initial magnetic pole estimation.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

004D Dual signal error

Details An error was detected in the signal related to the dual signal.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

004E NC command mode error

Details An error was detected in the control mode send from the NC.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

004F Instantaneous power interrupt

Details The control power supply has been shut down for 50ms or more.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

0050 Overload 1

Details Overload detection level became 100% or more. The motor or the drive unit is overloaded.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

0051 Overload 2

Details 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.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

0052 Excessive error 1

Details A position tracking error during servo ON was excessive.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

0053 Excessive error 2

Details A position tracking error during servo OFF was excessive.
- Servo stop method: Dynamic stop

0054 Excessive error 3

Details There was no motor current feedback when the alarm "Excessive error 1" was detected.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0056 Commanded speed error

Details In the C-axis control mode, excessive speed error was detected.
- Spindle stop method: Deceleration stop enabled

0058 Collision detection 1: G0

Details A disturbance torque exceeded the allowable value in rapid traverse modal (G0).
- Servo stop method: Maximum capacity deceleration stop

0059 Collision detection 1: G1

Details A disturbance torque exceeded the allowable value in the cutting feed modal (G1).
- Servo stop method: Maximum capacity deceleration stop

005A Collision detection 2

Details A current command with the maximum drive unit current value was detected.
- Servo stop method: Maximum capacity deceleration stop

005B Safely limited: Cmd spd err

Details A commanded speed exceeding the safely limited speed was detected in the safely limited mode.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

005D Safely limited: Door stat err

Details 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.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

005E Safely limited: FB speed err

Details A motor speed exceeding the safely limited speed was detected in the safely limited mode.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

005F External contactor error

Details A contact of the external contactor is welding.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

0080 Motor side dtc: cable err

Details The cable type of the motor side detector cable is for rectangular wave signal.
- Servo stop method: Initial error

0081 Machine side dtc: cable err

Details The cable type of the machine side detector cable does not coincide with the detector type which is set by the parameter.
- Servo stop method: Initial error

0087 Drive unit communication error

Details The communication frame between drive units was aborted.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

0088 Watchdog

Details The drive unit does not operate correctly.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

008A Drivers commu data error 1

Details The communication data 1 between drivers exceeded the tolerable value in the communication between drive units.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

008B Drivers commu data error 2

Details The communication data 2 between drivers exceeded the tolerable value in the communication between drive units.
- Servo stop method: Dynamic stop
- Spindle stop method: Coast to a stop

Power supply alarms

0061 Pw sply: Pwr module overcurnt

Details Overcurrent protection function in the power module has started its operation.

0062 Pw sply: Frequency error

Details The input power supply frequency increased above the specification range.

0066 Pw sply: Process error

Details An error occurred in the process cycle.

0067 Pw sply: Phase interruption

Details An open-phase condition was detected in input power supply circuit.

0068 Pw sply: Watchdog

Details The system does not operate correctly.

0069 Pw sply: Grounding

Details The motor power cable is in contact with FG (Frame Ground).

006A Pw sply: Ext contactor weld

Details A contact of the external contactor is welding.

006B Pw sply: Rush circuit error

Details An error was detected in the rush circuit.

006C Pw sply: Main circuit error

Details An error was detected in charging operation of the main circuit capacitor.

006D Pw sply: Parameter error

Details An error was detected in the parameter sent from the drive unit.

006E Pw sply: H/W error

Details An error was detected in the internal memory.
An error was detected in the A/D converter.
An error was detected in the unit identification.

006F Power supply error

Details No power supply is connected to the drive unit, or a communication error was detected.

0070 Pw sply: External EMG stop err

Details A mismatch of the external emergency stop input and NC emergency stop input continued for 30 seconds.

0071 Pw sply: Instant pwr interrupt

Details The power was momentarily interrupted.

0072 Pw sply: Fan stop

Details A cooling fan built in the power supply unit stopped, and overheat occurred in the power module.

0073 Pw sply: Over regeneration

Details 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.

0074 Pw sply: Option unit error

Details An alarm was detected in the power backup unit (power supply option unit).
Check the LED display on the power backup unit to identify what alarm is occurring to the unit. Refer to the instruction manual of your drive unit for details.

0075 Pw sply: Overvoltage

Details 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.

0076 Pw sply: Function setting err

Details The rotary switch setting of external emergency stop is not correct, or a wrong external emergency stop signal is input.
Undefined number was selected for the rotary switch setting of the power supply.

0077 Pw sply: Power module overheat

Details Thermal protection function in the power module has started its operation.

3.2 Initial Parameter Errors (S02)

S02 Initial parameter error:PR 2201-2456 (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.
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.

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 FUNC ALM

Details The STO signal has been input through the CN8 connector.

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

3.4 Parameter Errors (S51)

S51 Parameter error 2201-2456 (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.
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.

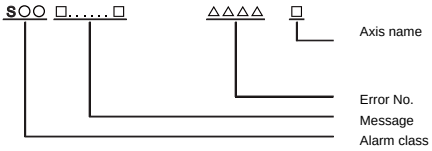
S51 Parameter error 13001-13256 (Axis name)

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

Error No. consists of four digits (0096 to). Servo warnings are explained in ascending order of the error No. The four digits on the left part of each warning indicate the error No.

(Note) For the details of servo warnings, refer to your drive unit's instruction manual.

Drive unit warnings

0096 Scale feedback error

Details An excessive difference in feedback amount was detected between the main side detector and the MPI scale in MPI scale absolute position detection system.
- Reset method: Automatically reset once the cause of the warning is removed.

0097 Scale offset error

Details An error was detected in the offset data that is read at the NC power-ON in MPI scale absolute position detection system.

009B Detec cnv: Mag pole shift warn

Details 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.
- Reset method: Automatically reset once the cause of the warning is removed.

009E Abs pos dtc: Rev count error

Details An error was detected in the revolution counter data of the absolute position detector. The accuracy of absolute position is not guaranteed.
- Reset method: Automatically reset once the cause of the warning is removed.

009F Battery voltage drop

Details The battery voltage to be supplied to the absolute position detector is dropping.

00A3 In initial setup of ABS posn.

Details 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.
This warning is detected during the initial setup of MBA405W. This warning turns OFF after the initial setup is completed by having the axis pass the Z-phase of MBA405W and turning the NC power ON again.
- Reset method: Automatically reset once the cause of the warning is removed.

00A4 Dual signal warning

Details An input was detected in the signal related to the dual signal.
- Reset method: Automatically reset once the cause of the warning is removed.

00A6 Fan stop warning

Details A cooling fan in the drive unit stopped.
- Reset method: Automatically reset once the cause of the warning is removed.

00E0 Over regeneration warning

Details Over-regeneration detection level exceeded 80%.
- Reset method: Automatically reset once the cause of the warning is removed.

00E1 Overload warning

Details A level of 80% of the Overload 1 alarm state was detected.
- Reset method: Automatically reset once the cause of the warning is removed.

00E4 Set parameter warning

Details An incorrect set value was detected among the parameters send from the NC in the normal operation.
- Reset method: Automatically reset once the cause of the warning is removed.

00E6 Control axis detach warning

Details A control axis is being detached. (State display)
- Reset method: Automatically reset once the cause of the warning is removed.

00E7 In NC emergency stop state

Details In NC emergency stop. (State display)
- Stop method: Deceleration stop enabled
- Reset method: Automatically reset once the cause of the warning is removed.

00E8-00EF Power supply warning

Details The power supply unit detected a warning. The error details are different according to the connected power supply unit.
Refer to "Power supply warning".
- Stop method: - (EA: Deceleration stop enabled)
- Reset method: Automatically reset once the cause of the warning is removed.

Power supply warnings

00E9 Instant pwr interrupt warning

Details The power was momentarily interrupted.

00EA In external EMG stop state

Details External emergency stop signal was input.
- Reset method: Automatically reset once the cause of the warning is removed.

00EB Pw sply: Over regenerat warn

Details Over-regeneration detection level exceeded 80%.
- Reset method: Automatically reset once the cause of the warning is removed.

00EE Pw sply: Fan stop warning

Details A cooling fan built in the power supply unit stopped.
- Reset method: Automatically reset once the cause of the warning is removed.

00EF Pw sply: Option unit warning

Details A warning is detected in the power backup unit (power supply option unit).
Check the LED display on the power backup unit to identify what alarm is occurring to the unit.
Refer to the using drive unit instruction manual for details.

3.6 Safety Function Warnings (S53)

S53 SAFETY FUNC WRG

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)

Axis names are expressed with a letter in the following manner:
- NC axis: axis name defined by the parameter
- Spindle: "S" = the 1st spindle, "T" = the 2nd spindle, "M" = the 3rd spindle, "N" = the 4th spindle, "P" = the 5th spindle, "Q" = the 6th spindle, "R" = the 7th spindle
- PLC axis: "1" = the 1st PLC axis, "2" = the 2nd PLC axis, "3" = the 3rd PLC axis, and so on.

(Note 1) "Y02" alarms are displayed as "Y02 System alarm" with the error number. Error number is the four digit number displayed after error name (start from 0050). "Y02" alarms are listed in ascending order in this manual.

(Note 2) "Y51" warnings are displayed as "Y51 Parameter error" with the error number. Error number is the four digit number displayed displayed after error name (start from 0001). "Y51" warnings are listed in ascending order in this manual.

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 1) When two or more "Y02 System alarms" occur at the same time, only the alarm which has occurred first is displayed.
(Note 2) Station No. always shows "0" in the alarm details, because C70 has only one communication channel.

Y02 SV commu er: CRC error 1 0051 0000

Details A communication error has occurred between controller and drive unit.

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 "Y02 System alarms" occur at the same time, only the alarm which has occurred first is displayed.

Y02 SV commu er: CRC error 2 0051 0001

Details A communication error has occurred between controller and drive unit.

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 "Y02 System alarms" occur at the same time, only the alarm which has occurred first is displayed.

Y02 SV commu er: Recv timing err 0051 0002

Details A communication error has occurred between controller and drive unit.

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 "Y02 System alarms" occur at the same time, only the alarm which has occurred first is displayed.

Y02 Servo communication error: Data ID error 0051 0x03

Details A communication error has occurred between CNC and drive unit.
The axis ID transferred from the drive unit has changed after initial communication.
x: Drive unit rotary switch No. (0 or later)

Remedy
- Take measures against noise.

(Note 1) When two or more "Y02 System alarms 0051" alarms occur at the same time, only the alarm which occurs first is displayed. Therefore, the display precedence will be as follows: 0006, 0x04, 0005, 0x20, then 0x03.
(Note 2) Station No. always shows "0" in the alarm details, because C70 has only one communication channel.
(Note 3) If the error is not cleared with the measures above, the drive unit may have a fault. Take a note of the 7-segment LED contents of each drive unit and contact service center.

Y02 Servo communication error : Number of received frames 0051 0x04

Details A communication error has occurred between CNC and drive unit.
The number of received frames was inconsistent in four consecutive communication cycles.
x: The number of received frames subtracted by one (0 or later)

Remedy
- Check for any duplication of rotary switch settings on drive units connected with other drive units.
- Confirm that the number of axes does not exceed the number designated by CNC.
- Check for any failure of the communication cable connectors.
- Check for any failure of the communication cables.
- Take measures against noise.

(Note 1) When two or more "Y02 System alarms 0051" alarms occur at the same time, only the alarm which occurs first is displayed. Therefore, the display precedence will be as follows: 0006, 0x04, 0005, 0x20, then 0x03.
(Note 2) Station No. always shows "0" in the alarm details, because C70 has only one communication channel.
(Note 3) If the error is not cleared with the measures above, the drive unit may have a fault. Take a note of the 7-segment LED contents of each drive unit and contact service center.

Y02 SV commu er: Commu error 0051 0005

Details A communication error has occurred between controller and drive unit.
Non-specified communication errors occurred in four consecutive communication cycles.

Remedy
- Check for any failure of the communication cable connectors.
- Check for any failure of the communication cables.
- Take measures against noise.

(Note 1) When two or more "Y02 System alarms 0051" alarms occur at the same time, only the alarm which occurs first is displayed. Therefore, the display precedence will be as follows: 0006, 0x04, 0005, 0x20, then 0x03.
(Note 2) Station No. always shows "0" in the alarm details, because C70 has only one communication channel.
(Note 3) If the error is not cleared with the measures above, the drive unit may have a fault. Take a note of the 7-segment LED contents of each drive unit and contact service center.

Y02 Servo communication error : Connect error 0051 0006

Details A communication error has occurred between CNC and drive unit.
CRC errors, overrun errors or short frame errors occurred in four consecutive communication cycles.
Otherwise, 250 bytes of "0"/"1" data was received.

Remedy
- Confirm that the rotary switch setting on the drive unit connected with CNC does not duplicate with any other.
- Confirm that the number of axes does not exceed the number designated by CNC.
- Check for any failure of the communication cable connectors.
- Check for any failure of the communication cables.
- Take measures against noise.

(Note 1) When two or more "Y02 System alarms 0051" alarms occur at the same time, only the alarm which occurs first is displayed. Therefore, the display precedence will be as follows: 0006, 0x04, 0005, 0x20, then 0x03.
(Note 2) Station No. always shows "0" in the alarm details, because C70 has only one communication channel.
(Note 3) If the error is not cleared with the measures above, the drive unit may have a fault. Take a note of the 7-segment LED contents of each drive unit and contact service center.

Y02 Control axis No. error: Connection error 0051 0x07

Details A communication error has occurred between CNC and drive unit.
x: Drive unit rotary switch No. (0 or later)

Remedy
- Take measures against noise.
- Check for any failure of the communication cable connectors.
- Check for any failure of the communication cables.
- The drive unit may have a fault. Take a note of the 7-segment LED contents of each drive unit and contact service center.
- Update the drive unit software version.

(Note 1) When two or more "Y02 System alarms 0051" alarms occur at the same time, only the alarm which occurs first is displayed. Therefore, the display precedence will be as follows: 0006, 0x04, 0005, 0x20, then 0x03.
(Note 2) Station No. always shows "0" in the alarm details, because C70 has only one communication channel.
(Note 3) If the error is not cleared with the measures above, the drive unit may have a fault. Take a note of the 7-segment LED contents of each drive unit and contact service center.

Y02 Servo communication error : Initial communication error 0051 0x20

Details A communication error has occurred between CNC and drive unit.
A drive unit stopped due to transition failure from initial communication to runtime.
x: Drive unit rotary switch No. (0 or later)

Remedy
- Confirm that "the spindle drive unit rotary switch No. + 1" does not duplicate with the lower two digits in "#1021 mcp_no (Drive unit I/F channel No. (servo)".
- Confirm that "the servo drive unit rotary switch No. + 1" does not duplicate with the lower two digits in "#3031 smcp_no (Drive unit I/F channel No. (spindle)".

(Note 1) When two or more "Y02 System alarms 0051" alarms occur at the same time, only the alarm which occurs first is displayed. Therefore, the display precedence will be as follows: 0006, 0x04, 0005, 0x20, then 0x03.
(Note 2) Station No. always shows "0" in the alarm details, because C70 has only one communication channel.
(Note 3) If the error is not cleared with the measures above, the drive unit may have a fault. Take a note of the 7-segment LED contents of each drive unit and contact service center.

Y02 SV commu er: Node detect error 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 "Y02 System alarms" 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 "Y02 System alarms" occur at the same time, only the alarm which has occurred first is displayed.

Y02 System alarm 0052 0001

Details Transfer to buffer is not properly done in servo communication.

Remedy
Software/ hardware may have a fault.
Contact service center.
(Note 1) When two or more "Y02 System alarms 0051" alarms occur at the same time, only the alarm which occurs first is displayed. Therefore, the display precedence will be as follows: 0006, 0x04, 0005, 0x20, then 0x03.
(Note 2) Station No. always shows "0" in the alarm details, because C70 has only one communication channel.
(Note 3) If the error is not cleared with the measures above, the drive unit may have a fault. Take a note of the 7-segment LED contents of each drive unit and contact service center.

Y03 Amp. Unequipped (Axis name)

Details The drive unit is not correctly connected.
Alphabet (axis name): Servo axis drive unit not mounted
1 to 8: 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
P: No.5 spindle drive unit not mounted
Q: No.6 spindle drive unit not mounted
R: No.7 spindle drive unit not mounted

Remedy
Check the drive unit mounting state.
- Check the end of the cable wiring.
- Check the cable for broken wires.
- Check the connector insertion.
- The drive unit input power has not been ON.
- The drive unit axis No. switch is illegal.
- Turn down the DIP switch on the drive unit of the axis corresponding to the error No. (axis name).
- Check for any duplication of rotary switch settings on a drive unit. The LED will indicate "11" if the drive unit has duplicate setting.
- Correct the "#1002 axisno (Number of axes)" and "#1039 spinno (Number of spindles)" settings.
- Before setup debugging, confirm that the "#2018 no_srv (Operation with no servo control)" is set to "1" and "#3024 sout (Spindle connection)" is set to "0" for any axis to which the drive unit is not connected. (Note that the normal setting is "0" in "#2018 no_srv" and "1" in "#3024 sout".)

(Note 1) This alarm is displayed for each part system. Therefore, the error No. is not displayed unless the alarm occurs in the displayed part system.
(Note 2) When the alarm occurs on a servo axis, the error No. indicates the axis name set in "#1013 axname (Axis name)". When the alarm occurs on a PLC axis or the spindle, the error No. display is fixed by the order of CNC control axes.

Y05 Initial parameter error 5 0

Details There is a problem in the value set for the parameter.

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)"

Y05 Initial parameter error 2187 0

Details There is a problem in the value set for the parameter.

Remedy Correct the value set for parameter "#2187 chgPLCax (PLC axis switchover axis No.)".

Y05 Initial parameter error 12800 0

Details There is a problem in the value set for the parameter.

Remedy Correct the value set for parameter "#12800 chgauxno (Auxiliary axis number)".

Y05 Initial parameter error 22014 (sub-number)

Details There is a problem, whose details are indicated by the sub-number, in the value set for the parameter.
[sub-numbers]
0001: A value other than "0" is set for the parameter #22014 when multi-secondary-axis synchronous control option is not available.
0002: More than 3 groups of axes are designated for synchronous control and multi-secondary-axis synchronous control combined.
0003: The axis designated as a secondary axis for multi-secondary-axis synchronous control is also designated as an axis for synchronous control.
0004: The axis designated as the primary axis for multi-secondary-axis synchronous control is also being designated as an axis for synchronous control.
0005: An axis that is used in more than one part systems is being designated as the primary axis.
0006: An axis that is designated as a secondary axis is also being designated as the primary axis.

Remedy Correct the values set for "#1068 slavno (Secondary axis number)" and/or "#22014 Mastno (Multi-secondary-axis sync primary axis number)".

Y06 mcp_no setting error

Details
- MCP Nos. of the servo/spindle drive units are not continuous.
- There is a duplicate setting.
- Axis No. is out of the setting range.
- Channel No. is out of 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))"

(Note 1) "#1021 mcp_no (Drive unit I/F channel No. (servo))" and "#3031 smcp_no (Drive unit I/F channel No. (spindle))" must be continuous.
(Note 2) This alarm is displayed taking precedence over the alarms "Y02 System alarm", "Y07 Too many axes connected" and "Y09 Too many axisno connected".
(Note 3) Also for the spindle whose parameter "#3024 sout Spindle connection" is set to "0", set the MCP No. to "#3031 smcp_no Drive unit I/F channel No. (spindle)". (C70 S/W Ver.D3 or later)

Y07 Too many axes connected 000x

Details The number of axes connected to each channel has exceeded 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 1 (0 to F)

Remedy
- Correct the "#3024 sout (Spindle connection)" setting for the spindle to which the drive unit is connected.
- Turn up the DIP switch for any unused axis in the multi-axes drive unit.
- Correct the "#1002 axisno (Number of axes)" and "#1039 spinno (Number of spindles)" settings.
- For the channel(s) with an alarm number other than "0", disconnect the connected axes as many as shown in the alarm No. so that the number of connected axes will not exceed the maximum number of connectable axes.

(Note 1) This alarm occurs when the number of the connected axes exceeded the maximum number of the connectable axes assumed in the system.
(Note 2) This alarm indicates a communication timeout state of drive unit (with "AA" in the drive unit LED display) as the initial communication is not executed.
(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 "Y02 System alarm" and "Y09 Too many axisno connected".

Y09 Too many axisno connected Exceeded number of axes 000x

Details The No. of the axis (drive unit's rotary switch No.) connected to each channel is bigger than the maximum number of connectable axes.
x: "1" when the axis number at drive unit interface channel 1 is too big

Remedy For the channel whose alarm number is "1", change the axis number (drive unit's rotary switch number) to a number within the limit of the maximum number of connectable axes.
Be sure to turn down the rightmost DIP switch on each drive unit.
(Note 1) This alarm occurs when the number of the connected axes exceeded the maximum number of the connectable axes assumed in the system.
(Note 2) If this alarm occurs, drive unit indicates a communication timeout (with "AA" in the LED display) as the initial communication is not executed.
(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 "Y02 System alarm".

Y11 Node Detect Err 8002-8300 0x00

Details Drive unit does not respond to the request from CNC when the CNC is turned ON.
Error No. shows the No. of communication phase at which the response stopped.
x: Station No. with the error (0 or later)

Remedy The communication error may be caused by the drive unit software version that does not correspond to the CNC software version. Check the drive unit software version.
This alarm is canceled after the CNC restarts.
When the alarm is not canceled, write down the alarm No. and the software version of each drive unit, then contact service center.

Y14 VIR.AX AMP EQU. (Axis name)

Details A drive unit is connected to a hypothetical axis (with "1" in "#2116 v_axis (Hypothetical axis)").

Remedy
- Disconnect the drive unit from the hypothetical axis.
- Correct the "#1021 mcp_no (Drive unit I/F channel No. (servo))" and servo drive unit rotary switch settings.

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 Parameter skip_tL illegal 0015

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

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

Y51 Parameter skip_t1 illegal 0016

Details The time constant has not been set or 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 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 tleng (Linear axis stroke length)".

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 Parameter Error 0201

Details Hypothetical axis control parameter setting is incorrect.

Remedy - Correct the following parameter settings:
"#1017 rot (Rotational axis)",
"#2116 v_axis (Hypothetical axis)",
"#2117 V_axno (Hypothetical axis No.)",
"#12015 v_dist (Hypothetical axis tool length)"

Y51 Spindle/C axis unit illegal 0202

Details The setting units of the spindle and C axis are different.

Remedy Match the spindle unit ("#3035 spunit") and C axis part system unit("#1003 iunit").

5. Safety Observation Alarms (Y)

Axis names are expressed with a letter in the following manner:
- NC axis: axis name defined by the parameter
- Spindle: "S" = the 1st spindle, "T" = the 2nd spindle, "M" = the 3rd spindle, "N" = the 4th spindle, "P" = the 5th spindle, "Q" = the 6th spindle, "R" = the 7th spindle
- PLC axis: "1" = the 1st PLC axis, "2" = the 2nd PLC axis, "3" = the 3rd PLC axis, and so on.

5.1 Safety Observation Alarms

(Note 1) "Y20" alarms are displayed as "Y20 Safety observation alarm" with an error number. Error numbers are the four digit numbers displayed after the error names (start from 0001). "Y20" alarms are listed in ascending order in this manual.

"(Note 2) When more than one safety observation alarms (Y20) are occurring, the alarm detected the earliest is displayed. When more than one safety observation alarms are detected in the same observation cycle, alarm display follows the below priority order:
0046, 0047, 0036, 0027, 0028, 0029, 0024, 0025, 0022, 0023, 0021, 0030, 0031, 0032, 0033, 0034, 0035, 0037, 0048, 0049, 0050, 0051, 0020, 0026, 0008, 0014, 0009, 0001, 0007, 0002, 0005, 0006, 0004, 0003, 0016, 0015, 0012, 0013"

"(Note 3) Although releasing most PR alarms requires rebooting the NC, some safety observation alarms (PR) (Note 4) can be released by pressing the reset button with having the X device designated by the parameter ""#1368(PR) SfAlmRstD"" ON.
However, merely implementing the reset procedure, without having the cause of the alarm occurrence being removed, wouldn't release safety observation alarms."

(Note 4) Alarms 0002, 0004, 0005, 0006, 0015, and 0016 can be released by pressing the reset button. Upon completion of releasing a safety observation alarm by pressing the reset button, the alarm of the highest priority of the remaining will be displayed.

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 No.

Details Contactor welding was detected.
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.
The contactor showing unusual move will be indicated as a bit.
bit0 : MC_dp1
bit1 : MC_dp2

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.

Y20 No spec: Safety observation 0009

Details "#2313 SV113 SSF8/bitF (Servo function selection 8)", "#13229 SP229 SFNC9/bitF (Spindle function 9)" and "#21125 SSU_num (Number of dual signal modules)" are set for a system with no safety observation option.

Remedy Disable "#2313 SV113 SSF8/bitF (Servo function selection 8)" and "#13229 SP229 SFNC9/bitF (Spindle function 9)".
Set "#21125 SSU_num (Number of dual signal modules)" to "0". Restart the NC.

Y20 Safety OBS ERR 0012 (Contactor data)

Details Contactor's operation is not following the NC's commands.
The contactor showing unusual move will be indicated as a bit.
bit0 : MC_dp1
bit1 : MC_dp2
(Example 1) Operation error only in MC_dp1 : 0001
(Example 2) Operation error in both MC_dp1 and MC_dp2 : 0003

Remedy
- Check if the contactor's auxiliary b contact signal is correctly output to the device set in "#1330 MC_dp1" and "#1331 MC_dp2".
- Check the wiring for contactor shutoff.
- Check for contactor's welding.
- Turn the controller ON again.

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 commanded position error 0015

Details The stop state of commanded position was released state during the stop monitoring.

Remedy Check the stop monitoring parameter and user sequence.
Turn the power of controller ON again.

Y20 FB pos error 0016

Details The stop state of feedback position was released during the stop monitoring.

Remedy Check the stop monitoring parameter and user sequence.
Turn the power of controller ON again.

Y20 Dual signal: compare error 0020 (Device No.)

Details The dual signals are not matched between PLC CPU and CNC CPU.
The following factors may cause the error.
- Cable is disconnected.
- Sensor is broken.

Alarm No. shows the device No. which has the error. ("0024" indicates the device No. X24.)
When two or more signals are detected for errors, the No. shows the first detected signal.

Remedy Check the wiring.

Y20 Dual signal: comparison ladder transfer error 0021 (Data transfer error code)

Details The request to transfer data from CNC CPU to PLC CPU was not successfully processed.
<Data transfer error code>
4029, 41CF: The user ladder area does not have enough capacity for dual-signal comparison ladder to be written in.
4031: Incorrect device size has been set in PC parameter.
413A: There is a possibility that the different version of dual-signal comparison sequence (SSU_CMP) or partly changed or deleted SSU_CMP was written in the PLC CPU.

Remedy <Data transfer error code>
4029, 41CF: Check whether the user ladder area has enough capacity. If the area does not enough capacity, decrease the number of steps in the user ladder and then restart the NC.
4031: Make sure that no change has been made to the device allocation settings of PC parameter.
Correct the PC parameter and then restart the NC.
Other than above: Contact the service center.
413A: Restart the NC. When SSU_CMP is stored by GX Works2 / GX Developer, reread it from the CNC CPU.

Y20 Dual signal: comparison ladder transfer timeout 0022 (Data request code)

Details A timeout error occurred at the data transfer request from CNC CPU to PLC CPU.
This error may occur when a file is being accessed by other devices such as GX Works2 / GX Developer and GOT.

Remedy Disconnect the access by other devices and restart the NC.

Y20 Dual signal: comparison ladder compare error 0023

Details The dual-signal comparison ladder written in PLC CPU is not matched with that in CNC CPU.
A fault of PLC CPU or CNC CPU may cause the error.

Remedy Contact the service center.

Y20 Dual signal: comparison stop (on PLC) 0024

Details Dual-signal comparison stopped on PLC CPU.
The following factor may cause the error.
"SSU_CMP" is not entered in the [PLC parameter] - [Program] settings.

Remedy Correct the settings of PC parameter.

Y20 Dual signal: comparison stop (on NC) 0025

Details Dual-signal comparison stopped on CNC CPU.

Remedy Contact the service center.

Y20 Dual signal: output/FB compare error 0026 (Device No.)

Details The output signal from dual signal module is not matched with the feedback signal.
The following factor may cause the error.
- The dual signal module is not supplied with 24VDC.

(Ex.) When a compare error is detected in Y24/X24 signal, 0024 will be displayed.
When more than one signal are detected, the smallest No. will be dispalyed.

Remedy Supply 24VDC to the dual signal module.
Make sure that the dual signal output is successfully done, and then restart the NC.
If the error is not cleared by these measures, the dual signal module may have a fault.
Replace the module.

Y20 Dual signal: parameter setting error 0027

Details The parameter settings are incorrect.
Parameters to check:
"#21125 SSU_num (Number of dual signal modules)"
"#21143 SSU_Dev1 (Dual signal module device1)" to "#21145 SSU_dev3 (Dual signal module device3)"
"#2180(PR) S_DIN Speed observation input door No."
"#3140(PR) S_DINSp Speed observation input door No."

Remedy Correct the parameter settings.

Y20 Dual signal: parameter compare error 0028

Details Parameters have not been successfully transferred from CNC CPU to PLC CPU.
Parameters to check:
"#21125 SSU_num (Number of dual signal modules)"
"#21142 SSU_delay (Dual-signal comparison tolerance time)"
"#21143 SSU_Dev1 (Dual signal module device1)" to "#21145 SSU_dev3 (Dual signal module device3)"

Remedy Contact the service center.

Y20 Dual signal: comparison ladder read error 0029

Details The controller, when turned ON, cannot read the dual-signal comparison ladder correctly from the FROM of CNC CPU.

Remedy Contact the service center.

Y20 Safety observation: module mount error 0030 (Unconfirmed module to be mounted)

Details Some of the dual signal modules in the parameter "#21125 SSU_num (Number of dual signal modules)" are not confirmed to be mounted.
Alarm No. shows the unconfirmed module to be mounted at the bit-level.
("0006" indicates the module No.2 and 3.)

Remedy Make sure that the dual signal modules entered in the parameter are all mounted.
Make sure that the remote I/O cable is connected.
Check for any overlapped station No. set with rotary switch of dual signal module.

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

Details - The parameters related to the safety observation function are not consistent with the check data, due to destruction of memory or other reason.
- Any value is set to #2448, #2449, #13248, or #13249 when "#21162(PR) mulstepssc Multi-step speed monitor enabled" is "1".

Remedy - Correct the parameter settings.
- When any value is set to #2448, #2449, #13248,
or #13249 when "#21162(PR) mulstepssc Multi-step speed monitor enabled"
is "1", set "0" to these parameters.
(Note) If the NC system is updated from the one older than Ver. C4 to the one equal or newer than Ver. C4, the error may occur. The error can be cleared by restarting the NC.

Y20 Safety observation: PLC CPU type error 0032

Details The PLC CPU type of the 1st module doesn't support the safety observation function.

Remedy Check the PLC CPU type.
Contact the service center.

Y20 Dual-signal comparison sequence error (NC side) 0033

Details NC side's dual-signal comparison sequence data is overwritten.

Remedy Rewrite the NC side's dual-signal comparison sequence.

Y20 Dual signal PC parameter illegal 0034 xxyy

Details PC parameter settings which were written to in the PLC CPU is illegal.

Remedy Refer to the following error indication "xxyy" to correct the setting.

- xx = 01
There is a contradiction between the setting of the dual signal module's head XY devices in I/O assignment setting and NC parameters "#21143 SSU_Dev1" - "#21145 SSU_Dev3".
Check the dual signal module's position, then make the same setting for PC parameters and NC parameters.
"yy" shows the module No. (yy=01 to 03)

- xx = 02
In I/O assignment's detail settings, output mode of the dual signal module at error is set to "Hold".
Set the output mode to "Clear".
"yy" shows the module No. (yy=01 to 03)

- xx = 03
The number of device points in device settings is illegal.
Correct the number of device points.
"yy" shows the No. corresponding to the device.
The correspondence between Nos. and devices is as follows:
00: M
02: L
03: F
04: V
10: B
11: SB
18: D
24: W
25: SW
32: T
35: C
38: ST

- xx = 04
High-speed timer limit is set to other than "10.00".
Set the high-speed timer limit to "10.00".

Y20 Safety observation PC parameter get error 0035

Details PLC CPU's PC parameters couldn't be got.

Remedy Check if the PC parameters are correctly written in the PLC CPU.
Contact service center.

Y20 Safety observation parameter setting lock password data error 0036

Details The password that is used to lock the safety observation parameter setting is incorrect.

Remedy Read the password data in text format, then set the
data in "#21150 Safety_key (Safety observation parameter password-lock cancel key)".

Y20 Safety observation device information setting parameter error 0037

Details The setting values of the safety device mounting information 1 to 4 (#21151, #21152, #21157, #21158) do not coincide with the safety device mounting information check 1 to 4 (#21153, #21154, #21159, #21160).

Remedy
Correct the following parameter settings.
- #21151 SC_EQP_1 Safety device mounting information 1
- #21152 SC_EQP_2 Safety device mounting information 2
- #21157 SC_EQP_3 Safety device mounting information 3
- #21158 SC_EQP_4 Safety device mounting information 4
- #21153 SC_EQP_CHK1 Safety device mounting information check 1
- #21154 SC_EQP_CHK2 Safety device mounting information check 2
- #21159 SC_EQP_CHK3 Safety device mounting information check 3
- #21160 SC_EQP_CHK4 Safety device mounting information check 4

Y20 Safety observation device memory check error (PLC side) 0046

Details An error was detected during device memory check of the PLC.

Remedy
Confirm that the devices used by the dual-signal comparison sequence are not written in the interruption program.
The PLC CPU may be broken.
Contact service center.

Y20 Safety observation device memory check error (NC side) 0047

Details An error was detected during device memory check of the NC.

Remedy
The NC CPU may be broken.
Contact service center.

Y20 Dual signal output check error at power ON (PLC side) 0048 (Device No.)

Details The output signal's ON/OFF check of the dual signal module didn't finish normally.

Remedy
The PLC side output transistor may be broken.
The output pin may be connected to 24VDC. Check the wiring of the device to which the error occurred.
The No. of the error module is displayed. Replace the dual signal module.

Y20 Dual signal output check error at power ON (NC side) 0049 (Device No.)

Details The output signal's ON/OFF check of the dual signal module didn't finish normally.

Remedy
The NC side output transistor may be broken.
The output pin may be connected to 24VDC. Check the wiring of the device to which the error occurred.
The No. of the error module is displayed. Replace the dual signal module.

Y20 Output OFF check error (PLC side) 0050 (Unit No.)

Details Although the output OFF check function turned OFF the dual signal module's output signals, there is a feedback input signal which is staying ON.

Remedy
The PLC side output transistor may be broken. The No. of the error module is displayed.
Replace the dual signal module.
Carry out the output OFF check to confirm there is no problem.

Y20 Output OFF check error (NC side) 0051 (Unit No.)

Details Although the output OFF check function turned OFF the dual signal module's output signals, there is a feedback input signal which is staying ON.

Remedy
The NC side output transistor may be broken.
The No. of the error module is displayed.
Replace the dual signal module.
Carry out the output OFF check to confirm there is no problem.

5.2 Safety Observation Warnings

(Note 1) "Y21" warnings are displayed as "Y21 Safety observation warning" with an error number. Error numbers are the four digit numbers displayed displayed after error names (start from 0001). "Y21" warnings are listed in ascending order in this manual.

(Note 2) When parameter "#1225/bit5" is set to "1", "Y21 safety observation warning 0001" will not be recorded in the alarm history.

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.

Y21 Dual signal: State after error unconfirmed 0020 (Device No.)

Details
- A dual-signal comparison error was detected.
  Signal outputs from both PLC and CNC CPUs have not been confirmed since the power was turned ON again.

The No. of device from which the signal output has not been confirmed is displayed.
When several signals have not been confirmed, the smallest device No. will be displayed.

Remedy
- Remove the cause of the dual-signal comparison error, turn the controller OFF and ON, then turn the signal ON and OFF in the dual-signal comparison state.
- The dual signals with the error can be reset and canceled if not used.

Y21 Safety obsv warning 0040 (sub-number)

Details The brake test cannot be started because the condition to start the brake test is not met.
[Sub-number](factor of errors)
0001: In automatic operation
0002: Not in-position
0003: During servo OFF
0004: In current limit
0005: In synchronization control
0006: Brake test parameter error
0007: Zero point initialization incomplete
0008: In PLC axis control of NC/PLC axis switch
0009: Drive unit is not mounted
* If there are several factors, the sub-number will be shown from the smallest.

Remedy Check the conditions for starting the brake test.
Remove the factor of the warning and reclose the brake test signal, the brake test will be restarted and this warning will be released.
* The brake test will not be started with the brake test start signal ON, even if the cause of the warning is removed.

Y21 Safety obsv warning 0041 (Axis name)

Details The change amount of the motor feedback position exceeded the tolerable value during the brake test 1, and the brake test was not properly completed.

Remedy Turn OFF the power to remedy the brake with an error, then restart restart the brake test.
This warning will be released when the brake test is properly completed.
This warning can also be released by pressing the reset button with having the X device designated by the parameter "#1368 SscAlmRstDev" ON.

Y21 Safety obsv warning 0042 (Axis name)

Details The change amount of the motor feedback position exceeded the tolerable value during the brake test 2, and the brake test was not properly completed.

Remedy Turn OFF the power to remedy the brake with an error, then restart restart the brake test.
This warning will be released when the brake test is properly completed.
This warning can also be released by pressing the reset button with having the X device designated by the parameter "#1368 SscAlmRstDev" ON.

Y21 Safety obsv warning 0043 (Axis name)

Details The change amount of the motor feedback position exceeded the tolerable value during the brake test 3, and the brake test was not properly completed.

Remedy Turn OFF the power to remedy the brake with an error, then restart restart the brake test.
This warning will be released when the brake test is properly completed.
This warning can also be released by pressing the reset button with having the X device designated by the parameter "#1368 SscAlmRstDev" ON.

6. System Alarms (Z)

Z20 Power ON again

Details
- A parameter was set on the CNC monitor screen, which would become valid after turning the power ON again.
- A parameter was set which would become valid after turning the power ON again via EZ-Socket.
- Parameter data (ALL.PRM) was input.
- Backup data (SRAM.BIN) was input by SRAM backup function.
- Backup data and restore data were restored.
- A parameter was changed by G10 L70 command, which would become valid after turning the power ON again.
- "#1060 SETUP" was set to "1" and the standard parameters were set.

Remedy Turn the power ON again.

Z30 ETHERNET ERROR 1 000E

Details Socket open error
A communication error occurred when downloading a program during a program server operation.
000E displayed with an error No. indicates the communication type. (FTP communication type)

Remedy Check the Ethernet communication path.
Check the system on the server side.

Z30 ETHERNET ERROR 5 000E

Details Data receive error
A communication error occurred when downloading a program during a program server operation.
000E displayed with an error No. indicates the communication type. (FTP communication type)

Remedy Check the Ethernet communication path.
Check the system on the server side.

Z30 ETHERNET ERROR 6 000E

Details Data receive number error
A communication error occurred when downloading a program during a program server operation.
000E displayed with an error No. indicates the communication type. (FTP communication type)

Remedy Check the Ethernet communication path.
Check the system on the server side.

Z51 EEPROM ERROR

Details The data read from EEPROM does not coincide with the data that has been written into it.

Remedy - If the same alarm occurs with the same operation, a hardware fault may be the cause. 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]
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 "0" for the following parameter. Then the alarm will be invalidated.

PLC Parameter BIT SELECT #6449
bit7 : Control unit overheat detected
---setting values---
0: Detect
1: Not detect

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 alarm and the I/O unit No. is displayed when an error occurs in the communication between the control unit and remote I/O unit.
The remote I/O unit No. is displayed in eight digits. Two digits (in hexadecimal) are used for each board and part system.
[Display format of remote I/O unit No.]
Z55 RIO communication stop
$\overline{(a)}\ \overline{(b)}\ \overline{(c)}\ \overline{(d)}\overline{(e)}\ \overline{(f)}\ \overline{(g)}\ \overline{(h)}$
(a)(b): Remote I/O 2nd part system communication interrupted station
(c)(d): Remote I/O 1st part system communication interrupted station
(e)(f): Remote I/O 3rd part system communication interrupted station
(g)(h): Board connection remote I/O communication interrupted station
(a)(b) indicates the following station in hexadecimal.
bit0: RIO (0th station)
bit1: RIO (first station)
bit2: RIO (second station)
bit3: RIO (third station)
bit4: RIO (fourth station)
bit5: RIO (fifth station)
bit6: RIO (sixth station)
bit7: RIO (seventh station)
This also applies for the remote I/O 1st part system communication interrupted station, remote I/O 3rd part system communication interrupted station and board connection remote I/O communication interrupted station.

Remedy
- Check and replace the cables.
- Replace the remote I/O unit.
- Check the power supply (existence of supply and voltage).
- When not using the safety observation, set "1" in "#21102 add02/bit2 (RIO communication interruption alarm disabled)".

Z57 System warning 0100

Details The specified capacity cannot be allocated for the buffer memory used for program server operation.

Remedy A remedy like changing options setting is required. Contact the service center.
(Even this alarm occurs, other functions than program server operation can be used.)

Z57 System warning 0101

Details Emergency stop hot line can not be canceled.
The latch signal of the hot line cannot be canceled when releasing the emergency stop.
(Only when the emergency stop input is released for a short time before the gate off.)

Remedy An unevenness of the gate off time causes this error in the configuration with more than two power supply units. Set the gate off time evenly.
Contact the service center when this warning stays on.

Z59 Acc/dec time cnst too large

Details Acceleration and deceleration time constants are too large.
(This alarm is output at the same time as "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.

Z83 During spindle rotation NC ON 0001

Details NC has started while the spindle is being rotated.

Remedy
- Turn the power OFF to confirm that the spindle has stopped, and then turn it ON again.

Z89 APLC ERROR 0001

Details C language module is not adequately stored in NC in APLC release.

Remedy Resend the C language module.

Z89 APLC ERROR 0002

Details SRAM size exceeded 16KB in APLC release.

Remedy Make the SRAM size to 16KB or smaller.

Z89 APLC ERROR 0003

Details DRAM size exceeded 512KB in APLC release.

Remedy Downsize the DRAM to 512KB or smaller.

Z89 APLC ERROR 0004

Details APLC module does not include initialize function aplc_top, dramSizeCheck, sramSizeCheck, or setUserBaseMain.

Remedy Check if APLC module includes the above functions.

Z89 APLC ERROR 0005

Details The contents of APLC module in FROM is illegal and cannot be loaded.

Remedy Check the contents of APLC module.
* Check if it does not include an undefined function."

Z89 APLC ERROR 0006

Details APLC was activated during APLC invalid mode.

Remedy Change to APLC valid mode.

Z99 FILE AREA ERROR 0001

Details The edited data is destroyed probably because it was not properly updated and the backup operation did not complete normally.

Remedy Format the area again.

Z99 FILE AREA ERROR 0002 (month, date)

Details There was a high possibility that the edited data was not properly updated so that it was recovered using the backup data.
The machining program is not the newest.

Remedy Check the machining program you were editing, and edit it again if it is same as the one before being edited.
This alarm will be canceled by turning ON the edit data recovery signal after recovering work is completed.
"Emergency stop DATA" will be canceled by turning the controller ON again.
The data when the recovered data was backuped will be displayed in four digits (month and date) behind the error No., as a rough idea for data recovery.

Z99 FILE AREA ERROR 0003

Details The edit work just before the power went down may not be reflected.
When the program capacity 2560m/1520m is set as option, the file will be compressed and saved after the program edit. The power supply for NC was cut during compressing the file.

Remedy Check the machining program you were editing, and edit it again if it is same as the one before editing.
This alarm will be canceled by turning ON the edit data recovery signal after recovering work is completed.
"Emergency stop DATA" will be canceled by turning the controller ON again.
Keep NC ON during the file compressing. This operation takes thirty seconds maximum.

Z99 FILE AREA ERROR 0004

Details The compressed data does not fit in the memory.

Remedy Delete unnecessary data and edit it again.
If the power is turned ON again while the error still appears, the program revert to the status before the error occurred.

Z99 FILE AREA ERROR 0005

Details Data cannot be uncompressed normally at power ON.

Remedy Format the area again. Contact the service center.

Z99 FILE AREA ERROR 0006

Details Memory necessary for edited data or compression cannot be allocated.

Remedy Contact the service center.

7. Absolute Position Detection System Alarms (Z7*)

Axis names are expressed with a letter in the following manner:
- NC axis: axis name defined by the parameter
- Spindle: "S" = the 1st spindle, "T" = the 2nd spindle, "M" = the 3rd spindle, "N" = the 4th spindle, "P" = the 5th spindle, "Q" = the 6th spindle, "R" = the 7th spindle
- PLC axis: "1" = the 1st PLC axis, "2" = the 2nd PLC axis, "3" = the 3rd PLC axis, and so on.

(Note 1) "Z70" alarms are displayed as "Z70 Abs data error" with the error number. Error number is the four digit number displayed after error name (start from 0001). "Z70" alarms are listed in ascending order in this manual.

(Note 2) "Z71" alarms are displayed as "Z71 Abs encoder failure" with the error number. Error number is the four digit number displayed after error name (start from 0001). "Z71" alarms are listed in ascending order in this manual.

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
#1016 iout
#1017 rot
#1018 ccw
#1040 M_inch
#2049 type

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.0002.

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 data error 0006 (axis name)

Details Deviation of the servo axis with scale when the power is OFF exceeds the set value in "#2051 check (Check)".

Remedy Search for the factor which led the deviation of the servo axis at the power OFF.
- Zero point initialization: Not required
- Alarm reset when power is turned OFF: -
- Servo alarm No.: -

Z70 Abs posn error 0007

Detail The difference of the machine positions at power OFF/ON exceeds the value set in "#2051 check".
The following are the principle cause of error.
1. The machine position was changed.
2. An error of the encoder was detected.

Remedy Make sure to always carry out the zero point initialization not to lose the absolute position.
Check if the machine position is not changed by moving to the reference position, etc.
When the machine position is not changed, reinitialize the zero point.
The machine may have moved by turning the power OFF.
If the machine position is changed, there may be a trouble with the encoder. Replace the encoder and reinitialize the zero point.

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.

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

Z73 Battery for abs data fault 0001

Details Low backup battery
Servo alarm 9F
Low battery voltage

Remedy
This is displayed when the battery voltage is low or the cable has been damaged.
The absolute position initialization is not required.
Even after the servo alarm 9F is canceled, this alarm will continue to be displayed until NC reset is entered.
(Note) When this alarm has occurred, do not turn OFF the drive unit power in order to protect the absolute position data. Replace the battery with the drive unit power ON.

8. Emergency Stop Alarms (EMG)

When there are several causes for an emergency stop, only one of them will be displayed. The display priority is shown below in descending order.

DATA, SRV, SPIN, PARA, LAD, MULT, IPWD, LINK, MCT, EXIN, CVIN, SUIN, ENC, PLC, APLC, STOP, STP2

Refer to Emergency stop cause (G10221/R21) to confirm which causes are detected.

EMG Emergency stop PLC

Details The built-in PLC has entered the emergency stop state during the sequence process.

Remedy - Investigate and remove the cause of the built-in 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 sequence program in PLC is not running.

Remedy - Check the setting of the toggle switch in front side of the PLC module. Correct it if set to STOP.

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 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 A DeviceNet communication error has occurred.
(Any of the network errors L10, L11 and L12 has occurred.)

Remedy - Clear the network error.
- Setting "0" in "#21113 Add13/bit0 DeviceNet error monitor" disables the DeviceNet communication error monitoring and clears this alarm.

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.
- Make sure that NC reset 1 signal, NC rest 2 signal, and reset & rewind signal are all OFF. (All part systems must be OFF on a multi-part system machine.)

EMG Emergency stop MCT

Details The status is one of the following:
- The contactor shutoff test is being executed.
- The output OFF check is being executed.
- The "dual signal check start" signal was not ON when "#21161 SftySgnlChkTrg (Dual signal check-time change)" was set to "1". The output check and contactor welding detection at the power ON have not been completed.

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.
- The emergency stop is reset automatically after the output OFF check is completed.
- If the contactor shutoff is not confirmed within 5 seconds after the "output OFF check" signal has been input, the "output OFF check error" alarm occurs. The dual signal module may be broken when this alarm occurs. Replace the module.
- When "#21161 SftySgnlChkTrg (Dual signal check time change)" is set to "1", turn ON the "dual signal check start" signal after the power ON.

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.

EMG Emergency stop SUIN

Details The emergency stop input signal (M0) is OFF in the NC/PLC safety circuit.

Remedy
- Check the conditions for turning ON the emergency stop input signal.
- Check for any broken wires.

EMG Emergency stop STP2

Details Sequence programs stopped in CNC.

Remedy - Correct the rotary switch 1 (on the right) of the control unit if set to “1”.

EMG Emergency stop MULT

Details An error related to Q bus or Qr bus occurred.

Remedy - Refer to the error No. that follows the message “A01 Multi CPU error” to take a remedy.

EMG Emergency stop DATA

Details An error was detected in the data in NC and the following alarm occurred.
- Z99 FILE AREA ERROR (except for 0004)

Remedy
- Refer to the remedy of "Z99 FILE AREA ERROR".
- This emergency stop will be canceled by resolving the error cause and turning the power ON again.

EMG Emergency stop APLC

Details Emergency stop status is established during APLC release.

Remedy Contact the machine tool builder.

EMG emergency stop ENC

Details The encoder is being replaced.

Remedy Complete replacing the encoder on the absolute position setting screen.

9. Auxiliary Axis Operation Errors (M)

(Note) "M00" alarms are displayed as "M00 AUX OPER. ALM." with the error number. Error number is four digit number displayed after error name (such as 0001). "M00" alarms are listed in ascending order in this manual.

M00 Aux ax R-pnt direction illegal 0003 (Axis No. 1 to 4)

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 (Axis No. 1 to 4)

Details The axis interlock function is valid.

Remedy - Cancel the interlock signal

M00 Aux ax internal interlock 0005 (Axis No. 1 to 4)

Details An interlock was established by the servo OFF function.

Remedy - Cancel the servo OFF.

M00 Aux ax stored stroke limit 0007 (Axis No. 1 to 4)

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 (Axis No. 1 to 4)

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 (Axis No. 1 to 4)

Details Reference position return was executed while initializing the absolute position.

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

M00 Aux ax no operation mode 0101 (Axis No. 1 to 4)

Details The operation mode is not designated, or the operation mode was changed during axis movement.

Remedy - Correctly designate the operation mode.

M00 Aux ax feedrate 0 0103 (Axis No. 1 to 4)

Details The feedrate set in the operation parameter is zero, or the override value is zero while the override is enabled.

Remedy - Set a value other than zero in the feedrate setting or override value.

M00 Aux ax sta No. illegal 0160 (Axis No. 1 to 4)

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

Remedy - Correctly designate the station No.

M00 Aux ax R-pnt ret incomplete 0161 (Axis No. 1 to 4)

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

Remedy - Execute the reference position return.

M00 Aux abs position initializing 0162 (Axis No. 1 to 4)

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

Remedy - Complete the absolute position reference point initialization.

M00 Aux ax abs position error 0163 (Axis No. 1 to 4)

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.

M00 Aux ax arbitrary positioning 0164 (Axis No. 1 to 4)

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.

M00 Aux arbitrary coordinate index sta No. ilgl 0165 (Axis No. 1 to 4)

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

Remedy - Check the commanded station No. and the parameter "#12801 station" setting.
- Designated station No.0 during arbitrary coordinate indexing.

10. CNCCPU-side Safety Sequence Alarm(U)

"These alarms occur when there are errors on the CNCCPU side safety sequence.
Refer to the instruction of sequencer CPU for the sequencer CPU alarms."

U10 Illegal PLC 0400 (Sub status)

Details The instruction being used is not supported by CNCCPU side safety sequence. Otherwise, nothing is designated in the CALL or CJ instruction.

Remedy Correct the sequence program.

U10 Illegal PLC 1000 (Sub status)

Details The instruction being used is not supported by CNCCPU side safety sequence.

Remedy Correct the sequence program.

U10 Illegal PLC 2700 (Sub status)

Details The instruction, integrated statement or integrated note being used is not supported by CNC-CPU side safety sequence.

Remedy - Correct the sequence program.
- Restart the NC after PC memory format, and then write the corrected sequence program.

U10 Illegal PLC 2800 (Sub status(Number of steps))

Details The setting of the number of device points for the CNCCPU side safety sequence is illegal.(It has changed from the initial settings.)
The name of the sequence program which is written with the illegal device point setting will be changed to ERRLAD-*(* is the accumulated count).

Remedy - Set back the number of device points to the default setting to write the CNCCPU side safety sequence.
Delete the sequence programs whose name is "ERRLAD-*".

U10 Illegal PLC 8001 (Sub status)

Details The designated value with BIN command is illegal.

Remedy Confirm the methods for using the BIN function commands.

U10 Illegal PLC 8002 (Sub status)

Details The designated value with BCD command is illegal.

Remedy Confirm the methods for using the BCD function commands.

11. Multi CPU Errors (A)

For alarms which are not explained below, refer to the error code list in "QCPU User's Manual (Hardware Design, Maintenance and Inspection)" (SH(NA)-080483).

A01 MULTI CPU ERROR 1000

Details Run mode suspended or failure of CPU module.
- Malfunctioning due to noise or other reason
- Hardware fault

Remedy
- Take noise reduction measures.
- Reset and restart the CPU module.
  If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1001

Details Run mode suspended or failure of CPU module.
- Malfunctioning due to noise or other reason
- Hardware fault

Remedy
- Take noise reduction measures.
- Reset and restart the CPU module.
  If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1002

Details Run mode suspended or failure of CPU module.
- Malfunctioning due to noise or other reason
- Hardware fault

Remedy
- Take noise reduction measures.
- Reset and restart the CPU module.
  If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1003

Details Run mode suspended or failure of CPU module.
- Malfunctioning due to noise or other reason
- Hardware fault

Remedy
- Take noise reduction measures.
- Reset and restart the CPU module.
  If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1004

Details Run mode suspended or failure of CPU module.
- Malfunctioning due to noise or other reason
- Hardware fault

Remedy
- Take noise reduction measures.
- Reset and restart the CPU module.
  If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1005

Details Run mode suspended or failure of CPU module.
- Malfunctioning due to noise or other reason
- Hardware fault

Remedy
- Take noise reduction measures.
- Reset and restart the CPU module.
  If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1006

Details Run mode suspended or failure of CPU module.
- Malfunctioning due to noise or other reason
- Hardware fault

Remedy
- Take noise reduction measures.
- Reset and restart the CPU module.
  If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1009

Details
- A failure is detected on the power supply module, CPU module, base unit or extension cable.

Remedy
- Reset and restart the CPU module.
  If the same error is detected again, it is considered that the power supply module, CPU module, base unit or extension cable is faulty. Contact your local service center.

A01 MULTI CPU ERROR 1010

Details Entire program was executed without the execution of an END instruction.
- When the END instruction is executed it is read as another instruction code, e.g. due to noise.
- The END instruction has been changed to another instruction code somehow.

Remedy
- Take noise reduction measures.
- Reset and restart the CPU module.
  If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1101

Details
- The sequence program storing built-in RAM/program memory in the CPU module is faulty.

Remedy
- This suggests a CPU module hardware fault. Contact your nearest Mitsubishi representative.

A01 MULTI CPU ERROR 1102

Details
- The work area RAM in the CPU module is faulty.

Remedy
- This suggests a CPU module hardware fault. Contact your nearest Mitsubishi representative.

A01 MULTI CPU ERROR 1103

Details
- The device memory in the CPU module is faulty.

Remedy
- This suggests a CPU module hardware fault. Contact your nearest Mitsubishi representative.

A01 MULTI CPU ERROR 1104

Details
- The address RAM in the CPU module is faulty.

Remedy
- This suggests a CPU module hardware fault. Contact your nearest Mitsubishi representative.

A01 MULTI CPU ERROR 1105

Details
- The memory in the CPU module is faulty.
- The CPU shared memory in the CPU module is faulty.

Remedy
- Take noise reduction measures.
- Reset and restart the CPU module.
  If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1150

Details
- The CPU module indicates a fault of memory in the Multi CPUs high-speed communication area.

Remedy
- Take noise reduction measures.
- Reset and restart the CPU module.
- If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1160

Details
- The program memory in the CPU module is faulty.

Remedy
- Take noise reduction measures.
- Format the program memory, write all files to the PLC, then reset the CPU module, and RUN it again.
- If the same error is displayed again, the possible cause is a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1161

Details
- Data in the built-in device memory was overwritten.

Remedy
- Take noise reduction measures.
- If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1162

Details
- A fault of the data in the battery was detected.
  (This error occurs when the automatic formatting is not set.)

Remedy
- Replace the battery of either CPU module or SRAM card.
- Take noise reduction measures.
- If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1200

Details
- The operation circuit for indexing in the CPU module does not operate normally.

Remedy
- This suggests a CPU module hardware fault.
  Contact your local service center.

A01 MULTI CPU ERROR 1201

Details - The hardware (logic) in the CPU module does not operate normally.

Remedy - This suggests a CPU module hardware fault.
Contact your local service center.

A01 MULTI CPU ERROR 1202

Details - The operation circuit for sequence processing in the CPU module does not operate normally.

Remedy - This suggests a CPU module hardware fault.
Contact your local service center.

A01 MULTI CPU ERROR 1300

Details - There is an output module with a blown fuse.

Remedy - Check FUSE. LED of the output modules and replace the module whose LED is lit.
- The module with a blown fuse can also be identified using a programming tool. Check the special registers SD1300 to SD1331 to see if the bit corresponding to the module is "1".
- When a GOT is bus-connected to the base unit, check the connection status of the extension cable and the earth status of the GOT.

A01 MULTI CPU ERROR 1310

Details - An interruption has occurred although there is no interrupt module.

Remedy - Any of the mounted modules is experiencing a hardware fault. Therefore, check the mounted modules and change the faulty module.
Contact your local service center.

A01 MULTI CPU ERROR 1311

Details - An interrupt request from other than the interrupt module was detected.

Remedy - Take action so that an interrupt will not be issued from other than the interrupt module.

Details - An interrupt request from the module where interrupt pointer setting has not been made in the PLC parameter dialog box was detected.

Remedy - Correct the interrupt pointer setting in the PLC system setting of the PLC parameter dialog box.
- Take measures so that an interrupt is not issued from the module where the interrupt pointer setting in the PLC system setting of the PLC parameter dialog box has not been made.
- Correct the interrupt setting of the network parameter.
- Correct the interrupt setting of the intelligent function module buffer memory.
- Correct the basic program of the QD51.

A01 MULTI CPU ERROR 1401

Details - There was no response from the intelligent function module in the initial communication.
- The size of the buffer memory of the intelligent function module is invalid.
- There was no response from the intelligent function module.
(When error is generated, the head I/O number of the special function module that corresponds to the common information is stored.)

Remedy - The CPU module is experiencing a hardware fault.
Contact your local service center.

A01 MULTI CPU ERROR 1402

Details - The intelligent function module was accessed in the program, but there was no response.

Remedy - The CPU module is experiencing a hardware fault.
Contact your local service center.

A01 MULTI CPU ERROR 1403

Details - There was no response from the intelligent function module when the END instruction is executed.
- An error is detected at the intelligent function module.
- The I/O module (intelligent function module) is nearly removed, completely removed, or mounted during running.

Remedy - The CPU module, base unit and/or the intelligent function module that was accessed is experiencing a hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1411

Details - When performing a parameter I/O allocation the intelligent function module could not be accessed during initial communications.
(On error occurring, the head I/O number of the corresponding intelligent function module is stored in the common information.)

Remedy - Reset and restart the CPU module.
If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty.
Contact your local service center.

A01 MULTI CPU ERROR 1412

Details
- The FROM/TO instruction is not executable, due to a control bus error with the intelligent function module.
(On error occurring, the program error location is stored in the individual information.)

Remedy
- Reset and restart the CPU module.
If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty.
Contact your local service center.

A01 MULTI CPU ERROR 1413

Details
An error is detected on the system bus.
- Self-diagnosis error of the system bus.
- Self-diagnosis error of the CPU module

Remedy
- Reset and restart the CPU module.
If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty.
Contact your local service center.

A01 MULTI CPU ERROR 1414

Details
- An error is detected on the system bus.
- Fault of a loaded module was detected.

Remedy
- Reset and restart the CPU module.
If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty.
Contact your local service center.

A01 MULTI CPU ERROR 1415

Details
- Fault of the main or extension base unit was detected.

Remedy
- Reset and restart the CPU module.
If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty.
Contact your local service center.

A01 MULTI CPU ERROR 1416

Details
- System bus fault was detected at PLC power-on or CPU module reset.
- In a multiple CPU system, a bus fault was detected at power-on or reset.

Remedy
- Reset and restart the CPU module.
If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty.
Contact your local service center.

A01 MULTI CPU ERROR 1430

Details
- A faulty of host CPU module was detected during the multi-CPUs high-speed communication.

Remedy
- Reset and restart the CPU module.
If the same error is displayed again, this suggests a CPU module hardware fault.
Contact your local service center.

A01 MULTI CPU ERROR 1431

Details
- A communication error with another CPU module was detected during the multi-CPUs high-speed communication.

Remedy
- Take noise reduction measures.
- Check the configuration of the main base unit in the CPU module.
- Reset and restart the CPU module. If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1432

Details
- A communication timeout error with another CPU was detected during the multi-CPUs high-speed communication.

Remedy
- Reset and restart the CPU module. If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1433

Details
- A communication error with another CPU was detected during the multi-CPUs high-speed communication.

Remedy
- Take noise reduction measures.
- Check the configuration of the main base unit in the CPU module.
- Reset and restart the CPU module. If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1434

Details
- A communication error with another CPU was detected during the multi-CPUs high-speed communication.

Remedy
- Take noise reduction measures.
- Check the configuration of the main base unit in the CPU module.
- Reset and restart the CPU module. If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1435

Details
- A communication error with another CPU was detected during the multi-CPUs high-speed communication.

Remedy
- Take noise reduction measures.
- Check the configuration of the main base unit in the CPU module.
- Reset and restart the CPU module. If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1436

Details
A fault is detected on the main base module in the multi-CPUs high-speed communication. (An error was detected on the multi-CPUs high-speed communication bus.).

Remedy
- Reset and restart the CPU module. If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1437

Details
A fault is detected on the main base module in the multi-CPUs high-speed communication. (An error was detected on the multi-CPUs high-speed communication bus.)

Remedy
- Take noise reduction measures.
- Check the configuration of the main base unit in the CPU module.
- Reset and restart the CPU module. If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 1500

Details
- A momentary power supply interruption has occurred.
- The power supply went off.

Remedy
- Check the power supply.

A01 MULTI CPU ERROR 1600

Details
- The battery voltage in the CPU module has dropped below stipulated level.

Remedy
- Change the battery.

Details
- The lead connector of the CPU module battery is not connected.

Remedy
- If the battery is for program memory, standard RAM or for the back-up power function, install a lead connector.

A01 MULTI CPU ERROR 1601

Details
- Voltage of the battery on memory card 1 has dropped below stipulated level.

Remedy
- Change the battery.

A01 MULTI CPU ERROR 1610

Details
- The number of writing to the FLashROM (the standard RAM or the area reserved by the system) exceeded one hundred thousand times.
(Number of writing>100,000 times)- Voltage of the battery on memory card 1 has dropped below stipulated level.

Remedy
- Replace the CPU modules.

A01 MULTI CPU ERROR 2000

Details
I/O module information power ON is changed.
- I/O module (or intelligent function module) not installed properly or installed on the base unit.

Remedy
Read the common information of the error using a programming tool, and check and/or change the module that corresponds to the numerical value (module number) there.
- Alternatively, monitor the special registers SD1400 to SD1431 using GX Developer, and change the fuse at the output module whose bit has a value of "1".
- When a GOT is bus-connected to the main base unit or extension base unit, check the connection status of the extension cable and the grounding status of the GOT.

A01 MULTI CPU ERROR 2001

Details
- During operation, a module was mounted on the slot where the empty setting of the CPU module was made.

Remedy
- During operation, do not mount a module on the slot where the empty setting of the CPU module was made.

A01 MULTI CPU ERROR 2011

Details
- The QA*B,QA1S*B was used as the base unit.

Remedy
- Do not use the QA*B,QA1S*B as the base unit.

A01 MULTI CPU ERROR 2100

Details
- In the I/O assignment setting of PLC parameter, intelligent function module was allocated to an I/O module or vice versa.
- In the I/O assignment setting of PLC parameter, a module other than CPU (or nothing) was allocated to the location of a CPU module or vice versa.
- In the I/O assignment setting of the PLC parameter, general switch setting was made to the module that has no general switch setting.
- In the I/O assignment setting of the PLC parameter dialog box, the number of points assigned to the intelligent function module is less than the number of points of the mounted module.

Remedy
- Make the PLC parameter I/O assignment setting again so it is consistent with the actual status of the intelligent function module and the CPU module.
- Delete the switch setting in the I/O assignment setting of the PLC parameter.

A01 MULTI CPU ERROR 2103

Details
- 2 or more interrupt module, QI60, where interrupt pointer setting has not been made are mounted.

Remedy
- Reduce the QI60 modules to one.
- Make interrupt pointer setting to the second QI60 module and later.

A01 MULTI CPU ERROR 2106

Details
- 5 or more MELSECNET/H modules have been installed.
- 5 or more Ethernet modules have been installed.
- The same network Nos. or station Nos. exist in the MELSECNET/10 network system.

Remedy
- Reduce the number of MELSECNET/H modules to 4 or less.
- Reduce the number of Ethernet modules to 4 or less.
- Check the network Nos. and station Nos.

A01 MULTI CPU ERROR 2107

Details
- The start X/Y set in the PLC parameter's I/O assignment settings is overlapped with the one for another module.

Remedy
- Make the PLC parameter's I/O assignment setting again so it is consistent with the actual status of the intelligent function module.

A01 MULTI CPU ERROR 2110

Details
- The location designated by the FROM/TO instruction set is not the intelligent function module.
- The module that does not include buffer memory has been specified by the FROM/TO instruction.
- The intelligent function module being accessed is faulty.
- Station not loaded was specified using the instruction whose target was the CPU shared memory.

Remedy
- Read the individual information of the error using a programming tool, check the FROM/TO instruction that corresponds to that numerical value (program error location), and correct when necessary.
- The intelligent function module that was accessed is experiencing a hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 2111

Details
- The location designated by a link direct device (J* \ *) is not a network module.
- The I/O module (intelligent function module) was nearly removed, completely removed, or mounted during running.

Remedy
- Read the individual information of the error using a programming tool, check the FROM/TO instruction that corresponds to that numerical value (program error location), and correct when necessary.
- The intelligent function module that was accessed is experiencing a hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 2112

Details
- The module other than intelligent function module is specified by the intelligent function module/special function module dedicated instruction. Or, it is not the corresponding intelligent function module.
- There is no network No. specified by the network dedicated instruction. Or the relay target network does not exist.

Remedy
- Read the individual information of the error using a programming tool and check the special function module dedicated instruction (network instruction) that corresponds to the value (program error part) to make modification.

A01 MULTI CPU ERROR 2116

Details - An instruction that does not allow the module under the control of another CPU to be specified is being used for a similar task.

Remedy - Read the individual information of the error using a programming tool and check the special function module dedicated instruction (network instruction) that corresponds to the value (program error part) to make modification.

A01 MULTI CPU ERROR 2124

Details
- A module is installed to the 65th or higher slot.
- A module is installed to the slot whose number is greater than the number of slots specified in the base setting.
- A module is installed to the location corresponding to the I/O points of the 4,096 or greater.
- A module is installed to the slot whose assigned I/O range includes the limit of.

Remedy
- Remove the module installed to the 65th or later slot.
- Remove the module installed at the slot whose number is greater than the number of slots specified in the base setting.
- Remove the module installed to the location of I/O points, 4,096 or greater.
- Replace the last module to a module which does not exceed the 4,096th point.

A01 MULTI CPU ERROR 2125

Details
- A module which the QCPU cannot recognize has been installed.
- There was no response form the intelligent function module/special function module.

Remedy
- Install a usable module.
- The intelligent function module is experiencing a hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 2140

Details - Motion CPU (Q172LX, Q172EX (-S1, S2, S3) or Q173PX(-S1)) is mounted to the CPU slot or slot No. 0 to 2.(QnUD(H)CPU does not lead this error.)

Remedy - Remove the motion CPU that is mounted to the CPU slot or slot No. 0 to 2.

A01 MULTI CPU ERROR 2150

Details - In a multiple CPU system, the control CPU of the intelligent function module incompatible with the multiple CPU system is set to other than CPU No.1.

Remedy
- Change the intelligent function module for the one compatible with the multiple CPU system (function version B or later).
- Change the setting of the control CPU of the intelligent function module incompatible with the multiple CPU system to CPU No.1.

A01 MULTI CPU ERROR 2200

Details - No parameter file is found all through the drives where the parameter should be validated.

Remedy - Write the parameter file to PLC of the drive that validates the parameter.

A01 MULTI CPU ERROR 2210

Details - The contents of the boot file are incorrect.

Remedy - Check the boot setting.

A01 MULTI CPU ERROR 2211

Details - File formatting failed at a boot.

Remedy
- Reboot.
- CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 2300

Details
- A memory card was removed without switching the memory card in/out switch OFF.
- The memory card in/out switch is turned ON although a memory card is not actually installed.

Remedy
- Remove memory card after placing the memory card in/out switch OFF.
- Turn on the card insert switch after inserting a memory card.

A01 MULTI CPU ERROR 2301

Details
- The memory card has not been formatted.
- Memory card format status is incorrect.

Remedy
- Format memory card.
- Reformat memory card.

Details
- A fault of the SRAM card was detected.
(This error occurs when the automatic formatting is not set.)

Remedy - Replace the battery of SRAM card and then format the SRAM card.

A01 MULTI CPU ERROR 2302

Details - A memory card that cannot be used with the CPU module has been installed.

Remedy - Format memory card.
- Reformat memory card.
- Check memory card.

A01 MULTI CPU ERROR 2400

Details - The file designated at the PLC file settings in the parameters cannot be found.

Remedy - Read the individual information of the error using a programming tool, check to be sure that the parameter drive name and file name correspond to the numerical values there (parameter number), and correct.
- Create a file created using parameters, and load it to the CPU module.

A01 MULTI CPU ERROR 2401

Details - Program memory capacity was exceeded by performing boot operation.

Remedy - Check and correct the parameters (boot setting).
- Delete unnecessary files in the program memory.
- Choose "Clear program memory" for boot in the parameter so that boot is started after the program memory is cleared.

Details - The file designated by the parameter cannot be created (even during the boot operation).

Remedy - Read the individual information of the error using a programming tool, check to be sure that the parameter drive name and file name correspond to the numerical values there (parameter number), and correct.
- Check the space remaining in the memory card.

A01 MULTI CPU ERROR 2410

Details - The specified program does not exist in the program memory.
- The file specified by the sequence program does not exist.

Remedy - Read the individual information of the error using a programming tool, check to be sure that the program corresponds to the numerical values there (program location), and correct.
- Create a file created using parameters, and load it to the CPU module.

A01 MULTI CPU ERROR 2411

Details - The file is a comment file or the like, which cannot be designated by the sequence program.
- The specified program exists in the program memory, but has not been registered in the program setting of the Parameter dialog box.
(This error may occur when the ECALL, EFCALL, PSTOP, PSCAN, POFF or PLOW instruction is executed.)

Remedy - Read the individual information of the error using a programming tool, check to be sure that the program corresponds to the numerical values there (program location), and correct.

A01 MULTI CPU ERROR 2500

Details - There is a program file that uses a device that is out of the range set in the PLC parameter device setting.
- After the PLC parameter device setting is changed, only the parameter is written into the PLC.

Remedy - Read the common information of the error using a programming tool, check to be sure that the parameter device allocation setting and the program file device allocation correspond to the numerical values there (file name), and correct if necessary.
- If PLC parameter device setting is changed, batch-write the parameter and program file into the PLC.

Details - After the PLC parameter index modification setting is changed, only the parameter is written into the PLC.

Remedy - If PLC parameter index modification setting is changed, batch-write the parameter and program file into the PLC.

A01 MULTI CPU ERROR 2501

Details - There are multiple program files although "none" has been set at the PLC parameter program settings.

Remedy - Edit the PLC parameter program setting to "yes".
Alternatively, delete unneeded programs.

A01 MULTI CPU ERROR 2502

Details - The program file is incorrect.
Alternatively, the file contents are not those of a sequence program.

Remedy - Check whether the program version is ***.QPG, and check the file contents to be sure they are for a sequence program.

A01 MULTI CPU ERROR 2503

Details - There are no program files at all.
(The common information displays the drive name only.)

Remedy - Check program configuration.
- Check parameters and program configuration.

A01 MULTI CPU ERROR 3000

Details - In a multiple CPU system, the intelligent function module under control of another CPU is specified in the interrupt pointer setting of the PLC parameter.

Remedy - Specify the head I/O number of the intelligent function module under control of the host CPU.
- Delete the interrupt pointer setting of the parameter.

Details - The PLC parameter settings for timer time limit setting, the RUN-PAUSE contact, the common pointer No., number of vacant slots, system interrupt settings or service operation settings are outside the range that can be used by the CPU module.

Remedy - Read the detailed information of the error using a programming tool, check the parameter items corresponding to those numerical values (parameter numbers), and correct when necessary.
- If the error is still generated following the correction of the parameter settings, the possible cause is the memory error of the CPU module's built-in RAM, program memory or the memory card. Contact your local service center.

Details - [Memory card (ROM)] is designated as a drive for the file register and "Use the following file" or "Use the same file name as the program" is selected in the PLC file settings, while ATA card is actually set to the PC card slot.

Remedy - Read the detailed information of the error using a programming tool, check the parameter items corresponding to those numerical values (parameter numbers), and correct when necessary.
- If the error is still generated following the correction of the parameter settings, the possible cause is the memory error of the CPU module's built-in RAM, program memory or the memory card. Contact your local service center.

A01 MULTI CPU ERROR 3001

Details - The parameter settings are corrupted.

Remedy - Read the detailed information of the error using a programming tool, check the parameter items corresponding to those numerical values (parameter numbers), and correct when necessary.
- If the error is still generated following the correction of the parameter settings, the possible cause is the memory error of the CPU module's built-in RAM, program memory or the memory card. Contact your local service center.

A01 MULTI CPU ERROR 3002

Details - The designated memory has no file register file, although “Use the following file” and no capacity have been set for the file register in the PLC parameter, PLC file settings.

Remedy - Read the detailed information of the error using a programming tool, check the parameter items corresponding to those numerical values (parameter numbers), and correct when necessary.
- If the error is still generated following the correction of the parameter settings, the possible cause is the memory error of the CPU module's built-in RAM, program memory or the memory card. Contact your local service center.

A01 MULTI CPU ERROR 3003

Details - The number of devices set at the PLC parameter device settings exceeds the possible CPU module range.

Remedy - Read the detailed information of the error using a programming tool, check the parameter items corresponding to those numerical values (parameter numbers), and correct when necessary.
- If the error is still generated following the correction of the parameter settings, the possible cause is the memory error of the CPU module's built-in RAM, program memory or the memory card. Contact your local service center.

Details - The automatic refresh range of the multiple CPU system exceeded the file register capacity.

Remedy - Change the file register file for the one refresh-enabled in the whole range.

A01 MULTI CPU ERROR 3004

Details - The parameter file is incorrect.
Alternatively, the contents of the file are not parameters.

Remedy - Check whether the parameter file version is ***QPA, and check the file contents to be sure they are parameters.

A01 MULTI CPU ERROR 3012

Details - Multiple CPU setting or control CPU setting differs from that of the reference CPU settings in a multiple CPU system.

Remedy - Match the multiple CPU setting or control CPU setting in the PLC parameter with that of the reference CPU (CPU No.1) settings.

A01 MULTI CPU ERROR 3013

Details Multiple CPU automatic refresh setting is any of the followings in a multiple CPU system.
- When a bit device is specified as a refresh device, a number other than a multiple of 16 is specified for the refresh-starting device.
- The device specified is other than the one that may be specified.
- The number of send points is an odd number.
- The total number of transmission points is greater than the maximum number of refresh points.
- The automatic refresh parameter was set for the CPU that does not support the automatic refresh.
- The device to transmit is not set.

Remedy Check the following in the multiple CPU automatic refresh parameters and make correction.
- Specify the device that may be specified for the refresh device.
- Set the number of send points to an even number.
- The total number of transmission points is within the maximum number of refresh points.
- Set the parameter to the CPU that supports the automatic refresh.
- Specify the device to transmit.

A01 MULTI CPU ERROR 3015

Details - In a multiple CPU system, the parameter settings are different between the modules.

Remedy - Read the error details using a programming tool, check and correct the details of the parameter that corresponds to the read value (parameter No. or CPU No.), as well as the parameter of the target module.

A01 MULTI CPU ERROR 3100

Details
- The number of actually installed modules is different from that designated in the number of modules setting parameter of MELSECNET/H.
- The head I/O number of actually installed modules is different from that designated in the network parameter of MELSECNET/H.
- Some data in the parameters cannot be handled.
- The station type of MELSECNET/H has been changed while the power is ON. (Reset and restart is required to change the station type.)

Remedy
- Check the network parameters and actual mounting status, and if they differ, make them matched. If any network parameter has been corrected, write it to the CPU module.
- Check the extension base unit stage No. setting.
- Check the connection status of the extension base units and extension cables. When the GOT is bus-connected to the main base unit and extension base units, also check the connection status.
- If the error occurs after the above checks, the possible cause is a hardware fault. Contact your local service center.

Details
- In a multiple CPU system, the MELSECNET/H under control of another CPU is specified as the head I/O number in the network setting parameter of the MELSECNET/H.

Remedy
- Delete the MELSECNET/H network parameter of the MELSECNET/H under control of another CPU.
- Change the setting to the head I/O number of the MELSECNET/H under control of the host CPU.

Details
- The network parameters of the MELSECNET/H operating as a normal station was changed to the control station, or the network parameter of the MELSECNET/H operating as a control station was changed to a normal station. (The network parameter is updated on the module side by resetting.)

Remedy - Reset the CPU module.

A01 MULTI CPU ERROR 3101

Details - The link refresh range exceeded the file register capacity.

Remedy - Set either the larger capacity for file register or the narrower range for link refresh.

Details
- The network No. specified by a network parameter is different from that of the actually mounted network.
- The head I/O No. specified by a network parameter is different from that of the actually mounted I/O unit.
- The network class specified by a network parameter is different from that of the actually mounted network.
- The network refresh parameter of the MELSECNET/H, MELSECNET/10 is out of the specified area.

Remedy
- Check the network parameters and mounting status, and if they differ, match the network parameters and mounting status. If any network parameter has been corrected, write it to the CPU module.
- Confirm the setting of the number of extension stages of the extension base units.
- Check the connection status of the extension base units and extension cables. When the GOT is bus-connected to the main base unit and extension base units, also check their connection status.
- If the error occurs after the above checks, the cause is a hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 3102

Details
- The result after checking network parameters in the network module shows an error.
- The parameters specific to MELSECNET/H and MELSECNET/10 are not normal.

Remedy
- Correct and write the network parameters.
- If the error occurs after correction, it suggests a hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 3103

Details
- Although the number of modules has been set to 1 or greater number in the Ethernet module count parameter setting, the number of actually mounted module is 0.
- The head I/O No. of the Ethernet network parameter differs from the I/O No. of the actually mounted module.

Remedy
- Correct and write the network parameters.
- If the error occurs after correction, it suggests a hardware fault. Contact your local service center.

Details
- In a multiple CPU system, the Q series Ethernet interface module under control of another station is specified to the head I/O number of the Ethernet network parameter.

Remedy
- Delete the Ethernet network parameter of MELSECNET/H module under control of another station.
- Change the setting to the head I/O number of the MELSECNET/H module under control of the host station.

A01 MULTI CPU ERROR 3104

Details
- The Ethernet and MELSECNET/H use the same network number.
- The network number, station number or group number set in the network parameter is out of range.
- The specified I/O No. is outside the range of the used CPU module.
- The Ethernet-specific parameter setting is not normal.

Remedy
- Correct and write the network parameters.
- If the error occurs after correction, it suggests a hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 3105

Details
- Though the number of CC-Link modules set in the network parameters is one or more, the number of actually mounted modules is zero.
- The head I/O number in the common parameters is different from that of the actually mounted module.
- The station type of the CC-Link module count setting parameters is different from that of the actually mounted station.

Remedy
- Correct and write the network parameters.
- If the error occurs after correction, it suggests a hardware fault. Contact your local service center.

Details
- In a multiple CPU system, the Q series CC-Link module under control of another station is specified as the head I/O number of the CC-Link network parameter.

Remedy
- Delete the CC-Link network parameter of the Q series CC-Link module under control of another station.
- Change the setting to the head I/O number of the Q series CC-Link module under control of the host station.

A01 MULTI CPU ERROR 3106

Details
- The CC-Link link refresh range exceeded the file register capacity.

Remedy
- Change the file register file for the one refresh-enabled in the whole range.

Details
- The network refresh parameter for CC-Link is out of range.

Remedy
- Check the parameter setting.

A01 MULTI CPU ERROR 3107

Details
- The CC-Link parameter setting is incorrect.
- The set mode is not allowed for the version of the mounted CC-Link module.

Remedy
- Check the parameter setting.

A01 MULTI CPU ERROR 3300

Details
- The head I/O number in the intelligent function module parameter set on GX Configurator differs from the actual I/O number.

Remedy
- Check the parameter setting.

A01 MULTI CPU ERROR 3301

Details
- The refresh setting of the intelligent function module exceeded the file register capacity.

Remedy
- Change the file register file for the one which allows refresh in the whole range.

Details
- The intelligent function module's refresh parameter setting is outside the available range.

Remedy
- Check the parameter setting.

A01 MULTI CPU ERROR 3302

Details
- The intelligent function module's refresh parameter is abnormal.

Remedy
- Check the parameter setting.

A01 MULTI CPU ERROR 3303

Details - In a multiple CPU system, the automatic refresh setting or other parameter setting was made to the intelligent function module under control of another station.

Remedy - Delete the automatic refresh setting or other parameter setting of the intelligent function module under control of another CPU.
- Change the setting to the automatic refresh setting or other parameter setting of the intelligent function module under control of the host CPU.

A01 MULTI CPU ERROR 3400

Details - The head I/O number of the target module in the remote password file is set to other than 0H to 0FF0H.

Remedy - Change the head I/O number of the target module to within the 0H to 0FF0H range.

A01 MULTI CPU ERROR 3401

Details Position specified as the head I/O number of the remote password file is incorrect due to one of the following reasons:
- Module is not loaded.
- Other than a the intelligent function module (I/O, A, QnA module)
- Intelligent function module other than the Q series serial communication module, modem interface module or Ethernet module
- Q series serial communication module or Ethernet module of function version A
The intelligent function module that allows the remote password setting is not mounted.

Remedy - Mount the intelligent function module (QJ71C24(CMO) or QJ71E71, with version B or later), which allows the remote password setting, in the position specified in the head I/O No. of the remote password file.

Details The Q series serial communication module, modem interface module or Ethernet module of function version B or later controlled by another CPU was specified in a multiple CPU system.

Remedy - Change it for the Ethernet module of function version B or later connected by the host CPU.
- Delete the remote password setting.

A01 MULTI CPU ERROR 4000

Details
- The program contains an instruction code that cannot be decoded.
- An unusable instruction is included in the program.

Remedy - Read the common information of the error using a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4002

Details
- The exclusive instruction designated by the program has an incorrect instruction name.
- The exclusive instruction specified in the program cannot be executed by the specified module.

Remedy - Read the common information of the error using a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4003

Details - The exclusive instruction designated by the program has an incorrect number of devices.

Remedy - Read the common information of the error using a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4004

Details - The exclusive instruction designated by the program a device which cannot be used.

Remedy - Read the common information of the error using a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4010

Details - There is no END (FEND) instruction in the program.

Remedy - Read the common information of the error using a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4020

Details - The total number of internal file pointers used by the program exceeds the number of internal file pointers set in the parameters.

Remedy - Read the common information of the error using a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4021

Details - The pointer Nos. overlap between common and local pointers, which are assigned to files.

Remedy - Read the common information of the error using a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4030

Details - The allocation pointer Nos. assigned by files overlap.

Remedy - Read the common information of the error using a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4100

Details - The instruction cannot process the contained data.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4101

Details
- The designated device number for data processed by the instruction exceeds the usable range.
- Alternatively, the stored data or constants for the devices designated by the instruction exceeds the usable range.
- In the settings of write to the host CPU shared memory, the write designation disabled area is specified as the write destination address.
- The range of stored data in the device designated by the instruction is duplicated.
- The device designated by the instruction exceeds the range of number of device points.
- The stored data in the file register designated by the instruction exceeds the usable range. If not so, no file register is set.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4102

Details
- The network No. or station No. specified for the network dedicated instruction is wrong.
- The link direct device (J(\W() setting is incorrect.
- The module No./network No/number of character strings specified for the exclusive instruction is beyond the allowed range.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

Details - In a multiple CPU system, the link direct device (J(\G() was specified for the network module under control of another station.

Remedy
- Delete from the program the link direct device which specifies the network module under control of another CPU.
- Using the link direct device, specify the network module under control of the host CPU.

Details - The character string designated with the exclusive instruction (enclosed in "") is not available.

Remedy - Read the common information of the error using GX Developer, and check and correct the error step corresponding to that value (program error location).

A01 MULTI CPU ERROR 4111

Details - An attempt was made to perform write/read to/from the CPU shared memory write/read disable area of the host station CPU module with the instruction.

Remedy - Read the common information of the error using GX Developer, and check and correct the error step corresponding to that value (program error location).

A01 MULTI CPU ERROR 4112

Details - The CPU module that cannot be specified with the multiple CPU dedicated instruction was specified.

Remedy - Read the common information of the error using GX Developer, and check and correct the error step corresponding to that value (program error location).

A01 MULTI CPU ERROR 4140

Details - The operation was executed with the input data that has any specific number ("-0", unnormalized numbers, nonnumeric characters, ± ∞).

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location) and correct the problem.

A01 MULTI CPU ERROR 4141

Details - An overflow occurred during the operation.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location) and correct the problem.

A01 MULTI CPU ERROR 4200

Details - No NEXT instruction was executed following the execution of a FOR instruction. Alternatively, there are fewer NEXT instructions than FOR instructions.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location) and correct the problem.

A01 MULTI CPU ERROR 4201

Details - A NEXT instruction was executed although no FOR instruction has been executed. Alternatively, there are more NEXT instructions than FOR instructions.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location) and correct the problem.

A01 MULTI CPU ERROR 4202

Details - More than 16 nesting levels are programmed for FOR instructions.

Remedy - Keep nesting levels at 16 or under.

A01 MULTI CPU ERROR 4203

Details - A BREAK instruction was executed although no FOR instruction has been executed prior to that.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4210

Details - The CALL instruction is executed, but there is no subroutine at the specified pointer.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4211

Details - There was no RET instruction in the executed subroutine program.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4212

Details - The RET instruction was before the FEND instruction in the main program.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4213

Details - More than 16 nesting levels are programmed for CALL instructions.

Remedy - Keep nesting levels at 16 or under.

A01 MULTI CPU ERROR 4220

Details - Though an interrupt input occurred, the corresponding interrupt pointer does not exist.

Remedy - Check whether the interrupt pointer No., specified in the parameter setting, exists in the program.
- Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4221

Details - An IRET instruction does not exist in the executed interrupt program.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4223

Details - An IRET instruction exists before the FEND instruction of the main program.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4231

Details - The number of IX and IXEND instructions is not equal.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4350

Details An incorrect CPU module was designated by the exclusive instruction for multi-CPUs high-speed communication set in the program.
- The designated module has already been reserved.
- The designated module has not been mounted.
- 'Head I/O No. of target CPU module divided by 16' (n1) is not within 3E0H to 3E3H.
- The designated CPU module cannot execute the instruction.
- The instruction was executed in the single CPU system.
- The designated module is the host CPU module.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4351

Details The designated CPU module cannot execute the exclusive instruction for multi-CPUs high-speed communication set in the program.
- The instruction name is not correct.
- The designated instruction is not supported by the CPU module.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4352

Details - An incorrect number of devices were designated with the exclusive instruction for multi-CPUs high-speed communication set in the program.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4353

Details - An unusable device was designated with the exclusive instruction for multi-CPUs high-speed communication set in the program.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4354

Details - An unusable character string was designated with the exclusive instruction for multi-CPUs high-speed communication set in the program.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 4355

Details - An invalid number of read/write data (number of request/response data) was designated with the exclusive instruction for multi-CPUs high-speed communication set in the program.

Remedy - Read the common information of the error using a programming tool, check error step corresponding to its numerical value (program error location), and correct the problem.

A01 MULTI CPU ERROR 5000

Details - The scan time of the initial execution type program exceeded the initial execution watch time specified in the PLC RAS setting of the PLC parameter dialog box.

Remedy - Read the individual information of the error with a programming tool, check its value (time), and shorten the scan time.

A01 MULTI CPU ERROR 5001

Details - The program scan time exceeded the WDT value specified in the PLC RAS setting of the PLC parameter dialog box.

Remedy - Read the individual information of the error with a programming tool, check its value (time), and shorten the scan time.
- Resolve the endless loop caused by jump transition.

A01 MULTI CPU ERROR 5010

Details - The program scan time exceeded the constant scan time specified in the PLC RAS setting of the PLC parameter dialog box.
- The low speed program execution time specified in the PLC RAS setting of the PLC parameter dialog box exceeded the excess time of the constant scan.

Remedy - Review the constant scan setting time.
- Review the constant scan time and low speed program execution time in the PLC parameter so that the margin time of constant scan may be fully reserved.

A01 MULTI CPU ERROR 7000

Details - In the operating mode of a multiple CPU system, a CPU error occurred at the CPU where "All station stop by stop error of CPU " was selected.
- In a multiple CPU system, a CPU module incompatible with the multiple CPU system was mounted.

Remedy - Read the individual information of the error using the GX Works2 / GX Developer, check the error of the PLC resulting in CPU module fault, and remove the error.

A01 MULTI CPU ERROR 7002

Details - There is no response from the target CPU module in a multiple CPU system during initial communication.
- In a multiple CPU system, a CPU module incompatible with the multiple CPU system was mounted.

Remedy - Reset restart the CPU module. If the same error is displayed again, this suggests the hardware fault of any of the CPU modules.
Contact your local service center.

A01 MULTI CPU ERROR 7004

Details
- In a multiple CPU system, a data error occurred in communication between the CPU modules.

Remedy
- Check the system configuration to see if modules are mounted in excess of the number of I/O points.
- When there are no problems in the system configuration, this indicates the CPU module hardware s faulty. Contact your local service center.

A01 MULTI CPU ERROR 7010

Details
- In a multiple CPU system, a faulty CPU module was mounted.
- In a multiple CPU system, a CPU module incompatible with the multiple CPU system was mounted.
  (The CPU module compatible with the multiple CPU system was used to detect an error.)

Remedy
- Read the individual information of the error using GX Developer, and replace the faulty CPU module.

A01 MULTI CPU ERROR 7011

Details
Either of the following settings was made in a multiple CPU system.
- Multiple CPU automatic refresh setting was made for the inapplicable CPU module.
- 'I/O sharing when using multiple CPUs' setting was made for the inapplicable CPU module.

Remedy
- Replace the CPU module to the one applicable to the 'I/O sharing when using multiple CPUs'.

Details
The system configuration is not applicable to the multi-CPUs high-speed communication.
- QnUD(H)CPU is not used for CPU No.1.
- Main base module for multi-CPUs high-speed communication (Q3(DB) is not used.

Remedy
- Change the system configuration to be applicable to the multi-CPUs high-speed communication.

A01 MULTI CPU ERROR 7012

Details
The CPU module that cannot configure QnUD(H)CPU nor multi-CPU system is mounted on the CPU slot or slot No. 0 to 2.
- Qn(H)CPU or QnPHCPU is mounted.
- PC CPU or C language-based controller is mounted.

Remedy
- Remove the CPU module that does not support QnUD(H)CPU.

A01 MULTI CPU ERROR 7013

Details
- The motion CPU (Q172/3(H)CPU(N)), which cannot configure QnUD(H)CPU nor multi-CPU system, is mounted to the CPU slot or slot No. 0 to 2.

(Note) This error may lead the module failure.

Remedy
- Remove the CPU module that does not support QnUD(H)CPU.

A01 MULTI CPU ERROR 7020

Details
- In the operating mode of a multiple CPU system, an error occurred in the CPU where "system stop" was not selected.
  (The CPU module where no error occurred was used to detect an error.)

Remedy
- Read the individual information of the error using a programming tool, check the error of the CPU module resulting in CPU module fault, and remove the error.

A01 MULTI CPU ERROR 7030

Details
- An assignment error occurred in the CPU-mountable slot (CPU slot, I/O slot 0, 1) in excess of the number of CPU modules specified in the multiple CPU setting of the PLC parameter dialog box.

Remedy
- Set the same value to the number of CPU modules specified in the multiple CPU setting of the PLC parameter dialog box and the number of mounted CPU modules (including CPU (empty)).
- Make the type specified in the I/O assignment setting of the PLC parameter dialog box consistent with the CPU module configuration.

A01 MULTI CPU ERROR 7031

Details
- An assignment error occurred within the range of the number of CPUs specified in the multiple CPU setting of the PLC parameter dialog box.

Remedy
- Set the same value to the number of CPU modules specified in the multiple CPU setting of the PLC parameter dialog box and the number of mounted CPU modules (including CPU (empty)).
- Make the type specified in the I/O assignment setting of the PLC parameter dialog box consistent with the CPU module configuration.

A01 MULTI CPU ERROR 7035

Details
- The CPU module has been mounted on the inapplicable slot.

Remedy
- Mount the CPU module on the applicable slot (CPU slot or I/O slot 0, 1).
- Remove the CPU from the inapplicable slot.

A01 MULTI CPU ERROR 8031

Details - An error of a stored file (valid parameter file) was detected.

Remedy - Write the file indicated by the individual information SD17 to SD22 into the individual information SD16(L), and turn the CPU power OFF and ON or execute 'reset' and 'reset canceling'.
- If the same error is displayed again, this suggests a CPU module hardware fault. Contact your local service center.

A01 MULTI CPU ERROR 9000

Details - Annunciator (F) was set ON

Remedy - Read the individual information of the error using a programming tool, and check the program corresponding to the numerical value (annunciator number).

A01 MULTI CPU ERROR 10001-10999

Details - Motion controller in the multi-CPU system has an error.
(QnUD(H)CPU does not lead this error.)

Remedy - Read the error details using a programming tool for the motion controller, and remove the error factor.

A01 MULTI CPU ERROR 11000-11999

Details - CNC CPU in the multi-CPU system has an error.
(QnUD(H)CPU does not lead this error.)

Remedy - See the error details on the NC display and remove the error factor.

A01 MULTI CPU ERROR 12000-12999

Details - RC CPU in the multi-CPU system has an error.
(QnUD(H)CPU does not lead this error.)

Remedy (Reserved for RC.)

12. Network Errors (L)

L10 DN INIT. ERR. 1 36 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FFH.
- The value of the local node No. (MAC ID) is out of range.
- The value of the mode switch is out of range.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set the local node number between 0 and 63.
- Set the mode switch to other than D - F.

L10 DN INIT. ERR. 1 39 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FFH.
- Two or more modes that have the same node No. (MAC ID) exist in the network.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set non-duplicate node Nos.

L10 DN INIT. ERR. 1 E0 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FFH.
- Network power is not being supplied.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Supply the network power (24VDC).

L10 DN INIT. ERR. 1 E1 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FFH.
- Other modules are not found in the network.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Connect other modules in the network.

L10 DN INIT. ERR. 1 F0 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FFH.
- Node No. setting switch or mode switch setting was changed during operation.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Return the node No. setting switch or mode switch setting to be the original setting.

L11 DN INIT. ERR. 2 02 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The number of input points and output points of the slave node set by parameters are both "0".

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set the number of input points and output points according to the slave node specifications.

L11 DN INIT. ERR. 2 03 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The lower byte of the slave node No. in the buffer memory is out of range.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set it between 0 and 63.

L11 DN INIT. ERR. 2 04 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The higher byte of the slave node No. in the buffer memory is out of range.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set it between 01H and 04H, or to 80H.

L11 DN INIT. ERR. 2 05 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The connection type in the buffer memory is out of range.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set it to one of the following: 0001H, 0002H, 0004H, or 0008H.

L11 DN INIT. ERR. 2 06 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- A slave node having the same node No. as the node No. of the local node is set in the buffer memory.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy - Set non-duplicate node Nos. in all nodes.

L11 DN INIT. ERR. 2 07 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- No slave node has been set.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy - Set at least one slave node.

L11 DN INIT. ERR. 2 08 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The total input data length of all slave nodes is too long.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy - Reduce the total data length of all slave nodes to 512 bytes or less.

L11 DN INIT. ERR. 2 09 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The total output data length of all slave nodes is too long.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy - Reduce the total data length of all slave nodes to 512 bytes or less.

L11 DN INIT. ERR. 2 0A (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The watchdog timeout action value in a parameter is invalid.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy - Set it to one of the following: 0000H, 0001H, 0002H, or 0003H.

L11 DN INIT. ERR. 2 0B (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The expected packet rate value in the buffer memory is smaller than the production inhibit time value.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy - Change the value so that the expected packet rate is greater than or equal to the production inhibit time value.

L11 DN INIT. ERR. 2 0C (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- Flash ROM checksum error (parameter area for the master function)

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy - Save the parameters again.
- Do not turn OFF the power or reset while saving the parameters.

L11 DN INIT. ERR. 2 0D (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- Flash ROM checksum error (parameter area for the slave function)

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy - Save the parameters again.
- Do not turn OFF the power or reset while saving the parameters.

L11 DN INIT. ERR. 2 0E (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- Flash ROM checksum error (auto communication start setting area)

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy - Save the parameters again.
- Do not turn OFF the power or reset while saving the parameters.

L11 DN INIT. ERR. 2 0F (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- Flash ROM all clear error

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Save the parameters again.
- Do not turn OFF the power or reset while clearing all parameters.

L11 DN INIT. ERR. 2 10 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The number of input points per slave node has exceeded 256 bytes.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Correct the number of input points per slave node to 256 bytes or less.

L11 DN INIT. ERR. 2 11 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The number of output points per slave node has exceeded 256 bytes.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Correct the number of output points per slave node to 256 bytes or less.

L11 DN INIT. ERR. 2 15 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The production inhibit time value was set to 0 ms (setting value "1") in cyclic.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set the production inhibit time value to a value other than 0 ms.

L11 DN INIT. ERR. 2 16 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- Slave nodes that were set by parameters are all reserved nodes.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set the parameters according to the slave nodes connected to the network.

L11 DN INIT. ERR. 2 80 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The number of reception bytes of the slave function is out of range.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set it within the range between 0 and 128 bytes.

L11 DN INIT. ERR. 2 81 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The number of transmission bytes of the slave function is out of range.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set it within the range between 0 and 128 bytes.

L11 DN INIT. ERR. 2 82 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The numbers of transmission bytes and reception bytes of the slave function are both set to "0".

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set either the number of transmission bytes or the number of reception bytes to a value other than "0".

L11 DN INIT. ERR. 2 A0 (Error-detected module I/O No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is FEH.
- The numbers of I/O points of both the master and slave functions were set to "0" when both the master and slave functions were used.

"Error-detected module I/O No." shows the error-detected module I/O No. with the last digit removed.

Remedy
- Set the number of I/O points of the slave node in a master function parameter.
- Set the number of transmission/reception bytes in a slave function parameter. (Be sure to set either the master function or slave function.)

L12 DN LINK ERROR 01 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- A network problem was detected after communication was started.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check that the cable is connected correctly.

L12 DN LINK ERROR 1E (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- Slave node did not respond.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check the entire network and slave node statuses such as whether or not the MAC ID and baud rate are set correctly, a slave node is down, or a terminal resistor is disconnected.

L12 DN LINK ERROR 20 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- Slave node responded with a non-prescribed error.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Read the communication error information, and take an appropriate action according to the error information.

L12 DN LINK ERROR 23 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- Slave node responded with an error when establishing a connection.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Read the communication error information, and take an appropriate action according to the error information.

L12 DN LINK ERROR 24 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- The input data size of a parameter is different from the size of the actual slave node.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check the slave node manual and set the correct input data size.

L12 DN LINK ERROR 25 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- The output data size of a parameter is different from the size of the actual slave node.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check the slave node manual and set the correct output data size.

L12 DN LINK ERROR 26 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- Response data of a function that is not supported by the QJ71DN91 was received.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check the slave node manual, and change the setting so that any data of functions not supported by the QJ71DN91 will not be sent by the slave node.
- Check the entire network and slave node statuses such as whether or not a terminal resistor is disconnected.

L12 DN LINK ERROR 27 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- The connection is set to the mode that was already specified.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check the entire network and slave node statuses such as whether or not a terminal resistor is disconnected.

L12 DN LINK ERROR 28 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- Unexpected invalid data was received when establishing a connection.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check the entire network and slave node statuses such as whether or not a terminal resistor is disconnected.

L12 DN LINK ERROR 29 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- Connection has already been established with that slave node.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Wait a while, and reset the slave node if the connection cannot be established.

L12 DN LINK ERROR 2A (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- The data length of a polling response is different from the data length read from the slave node when establishing a connection.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check the entire network and slave node statuses such as whether or not a terminal resistor is disconnected.

L12 DN LINK ERROR 2B (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- The first division data was received twice in the division reception of a polling response.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check the entire network and slave node statuses such as whether or not a terminal resistor is disconnected.

L12 DN LINK ERROR 2C (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- The received division data No. is different from the expected No. in the division reception of a polling response.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check the entire network and slave node statuses such as whether or not a terminal resistor is disconnected.

L12 DN LINK ERROR 2D (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- Intermediate data or last data was received before receiving the first division data in the division reception of a polling response.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check the entire network and slave node statuses such as whether or not a terminal resistor is disconnected.

L12 DN LINK ERROR 3B (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- Two or more identical node Nos. (MAC IDs) were detected in parameters.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Two or more slave nodes having the same node No. are set in the parameters. Set the correct node Nos.
- A slave node having the same node No. as that of the local node exists in the parameters.

L12 DN LINK ERROR 47 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- Incorrect connection type was specified.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check that the connection type value is correct.
- Read the communication error information, and take an appropriate action according to the error information.

L12 DN LINK ERROR 80 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- Timeout occurred during the polling connection of the slave function.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Check the entire network and slave node statuses such as whether or not a terminal resistor is disconnected.
- Check the master node status.

L12 DN LINK ERROR 81 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- A connection other than explicit messages and polling was allocated.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Do not allocate I/O connections other than polling.

L12 DN LINK ERROR 82 (Error-detected slave node No.)

Details A deviceNet initialization error has occurred. The error-detected node No. is other than FFH and FEH.
- The number of reception bytes of polling is greater than the maximum number of reception points.

"Error-detected slave node No." shows the error-detected slave node No. in decimal.

Remedy
- Match the I/O point setting of the master node with that of the QJ71DN91.

L13 DN MESSAGE ERR. 161

Details A message communication execution error has occurred.
- The specified slave node No. is other than 0 to 63.

Remedy
- Set it between 0 and 63.

13. Program Errors (P)

(Note) Program error messages are displayed in abbreviation on the screen.

P10 EXCS. AXIS. No.

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 AXIS ADR. ERROR

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.

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.

Remedy - Correct the program.

P30 PARITY H

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

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 ADDRESS. ERROR

Details An address not listed in the specifications has been used.
P command was found in a block with G code macro and MSTB macro.

Remedy
- Correct the program address.
- Correct the parameter settings.
- Check the specifications.
- Separately command G code macro, MSTB macro or P command in different block.

P33 FORMAT ERROR

Details The command format in the program is not correct.

Remedy - Correct the program.

P34 G-CODE ERROR

Details The commanded G code is not in the specifications.
An illegal G code was commanded during the coordinate rotation command.

Remedy - Correct the G code address in the program.

Details G51.2 or G50.2 was commanded when "#1501 polyax (Rotational tool axis number)" was set to "0".
G51.2 or G50.2 was commanded when the tool axis was set to the linear axis ("#1017 rot (Rotational axis)" is set to"0").

Remedy - Correct the parameter settings.

P35 CMD-VALUE OVER

Details The setting range for the addresses has been exceeded.
The program coordinates overflowed because commands to the linear type rotary axis accumulated in one direction.

Remedy - Correct the program.

P36 PROGRAM END ERR

Details "EOR" has been read during 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 PROG. No. 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 99999.
- Add M02 or M03 to the end of the program running in FTP operation.

P39 NO SPEC ERR

Details
- A non-specified G code was commanded.
- The selected operation mode is out of specifications.

Remedy - Check the specifications.

P45 G-CODE COMB.

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.

P60 OVER CMP. LENG.

Details The commanded movement distance is excessive (over 231).

Remedy - Correct the command range for the axis address.

P62 F-CMD. NOTHING

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 G05P3 SPEC

Details

Remedy - Check whether the specifications are provided for the high-speed mode III.

P70 ARC ERROR

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

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 HELICAL SPEC

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.

P90 NO THREAD SPEC

Details A thread cutting command was issued though it is out of specifications.

Remedy - Check the specifications.

P93 SCREW PITCH ERR

Details An illegal thread lead (thread pitch) was specified at the thread cutting command.

Remedy - Correct the thread lead for the thread cutting command.

P111 PLANE CHG (CR)

Details Plane selection commands (G17, G18, G19) were issued during a coordinate rotation (G68) was being commanded.

Remedy - Always command G69 (coordinate rotation cancel) after the G68 command, and then issue a plane selection command.

P112 PLANE CHG (CC)

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

Details The circular command axis does not correspond to the selected plane.

Remedy - Select a correct plane before issuing a circular command.

P122 NO AUTO C-OVR

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.

P130 2nd AUX. ADDR

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 G96 SPEC

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 S = 0

Details No spindle rotation speed command has been issued.

Remedy - Correct the program.

P133 G96 P-No. ERR

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.

P150 NO C-CMP SPEC

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 G2, 3 CMP. ERR

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 I.S.P NOTHING

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.

Remedy - Correct the program.

P153 I.F ERROR

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.

P155 F-CYC ERR (CC)

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 BOUND DIRECT

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 SIDE REVERSED

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 P.

Details An illegal tip point No. (other than 1 to 8) was found during G46 nose R compensation.

Remedy - Correct the tip point No.

P170 NO CORR. NO.

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.

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.

P171 NO G10 SPEC

Details Compensation data input by program (G10) was commanded though it is out of specifications.

Remedy - Check the specifications.

P172 G10 L-No. ERR

Details An address of G10 command is not correct.

Remedy - Correct the address L No. of the G10 command.

P173 G10 P-No. ERR

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 G11 SPEC

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 LIFE COUNT ACT

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 LIFE DATA 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 GROUP NO. ILL.

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 BORING CYC.

Details A fixed cycle command (G72 - G89) was issued though it is out of specifications.

Remedy
- Check the specifications.
- Correct the program.

P181 NO S-CMD (TAP)

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 SYN 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.

Remedy
- Check connection to the main spindle.
- Check that the main spindle encoder exists.
- Set 1 to the parameter #3024 (sout).

P183 PTC/THD No.

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 NO PTC/THD CMD

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.

P187 Tap SP clamp 0

Details The external spindle speed clamp signal was turned ON without setting the tapping spindle's external spindle speed when commanding the synchronous tapping.

Remedy
- Set the external spindle speed clamp speed parameter.
- Turn the external spindle speed clamp signal OFF.

P190 NO CUTTING CYC

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 LENG ERR

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 ERR

Details Chamfering in the thread cutting cycle is illegal.

Remedy - Set a chamfering amount not exceeding the cycle.

P200 NO MRC CYC SPC

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 PROG. ERR (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 OVR (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 CONF. ERR (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 VALUE ERR (MRC)

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 PAT CYC SPC

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 SPECIAL CYC

Details There are no special fixed cycle specifications.

Remedy - Check the specifications.

P221 NO HOLE (S-CYC)

Details "0" has been specified for the number of holes in special fixed cycle mode.

Remedy - Correct the program.

P222 G36 ANGLE ERR

Details A G36 command specifies "0" for angle intervals.

Remedy - Correct the program.

P223 G12 G13 R ERR

Details The radius value specified with a G12 or G13 command is below the compensation amount.

Remedy - Correct the program.

P224 NO G12, G13 SPC

Details There are no circular cutting specifications.

Remedy - Check the specifications.

P230 NESTING OVER

Details Over 8 times of subprogram calls have been done in succession from a subprogram.
- A M198 command was found in the program in the data server.
- The program in the IC card has been called more than once (the program in the IC card can be called only once during nested).

Remedy - Correct the program so that the number of subprogram calls does not exceed 8 times.

P231 NO N-NUMBER

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.
- The file name of the program registered in IC card is not corresponding to O No.

Remedy
- Enter the machining program.
- Check the subprogram storage destination parameters.
- Ensure that the external device (including IC card) that contains the file is mounted.

P241 NO VARI NUMBER

Details The variable No. commanded is out of the range specified in the specifications.

Remedy
- Check the specifications.
- Correct the program variable No.

P242 EQL. SYM. MSSG.

Details The "=" sign has not been commanded when a variable is defined.

Remedy - Designate the "=" sign in the variable definition of the program.

P243 VARIABLE ERR.

Details An invalid variable has been specified in the left or right side of an operation expression.

Remedy - Correct the program.

P260 NO COOD-RT SPC

Details A coordinate rotation command was issued though it is out of specifications.

Remedy - Check the specifications.

P261 G-CODE COMB

Details Another G code or a T command has been issued in the block of coordinate rotation command.

Remedy - Correct the program.

P262 Modal Err

Details A coordinate rotation command has been issued during modal in which coordinate rotation is not allowed.

Remedy - Correct the program.

P270 NO MACRO SPEC

Details A macro specification was commanded though it is out of specifications.

Remedy - Check the specifications.

P271 NO MACRO INT.

Details A macro interruption command has been issued though it is out of specifications.

Remedy - Check the specifications.

P272 MACRO ILL.

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 OVERCALL

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 ARG. EX.

Details The number of argument sets in the macro call argument type II has exceeded the limit.

Remedy - Correct the program.

P276 CALL CANCEL

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 ALM MESG

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 EXC. [,]

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 [,] ILLEGAL

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 CALC. IMPOSS.

Details The arithmetic formula is incorrect.

Remedy - Correct the formula in the program.

P283 DIVIDE 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.

P290 IF SNT. ERROR

Details There is an error in the "IF[<conditional>]GOTO(" statement.

Remedy - Correct the program.

P291 WHILE SNT. ERR

Details There is an error in the "WHILE[<conditional>]DO(-END(" statement.

Remedy - Correct the program.

P292 SETVN SNT. ERR

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 EXCESS

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-END MMC.

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 TPE

Details There is a WHILE or GOTO statement on the tape during FTP operation.

Remedy - Apply memory mode operation instead of FTP operation that does not allow the execution of the program with a WHILE or GOTO statement.

P296 NO ADR (MACRO)

Details A required address has not been specified in the user macro.

Remedy - Correct the program.

P297 ADR-A ERR.

Details The user macro does not use address A as a variable.

Remedy - Correct the program.

P298 PTR OP (MACRO)

Details User macro G200, G201, or G202 was specified during tape or MDI mode.

Remedy - Correct the program.

P300 VAR. NAME ERROR

Details The variable names have not been commanded properly.

Remedy - Correct the variable names in the program.

P301 VAR. NAME DUPLI

Details A duplicate variable name was found.

Remedy - Correct the program so that no duplicate name exists.

P360 NO PROG.MIRR.

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.

P380 NO 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 ARC R/C SPC

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 CORNER NO MOVE

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 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 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 G0 G33 IN CONR

Details A block with corner chamfering/corner rounding was given during G00 or G33 modal.

Remedy - Correct the program.

P390 NO GEOMETRIC

Details A geometric command was issued though it is out of specifications.

Remedy - Check the specifications.

P391 NO GEOMETRIC 2

Details There are no geometric IB specifications.

Remedy - Check the specifications.

P392 LES AGL (GEOMT)

Details The angular difference between the geometric line and line is 1° or less.

Remedy - Correct the geometric angle.

P393 INC ERR (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 G01 (GEOMT)

Details The second geometric block contains no linear command.

Remedy - Issue the G01 command.

P395 NO ADRS (GEOMT)

Details The geometric format is invalid.

Remedy - Correct the program.

P396 PL CHG. (GEOMT)

Details A plane switching command was issued during geometric command processing.

Remedy - Complete the plane switching command before geometric command processing.

P397 ARC ERR (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 GEOMETRIC1B

Details A geometric command was issued though the geometric IB specifications are not provided.

Remedy - Check the specifications.

P420 NO PARAM IN

Details Parameter input by program (G10) was commanded though it is out of specifications.

Remedy - Check the specifications.

P421 PRAM. IN 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, G11 were not commanded in independent blocks.

Remedy - Correct the program.

P430 AXIS NOT RET.

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 2ndREF. SPC

Details A command for second, third or fourth reference position return was issued though there are no such command specifications.

Remedy - Check the specifications.

P434 COLLATION ERR

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/M ERROR

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/M ERROR

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 NOT USE (G52)

Details A local coordinate system command was issued during execution of the G54.1 command.

Remedy - Correct the program.

P450 NO CHUCK BARR.

Details The chuck barrier on command (G22) was specified although the chuck barrier is out of specifications.

Remedy - Check the specifications.

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.

P480 No spec: Milling

Details
- Polar coordinate interpolation was commanded when the polar coordinate interpolation specifications were not provided.

Remedy - Check the specifications.

P481 Illegal G code (mill)

Details
- 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
- G07. 1 was commanded when the cylindrical compensation is disabled.
- G12. 1 was commanded when the polar coordinate interpolation is disabled.
- Cylindrical interpolation/polar coordinate interpolation was commanded before tool compensation cancellation is completed.

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 command unacceptable in the cylindrical interpolation was issued.
- A T command was issued during the cylindrical interpolation or polar coordinate interpolation mode.
- Cylindrical interpolation or polar coordinate interpolation was commanded during the constant surface speed control mode (G96).
- A plane selection command was issued during the polar coordinate interpolation mode.
- A movement command was issued when the plane was not selected just before or after the G07.1 command.

Remedy - Correct the program.

P486 Milling error

Details
- Cylindrical interpolation or polar coordinate interpolation was commanded during mirror image.

Remedy - Correct the program.

P487 Travel n/a (mill)

Details A movement command was issued to a position which is out of the movable range on the polar coordinate interpolation surface.

Remedy - Check the machining program, parameters and the amount of tool compensation.

P600 NO AUTO TLM.

Details An automatic tool length measurement command (G37) was issued though it is out of specifications.

Remedy - Check the specifications.

P601 NO SKIP SPEC.

Details A skip command (G31) was issued though it is out of specifications.

Remedy - Check the specifications.

P602 NO MULTI SKIP

Details A multiple skip command (G31.1, G31.2 or G31.3) 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 ILL. AXIS command

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-CMD IN 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 NO T-CMD BEFOR

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 ILL. SIGNL

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 ERROR (CC)

Details A skip command was issued during radius compensation processing.

Remedy - Issue a radius compensation cancel (G40) command or remove the skip command.

P609 NO PLC SKIP

Details PLC skip has been commanded (L to G31) while PLC skip is out of specifications.

Remedy - Check the specifications.

P610 ILLEGAL PARA.

Details
- G114.1 was commanded when the spindle synchronization with PLC I/F command was selected.
- Spindle synchronization was commanded to a spindle that is not connected serially.

Remedy
- Check the program.
- Check the argument of G114.1 command.
- Check the state of spindle connection.

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.

P990 PREPRO S/W ERR

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.

II Parameters

1. Machining 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.

【#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 99

【#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. (for L system only)

Set the maximum value when inputting the tool wear compensation amount.
A value exceeding this setting value cannot be set.

---Setting range---
0 to 99.999 (mm)

【#8011】 INC. MAX. (for L system only)

Set the maximum value for when inputting the tool wear compensation amount in the incremental mode.
A value exceeding this setting value cannot be set.

---Setting range---
0 to 99.999 (mm)

【#8012】 G73 n (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 screw cut up amount for G76 and G78 (thread cutting cycle).

---Setting range---
0 to 127 (0.1 lead)

【#8015】 CDZ-ANGLE (for L system only)

Set the screw cut up angle for G76 and 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 99.999 (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 d+⊿d, d, d-⊿d using the value (d) commanded with D as a reference. Set the change amount ⊿d.

---Setting range---
0 to 99.999 (mm)

【#8018】 G84/G74 n (for M system only)

Not used. Set to "0".

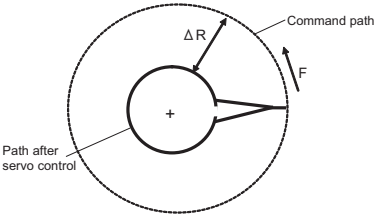
【#8019】 R COMP

Set a compensation coefficient for reducing a control error in the reduction of a corner roundness and arc radius.
Indicates a maximum control error (mm) in parentheses.
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

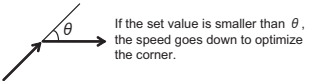
Displays the theoretical radius decrease error amount, ΔR(mm), from the automatic calculation by NC.



Theoretical radius decrease amount in arc

【#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.



(Note) If "0" is set, it will be handled as "5" degrees.
The standard setting value is "0".

---Setting range---
0 to 30 (°)
0: 5 degree (Equals to setting "5")

【#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)

【#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 the program coordinate rotation 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

【#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.

【#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

Not used. Set to "0".

【#8111】 Milling Radius

Set whether to specify the program travel amount by the radius value of all axes in milling or by setting of each axis.
Normally, the radius value command of all axes is set.
0: All axes radius value command
1: Each axis setting ("#1019")

【#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 II B.)

【#8213(PR)】 Rotation axis type

Select the rotation type (short-cut enabled/disabled) or linear type (workpiece coordinate linear type/all coordinate linear type).
This parameter is enabled only when "#1017 rot" is set to "1".

0: Disable short-cut
1: Enable short-cut
2: Workpiece coordinate linear type

(Note 1) When "2" is set, PLC axes will move as same as when "0" is set.
(Note 2) The movement method varies as follows according to the rotary axis type you designate.

<Workpiece coordinate value>
0,1 : Display range 0° to 359.999°
2 : Display range -99999.999° to 99999.999°
<Machine coordinate value/relative position>
0,1,2 : Display range 0° to 359.999°
<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 : 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 : 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 follows the ABS command or the INC command.
Returns with movement within 360 degrees from the middle point to reference position.

【#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)

2. Base Specifications 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.

【#1001(PR)】 SYS_ON System validation setup

Select the existence of PLC axes and part systems.
0: Not exist
1: Exist

【#1002(PR)】 axisno Number of axes

Set the number of control axes and PLC axes.
Up to 16 axes, including the number of spindles (in "#1039 spinno"), can be set.
Control axis: 0 to 8
PLC axis: 0 to 8
When set to "0", the number of control axes in the part system will be "0". "1" or more control axes must be set for the 1st part system.

【#1003(PR)】 iunit Input setup unit

Select the input setting increment for each part system and PLC axis.
The parameter setting increment will follow this specification.
B : 1 μ m
C : 0.1 μ m

【#1013(PR)】 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 and 2 are shown as the axis names.)

---Setting range---
X,Y,Z,U,V,W,A,B,C

【#1014(PR)】 incax Increment command axis name

Set the axis name when commanding an incremental value for the axis travel amount.
Available alphabets are the same as in "#1013 axname".
(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 AbsInc" = "0").

---Setting range---
X, Y, Z, U, V, W, A, B, C

【#1015(PR)】 cunit Program command unit

Set the minimum increment of program travel command.
When set to "0", it becomes 0.001mm(1 μ m).
cunit Travel amount for travel command 1
1: 0.0001 mm (0.1 μ m)
10: 0.001 mm (1 μ m)
100: 0.01 mm (10 μ m)
1000: 0.1 mm (100 μ m)
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.

【#1016(PR)】 iout Inch output

Select the unit system used for setting mechanical values (ball screw pitch and position detection unit).
0 : Metric system
1 : Inch system

【#1017(PR)】 rot Rotational axis

Select whether the axis is a rotary axis or linear axis.
For the rotary axis, the position display will be 360 degrees, and the axis will return to 0 degrees.
If the position display is to be continuously displayed even with the rotary axis, set the axis as a linear axis.
0: Linear axis
1: Rotary axis

【#1018(PR)】 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

【#1019(PR)】 dia Diameter specification axis

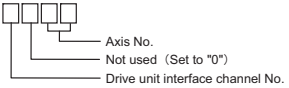
Select the command method of program travel amount.
When the travel amount is commanded with the diameter dimensions, the travel distance will be 5mm when the command is 10mm of travel distance.
The travel amount per pulse will also be halved during manual pulse feed.
If diameter is selected, tool length, 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

【#1020(PR)】 sp_ax Spindle Interpolation

Select "1" when using the spindle for the contour control of NC axis (C-axis).
0: Servo axis is used for contour control.
1: Spindle is used for contour control.

【#1021(PR)】 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.



[Possible setting range]
0000 to FFFF
[Valid setting range]
1001 to 1010

【#1025】 I_plane Initial plane selection

Select the plane to be selected when the power is turned ON or reset.
0: X-Y plane (G17 command state)
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

【#1037(PR)】 cmdtyp Command type

Set the G code list and compensation type for programs.
1 : List1(for M) Type A(one compensation amount for one compensation No.)
2 : List1(for M) Type B(shape and wear compensation amounts for one comp. No.)
3 : List2(for L) Type C(shape and wear compensation amounts for one comp. No.)
4 : List3(for L) Ditto

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.
Thus, after changing this parameter, initialize the system with "#1060 SETUP".

(1060) DATA (1) ( ) INPUT

↓

"BASE PARA SET? (Y/N)" : N INPUT

↓

"FORMAT? (Y/N)" : Y INPUT

↓ (Note)

"SETUP COMPLETE"

(Note) Executing formatting in the above process will initialize the machining program, tool offset data and common variables. Back up necessary machining programs, tool offset data, and common variables in an external memory before initializing.

【#1038】 plcsel

Not used. Set to "0".

【#1039(PR)】 spinno Number of spindles

Select the number of spindles.
0: No spindle
1 to 7: One to Seven spindles

【#1040(PR)】 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

【#1041(PR)】 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) Selection of inch and metric unit
When the setting value of "#1041 I_inch" is changed, the unit of length is changed after reset. The following parameters concerning length, however, are not changed automatically. Change the setting values of following parameters according to the new unit system.

(1) Tool compensation amount (Tool length compensation amount, tool wear compensation amount and tool tip compensation amount)
(2) Workpiece coordinate offset
(3) Machining parameter
#8004 SPEED ("#8004 SPEED" is 10 inches/min. unit for the inch system.)
#8005 ZONE r #8006 ZONE d #8009 DSC. ZONE
#8010 ABS. MAX. #8011 INC. MAX. #8012 G73n
#8013 G83n #8016 G71 MINIMUM #8017 G71 DELTA-D
#8018 G84/G74n
(4) Axis parameter
#8204 OT-CHECK-N #8205 OT-CHECK-P
#8206 TOOL CHG.P #8209 G60 Shift
(5) Barrier data #8300-#8306
(6) Base specifications parameter #1084 RadErr

【#1042(PR)】 pcinch PLC axis command (inch)

Select the unit system for the commands to the PLC axis and the PLC indexing axis.
When changing the NC axis/PLC axis switchover to the PLC axis control, the command unit is set in accordance with the parameter setting.
0: Metric system
1: Inch system

【#1043】 lang Select language displayed

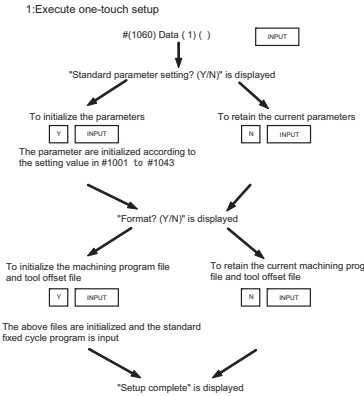
Select the display language.
0: English (Standard)
1: Japanese (Standard)
11: German (Option)
12: French (Option)
13: Italian (Option)
14: Spanish (Option)
21: Polish (Option)
22: Simplified Chinese (Option)

【#1044(PR)】 auxno

Not used. Set to "0".

【#1060】 SETUP Activate setup processing

Execute the functions required for initializing the system.



(Note) Most setup parameters will be initialized with one-touch setup. So confirm the data before executing.
This parameter will automatically be set to 0 when the power is turned ON.

【#1061(PR)】 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

【#1064(PR)】 svof Error correction

Select whether to correct the error when the servo is OFF.
0: Not correct the error
1: Correct the error

【#1065】 JOG_H JOG response type

Set the JOG responsiveness type.
0: Conventional specification
JOG is started or stopped by a signal via ladder without reference to an external signal input.
1: Type 1
JOG is started or stopped by an external signal.
2: Type 2
JOG is started or stopped by logical AND of an external signal and a signal via ladder.
3: Type 3
JOG is started when a signal via ladder rises. It is stopped when an external signal and a signal via ladder fall.
4: Type 4
Reference position return mode:
JOG is started or stopped by a signal via ladder without reference to an external input signal (conventional specification).
Non-reference position return mode:
JOG is started or stopped by logical AND of an external signal and a signal via ladder (type 2).

---Setting range---
0 to 4

【#1066】 JOG_HP Select JOG activation (+) device

Set the device No. to input +JOG activation signal.
The device type is specified by "#1071 JOG_D".
The effective setting range varies depending on the device type.
A value specified outside of the effective range is invalid.

---Setting range---
X: 0000 to 02FF (hexadecimal)
M: 0000 to 8191 (decimal)

【#1067】 JOG_HN Select JOG activation (-) device

Set the device No. to input -JOG activation signal.
The device type is specified by "#1071 JOG_D".
The effective setting range varies depending on the device type.
A value specified outside of the effective range is invalid.

---Setting range---
X: 0000 to 02FF (hexadecimal)
M: 0000 to 8191 (decimal)

【#1068(PR)】 slavno Secondary axis number

Set the axis number of the secondary axis in synchronous control.
The axis number is an NC number excluding the spindle and PLC axis.
Two or more secondary axes cannot be set for one primary axis.
This parameter cannot be set for a secondary axis.
When using the multi-part system, the relation of the primary axis and secondary axis cannot extend over part systems.
0: No secondary axis
1 to 8: First to eighth 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

【#1071(PR)】 JOG_D JOG activation signal device name

Select the device to input JOG activation signal(+/-).
0: X device
1 or 2: M device
Set the parameters "#1066 JOG_HP" and "#1067 JOG_HN" according to this device specification parameter.

---Setting range---
0 to 2

【#1072】 chop_ax Chopping axis

Select the chopping axis.
0: Non-chopping axis
1: Chopping axis

【#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】 Abslnc ABS/INC address (for L system only)

Select the command method for the absolute and incremental commands.
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.)

When "1" is selected, using two axis names, one each for the absolute and incremental commands, allows to issue the absolute and incremental commands appropriately to an axis.

【#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 Specify boring axis (for M system only)

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)

【#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.

【#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

【#1089】 Cut_RT

Not used. Set to "0".

【#1090】 Lin_RT

Not used. Set to "0".

【#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 (!) 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

【#1096(PR)】 T_Ltyp Tool life management type (for L system only)

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.

【#1097】 Tldigt Tool wear compensation number 1-digit command

Select the number of digits of the tool wear compensation No. in the T command.
0: The 2 high-order digits are the tool No., and the 2 low-order digits are the wear compensation No.
1: The 3 high-order digits are the tool No., and the 1 low-order digit is the wear compensation No.

This parameter will be fixed to “0” when tool life management II is selected.

【#1098】 Tlno. Tool length offset number

Select the number of digits of the tool length compensation No. in the T command.
0: The 2 or 3 high-order digits are the tool No.
The 2 or 1 low-order digits are the tool length compensation and wear compensation Nos.
1: The 2 or 3 high-order digits are the tool No. and tool length compensation Nos.
The 2 or 1 low-order digits are the wear compensation 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

【#1102】 tlm Manual tool length measuring system (for L system only)

Select the measurement method for manual tool measurement I.
0: Align tool with basic point
1: Input measurement results

【#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.

【#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】 Tllfsc 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】 TlrectM 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

【#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)

【#1112(PR)】 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

【#1113(PR)】 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 thread cutting

Set the queue number during screw thread cutting when chamfering is disabled.

---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

【#1117(PR)】 H_sens Handle response switch

Not used. Set to "0".

【#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

【#1120(PR)】 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.

【#1122(PR)】 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 zero prohibit

Select whether to use the origin zero 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

Not used. Set to "0".

【#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】 RstVCI Clear variables by resetting

Select how to handle the common variables when resetting.
0: Common variables won't change after resetting.
1: The following common variables will be cleared by resetting:
#100 to #149 when 100 sets of variables are provided.
#100 to #199 when 200 sets or more of variables are provided.

【#1129】 PwrVCI 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: The following common variables will be cleared when the power is turned ON:
#100 to #149 when 100 sets of variables are provided.
#100 to #199 when 200 sets or more of variables are provided.

【#1130】 set_t Display selected tool number

Select the tool command value display on the POSITION screen.
0: Display T-modal value of program command
1: Display Tool No. sent from PLC

【#1131】 Fldcc

Not used. Set to "0".

【#1132】 CRT

Not used. Set to "0".

【#1133】 ofsmem Select how to set up tool wear compensation screen

Select whether to display the # number stored at the previous setup, when selecting the tool compensation screen.
0: Not display the # number when selecting the screen.
1: Display the stored # number when selecting the screen.

【#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

【#1138】 Pnosel Select screen by parameter number

Select whether to enable the function to select a screen by specifying a parameter number.
0: Disable
1: Enable

【#1139】 edtype Edit type selection

Select an edit type.
0: Screen edit type (M50 or equivalent operation)
1: Screen edit type
(The screen of EDIT or MDI is changed automatically according to the selected operation mode.)
2: Word edit type
(The screen of EDIT or MDI is changed automatically according to the selected operation mode.)

【#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】 I_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 G92S command.
0: G92S 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 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.

【#1148】 I_G611 Initial high precision

Set the high accuracy control mode for the modal state when the power is turned ON.
0: G64 (cutting mode) at power ON
1: G61.1 (high-accuracy control mode) at power ON

【#1149】 cireft Arc deceleration speed change

Select whether to decelerate at the arc entrance or exit.
0: Not decelerate
1: Decelerate

【#1150】 Fldc0

Not used. Set to "0".

【#1151】 rstint Reset initial

Select whether to initialize (power ON state) the modals by resetting.
0: Not initialize modal state
1: Initialize modal state

【#1152】 I_G20 Initial command unit

Select inch or metric command mode at power-ON or resetting.
0 : Metric command (G21 command state)
1 : Inch command (G20 command state)

This selection is enabled at reset input.
Related parameter : "#1226 bit6" Set up and display unit selection

【#1154(PR)】 pdoor

Not used. Set to "0".

【#1155】 DOOR_m Signal input device 1 for door interlock II

Set a fixed device No. (X device No.) to input the door interlock II signal.
Using this device can realize the same operation as the door open II signal input, without passing through the PLC.
"000" can not be used as a fixed device No.
When not using the fixed device No, set this to "100".
(Note) When you set a device No. with this parameter, make sure also to set the same No. to "#1156".

---Setting range---
000 to 2FF(hexadecimal)

【#1156】 DOOR_s Signal input device 2 for door interlock II

Set a fixed device No. (X device No.) to input the door lock II signal.
Set the same value as #1155.

---Setting range---
000 to 2FF(hexadecimal)

【#1157】 F0atrn

Not used. Set to "0".

【#1158】 F0atno

Not used. Set to "0".

【#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.
Although later CNC software versions allow constant connection of MS Configurator while this parameter is set to "0", the available functions are limited.

【#1166】 fixpro Fixed cycle editing

Select a type of program dealt on the edit/program list/data in/out screen, general program or fixed cycle.
0: General programs can be edited, etc.
1: Fixed cycles can be edited, etc.

【#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

【#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---
1 to 100 (%)

【#1172】 tapovr Tap return override

Set the override value when leaving the tap end point in the synchronous tapping cycle.
The setting range is 1 to 999, and the unit is %.
When a value less than 100 is set, it will be judged as 100%.

---Setting range---
1 to 999 (%)

【#1173】 dwlskp G04 skip condition

Set the skip signal for ending the G04 (dwell) command.

Setting	Skip signals			
	SKIP3	SKIP2	SKIP1	SKIP0
0	×	×	×	×
1	×	×	×	○
2	×	×	○	×
3	×	×	○	○
4	×	○	×	×
5	×	○	×	○
6	×	○	○	×
7	×	○	○	○
8	○	×	×	×
9	○	×	×	○
10	○	×	○	×
11	○	×	○	○
12	○	○	×	×
13	○	○	×	○
14	○	○	○	×
15	○	○	○	○

Skip when ○ signal is input.

【#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".

【#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".

【#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".

【#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
:
8: 8th axis

However, when set to other than “0”, the priority will be on the program setting.

【#1182】 thr_F Thread cutting speed

Set the screw cut up 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)

---Setting range---
1 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)

---Setting range---
1 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)

---Setting range---
1 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)

---Setting range---
1 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)

---Setting range---
1 to 1000000 (mm/min)

【#1190(PR)】 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

【#1191(PR)】 s_angl Inclination angle (for L system only)

Set the inclination angle α of the oblique coordinate X' axis from X axis on the orthogonal coordinate system.

---Setting range---
-80.000 to 80.000 (°)

【#1192(PR)】 s_zrmv Compensation at reference point return (for L system only)

Select whether to compensate for the Z axis motion during the X axis manual reference position return under the inclined axis control.
0 : Compensate for Z axis
1 : Not compensate for Z axis

【#1193】 inpos Validate in-position check

Select the manner of how to check deceleration when a positioning command is being issued.
0: Command deceleration check
(Positioning is completed when the deceleration is completed at the acceleration/ deceleration speed commanded from the control unit.)
1: In-position check
(Positioning is completed when the servo drive unit detects the machine having reached within a set distance from the end point. This set distance is determined in "#2224 SV024".)
2: Command deceleration check (Commanded deceleration check is executed when cutting feed is shifted to rapid traverse.)
3: In-position check (Commanded deceleration check is executed when cutting feed is shifted to rapid traverse.)

For the details of each setting values, refer to "Deceleration Check" - "Deceleration Check and Parameters".

【#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 for T command

Select whether to enable or disable T command macro call of user macro.
0: Disable
1: Enable

【#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(PR)】 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)

【#1200(PR)】 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

【#1201(PR)】 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.

(Note) Set "0" for the 2nd part system and the following.

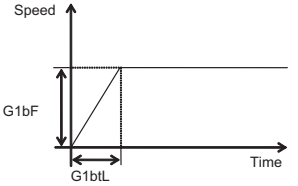
【#1206】 G1bF Maximum speed

Set a cutting feedrate when applying pre-interpolation acceleration/deceleration.

---Setting range---
1 to 1000000 (mm/min)

【#1207】 G1btL Time constant

Set a cutting feed time constant when applying pre-interpolation acceleration/deceleration.



---Setting range---
1 to 5000 (ms)

【#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 1000000 (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	*	*	*	*	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: (Not used)

bit 10: Group 17 Constant surface speed control command modal initialization

bit F: (Not used)

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	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: Group 15 Facing turret mirror image initialization

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: (Not used)

bit E: (Not used)

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

【#1211】 FHtyp Feed hold stop type

Select the type of the external signal used for feed hold.
0: Disable the external signal.
1: Enable the external signal (contact A)
2: Enable the external signal (contact B)

---Setting range---
0 to 2

【#1212】 FHno Feed hold external signal device

Set the device No. (X**) used to input the feed hold signal.

---Setting range---
000 to 2FF (hexadecimal)

【#1216】 extdcc External deceleration level

Set the upper limit value of the feedrate when the external deceleration signals are enabled. This parameter is valid when "#1239 set11/bit6" is set to "0".

---Setting range---
1 to 1000000 (mm/min)

【#1218】 aux02

bit3: Parameter input/output format

Select the parameter input/output format.
0: Type I
1: Type II (related to "#1218 aux02/bit5")

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

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.

【#1219】 aux03

bit1

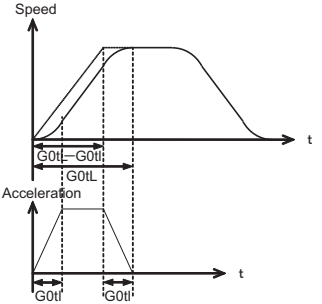
Reserved for system.

bit3

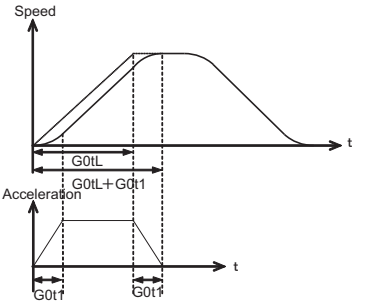
Reserved for system.

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

bit06: MDI part system interlock enabled

Select the part system in which the MDI setting is completed when pushing down the input during editing MDI.
0: All the part systems
1: Only the part system being displayed

【#1223】 aux07

bit3: Synchronous tapping in-position check valid

0: Disable (Conventional method: execute same in-position check at the hole bottom/R point)
1: Enable (Extension method: able to select the in-position check enable/disable at the hole bottom/R point)

Related parameters:
#1223/bit4 Synchronous tapping hole bottom in-position check

bit4: Synchronous tapping hole bottom in-position check

Select enable/disable of Synchronous tapping hole bottom in-position check.
0: Disable
1: Enable

bit6: Synchronous tapping (,S) cancel

0: Retain a spindle speed (, S) when performing synchronous tapping retract.
1: Cancel a spindle speed (, S) by retract with G80.

bit7: Synchronous tapping method

Select a synchronous tapping method.
0: Enable multi-step acceleration/deceleration and rapid return synchronous tapping
1: Disable multi-step acceleration/deceleration and rapid return synchronous tapping

【#1224】 aux08

bit0: Data sampling valid

Set valid/invalid for the data sampling.
0: Setting of sampling parameter invalid
1: Setting of sampling parameter valid

【#1225】 aux09

bit5: Alarm history recording option of the safety observation warning

Select whether to record "Y21 Safety observation warning 0001" (Speed obsv signal: Speed over) to the alarm history.
0: Record
1: Not record

【#1226】 aux10

bit0: Tool compensation data for external workpiece coordinate offset measurement

Select the tool offset data to be used for external workpiece coordinate offset measurement.
0: Tool length data and nose wear data
1: Tool length data

bit1: Optional block skip type

Select whether to enable optional block skipping in the middle of a block.
0: Enable block skipping only at the beginning of a block.
1: Enable block skipping at the beginning of the block and in the middle of a block.

bit2: Single block stop timing

Select the timing at which the single block signal is enabled.
0: Enable the single block stop after the block is finished, when the signal goes ON during automatic operation startup.
1: Enable the single block stop when the signal is ON at the end of the block.

bit3 : C axis reference position return type

Select the type of reference position return for the C axis.
0 : Return to the zero point by G28 reference position return command and manual reference position return start-up.
1 : The reference position return will be carried out before executing the first block of the first C axis command after switching over to the C aix mode in an automatic mode. Return to the zero point by G28 reference position return command and manual reference position return start-up.

bit4: S command during constant surface speed

Select whether to output a strobe signal when S command is issued in constant surface speed mode.
0: Output no strobe signal in constant surface speed mode.
1: Output strobe signals even in constant surface speed mode.

bit5: Dog/OT signal arbitrary assignment enabled

Select whether to enable the signal assignment for the origin dog and H/W OT.
0: Disable
1: Enable arbitrary allocation

bit6: Setting and display unit selection

Select the unit to be used as the setting/display unit or handle feed unit from the command unit or internal unit.
0: Internal unit
1: Command unit

(Note 1) This parameter is enabled only in initial millimeter mode (when "#1041 I_inch" is set to "0"). The internal unit is always used in initial inch mode (when "#1041 I_inch" is set to "1").

(Note 2) This parameter is enabled immediately after it is set.

(Note 3) If addition setting is performed for tool and workpiece offset data with the command unit "inch" and internal unit "mm", an error may occur.

Related parameter: "#1152 I_G20 (Initial command unit)"

【#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.

bit4: Program address check

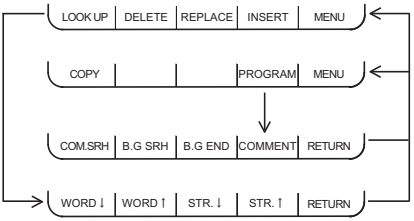
Specify whether to simply check the program addresses when the machining program is executed.
0: Not check the program address.
1: Check the program address.

bit5: Spindle rotation speed clamp

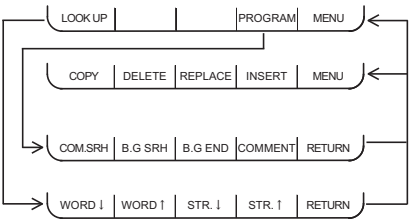
Specify whether to clamp the rotation speed in constant surface speed mode when the spindle rotation clamp command is issued.
0: Clamps the rotation regardless of the constant surface speed mode.
1: Clamps the rotation only in constant surface speed mode.

bit6: Switch menu type

Set the menu type for the word edit (the parameter "#1139 edtype" is "2").
0: Menu type 1



1: Menu type 2



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: Switch coordinate value screen

Set this to switch the coordinate value screens.
0: 80-character screen
1: 40-character screen

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

Select the data protection range in data transmission mode.
0: Enable the protection in both sending and receiving data.
1: Enable the protection only in sending data.

bit4: Select operation error or stop code

Select whether to handle the block start and cutting start interlocks as stop codes.
0: Operation error
1: Stop code

bit5: Select constant surface speed coordinates

Select the coordinate system for constant surface speed control.
0: Workpiece coordinate
1: Absolute value coordinate

bit6: Switch relative values displayed

Select whether to preset the relative coordinates with 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. (Same as conventional)
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 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

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

【#1234】 set06

bit5: Enable sampling parameter output

Select whether to enable sampling parameter.
0: Disable
1: Enable
Sampling parameter will be put out only when this parameter is enabled and "#1224 aux08/ bit0" = "1".

【#1236】 set08

bit0: Rotary axis Manual feed rate unit selection

Select the manual feed rate unit for a rotary axis.
0: Fixed to [°/min]
1: Conventional

【#1237(PR)】 set09

bit0: External workpiece offset

Select this function to use the external workpiece coordinates by shifting them to the Z axis.
0: Not reverse the sign of external workpiece offsets (Z shift) (same as conventional).
1: Reverse the sign of external workpiece offsets (Z shift).

(Note) When you choose to reverse the sign of external workpiece offsets (Z shift), do not measure those external workpiece offsets.
However, you can measure the external workpiece offsets using a tool pre-setter.

【#1239(PR)】 set11

bit0: Coil switching method

0 : Via PLC. (YD3F)
1 : NC internal processing. (YD3F is disabled.)

(Note1) Set to "0" when the system structure requires a mechanical gear for a spindle.
(Note2) When this parameter is set to "1", the spindle speed is clamped to the maximum speed of the gear 2 ("#3006 smax2" or "#3014 stap2" when tapping) regardless of the input gear.

bit5 : Enable external spindle speed clamp

Select whether to enable spindle speed clamp function using 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, #2161 - #2165 exdcax1-6 External deceleration speed 1-6)

【#1240(PR)】 set12

bit0: Handle input pulse selection

Select the handle input pulse.
0: MITSUBISHI CNC standard handle pulse
1: Handle 400 pulse

【#1241(PR)】 set13

bit0 : No G-CODE COMB. Error

Select the operation for when an illegal combination of modal and unmodal G codes are commanded in a same block.
0 : The program error (P45) will occur.
1 : A program error can be avoided but the modal G code will be ignored.

【#1245】 set17

bit0: Enable I point in-position check

Select whether to enable I point in-position check.
0: Disable
1: Enable

bit1: Enable R point --> I point in-position check

ect whether to enable R point --> I point in-position check
0: Disable
1: Enable

【#1258(PR)】 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.

bit1: Enable Position check excessive detection alarm at power ON

Select the alarm to be output when the machine position at the power OFF/ON is bigger than a value set in "#2051 check".
0: Z70 0006(Abs posn error) will be output.
1: Z70 0007(position check excessive detection at power ON) will be output.

bit7 : PLC axis buffering mode action changeover

Select the action of rotary axis when issuing an absolute value command to the PLC axis in buffering mode.
0 : Shift as much as the incremental amount calculated by subtracting current value from command value.
1 : When short-cut is disabled, follow the sign of the command value. When short-cut is enabled, take a short-cut to the commanded position.

【#1270(PR)】 ext06

bit5: Coordinate rotation angle without command

Select the operation when there is no rotation angle command R for the L system 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".

bit7: Handle C axis coordinate during cylindrical interpolation

Specify whether the rotary axis coordinate before the cylindrical interpolation start command is issued is kept during the cylindrical interpolation or not.
0: Do not keep
1: Keep

【#1273(PR)】 ext09

bit0 : Arcsine ASIN calculation result range changeover

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°)

【#1277(PR)】 ext13

bit0: Tool life management II count type 2

Select how and when the mount or use count is incremented in tool life management II.
0: Type 1 (Default)
Increment the count each time a spindle tool is used for cutting.
1: Type 2
Increment the count by one for a tool that is used or mounted in one program. This incrementing is done at resetting.

【#1279(PR)】 ext15

bit3: Retaining the asynchronous feed modal during polar coordinate(cylindrical) interpolation

Select whether to retain the asynchronous feed modal during the polar coordinate(cylindrical) interpolation even after its interpolation is canceled. Simultaneously, select whether to retain the speed even after the polar coordinate(cylindrical)interpolation is canceled, in cases where the polar coordinate(cylindrical) interpolation has been started and the speed is commanded.
0: Do not retain
1: Retain

【#1281(PR)】 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: Primary and secondary 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: Primary and secondary axes start the return synchronizing, and when the primary axis stops at the reference position, the secondary also stops. Thus, the relative position of the primary and secondary is kept.

bit3: Synchronous control operation setting

Select whether or not the positioning of secondary axis automatically aligns with that of primary axis when the axis subject to synchronous control is changed from servo OFF to servo ON.
0: The positioning automatically aligns.
1: The positioning does not align.

bit4: Handle feed clamp selection

Select the operation when the speed has been clamped by the clamp speed in handle feed mode.
0: Clamp the movement speed (compatible with conventional specifications)
1: Clamp the number of handle input pulses

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 during synchronization

Select the method of how to compensate the secondary axis when compensating external machine coordinate system 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: Primary axis and secondary axis are independently compensated.
1: Primary axis' compensation amount is applied to secondary 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: Primary and secondary axes start the return synchronizing, and when the primary axis stops at the reference position, the secondary also stops. Thus, the relative position of the primary and secondary is kept.
1: Primary and secondary 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.

【#1282(PR)】 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 secondary axis's signal is output when the secondary axis reaches the reference position coordinate.
0: A master axis's reference position reached signal is output only when both of the master and secondary 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.

【#1284(PR)】 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".

【#1287(PR)】 ext23

bit4: Relative coordinate counter display

(M system)
0: Display the position on the program including tool length compensation.
1: Display the position on the program excluding tool length compensation.
(L system)
0: Display the position on the program including tool shape compensation.
1: Display the position on the program excluding tool shape compensation.

bit5: Relative coordinate counter display

(M system)
0: Display the position on the program including tool radius compensation.
1: Display the position on the program excluding tool radius compensation.
(L system)
0: Display the position on the program including nose R compensation.
1: Display the position on the program excluding nose R compensation.

bit6: Workpiece coordinate counter display

(M system)
0: Display the position on the program including tool length compensation.
1: Display the position on the program excluding tool length compensation.
(L system)
0,1: Display the position on the program which excludes tool shape compensation.
This display is also registered to the values of the system variables #5041 and after.

bit7: Workpiece coordinate counter display

(M system)
0: Display the position on the program including tool radius compensation.
1: Display the position on the program excluding tool radius compensation.
(L system)
0: Display the position on the program including nose R compensation.
1: Display the position on the program excluding nose R compensation.
This display is also registered to the values of the system variables #5041 and after.

【#1300(PR)】 ext36

bit7: Spindle synchronization command method

Select the command method for spindle synchronization control.
0: Spindle synchronization control II
(Controlled by PLC)
1: Spindle synchronization control I
(Controlled by G code)

【#1301】 nrfchk Near reference position check method

Select the method to judge the "near reference position".
0: Conventional judging method using command type machine position
1: High-speed judging method using command type machine position
2: High-speed judging method using feedback position

【#1302】 AutoRP Automatic return by program restart

0: Move the system manually to the restart position and then restart the program.
(Automatic return is unavailable.)
1: The system automatically moves to the restart position at the first activation after the program restarts. (Manual return is also available.)

【#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】 TapDwl Hole bottom wait time

Set the hole bottom wait time of synchronous tap.
Comparing with P command, a greater value will be applied as the hole bottom wait time.
When an in-position check is performed at the hole bottom, the dwell for specified period of time will be completed after the completion of the in-position check.
(Note) This parameter is enabled when "#1223 aux07 /BIT3, BIT4" is set "1".

---Setting range---
0 to 999 (ms)

【#1314】 TapInp In-position check width for tapping hole bottom(tap axis)

Set the hole bottom in-position check width for synchronous tapping.
The value of "#2224 sv024" is applied when "0" is set.
(Note) This parameter is enabled when "#1223 aux07/bit3,bit4" is set "1".

---Setting range---
0 to 99.999 (mm)

【#1323(PR)】 chopsel Chopping command method

Select how to command chopping.
0: Command with PLC interface
1: Command with a G code

【#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)

【#1330(PR)】 MC_dp1 Contactor weld detection device 1

When safety observation is executed, set the device of a safety signal unit (the sequencer side device No.) 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.

---Setting range---
0000 to 01FF (HEX)

【#1331(PR)】 MC_dp2 Contactor weld detection device 2

When safety observation is executed, set the device of a safety signal unit (the sequencer side device No.) 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.

---Setting range---
0000 to 01FF (HEX)

【#1357(PR)】 mchkt1 Contactor operation check tolerance time 1

Set the time between outputting the contactor shutoff output 1 and establishing an emergency stop in case the contactor does not move.
When set to "0", this function will be invalidated.

---Setting range---
0 to 30000(ms)

【#1361(PR)】 aux_acc Auxiliary axis constant inclination

Select the acceleration/deceleration type of the auxiliary axis in PLC axis indexing.
0 : Acceleration and deceleration with constant time
1 : Acceleration and deceleration with a constant angle of inclination

【#1368(PR)】 SfAlmRstD Safety observation alarm reset inputting device

Turn ON the X device set in this parameter to cancel the safety observation alarm by resetting.
Select other device than reset button to avoid mistakenly canceling the safety observation alarm which may happen by only pressing the reset button if the same device No. as the X device assigned to the reset button is set in this parameter.
When set to "0", the safety observation alarm will not be canceled with the reset button. (X0 cannot be used)

---Setting range---
0000 to 01FF (HEX)

【#1383】 Alm1DBord Alarm displaying threshold (1D)

Set threshold for turning ON the detector alarm (1D).
The threshold is "2" when "0" is set.

---Setting range---
0 to 4000

【#1384】 Alm1FBord Alarm displaying threshold (1F)

Set threshold for turning ON the detector alarm (1F).
The threshold is "2" when "0" is set.

---Setting range---
0 to 4000

【#1385】 Alm2DBord Alarm displaying threshold (2D)

Set threshold for turning ON the detector alarm (2D).
The threshold is "2" when "0" is set.

---Setting range---
0 to 4000

【#1386】 Alm2FBord Alarm displaying threshold (2F)

Set threshold for turning ON the detector alarm (2F).
The threshold is "2" when "0" is set.

---Setting range---
0 to 4000

【#1387】 Alm41Bord Alarm displaying threshold (41)

Set threshold for turning ON the detector alarm (41).
The threshold is "1" when "0" is set.

---Setting range---
0 to 3

【#1388】 Alm42Bord Alarm displaying threshold (42)

Set threshold for turning ON the detector alarm (42).
The threshold is "1" when "0" is set.

---Setting range---
0 to 3

【#1493(PR)】 ref_syn Synchronization at zero point initialization

(Note) Set to "1" for position command synchronization control.
0 : Primary axis and secondary axis determine their zero points individually.
1 : The zero points of both primary and secondary axes are determined by initializing the primary axis' zero point.
When using the stopper method and either the primary axis or the secondary axis reaches the current limit, both axes proceed to the next step.

【#1496(PR)】 push_typ Synchronization when initializing the zero point

0 : Follows #1493.
1 : When #1493=1 and both the primary and secondary axes reach the current limit when using the stopper method, the droop will be canceled and both axes proceed to the next step.

【#1501】 polyax

Not used. Set to "0".

【#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

【#1510】 DOOR_H

Not used. Set to "0".

【#1511】 DOORPm

Not used. Set to "0".

【#1512】 DOORPs

Not used. Set to "0".

【#1516】 mill_ax Milling axis name (rotary axis name of polar coordinate interpolation)

Set the name of the rotary axis used in milling interpolation. Only one rotary axis can be set.

---Setting range---
A name for the rotary axis: "C", "B", etc.

【#1517】 mill_C Hypothetical axis command name

Select the hypothetical axis command name for cylindrical interpolation/polar coordinate interpolation.
This parameter corresponds to the rotary axis name.
0: Y axis command
1: Command rotary axis name.

【#1520(PR)】 Tchg34 Additional axis tool compensation selection

Select axis to carry out the additional axis' tool compensation function for.
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 (°)

【#1522(PR)】 C_axis Normal line control axis

Set the number of the axis for normal line control.
Set a rotary axis No.

---Setting range---
1 to 8

【#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

【#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)

【#1567】 mill_err Error between linear axis and rotary axis center

Set the error between the linear axis and the rotary axis center (the error being deviation from the rotary axis center to the vertical direction of linear axis.)
Set the error amount by the radius value.

---Setting range---
-9999.999 to 9999.999 (mm)

【#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.

---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" is set.

---Setting range---
0 to 50 (ms)

【#1801】 Hacc_c Arc radius clam acceleration

---Setting range---
-99999999 to +99999999

【#1802】 Macc_c Acceleration check at middle speed

---Setting range---
-99999999 to +99999999

【#1803】 Lacc_c Acceleration check at low speed

---Setting range---
-99999999 to +99999999

【#1811】 Hcof_A X-axis high acceleration coefficient β

---Setting range---
-99999999 to +99999999

【#1812】 Hcof_B X-axis high acceleration coefficient α

---Setting range---
-99999999 to +99999999

【#1813】 Mcof_A X-axis middle acceleration coefficient β

---Setting range---
-99999999 to +99999999

【#1814】 Mcof_B X-axis middle acceleration coefficient α

---Setting range---
-99999999 to +99999999

【#1815】 Lcof_A X-axis low acceleration coefficient β

---Setting range---
-99999999 to +99999999

【#1816】 Lcof_B X-axis low acceleration coefficient α

---Setting range---
-99999999 to +99999999

【#1817】 mag_C X-axis change magnification θ [%]

Set to "0" when no compensation or change is executed.

---Setting range---
-99999999 to +99999999

【#1821】 Hcof_A Y-axis high acceleration coefficient β

---Setting range---
-99999999 to +99999999

【#1822】 Hcof_B Y-axis high acceleration coefficient α

---Setting range---
-99999999 to +99999999

【#1823】 Mcof_A Y-axis middle acceleration coefficient β

---Setting range---
-99999999 to +99999999

【#1824】 Mcof_B Y-axis middle acceleration coefficient α

---Setting range---
-99999999 to +99999999

【#1825】 Lcof_A Y-axis low acceleration coefficient β

---Setting range---
-99999999 to +99999999

【#1826】 Lcof_B Y-axis low acceleration coefficient α

---Setting range---
-99999999 to +99999999

【#1827】 mag_C Y-axis change magnification θ [%]

Set to "0" when no compensation or change is executed.

---Setting range---
-99999999 to +99999999

【#1926(PR)】 IP address IP address

Set the NC's IP address.
Set the NC IP address seen from an external source.
IP address will be "192.168.1.2" when NC is initialized.

【#1927(PR)】 Subnet mask Subnet mask

Set the subnet mask for the IP address.

【#1928(PR)】 Gateway address Gateway

Set the IP address for the gateway.

【#1929】 Port number Port No.

Set the HMI connection port No.
(Set the default value 64758 unless particularly required.)

---Setting range---
0 to 65535

【#1930(PR)】 Speed Auto/10M

Select the communication rate.
0 : Set the communication rate by automatically recognizing “10M” or “100M”.
1 : Fix the rate at "10M".

【#11033(PR)】 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
(Note 1)This parameter is enabled when "#1258 set30/bit0" is set to "1".
(Note 2)bit4 to bit7 are not used. Set to "0".
(Note 3)This parameter is independent of PLC skip.

---Setting range---
00000000 to 00001111 (Binary)

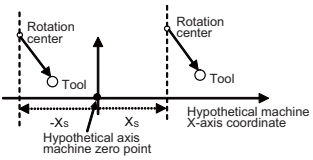
【#12015(PR)】 v_dist Hypothetical axis tool length

In the hypothetical linear axis control, set the length in the hypothetical plane from the rotation center of the actual rotary axis to the tool center.
Setting "0" disables the hypothetical axis.

---Setting range---
0 to 99999.999 (mm)

【#12016(PR)】 v_ori Hypothetical axis machine zero point

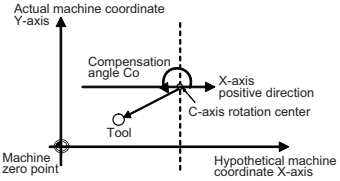
Set the distance Xs from the hypothetical axis machine zero point to the center of the rotary axis. If the rotation center is left side from the zero point as follows, set a negative value.



---Setting range---
-99999.999 to 99999.999 (mm)

【#12017(PR)】 ofsang Actual rotary axis compensation angle

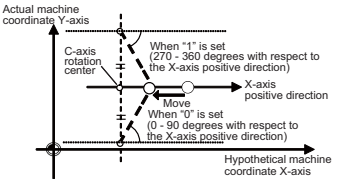
Set the angle Co of the vector from the rotation center to the tool when the C-axis (actual axis) is positioned at 0 degrees with respect to the positive direction of the hypothetical axis (X-axis) in the hypothetic plane.



---Setting range---
0 to 359.999(°)

【#12018】 ClAng1 Angle 1 in conversion

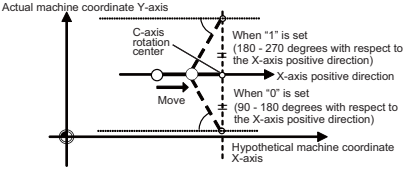
Set which solution is applied when the rotary axis angle is 0 degrees with respect to the X-axis positive direction and a command would give an equal travel distance in both directions along Y-axis.



0: Solution between 0 - 90 degrees with respect to the X-axis positive direction (The tool will face upward.)
1: Solution between 270 - 360 degrees with respect to the X-axis positive direction (The tool will face downward.)

【#12019】 ClAng2 Angle 2 in conversion

Set which solution is applied when the rotary axis angle is 180 degrees with respect to the X-axis positive direction and a command would give an equal travel distance in both directions along Y-axis.



0: Solution between 90 - 180 degrees with respect to the X-axis positive direction
1: Solution between 180 - 270 degrees with respect to the X-axis positive direction

【#12020(PR)】 r_lim+ Actual axis movable range (+)

In the hypothetic axis mode, set a movable range of the actual linear axis in positive direction in the hypothetic plane with a distance from the machine zero point.

---Setting range---
0 to 99999.999 (mm)

【#12021(PR)】 r_lim- Actual axis movable range (-)

In the hypothetic axis mode, set a movable range of the actual linear axis in negative direction in the hypothetic plane with a distance from the machine zero point.

---Setting range---
0 to 99999.999 (mm)

【#21025】 SmpDelay

Set a sampling time after an alarm occurs.

---Setting range---
0 to 3000 (ms)

【#21028】 ed_mess

Set an edit type.
0 : Display messages with state
1 : Display operation messages

【#21029】 NCname

Set this to display the NC unit name on the CE terminal screen.

---Setting range---
8 or less alphanumeric characters

【#21030】 AlmHold (h)

Set the time to delete sampling data automatically after an alarm occurs.
If "0" is set, the alarm will not be deleted automatically.

---Setting range---
0 to 9999 (h)

【#21031】 UnitMax

Set the number of control units to connect when setting and displaying several NC units with one terminal using the multiple NC common display function. Up to 15 NC control units can be connected.
As the default value is "0", the number of NC units to connect will be regarded as one unless you set this parameter.
(The setting values "0" and "1" are handled in the same manner.)

---Setting range---
0 to 15 (Default value : 0)

【#21032】 UnitNum

Set the control unit's station No. when setting and displaying several NC units with one terminal using the multiple NC common display function.
"0" is the first station No. and "14" is the last station No.
Make sure that the stations are not set in duplicate.

---Setting range---
0 to 14 (Default value: 0)

【#21033】 KeyCtrlLmt

Select the limit type of key operation right acquisition.
0: Enable the acquisition of key operation right from another display unit for all the screens.
1: Disable the acquisition of key operation right while the program screen is opened.
2: Disable the acquisition of key operation right from another display unit for all the screens.

【#21034】 ReMonDisp

Select the display limitation of the remote monitor tool.
0: Not limit the remote monitor tool displays.
1: Not send the display information to the remote monitor tool.

(Note) Avoid setting from the remote monitor tool.
The display will not appear from the time you set this parameter.

【#21035】 ComErrDly Communication alarm display delay

Displaying the error and storing the error in the alarm history will be delayed for the set time duration when a communication error (Y02 System alarm 0051) occurs.
Set this parameter if a communication error occurs when turning OFF the power. If not (if not using), set to "0".

---Setting range---
0 to 5000 (ms)

【#21036】 SrvAlmDly Servo alarm display delay

Displaying the error and storing the error in the alarm history will be delayed for the set time duration when a servo/spindle alarm occurs.
Set this parameter if a servo/spindle alarm occurs when turning OFF the power. If not (or if not using), set to "0".

---Setting range---
0 to 5000 (ms)

【#21037】 FTP Host address FTP server IP address

Set the FTP server IP address.
Separate the each element with "." (period).

---Setting range---
Setting must be done in accordance with the network code of the connecting environment.

【#21038】 FTP User name FTP server login name

Set the FTP server login name.

---Setting range---
15 or less alphabets, numbers, and symbols.
Alphabets in capital letters only.

【#21039】 FTP PASSWORD FTP server login password

Set the FTP server login password.

---Setting range---
15 or less alphabets, numbers, and symbols.
Alphabets in capital letters only.

【#21040】 FTP Directory Downloaded file's pass

Set the pass of the file to be downloaded.
Use (*) for colons (:) which separate drive names. * will be recognaized as the end of the drive name.
Input slash (/) instead of (\) to mark off the directory, even if the server is Windows.

---Setting range---
20 or less characters.
Alphabets in capital letters only.

【#21041】 FTP File name Downloaded file's name

Set the name of the file to be downloaded.

---Setting range---
20 or less characters.
Alphabets in capital letters only.

【#21042】 FTP Retry Num retry

Set the number of times to retry when a connection error occurs.

---Setting range---
0 to 999 (times)

【#21043】 FTP Timeout Connection time out

Set the timeout time when connecting.

---Setting range---
0 to 99 (s)

【#21048】 mmacpro Tool builders macro password

Resister and certify a password for editing machine builder macro programs and other operations.
- When the password has not been set yet, less than eight letters of arbitrary alphabets in capitals and numbers except "0" can be set.
- When the password is already registered (displaying ****), enter this password to cancel protection and the password will be displayed. Entering a password that is not registered causes "E01 Setting error".

---Setting range---
Up to eight letters of alphabets in capitals and numbers. ("0" is not accepted.)

【#21049】 SPname

Select the spindle No. to be selected in G43.1 modal for each part system.
0 : 1st spindle
1 : 1st spindle
2 : 2nd spindle
3 : 3rd spindle
4 : 4th spindle
5 : 5th spindle
6 : 6th spindle
7 : 7th spindle

【#21050】 plcdwlskp G04 skip condition

Set the PLC skip signal for suspending the G04 (dwell) command.
The PLC skip signal 1 to 32 is corresponded to bit0 to 31.

---Setting range---
00000000 to FFFFFFFF(HEX)

【#21051】 plcskip1 G31.1 skip condition

Designate the PLC skip signal in multi-step skip G31.1.
The PLC skip signal 1 to 32 is corresponded to bit0 to 31.

---Setting range---
00000000 to FFFFFFFF(HEX)

【#21052】 plcskip2 G31.2 skip condition

Designate the PLC skip signal in multi-step skip G31.2.
The PLC skip signal 1 to 32 is corresponded to bit0 to 31.

---Setting range---
00000000 to FFFFFFFF(HEX)

【#21053】 plcskip3 G31.3 skip condition

Designate the PLC skip signal in multi-step skip G31.3.
The PLC skip signal 1 to 32 is corresponded to bit0 to 31.

---Setting range---
00000000 to FFFFFFFF(HEX)

【#21101】 add01

bit0: FPLC axis rapid traverse mode acceleration/deceleration type

Select the acceleration/ deceleration type in PLC axis's rapid traverse mode.
0 : Select constant time-constant acceleration/deceleration
1 : Select constant inclination acceleration/deceleration
(Note) This parameter cannot be used when the peripheral axis (MC1K I/F) is used.

bit1: FPLC axis cutting feed mode acceleration/ deceleration type /Peripheral axis (MC1K I/F) acceleration/ deceleration type

Select the acceleration/ deceleration type in PLC axis's cutting feed mode.
0 : Select constant time-constant acceleration/deceleration
1 : Select constant inclination acceleration/deceleration
(Note) Select the peripheral axis's (MC1K I/F) acceleration/deceleration type when the peripheral axis is used.

bit2: FCircular command block overlap enabled

Select whether to enable the block overlap at the circular command.
0 : Disable
1 : Enable

bit3: FG31 automatic acceleration/ deceleration

Select whether to enable dry run, override and automatic acceleration/ deceleration for the G31 (skip) command.
0 : Disable
1 : Enable

bit4

Reserved for system.

bit5

Reserved for system.

bit6

Reserved for system.

【#21102】 add02

bit1

Reserved for system.

bit2

Reserved for system.

【#21103】 add03

bit0

Reserved for system.

bit1

Reserved for system.

【#21104】 add04

bit0: Search mode hold (word edit)

Set hold/non-hold of search mode.
0 : When a search is executed, go back to the 1st menu. (conventional)
1 : Hold the search mode even if a search is executed.

bit2: Search menu ON (screen edit)

Switch operation methods for data search.
0 : Execute string search downward. (conventional)
1 : Switch to search menu for the word/string search to execute upward/downward search.

bit3: Default insert ON (screen edit)

Switch the mode between insert/write.
0 : Turn ON the overwrite mode when the screen is switched. (conventional)
1 : Turn ON the insert mode when the screen is switched, and it is held until the next screen switching.

bit4: Switching the number of lines to feed (screen edit)

Switch the page feeding for the edit programs.
0 : Feed 11 lines.(conventional)
1 : Feed 12 lines in screen units.

【#21105】 add05

bit0: Program in-position type 2

Select the operation type of programmable in-position check.
0: When "#1193 inpos" is "1" or "3", ",I" command is enabled. The maximum difference between ",I" command value and the parameter setting value is enabled.
1: Regardless of "#1193 inpos" setting, ",I" command is enabled. Only ",I" command value is enabled.

bit1: Macro single speeding up

Select a state of continuous operation when "#8101 macro single" is enabled.
0: Disable
1: Enable

bit2: Conventional Emergency stop canceling method

Select the method for emergency stop cancel process.
0: Check the hot line gate OFF signal and cancel the emergency stop
1: Conventional method (without checking the gate OFF signal)
* Normally, "0" is set. Setting "1" is to avoid a failure in the emergency stop cancel.

【#21113】 add13

bit0: DeviceNet error monitor

Select whether to enable the DeviceNet error monitoring.
0 : Disable
1 : Enable

【#21125(PR)】 SSU_num Number of dual signal modules

Set the number of dual signal modules to install.
Setting to "0" means that the dual-signal comparison is not carried out.

---Setting range---
0 to 3

【#21126 to 21141(PR)】 SODR_1 to SODR_16 Speed monitor input device door 1 to 16

Set the device Nos. to which the door sensor signal is input to inform the open/close states of the doors 1 to 16 during speed monitoring.
Setting to "0" means that the door is always open.
Therefore, "X0" cannot be used as the input device of door signals.
(Note)These settings will be ignored when #21163(InvalidDoorSgnl) is set to "1".

---Setting range---
0000 to 01FF (hexadecimal)

【#21142(PR)】 SSU_delay Dual-signal comparison tolerance time

Set the time in which mismatches of input/output signals to/from PLC and NC in the dual signal module are allowed.
When set to "0", the signal comparison tolerance time is 100ms.

---Setting range---
0 to 50(100ms)

【#21143 to 21145(PR)】 SSU_Dev1 to SSU_Dev3 Dual signal module device

Set the head device Nos. to which the dual signal modules, station No. 0 to 2, are installed.
This I/O assignments need to correspond to those in GX Works2 / GX Developer.
The same device No. cannot be shared among different modules.

---Setting range---
0000 to 01FF (hexadecimal)

【#21149(PR)】 Safety_passwd Safety observation parameter password

Set a password for changing the safety observation parameter settings.
The password will be enabled after the power is turned OFF and ON.

The password locks the following parameter settings:

[Base specifications parameters]
- #1329 Emgcnt Emergency stop contactor shut-off time
- #1330 MC_dp1 Contactor weld detection device 1
- #1331 MC_dp1 Contactor weld detection device 2
- #1357 mchkt1 Contactor operation check allowed time 1
- #1368 SfAlmRstD Safety observation alarm reset inputting device
- #21125 SSU_num Number of dual signal modules
- #21126 to 21141 SODR_1 to 16 Speed monitor input device door 1 to 16
- #21142 SSU_delay Dual-signal comparison tolerance time
- #21143 to 21145 SSU_Dev1 to Dev3 Dual signal module device 1 to 3
- #21149 Safety_passwd Safety observation parameter password
- #21151 SC_EQP_1 Safety device mounting information 1
- #21152 SC_EQP_2 Safety device mounting information 2
- #21153 SC_EQP_CHK1 Safety device mounting information check 1
- #21154 SC_EQP_CHK2 Safety device mounting information check 2
- #21155 Built in Safety Built in safety circuit
- #21156 SSU_wrg Reset Comparison error warning reset cancel
- #21157 SC_EQP_3 Safety device mounting information 3
- #21158 SC_EQP_4 Safety device mounting information 4
- #21159 SC_EQP_CHK3 Safety device mounting information check 3
- #21160 SC_EQP_CHK4 Safety device mounting information check 4
- #21161 SftySgnlChkTrg Dual signal check-time change
- #21162 mulstepssc Multi-step speed monitor enabled
- #21163 InvalidDoorSgnl Door monitor disabled

[Axis specifications parameters]
- #2118 S_DSI Speed monitor Door selection
- #2140 S_FiI Speed monitor Error detection time during servo OFF
- #2180 S_DIN Speed observation input door No.
- #2181 to #2184 sscfeed1 to sscfeed4 Safety observation speed 1 to 4

[Servo parameters]
- #2233 SV033 SSF2 Servo function selection 2/ bitD rps Safety observation safety speed setting increment
- #2248 SV048 EMGrt Vertical axis drop prevention time
- #2255 SV055 EMGx Max. gate off delay time after emergency stop
- #2282 SV082 SSF5 Servo function selection 5/ bitC,D,E,F dis Digital signal input selection
- #2313 SV113 SSF8 Servo function selection 8/ bitF ssc Safety observation function
- #2438 SV238 SSCFEED Safety observation Safety speed
- #2439 SV239 SSCRPM Safety observation Safety motor speed

[Spindle parameters]
- #3071 SscDrSelSp Speed monitor Door selection
- #3072 Ssc Svof Filter Sp Speed monitor Error detection time during servo OFF
- #3140 S_DINSp Speed observation input door No.
- #3141 to #3144 sscfeedsp1 to sscfeedsp4 Safety observation speed 1 to 4

[Spindle specifications parameters]
- #13055 SP055 EMGx Max. gate off delay time after emergency stop
- #13227 SP227 SFNC7 Servo function 7/ bitC,D,E,F dis Digital signal input selection
- #13229 SP229 SFNC9 Spindle function 9/ bitD rps Safety observation speed setting unit, bitF ssc Safety observation function
- #13238 SP238 SSCFEED Safety observation safety speed
- #13239 SP239 SSCRPM Safety observation safety motor speed

---Setting range---
0 to 99999

【#21150(PR)】 Safety_key Safety observation parameter password-lock cancel key

Set this parameter to cancel the password-lock when changing the safety observation parameter settings.
Set the value that has been set in "#21149 Safety_passwd (Safety observation parameter password)". Then the lock will be canceled.

---Setting range---
0 to 99999

【#21151(PR)】 SC_EQP_1 Safety device mounting information 1

Set the devices' mount status when the device manufacturer's safety sequence is shared by machines with different safety device configurations.
Each bit's data is copied to M800 - M807 respectively at every power ON, which may be used in the device manufacturer's safety sequence on both NC-side and PLC-side.

Each bit corresponds to the following device No.
bit0: M800
bit1: M801
bit2: M802
bit3: M803
bit4: M804
bit5: M805
bit6: M806
bit7: M807

---Setting range---
00000000 to 11111111

【#21152(PR)】 SC_EQP_2 Safety device mounting information 2

Set the devices' mount status when the device manufacturer's safety sequence is shared by machines with different safety device configurations.
Each bit's data is copied to M808 - M815 respectively at every power ON, which may be used in the device manufacturer's safety sequence on both NC-side and PLC-side.

Each bit corresponds to the following device No.
bit0: M808
bit1: M809
bit2: M810
bit3: M811
bit4: M812
bit5: M813
bit6: M814
bit7: M815

---Setting range---
00000000 to 11111111

【#21153(PR)】 SC_EQP_CHK1 Safety device mounting information check 1

Use this parameter to prevent the incorrect setting of "#21151 SC_EQP_1 (Safety device mounting information 1)".
Set the same value as in "#21151 SC_EQP_1 (Safety device mounting information 1)".
Each bit's data is copied to M816 - M823 respectively at the power ON.

Each bit corresponds to the following device No.
bit0: M816
bit1: M817
bit2: M818
bit3: M819
bit4: M820
bit5: M821
bit6: M822
bit7: M823

---Setting range---
00000000 to 11111111

【#21154(PR)】 SC_EQP_CHK2 Safety device mounting information check 2

Use this parameter to prevent the incorrect setting of "#21152 SC_EQP_2 (Safety device mounting information 2)".
Set the same value as in "#21152 SC_EQP_2 (Safety device mounting information 2)".
Each bit's data is copied to M824 - M831 respectively at the power ON.

Each bit corresponds to the following device No.
bit0: M824
bit1: M825
bit2: M826
bit3: M827
bit4: M828
bit5: M829
bit6: M830
bit7: M831

---Setting range---
00000000 to 11111111

【#21155(PR)】 Built in Safety Built-in safety circuit

Select whether to execute the built-in safety circuit.
0: Not transfer the element manufacturer's safety sequence to PLC.
Not execute the element manufacturer's safety sequence on NC-side.
1: Transfer the element manufacturer's safety sequence to PLC.
Execute the element manufacturer's safety sequence on NC-side.

【#21156(PR)】 SSU_wrg Reset Comparison error warning reset cancel

Select the operation after "Y21 Safety observation warning 0020" (Dual signal: State after error unconfirmed) occurs.
0: Temporarily clear the warning after resetting.
The warning will be shown after the power is turned ON again.
1: Clear the warning after resetting.
The warning will not be shown after the power is turned ON again.

【#21157(PR)】 SC_EQP_3 Safety device mounting information 3

Set the devices' mount status when the device manufacturer's safety sequence is shared by machines with different safety device configurations.
Each bit's data is copied to M832 - M839 respectively at every power ON, which may be used in the device manufacturer's safety sequence on both NC-side and PLC-side.

Each bit corresponds to the following device No.
bit0: M832
bit1: M833
bit2: M834
bit3: M835
bit4: M836
bit5: M837
bit6: M838
bit7: M839

---Setting range---
00000000 to 11111111

【#21158(PR)】 SC_EQP_4 Safety device mounting information 4

Set the devices' mount status when the device manufacturer's safety sequence is shared by machines with different safety device configurations.
Each bit's data is copied to M840 - M847 respectively at every power ON, which may be used in the device manufacturer's safety sequence on both NC-side and PLC-side.

Each bit corresponds to the following device No.
bit0: M840
bit1: M841
bit2: M842
bit3: M843
bit4: M844
bit5: M845
bit6: M846
bit7: M847

---Setting range---
00000000 to 11111111

【#21159(PR)】 SC_EQP_CHK3 Safety device mounting information check 3

Use this parameter to prevent the incorrect setting of "#21157 SC_EQP_3 (Safety device mounting information 3)".
Set the same value as in "#21157 SC_EQP_3 (Safety device mounting information 3)".
Each bit's data is copied to M848 - M855 respectively at the power ON.

Each bit corresponds to the following device No.
bit0: M848
bit1: M849
bit2: M850
bit3: M851
bit4: M852
bit5: M853
bit6: M854
bit7: M855

---Setting range---
00000000 to 11111111

【#21160(PR)】 SC_EQP_CHK4 Safety device mounting information check 4

Use this parameter to prevent the incorrect setting of "#21158 SC_EQP_4 (Safety device mounting information 4)".
Set the same value as in "#21158 SC_EQP_4 (Safety device mounting information 4)".
Each bit's data is copied to M856 - M863 respectively at the power ON.

Each bit corresponds to the following device No.
bit0: M856
bit1: M857
bit2: M858
bit3: M859
bit4: M860
bit5: M861
bit6: M862
bit7: M863

---Setting range---
00000000 to 11111111

【#21161(PR)】 SftySgnl ChkTrg Dual signal check-time change

Set this parameter to change the dual signal module's output ON/OFF check time and the contactor welding detection start time after the power ON.
0: Automatically start checking after the power ON
1: Start checking at the rising edge of the "Dual signal check start (G+001/Y311)" signal.

(Note) Setting "1" is allowed only when the power supply to I/Os is impossible at the controller's power ON.

【#21162(PR)】 mulstepssc Multi-step speed monitor enabled

Select whether to enable the multi-step speed monitor.
0: Disable (Speed monitor for each door, no monitoring speed changeover)
1: Enable (Multi-step speed monitor for each axis)

(Note) When enabling the multi-step speed monitor, set the safety observation "safety speed" (SV238/ SP238) and "safety motor speed" (SV239/ SP239) to "0" for all servo axes and spindles. Unless these are set to "0", a safety observation alarm will occur when the NC is turned ON.

【#21163(PR)】 Invalid DoorSgnl Door monitor disabled

Select whether to enable the door monitor between NC and drive unit.
When the door monitor is disabled, door will always be treated as closed between NC and drive unit.
0 : Enable
1 : Disable

【#21164】 BR_INT Brake test interval

Set an interval between the completion of brake test and the next signal activating "brake test incomplete".
The interval is 8 (hours) when "0" is set.

---Setting range---
0 to 255 (hours)

3. Axis Specifications 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.

【#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)

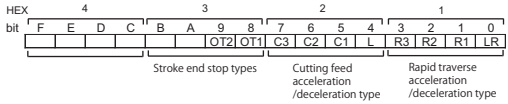
【#2002】 clamp Cutting feedrate for clamp function

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)

【#2003(PR)】 smgst Acceleration and deceleration modes

Set acceleration and deceleration control modes.
Set value is in hexadecimal.



HEX-1 Rapid traverse acceleration/deceleration type

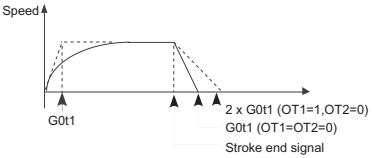
0(bit3,2,1,0 = 0000) : Step
1(bit3,2,1,0 = 0001) : Linear acceleration/deceleration
2(bit3,2,1,0 = 0010) : Prim ary delay
8(bit3,2,1,0 = 1000) : Exponential acceleration and linear deceleration
F(bit3,2,1,0 = 1111) : Soft acceleration/deceleration
(Note) R1 > R3 when both R1 and R3 contain 1.

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



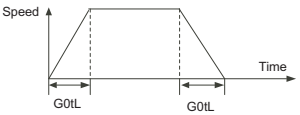
(Note) OT1(bit8) is valid under the following conditions (valid for dog type zero point return):
- Stop type: Linear deceleration
- Acceleration/Deceleration mode: Exponential acceleration and Linear deceleration

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".

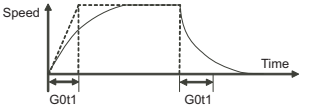


---Setting range---
1 to 4000 (ms)

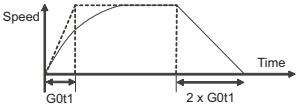
【#2005】 G0t1 G0 time constant(primary delay) / Second-step time constant for soft acceleration/deceleration

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.

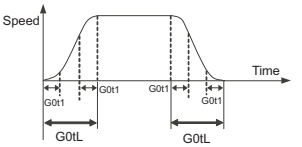
<Rapid traverse feed with primary delay>



<Rapid traverse feed with exponential acceleration and linear deceleration>



<Soft acceleration/deceleration>



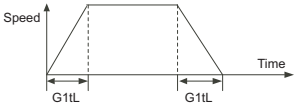
---Setting range---
1 to 5000 (ms)

【#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".

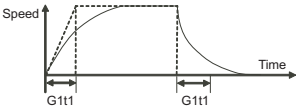


---Setting range---
1 to 4000 (ms)

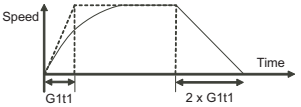
【#2008】 G1t1 G1 time constant (primary delay)/Second-step time constant for soft acceleration/deceleration

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.

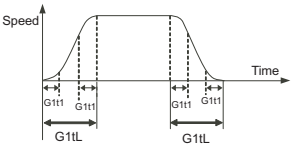
<Cutting feed with primary delay>



<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.

---Setting range---
-9999 to 9999
(command unit / 2)

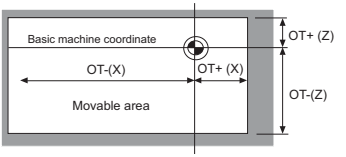
【#2012】 G1back G1 backlash

Set up the backlash compensation amount when the direction is reversed with the movement command in cutting mode.

---Setting range---
-9999 to 9999
(command unit / 2)

【#2013】 OT - Soft limit I -

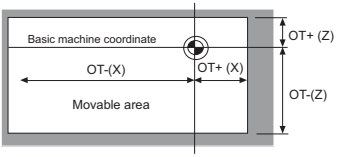
Set a soft limit area with reference to the zero point of the basic machine coordinate. Set the coordinate in the negative direction for the movable area of stored stroke limit 1. The coordinate in the positive direction is set in "#2014 OT+".
To narrow the available range in actual use, use the parameters "#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 or TLM standard length

Set a sensor position in the negative 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.

---Setting range---
-99999.999 to 99999.999 (mm)

【#2016】 tlml+ Positive direction sensor of tool setter

Set the sensor position in the positive direction when using the tool setter.

---Setting range---
-99999.999 to 99999.999 (mm)

【#2017】 tap_g Axis servo gain

Set the position loop gain for special operations (synchronous tapping, interpolation with spindle C axis, etc.).
Set the value in 0.25 increments.
The value of "#2249 SV049 PGN1sp" is also set.
The standard setting value is "10".

---Setting range---
0.25 to 200.00 (rad/s)

【#2018(PR)】 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 4: 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

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 primary axis.
When "0" is set, the error check will not be carried out.

---Setting range---
0 to 99999.999 (mm)

【#2025】 G28rap G28 rapid traverse rate

Set a rapid traverse rate for the dog type reference position return command.

---Setting range---
1 to 1000000 (mm/min)

【#2026】 G28crp G28 approach speed

Set the approach speed to the reference position.

(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)

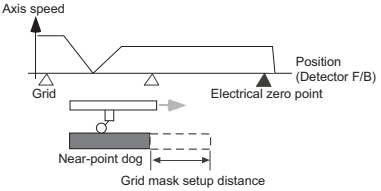
【#2027】 G28sft Reference position shift distance

Set the distance from the electrical zero-point detection position to the reference position.

---Setting range---
0 to 65535 (μ m)

【#2028】 grmask Grip 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.

---Setting range---
0 to 65535 (μ m)
Even for the specifications in sub-micrometric system, set up the value in units of μ m.

【#2029】 grspc Grid interval

Set a detector's grid interval.
Normally, set a value equal to the ball screw pitch. However, if the detector grid interval is different from the screw pitch because a linear scale etc. is used, set the detector's grid interval.

Use its divisors, if you wish to reduce the grid interval.

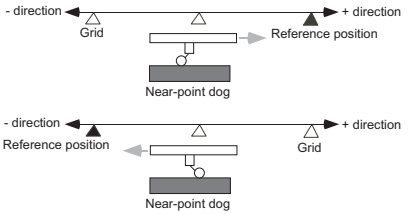
You can set the minimum setting increment to be 0.001mm, by using a negative value.
Example) Setting value
1 -> 1.000 mm (°)
-1 -> 0.001 mm (°)
Even when the specification is in sub-micrometric system, 0.001 mm is the minimum setting increment.

---Setting range---
-32767 to 999(mm)

【#2030(PR)】 dir (-) Reference position direction (-)

Select which side of the near-point dog the reference position is established.
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

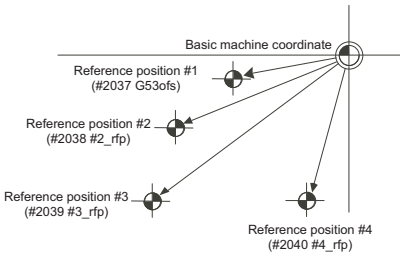
Select whether the reference position is provided for the axis.
0: Reference position is provided. (Normal controlled axis)
1: No reference position is provided.
When "1" is set, reference position return is not required before automatic operation starts.

【#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.

【#2037】 G53ofs Reference position #1

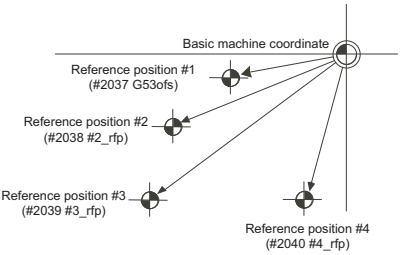
Set the position of the first reference position from the zero point of the basic machine coordinate.



---Setting range---
-99999.999 to 99999.999 (mm)

【#2038】 #2_rfp Reference position #2

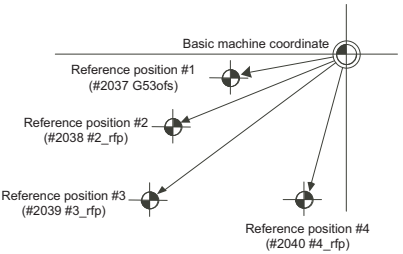
Set the position of the second reference position from the zero point of the basic machine coordinate.



---Setting range---
-99999.999 to 99999.999 (mm)

【#2039】 #3_rfp Reference position #3

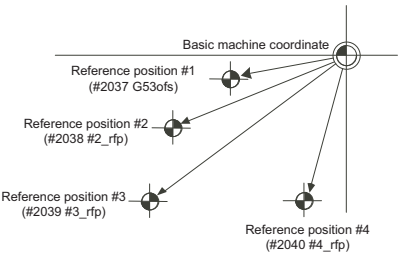
Set the position of the third reference position from the zero point of the basic machine coordinate.



---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)

【#2049(PR)】 type Absolute position detection method

Select the absolute position zero point alignment method.
0 : Not absolute position detection
1: Stopper method (push onto mechanical stopper)
2: Marked point alignment method (align with marked point)
3: Dog-type (align using dog and contactless switch)
4: Marked point alignment method II (Align to alignment mark. Grid return won't be performed after marked point alignment.)
9: Simple absolute position detection (Not absolute position detection, but the position when the power is turned OFF is registered.)
Automatic initial setting is enabled only when the automatic stopper method is selected.

【#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)

【#2052】 absg28 Width compared by G28

Set the allowable range of the comparison result when comparing the positions during G28 or G30.
0: Not compare
1 to 65535 (in increments of 0.5 μ m):
If the difference between the position read by the detector and that in the control unit exceeds this range, an alarm will be output to stop the machine. The standard setting is 100.

---Setting range---
0 to 65535 (0.5 μ m)

【#2053】 absm02 Width compared by M02

Set the allowable range of the comparison result when comparing the positions during M02 or M30.
0: Not compare
1 to 65535 (in increments of 0.5 μ m):
If the difference between the position read by the detector and that in the control unit exceeds this range, an alarm will be output to stop the machine. The standard setting is 100.

---Setting range---
0 to 65535 (0.5 μ m)

【#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 width will be equivalent to the grid width setting.

---Setting range---
0 to 32.767 (mm)

【#2058】 nrefn Near zero point -

Set the negative direction width where the near reference position signal is output.
When set to "0", the width will be equivalent to the grid width setting.

---Setting range---
0 to 32.767 (mm)

【#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.
Marked point in marked point alignment method.
1: Grid point just before stopper.
On the grid point just before the marked point in marked point alignment method.

【#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_1Btype Soft limit IB type

Select the type of stored stroke limit I in which "#2062 OT_1B+" or "#2061 OT_1B-" is enabled.
0 : Enable Soft limit IB
1 : Disable Soft limit IB and IC
2 : Enable Soft limit IC

【#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 (%)

【#2070(PR)】 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

【#2073】 zrn_dog Origin dog Random assignment device

Set the input device in this parameter to assign the origin dog signal.

(Note 1) This parameter is valid when "1" is set in "#1226 aux10/bit5".
(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

Set the input device in this parameter to assign the OT (+) signal.

(Note 1) This parameter is valid when "1" is set in "#1226 aux10/bit5".
(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

Set the input device in this parameter to assign the OT (-) signal.

(Note 1) This parameter is valid when "1" is set in "#1226 aux10/bit5".
(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

Not used. Set to "0".

【#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.

---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)

【#2079(PR)】 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.

---Setting range---
0 to 8

【#2086】 exdcax1 External deceleration speed 1

Set the upper limit of the feedrate when the external deceleration signal is ON and only one axis is moved. In automatic operation, the upper limit of the combined speed is applied.
Set #2086 when using the external deceleration for each axis, and #2161 - #2165 when using the external deceleration 2nd step or later.
This parameter is enabled when "#1239 set11/bit6" is set to "1".

---Setting range---
1 to 1000000 (mm/min)

【#2116(PR)】 v_axis Hypothetical axis

Select whether the axis is used as a hypothetical axis or an actual axis.
When not using the hypothetical linear axis control, set "0" for all axes.
0: Actual axis
1: Hypothetical axis

【#2117(PR)】 v_axno Hypothetical axis No.

In hypothetical linear axis control, set the relation of the actual axis to the hypothetical axis in the hypothetical plane.
For actual linear axes, set the axis No., used in the part system, of the hypothetical axis parallel to the actual axis.
For actual rotation axes, set the axis No., used in the part system, of the hypothetical axis vertical to the actual linear axis.
Setting for the PLC axes will be ignored. In multi-part system, axes in another part system cannot be set.

0: Actual/ hypothetical axis out of the hypothetical plane
1 or later (axis Nos. used in the part system): Hypothetical axis No. to set

【#2118(PR) 】 S_DSI Speed monitor Door selection

Select which door group of the speed monitoring the spindle belongs to.
The belonging door group corresponds to the following bits of the parameter.
bit0 : Door 1
bit2 : Door 2
:
bitF : Door 16
It is possible to belong to two or more door groups.
(Example) 0013: Belongs to door 1, 2, and 5 groups.
Belongs to door 1 group when "0000" is set.
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.

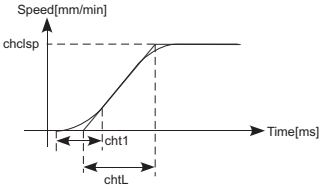
【#2140(PR)】 S_Fil Speed monitor Error detection time during servo OFF

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 and 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 and 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)

【#2161】 exdcax2 External deceleration speed 2

Set the upper limit of the feedrate when the external deceleration signal is ON and only one axis is moved. In automatic operation, the upper limit of the combined speed is applied.
Set #2086 when using the external deceleration for each axis, and #2161 - #2165 when using the external deceleration 2nd step or later.
This parameter is enabled when "#1239 set11/bit6" is set to "1".

---Setting range---
1 to 1000000(mm/min)

【#2162】 exdcax3 External deceleration speed 3

Set the upper limit of the feedrate when the external deceleration signal is ON and only one axis is moved. In automatic operation, the upper limit of the combined speed is applied.
Set #2086 when using the external deceleration for each axis, and #2161 - #2165 when using the external deceleration 2nd step or later.
This parameter is enabled when "#1239 set11/bit6" is set to "1".

---Setting range---
1 to 1000000(mm/min)

【#2163】 exdcax4 External deceleration speed 4

Set the upper limit of the feedrate when the external deceleration signal is ON and only one axis is moved. In automatic operation, the upper limit of the combined speed is applied.
Set #2086 when using the external deceleration for each axis, and #2161 - #2165 when using the external deceleration 2nd step or later.
This parameter is enabled when "#1239 set11/bit6" is set to "1".

---Setting range---
1 to 1000000(mm/min)

【#2164】 exdcax5 External deceleration speed 5

Set the upper limit of the feedrate when the external deceleration signal is ON and only one axis is moved. In automatic operation, the upper limit of the combined speed is applied.
Set #2086 when using the external deceleration for each axis, and #2161 - #2165 when using the external deceleration 2nd step or later.
This parameter is enabled when "#1239 set11/bit6" is set to "1".

---Setting range---
1 to 1000000(mm/min)

【#2165】 exdcax6 External deceleration speed 6

Set the upper limit of the feedrate when the external deceleration signal is ON and only one axis is moved. In automatic operation, the upper limit of the combined speed is applied. Set #2086 when using the external deceleration for each axis, and #2161 - #2165 when using the external deceleration 2nd step or later.
This parameter is enabled when "#1239 set11/bit6" is set to "1".

---Setting range---
1 to 1000000(mm/min)

【#2179】 TapInpl In-position width for Tapping initial point

Set the in-position check width for synchronous tapping I point.
The value of "#2224 sv024" is applied when it is set "0".
* This parameter is enabled only when "#1223/bit3" and "#1245/bit0 or bit1" are "1".

---Setting range---
0 to 99.999 (mm)

【#2180(PR)】 S_DIN Speed monitor 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
:
bitF : Door16 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 "#2118 S_DSI" is enabled.

---Setting range---
0000 to FFFF (HEX)

【#2181(PR)】 sscfeed1 Safety observation speed 1

Set the safety observation speed, which is at the machine end, in the multi-step speed monitor mode 1.

---Setting range---
0 to 18000 (mm/min or °/min)

【#2182(PR)】 sscfeed2 Safety observation speed 2

Set the safety observation speed, which is at the machine end, in the multi-step speed monitor mode 2.

---Setting range---
0 to 18000 (mm/min or °/min)

【#2183(PR)】 sscfeed3 Safety observation speed 3

Set the safety observation speed, which is at the machine end, in the multi-step speed monitor mode 3.

---Setting range---
0 to 18000 (mm/min or °/min)

【#2184(PR)】 sscfeed4 Safety observation speed 4

Set the safety observation speed, which is at the machine end, in the multi-step speed monitor mode 4.

---Setting range---
0 to 18000 (mm/min or °/min)

【#2187(PR)】 chgPLCax PLC axis switchover axis No.

Set the I/F No. of a PLC axis to use when switching between NC axis and PLC axis. Set the I/F No. of a vacant PLC axis. Set to "0" when not using.

---Setting range---
0 to 8

【#2605(PR)】 BR_SIG Brake output signal number

Set a safety signal number for executing the brake test.
The brake test is not executed when "0" is set.
(E.g.) If "0x0c" is set, the brake output signal is Y0C on the side of PLC or Y20C on the side of NC (when initial device number is 200).
* The safety output signal set in this parameter does not check the signal state on the NC side and PLC side during brake test.

---Setting range---
0 to 0x1FF

【#2606(PR)】 BR_WT Brake test command waiting time

Set the lead time between NC receiving the brake test start signal and NC sending out the movement command for the brake test.
This set time is also the time from test pattern end until the next test pattern.
The waiting time is 400(ms) when "0" is set.

---Setting range---
0 to 60000 (ms)

【#2607(PR)】 BR_Ilim Brake test current limit value

Set a current (torque) limit value in the brake test as a proportion to the stall current.
"Y21 Safety observation warning 0040" is output when "0" is set and the brake test signal turned ON, and the brake test is not executed.

---Setting range---
0 to 100 (%)

【#2608(PR)】 BR_Ft Brake test travel amount

Set a travel amount to command to the motor at the brake test.
"Y21 Safety observation warning 0040" is putout when "0" is set and the brake test turned ON, and the brake test is not executed.

---Setting range---
-99999.999 to +99999.999 (mm or °)

【#2609(PR)】 BR_Feed Brake test command speed

Set a command speed to command to the motor at the brake test.
"Y21 Safety observation warning 0040" is putout when "0" is set and the brake test turned ON, and the brake test is not executed.

---Setting range---
0 to 1000000 (mm/min or °/min)

【#2610(PR)】 BR_Tol Brake test tolerance of motor travel amount

Set a tolerance for motor travel amount at the brake test.
If the change amount of FB position from the start of brake test exceeds this tolerance, according to the test patterns 1 to 3, a warning is applied among "Y21 Safety obsv warning 0041", "Y21 Safety obsv warning 0042" and "Y21 Safety obsv warning 0043".
The tolerance of motor travel is 100(mm) when "0" is set.

---Setting range---
0 to 99999.999 (mm or °)

【#2611(PR)】 BR_ObT Brake test observation time

At the brake test, set the duration observing the change amount of FB position from the output completion of movement command.
The observation time is 1000(ms), when "0"is set.

---Setting range---
0 to 30000 (ms)

【#2612(PR)】 SosTolD Stop observation tolerable positioning deviation amount

Set the deviation amount of tolerable position at stop observation

---Setting range---
0 to 65535 (μ m or 1°/1000)

【#2613(PR)】 SosAlmT Stop observation error detection time

Set the time to detect the state of the amount of position deviation exceeding the tolerable position deviation amount as the error during the stop observation. (The time until the state is regarded as out of stop state.)

---Setting range---
0 to 65535 (ms)

【#22011】 bscmp- Offset compensation position

Set the coordinate position to compensate by the offset amount on the machine basic coordinate system.
(Note) Either #22011 or #22012 can be negative.

---Setting range---
-99999.999 to 99999.999

【#22012】 bscmp+ Max. compensation position

Set the coordinate position to compensate by the maximum offset amount on the machine basic coordinate system.
(Note) Either #22011 or #22012 can be negative.

---Setting range---
-99999.999 to 99999.999

【#22013】 synwd

Not used. Set to "0".

【#22014(PR)】 Mastno Multi-secondary-axis sync primary axis number

Set the axis No. of the primary axis to the each secondary axis to set multiple-secondary-axis synchronous control.
The axis number is a serial number of NC axis that regards the 1st axis of the 1st part system as "1".
Set to "0" when not using.

---Setting range---
0 to 16

4. Servo 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.

【#2201(PR)】 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

【#2202(PR)】 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)

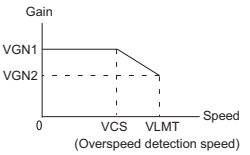
【#2205】 SV005 VGN1 Speed loop gain 1

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 "50".
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

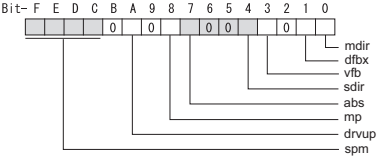
Type 3: When SV082/bit1=1
Set the compensation torque equivalent of dynamic friction amount of the type 3 method compensation amount. The standard setting is double the dynamic friction torque.
Related parameters: SV041, SV082/bit2,1, SV085, SV086

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%).

【#2217(PR)】 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 HF, HP motor (Standard)
2: Not used
3: 400V HF-H, HP-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:

- For MDS-DM2/D2-V3 Series
  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 (2250Hz)

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

【#2218(PR)】 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)

【#2219(PR)】 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).
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"
When the NC is C70 and "SV019 > 32767", set "the reminder of above - 65536 (negative number)" to "SV019".

---Setting range---
When SV117 = 0, the setting range is from 0 to 32767 (kp)
When SV117 ≠ 0
For M700V, M70V, M70, E70: 0 to 65535 (p)
For C70: -32768 to 32767 (p)

【#2220(PR)】 SV020 RNG2 Main side encoder resolution

Set the number of pulses per revolution of the motor side encoder.
OSA18 (-A48) (260,000 p/rev) ---------- SV020 = 260
OSA105 (-A51) (1,000,000 p/rev) ------- SV020 = 1000
OSA166 (-A74N) (16,000,000 p/rev) ----- SV020 = 16000

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).
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"
When the NC is C70 and "SV020 > 32767", set "the reminder of above - 65536 (negative number)" to "SV020".

---Setting range---
When SV118 = 0, the setting range is from 0 to 32767 (kp)
When SV118 ≠ 0
For M700V, M70V, M70, E70: 0 to 65535 (p)
For C70: -32768 to 32767 (p)

【#2221】 SV021 OLT Overload detection time constant

Normally, set to "60". (For machine tool builder 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 machine tool builder 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).

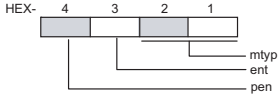
【#2224】 SV024 INP In-position detection width

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---
0 to 32767 (μm)

【#2225(PR)】 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 (OSA105ET2A, OSA166ET2NA)
  pen=6
- For serial signal output rotary scale (including MDS-B-HR)
  pen=6
- For rectangular wave signal output scale
  pen=8
- For serial signal output linear scale (including MDS-B-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)

HF75 : 01h	HP54 : 11h	HF-KP13 : E9h (Note 3)
HF105 : 02h	HP104 : 12h	HF-KP23 : EAh
HF54 : 03h	HP154 : 13h	HF-KP43 : EBh
HF104 : 04h	HP224 : 1Bh	HF-KP73 : ECh
HF154 : 05h, 0Fh (Note 1)	HP204 : 14h	
HF224 : 06h	HP354 : 15h	
HF204 : 07h	HP454 : 16h	
HF354 : 08h	HP704 : 17h	
HF123 : 24h	HP903 : 18h	
HF223 : 26h, 2Dh (Note 2)	HP1103 : 19h	
HF303 : 28h		
HF453 : 09h		
HF703 : 0Ah		
HF903 : 0Bh		
HF142 : 25h		
HF302 : 27h, 2Eh (Note 2)		

(Note 1) When MDS-D2-V3 is connected
(Note 2) When MDS-D2-V3 M/S axis is connected
(Note 3) MDS-DJ-V1/V2 only

For SV017/bitF-C = 3 (400V standard motor series)

HF-H75 : 01h,	HP-H54 : 11h
HF-H105 : 02h,	HP-H104 : 12h
HF-H54 : 03h,	HP-H154 : 13h
HF-H104 : 04h,	HP-H204 : 14h
HF-H154 : 05h,	HP-H354 : 15h
	HP-H454 : 16h
HF-H204 : 07h,	HP-H704 : 17h
HF-H354 : 08h,	HP-H903 : 18h
HF-H453 : 09h,	HP-H1103: 19h
HF-H703 : 0Ah	
HF-H903 : 0Bh,	HP-H224 : 1Bh
HC-H1502: B9h	

For linear motor and direct-drive motor, follow the settings stated in respective materials.

【#2226】 SV026 OD2 Excessive error detection width during servo OFF

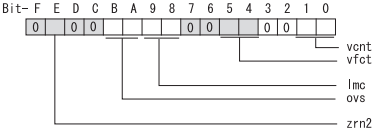
Set the excessive error detection width during servo OFF.
When set to "0", the excessive error alarm detection will be ignored, so do not set to "0".
<Standard setting value>
OD1=OD2= (Rapid traverse rate [mm/min]) / (60×PGN1) / 2 [mm]

Related parameters: SV023

---Setting range---
0 to 32767 (mm)
However, when SV084/bitC=1, the setting range is from 0 to 32767 (μ m).

【#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

【#2228(PR)】 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 (Mechanical 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

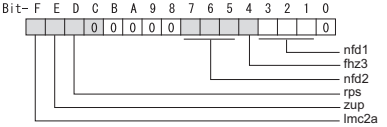
Set the unbalance torque on vertical axis and inclined axis.
When the vertical axis pull up function is enabled, the pull up compensation direction is determined by this parameter's sign. When set to "0", the vertical axis pull up will not be executed.
This can be used for speed loop delay compensation 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) and safely limited speed (SV238).

0: mm/min 1: 100mm/min

Related parameters: SV073, SV238

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 (1,125Hz)

bit 3-1 : nfd1 Depth of Notch filter 1

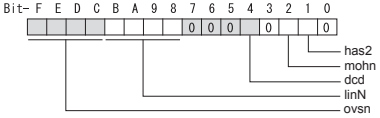
Set the depth of Notch filter 1 (SV038).
bit3,2,1=
000: - ∞
001: -18.1[dB]
010: -12.0[dB]
011: -8.5[dB]
100: -6.0[dB]
101: -4.1[dB]
110: -2.5[dB]
111: -1.2[dB]

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 2 μ m.
In the feed forward control, set the non-sensitive band of the model position droop and ignore the overshooting of the model.
0 : 0 μ m, 1: 2 μ m, 2: 4 μ m,---, E : 28 μ m, F: 30 μ m

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

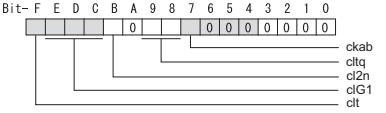
Related parameters: SV084/bitF

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 :

Not used. Set to "0".

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

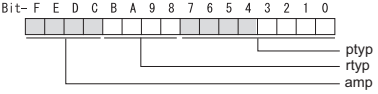
bit 6-0 :

Not used. Set to "0".

【#2236(PR)】 SV036 PTYP Power supply type/ Regenerative resistor type

MDS-D2/DH2 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

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-D2-CV-37 / MDS-DH2-CV-37 : 04
MDS-D2-CV-75 / MDS-DH2-CV-75 : 08
MDS-D2-CV-110 / MDS-DH2-CV-110 : 11
MDS-D2-CV-185 / MDS-DH2-CV-185 : 19
MDS-D2-CV-300 / MDS-DH2-CV-300 : 30
MDS-D2-CV-370 / MDS-DH2-CV-370 : 37
MDS-D2-CV-450 / MDS-DH2-CV-450 : 45
MDS-D2-CV-550 / MDS-DH2-CV-550 : 55
MDS-DH2-CV-750 : 75

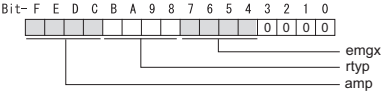
When the emergency stop input signal of the power supply unit is "enabled"
(Note) Set the power supply rotary switch to "4".
Power supply unit is not connected : 00
MDS-D2-CV-37 / MDS-DH2-CV-37 : 44
MDS-D2-CV-75 / MDS-DH2-CV-75 : 48
MDS-D2-CV-110 / MDS-DH2-CV-110 : 51
MDS-D2-CV-185 / MDS-DH2-CV-185 : 59
MDS-D2-CV-300 / MDS-DH2-CV-300 : 70
MDS-D2-CV-370 / MDS-DH2-CV-370 : 77
MDS-D2-CV-450 / MDS-DH2-CV-450 : 85
MDS-D2-CV-550 / MDS-DH2-CV-550 : 95
MDS-DH2-CV-750 : B5

MDS-DM2-SPV Series

Not used. Set to "0000".
External emergency stop power supply type is set by spindle parameter (SP032).

MDS-DJ-V1/V2 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

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 2250 (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, 2 μ m is the actual value to be set. Adjust increments of 1 μ m.

---Setting range---
0 to 255 (μ m)

【#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 2250 (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 HF(-H) Series or HP(-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.

Related parameters: SV033/bitE, SV055, SV056

---Setting range---
0 to 20000 (ms)

【#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 "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---
-1 to 127
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---
-1 to 127
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.

【#2273(PR)】 SV073 FEEDout Specified speed output speed

Set the specified speed.
Also set SV082/bit9,8 to output digital signal.

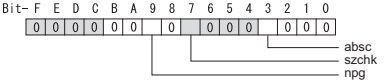
---Setting range---
0 to 32767 (r/min)
However, when SV033/bitD=1, the setting range is from 0 to 32767 (100mm/min).
(Only for MDS-D2/DH2 and MDS-DM2)

【#2274-2280】 SV074 - SV080

This parameter is set automatically by the NC system.

【#2281(PR)】 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-DJ-V1/V2 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

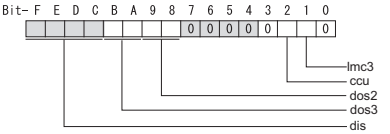
0: Disable 1: Enable

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 : dis Digital signal input selection

0: No signal
1: SLS (Safely Limited Speed) function door state signal
2: Battery box voltage drop warning (It is not available for MDS-DJ-V1/V2 Series.)
3 to F: Setting prohibited

bit B-A : dos3 Digital signal output 3 selection

bitB,A=
00: Disable
01: Setting prohibited
10: Contactor control signal output (For MDS-DJ-V1/V2)
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

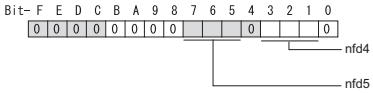
Related parameters: SV016, SV041, SV085, SV086

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

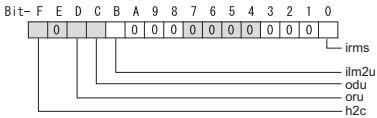
Set the depth of Notch filter 4 (SV087).
bit3,2,1=
000: - ∞
001: -18.1[dB]
010: -12.0[dB]
011: -8.5[dB]
100: -6.0[dB]
101: -4.1[dB]
110: -2.5[dB]
111: -1.2[dB]

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 2250 (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 2250 (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---
0 to 2000 (μm)

【#2296】 SV096

Not used. Set to "0".

【#2297】 SV097

Not used. Set to "0".

【#2298】 SV098

Not used. Set to "0".

【#2299】 SV099

Not used. Set to "0".

【#2300】 SV100

Not used. Set to "0".

【#2301】 SV101 TMA1 OMR-FF movement averaging filter time constant 1

Set the movement averaging filter time constant in OMR-FF control.
The standard setting is "88".
Set to "0" when not using OMR-FF control.

---Setting range---
0 to 711 (0.01ms)

【#2302】 SV102 TMA2 OMR-FF movement averaging filter time constant 2

Set the movement averaging filter time constant in OMR-FF control.
The standard setting is "88".
Set to "0" when not using OMR-FF control.

---Setting range---
0 to 711 (0.01ms)

【#2303】 SV103

Not used. Set to "0".

【#2304】 SV104 FFR0 OMR-FF inner rounding compensation gain for G0

Set the inner rounding compensation amount (drive side feed forward gain) in OMR-FF control.
When a shape tracking error is too large in OMR-FF control, adjust it by setting this parameter.
The higher the setting value is, the less the shape tracking error will be, however, overshooting during acceleration/deceleration will increase.
Lower the value when vibration occurs during the G0 acceleration/deceleration.
The standard setting is "10000".
Set to "0" when not using OMR-FF control.

---Setting range---
0 to 20000 (0.01%)

【#2305】 SV105 FFR1 OMR-FF inner rounding compensation gain for G1

Set the inner rounding compensation amount (drive side feed forward gain) in OMR-FF control.
When a shape tracking error is too large in OMR-FF control, adjust it by setting this parameter.
The higher the setting value is, the less the shape tracking error will be, however, overshooting during acceleration/deceleration will increase.
Lower the value when vibration occurs during the G1 acceleration/deceleration.
The standard setting is "10000".
Set to "0" when not using OMR-FF control.

---Setting range---
0 to 20000 (0.01%)

【#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】 SV107

Not used. Set to "0".

【#2308】 SV108

Not used. Set to "0".

【#2309】 SV109

Not used. Set to "0".

【#2310】 SV110

Not used. Set to "0".

【#2311】 SV111

Not used. Set to "0".

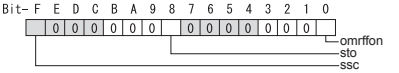
【#2312】 SV112 IFF OMR-FF current feed forward gain

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 : ssc SLS (Safely Limited Speed) function

0: Stop 1: Start

bit E-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

bit 7-1 :

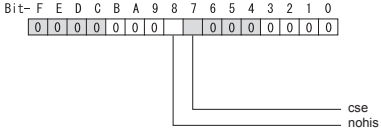
Not used. Set to "0".

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)

Set "1" for C70.

0: Enable 1: Disable

bit 7 : cse Command speed monitoring function

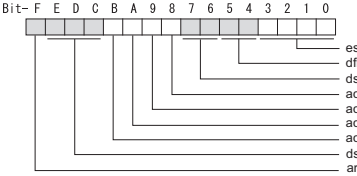
0: Normal setting 1: Enable

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".

【#2317(PR)】 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

【#2318(PR)】 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】 SV119

Not used. Set to "0".

【#2320】 SV120

Not used. Set to "0".

【#2321】 SV121

Not used. Set to "0".

【#2322】 SV122

Not used. Set to "0".

【#2323】 SV123

Not used. Set to "0".

【#2324】 SV124

Not used. Set to "0".

【#2325】 SV125

Not used. Set to "0".

【#2326】 SV126

Not used. Set to "0".

【#2327】 SV127

Not used. Set to "0".

【#2328】 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)

【#2330(PR)】 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)

【#2331(PR)】 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 (μ m)

【#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)

【#2399-2437】 SV199 - SV237

Not used. Set to "0".

【#2438】 SV238 SSCFEED Safely limited speed

Set the machine's safely limited speed for the SLS (Safely Limited Speed) function.
Set this parameter within the following setting ranges.
For linear axis: 2000mm/min or less
For rotary axis: 18000°/min (50r/min) or less
When not using, set to "0".

Related parameters: SV033/bitD, SV113/bitF, SV239

---Setting range---
0 to 18000 (mm/min) or (°/min)
However, when SV033/bitD=1, the setting range is from -32768 to 32767 (100 mm/min) or (100°/min).

【#2439】 SV239 SSCRPM Safely limited motor speed

Set the motor's safely limited speed for the SLS (Safely Limited Speed) function.
Set a value to hold the following relationship.
Be aware when setting the parameter as the setting units for general motors and linear motors are different.

<<For general motor>>
SV239=(SV238/SV018) x (SV002/SV001)
Only when the product is 0, set to "1".

<<For linear motor>>
SV239=SV238/60
Only when the product is 0, set to "1".
When not using, set to "0".

---Setting range---
For general motor:0 to 32767 (r/min)
For linear motor: 0 to 32767 (mm/s)

【#2440-2443】 SV240 - SV243

Not used. Set to "0".

【#2444(PR)】 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 (0.05 μ m) is set.

Related parameters: SV129

---Setting range---
0 to 2000 (1/ μ m)

【#2445-2456】 SV245 - SV256

Not used. Set to "0".

5. Spindle 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.

【#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 99999 (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 99999 (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 99999 (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 99999 (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 99999 (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 99999 (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 99999 (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 99999 (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)

【#3021】

Not used. Set to "0".

【#3022(PR)】 sgear Encoder gear ratio

Set the gear ratio of the spindle to the encoder.
Setting value 0 ---> Detector : Spindle = 1:1
Setting value 1 ---> Detector : Spindle = 1:2
Setting value 2 ---> Detector : Spindle = 1:4
Setting value 3 ---> Detector : Spindle = 1:8
This parameter is enabled only when "S-analog" is set by the spindle connection parameter "#3024 sout".

---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)

【#3024(PR)】 sout Spindle connection

Select the type of spindle to connect.
0: Dedicated optical communication network (Test mode)
Set it when a spindle drive is not connected. In this mode, the alarm for drive units not mounted will not occur even when no spindle drive unit is connected.
1: Dedicated optical communication network
2 - 5: Analog connection (Not used)
(Note 1) The setting of "#3031 smcp_no" is also necessary on the test mode and the spindle is included in the maximum number of spindles and control axes.
(Note 2) When the spindle to be used as the spindle/C axis is set to the test mode, set "1" to "#2018 no_srv" for the C axis.
Without the setting, the error indicating that the C axis is not mounted will occur.
In this case, do not set the servo ON for the C axis. When the servo is set ON for the C axis, all the subsequent axes cannot be set as servo ON (cannot be operated as a C axis).
To test commands for the C axis, set the parameter for NC axis instead of the spindle/C axis. (In this case, allocate another number available to "#1021 mcp_no".)

---Setting range---
0 to 5

【#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 spindle forward run/reverse run M command (L system only)

Set the M codes for the spindle forward run/reverse run commands during asynchronous tapping.
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, the M code for spindle forward run command is handled as "3" and the M code for spindle reverse run command as "4".

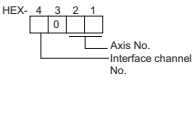
---Setting range---
0 to 999999

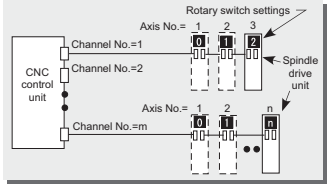
【#3029】 tapsel

Not used. Set to "0".

【#3031(PR)】 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 a spindle to be connected to CNC via analog interface, set to "0000".

---Setting range---
1001 to 1010

- For MDS-DM2-SPV2/SPV3 Series
These drive units have no rotary switches for axis No. selection.
The spindle axis No. is fixed to 1st axis, so set "01" as the number of axes. (last 2 digits).

【#3035(PR)】 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. Note, however, that this parameter is enabled only for the MDS-D Series spindle drive unit.
Spindle/C axis depends on this parameter setting and the C axis output unit (servo) is ignored.
B: 1 μ m
C: 0.1 μ m

【#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 spindle motor and spindle's relative polarity.
0: Positive polarity
(Spindle CW rotation at motor CW rotation)
1: Negative polarity
(Spindle CCW rotation at motor CW rotation)

【#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 phase synchronization control is started.
When "0" is set, the time will be 2 seconds. 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 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 0.5 seconds. When "100" or less is set, the time will be 100ms.

---Setting range---
0 to 9999 (ms)

【#3070】 syprt Phase synchronization speed

Set the amount of speed fluctuation of synchronous spindle during phase synchronization control. Set this as a proportion to commanded speed.
When "0" is set, the amount will be 100%.

---Setting range---
0 to 100 (%)

【#3071(PR)】 SscDrSelSp Speed monitor Door selection

Select which door group of the speed monitoring a spindle belongs to.
The belonging door group corresponds to the following bits of the parameter.
bit0 : Door 1
bit2 : Door 2
:
bitF : Door 16
It is possible to belong to two or more door groups.
(Example) 0013: Belongs to door 1, 2, and 5 groups.
Belongs to door 1 group when "0000" is set.
(Note) Speed monitoring is not executed when SP229:SFNC9/bitF is "OFF".

---Setting range---
0000 to FFFF (HEX)

【#3072(PR)】 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).

---Setting range---
0 to 9999 (ms)

【#3075(PR)】 SosTolDsp Stop observation positioning tolerance deflection

Set a tolerative position deflection during the stop monitoring.

---Setting range---
0 to 65535 (1°/1000)

【#3076(PR)】 SosAlmTsp Stop observation error detection time

Set the time to detect the state of the amount of position deviation exceeding the tolerable position deviation amount as the error during the stop observation. (The time until the state is regarded as out of stop state.)

---Setting range---
0 to 65535 (ms)

【#3101】 sp_t 1 Time constant for spindle rotation with S command (Gear: 00)

Set the acceleration/deceleration time constant for a spindle when the spindle is rotated by an S command (spindle control mode = speed operation mode) using gear 00 (Linear acceleration/deceleration pattern).
This parameter is also used to set the time constant for the spindle rotation when the Z-phase is detected.
(Note) If you set this parameter to "0" by SRAM clear, etc., the time constant is equivalent to "1ms".

---Setting range---
0 to 30000 (ms)

【#3102】 sp_t 2 Time constant for spindle rotation with S command (Gear: 01)

Set the acceleration/deceleration time constant for a spindle when the spindle is rotated by an S command (spindle control mode = speed operation mode) using gear 01 (Linear acceleration/deceleration pattern).
This parameter is also used to set the time constant for the spindle rotation when the Z-phase is detected.
(Note) If you set this parameter to "0" by SRAM clear, etc., the time constant is equivalent to "1ms".

---Setting range---
0 to 30000 (ms)

【#3103】 sp_t 3 Time constant for spindle rotation with S command (Gear: 10)

Set the acceleration/deceleration time constant for a spindle when the spindle is rotated by an S command (spindle control mode = speed operation mode) using gear 10 (Linear acceleration/deceleration pattern).
This parameter is also used to set the time constant for the spindle rotation when the Z-phase is detected.
(Note) If you set this parameter to "0" by SRAM clear, etc., the time constant is equivalent to "1ms".

---Setting range---
0 to 30000 (ms)

【#3104】 sp_t 4 Time constant for spindle rotation with S command (Gear: 11)

Set the acceleration/deceleration time constant for a spindle when the spindle is rotated by an S command (spindle control mode = speed operation mode) using gear11 (Linear acceleration/deceleration pattern).
This parameter is also used to set the time constant for the spindle rotation when the Z-phase is detected.
(Note) If you set this parameter to "0" by SRAM clear, etc., the time constant is equivalent to "1ms".

---Setting range---
0 to 30000 (ms)

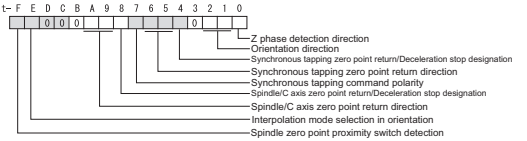
【#3105】 sut Speed reach range

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.



bit F : Spindle zero point detection with contactless switch

0: Normal 1: Enable spindle zero point detection using proximity switch

bit E : Interpolation mode selection in orientation

0: Interpolation mode (Use the interpolation mode gain "SP002 PGN".)
1: Non-interpolation mode (Use the non-interpolation mode gain "SP001 PGV")
Select this when vibration occurs since the gain is too high during the orientation.

bit D-B :

Not used. Set to "0".

bit A-9 : Spindle/C axis zero point return direction

00: Short-cut 01: Forward run 10: Reverse run 11: Reverse run

bit 8 : Designate zero point return/deceleration stop of spindle/C axis

0: Zero point return 1: Deceleration stop

bit 7 : Synchronous tapping command polarity

0: Forward direction 1: Reverse direction

bit 6-5 : Synchronous tapping zero point return direction

00: Short-cut 01: Forward run 10: Reverse run 11: Reverse run

bit 4 : Designate zero point return/deceleration stop in synchronous tapping

0: Zero point return; a start position in synchronous tapping is adjusted to "#3111 tap_sft (Synchronous tapping zero point return shift amount)". (Use this setting when the tapping start position needs to be adjusted.)
1: Deceleration stop; tapping starts from the position where the synchronous tap is commanded.

bit 3 :

Not used. Set to "0".

bit 2-1 : Orientation direction

00: Short-cut 01: Forward run 10: Reverse run 11: Reverse run

bit 0 : 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

Not used. Set to "0".

【#3115】 sp2_t1 Time constant in orientation/position loop reference position return (Gear: 00)

Set the acceleration/deceleration time constant to reach the spindle's limit speed (slimt), when spindle rotates in orientation/position loop zero point return method (C axis, tapping) using gear 00 (Linear acceleration/deceleration pattern).
(Note 1) Set a value that is bigger than the values set by "#3101 sp_t1 to #3104 sp_t4".
(Note 2) If you set this parameter to "0" by SRAM clear, etc., the time constant is equivalent to "1ms".
If this parameter is set to an illegal value, this parameter follows the settings of "sp_t1 to sp_t4".

---Setting range---
0 to 30000 (ms)

【#3116】 sp2_t2 Time constant in orientation/position loop reference position return (Gear: 01)

Set the acceleration/deceleration time constant to reach the spindle's limit speed (slimt), when spindle rotates in orientation/position loop zero point return method (C axis, tapping) using gear 01 (Linear acceleration/deceleration pattern).
(Note 1) Set a value that is bigger than the values set by "#3101 sp_t1 to #3104 sp_t4".
(Note 2) If you set this parameter to "0" by SRAM clear, etc., the time constant is equivalent to "1ms".
If this parameter is set to an illegal value, this parameter follows the setting of "sp_t1 to sp_t4".

---Setting range---
0 to 30000 (ms)

【#3117】 sp2_t3 Time constant in orientation/position loop reference position return (Gear: 10)

Set the acceleration/deceleration time constant to reach the spindle's limit speed (slimt), when spindle rotates in orientation/position loop zero point return method (C axis, tapping) using gear 10 (Linear acceleration/deceleration pattern).
(Note 1) Set a value that is bigger than the values set by "#3101 sp_t1 to #3104 sp_t4".
(Note 2) If you set this parameter to "0" by SRAM clear, etc., the time constant is equivalent to "1ms".
If this parameter is set to an illegal value, this parameter follows the setting of "sp_t1 to sp_t4".

---Setting range---
0 to 30000 (ms)

【#3118】 sp2_t4 Time constant in orientation/position loop reference position return (Gear: 11)

Set the acceleration/deceleration time constant to reach the spindle's limit speed (slimt), when spindle rotates in orientation/position loop zero point return method (C axis, tapping) using gear 11 (Linear acceleration/deceleration pattern).
(Note 1) Set a value that is bigger than the values set by "#3101 sp_t1 to #3104 sp_t4".
(Note 2) If you set this parameter to "0" by SRAM clear, etc., the time constant is equivalent to "1ms".
If this parameter is set to an illegal value, this parameter follows the setting of "sp_t1 to sp_t4".

---Setting range---
0 to 30000 (ms)

【#3119】 ext_clp External spindle speed clamp feedrate

Set the external spindle speed clamp feedrate.
The value is compared to each command feedrate of spindle when the external spindle speed clamp signal is ON. The smaller federate will be applied for operation.

---Setting range---
0 to 99999 (r/min)

【#3120】 staptr Time constant reduction rate in high-speed synchronous tapping

When performing high-speed synchronous tapping, 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(%)

【#3127】 SPECSP Spindle specification

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)

【#3130】 syn_spec Spindle synchronization specification

bit1: Acceleration/ deceleration type in phase alignment

0: Phase alignment method Type 2 (Acceleration/ deceleration method)
1: Phase alignment method Type 1 (Step alignment method)

【#3140(PR)】 S_DINSp Speed monitor 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
:
bitF : Door16 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 FFFF (HEX)

【#3141(PR)】 spsscfeed1 Safety observation speed 1

Set the safety observation speed, which is at the machine end, in the multi-step speed monitor mode 1.
(Note) The lower two digits of the setting value are ignored. An input value "1234567" is recognized as "1234500", "99" is "0".

---Setting range---
0 to 1800000 (°/min)

【#3142(PR)】 spsscfeed2 Safety observation speed 2

Set the safety observation speed, which is at the machine end, in the multi-step speed monitor mode 2.
(Note) The lower two digits of the setting value are ignored. An input value "1234567" is recognized as "1234500", "99" is "0".

---Setting range---
0 to 1800000 (°/min)

【#3143(PR)】 spsscfeed3 Safety observation speed 3

Set the safety observation speed, which is at the machine end, in the multi-step speed monitor mode 3.
(Note) The lower two digits of the setting value are ignored. An input value "1234567" is recognized as "1234500", "99" is "0".

---Setting range---
0 to 1800000 (°/min)

【#3144(PR)】 spsscfeed4 Safety observation speed 4

Set the safety observation speed, which is at the machine end, in the multi-step speed monitor mode 4.
(Note) The lower two digits of the setting value are ignored. An input value "1234567" is recognized as "1234500", "99" is "0".

---Setting range---
0 to 1800000 (°/min)

【#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) The control mode is commanded by NC.
When carrying out the SHG control, set SP036/bit4 to "1".

---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 (%)

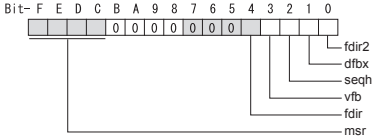
【#13016】 SP016 DDT Phase alignment deceleration rate

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 Δ T ≠ 0), set this parameter together with SP070 (KDDT).

---Setting range---
1 to 32767 (0.1(r/min)/ms)

【#13017(PR)】 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 (2250Hz)

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

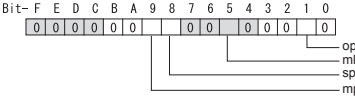
Related parameters: SP051, SP052

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

【#13018(PR)】 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-DJ-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".

【#13019(PR)】 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 M700V, M70V, M70, E70: 0 to 65535 (p)
For C70: -32768 to 32767 (p)

【#13020(PR)】 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-B-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
MBE405W: SP020 = 4000

Tool spindle motor
OSA18(-A48): SP020 = 260

---Setting range---
When SP098=0, the setting range is from 0 to 32767 (kp)
When SP098 ≠ 0
For M700V,M70V,M70,E70: 0 to 65535 (p)
For C70: -32768 to 32767 (p)

【#13021(PR)】 SP021 OLT Overload detection time constant

Set the detection time constant of Overload 1 (Alarm 50). (For machine tool builder 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 machine tool builder 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)

【#13026(PR)】 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-DJ-SP Series.

---Setting range---
0 to 32767 (r/min)

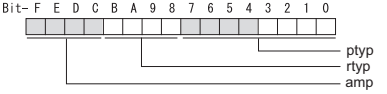
【#13031(PR)】 SP031 MTYP Motor type

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

【#13032(PR)】 SP032 PTYP Power supply type/ Regenerative resistor type

MDS-D2/DH2 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

bit B-8 : rtyp

Not used. Set to "0".

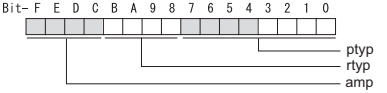
bit 7-0 : ptyp External emergency stop setting

When the emergency stop input signal of the power supply unit is "disabled"
Power supply unit is not connected : 00
MDS-D2-CV-37 / MDS-DH2-CV-37 : 04
MDS-D2-CV-75 / MDS-DH2-CV-75 : 08
MDS-D2-CV-110 / MDS-DH2-CV-110 : 11
MDS-D2-CV-185 / MDS-DH2-CV-185 : 19
MDS-D2-CV-300 / MDS-DH2-CV-300 : 30
MDS-D2-CV-370 / MDS-DH2-CV-370 : 37
MDS-D2-CV-450 / MDS-DH2-CV-450 : 45
MDS-D2-CV-550 / MDS-DH2-CV-550 : 55
MDS-DH2-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-D2-CV-37 / MDS-DH2-CV-37 : 44
MDS-D2-CV-75 / MDS-DH2-CV-75 : 48
MDS-D2-CV-110 / MDS-DH2-CV-110 : 51
MDS-D2-CV-185 / MDS-DH2-CV-185 : 59
MDS-D2-CV-300 / MDS-DH2-CV-300 : 70
MDS-D2-CV-370 / MDS-DH2-CV-370 : 77
MDS-D2-CV-450 / MDS-DH2-CV-450 : 85
MDS-D2-CV-550 / MDS-DH2-CV-550 : 95
MDS-DH2-CV-750 : B5

MDS-DM2-SPV Series: Power supply type

Set as follows for the spindle drive section of the MDS-DM2-SPV.



bit F-C : amp

Not used. Set to "0".

bit B-8 : rtyp

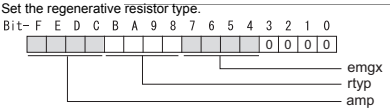
Not used. Set to "0".

bit 7-0 : ptyp External emergency stop setting

Normal : 19
External emergency stop function: 59

MDS-DJ-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

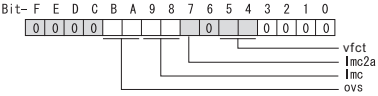
Set the external emergency stop function.
0: Disable 4: Enable

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

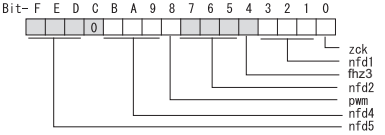
Suppress vibration by machine backlash when axis stops.
bit5,4=
00: Disable
01: 1 pulse
10: 2 pulse
11: 3 pulses

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

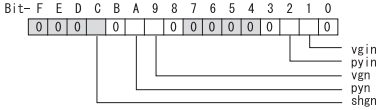
Set the depth of Notch filter 1 (SP038).
bit3,2,1=
000: - ∞
001: -18.1[dB]
010: -12.0[dB]
011: -8.5[dB]
100: -6.0[dB]
101: -4.1[dB]
110: -2.5[dB]
111: -1.2[dB]

bit 0 :

Not used. Set to "0".

【#13035(PR)】 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 8-3 :

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

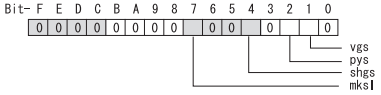
The speed loop gain set after the in-position can be selected.
0: Select Set 1 1: Select Set 2

bit 0 :

Not used. Set to "0".

【#13036(PR)】 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 6-5 :

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 2250 (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 2250 (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.

Related parameters: SP056

---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

---Setting range---
0 to 29900 (ms)

【#13057(PR)】 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

【#13058(PR)】 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

【#13059(PR)】 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

【#13060(PR)】 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

【#13061(PR)】 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

【#13062(PR)】 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

【#13063(PR)】 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

【#13064(PR)】 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 (control input 1/bitA, 9, 8) " is set to "001".

---Setting range---
0 to 999 (Short-time rated %)

【#13066】 SP066 TLM2 Torque limit 2

Set the torque limit value when "the torque limit (control input 1/bitA, 9, 8)" is set to "010".

---Setting range---
0 to 999 (Short-time rated %)

【#13067】 SP067 TLM3 Torque limit 3

Set the torque limit value when "the torque limit (control input 1/bitA, 9, 8) " is set to "011".

---Setting range---
0 to 999 (Short-time rated %)

【#13068】 SP068 TLM4 Torque limit 4

Set the torque limit value when "the torque limit (control input 1/bitA, 9, 8) " is set to "100".

---Setting range---
0 to 999 (Short-time rated %)

【#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)

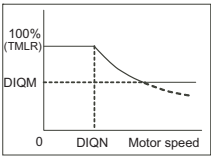
【#13070】 SP070 KDDT Phase alignment deceleration rate scale

Set the scale for SP016 (DDT) to change the deceleration rate only during rotation command (command F Δ 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

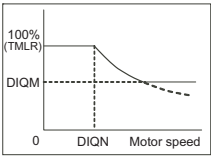
Set this parameter to adjust the deceleration time by changing the current limit value during deceleration depending on the motor speed.
As shown below, set the lower limit rate of the current limit in SP071 (DIQM), and use with SP072 (DIQN).
When DIQM is set to 100%, the standard current limit value in deceleration (TMLR) is applied.



---Setting range---
0 to 999 (%)

【#13072】 SP072 DIQN Variable current limit during deceleration, break point speed

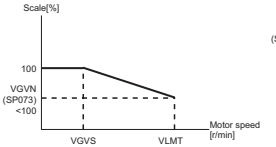
Set this parameter to adjust the deceleration time by changing the current limit value during deceleration depending on the motor speed.
As shown below, set the lower limit rate of the current limit in SP071 (DIQM), and use with SP072 (DIQN).
When DIQM is set to 100%, the standard current limit value in deceleration (TMLR) is applied.



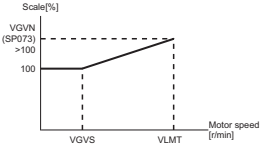
---Setting range---
1 to 32767 (r/min)

【#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

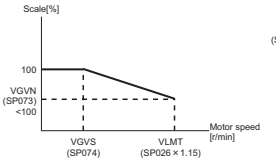


When increasing the speed loop gain at high speed

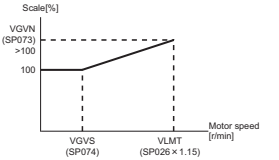
---Setting range---
0 to 999 (%)

【#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 machine tool builder 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 machine tool builder 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 machine tool builder 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 machine tool builder 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 machine tool builder 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 machine tool builder 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 machine tool builder 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 machine tool builder 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 machine tool builder 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 machine tool builder 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 2250 (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 2250 (Hz)

【#13089】 SP089 TMKQ Spindle output stabilizing gain Q axis

Set the magnification of the torque current stabilizing gain. (For machine tool builder 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 machine tool builder 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】 SP099

Not used. Set to "0".

【#13100】 SP100

Not used. Set to "0".

【#13101】 SP101 TMA1 OMR-FF movement averaging filter time constant 1

Set the movement averaging filter time constant in OMR-FF control.
The standard setting is "88".
Set to "0" when not using OMR-FF control.

---Setting range---
0 to 711 (0.01ms)

【#13102】 SP102 TMA2 OMR-FF movement averaging filter time constant 2

Set the movement averaging filter time constant in OMR-FF control.
The standard setting is "88".
Set to "0" when not using OMR-FF control.

---Setting range---
0 to 711 (0.01ms)

【#13103】 SP103

Not used. Set to "0".

【#13104】 SP104 FFR0 OMR-FF inner rounding compensation gain for G0

Set the inner rounding compensation amount (drive side feed forward gain) in OMR-FF control.
When a shape tracking error is too large in OMR-FF control, adjust it by setting this parameter.
The higher the setting value is, the less the shape tracking error will be, however, overshooting during acceleration/deceleration will increase.
Lower the value when vibration occurs during the G0 acceleration/deceleration.
The standard setting is "10000".
Set to "0" when not using OMR-FF control.

---Setting range---
0 to 20000 (0.01%)

【#13105】 SP105 FFR1 OMR-FF inner rounding compensation gain for G1

Set the inner rounding compensation amount (drive side feed forward gain) in OMR-FF control.
When a shape tracking error is too large in OMR-FF control, adjust it by setting this parameter.
The higher the setting value is, the less the shape tracking error will be, however, overshooting during acceleration/deceleration will increase.
Lower the value when vibration occurs during the G1 acceleration/deceleration.
The standard setting is "10000".
Set to "0" when not using OMR-FF control.

---Setting range---
0 to 20000 (0.01%)

【#13106】 SP106 PGM OMR-FF scale model gain

Set the scale model gain (position response) in OMR-FF control.
Set the same value as SP002(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】 SP107

Not used. Set to "0".

【#13108】 SP108

Not used. Set to "0".

【#13109】 SP109

Not used. Set to "0".

【#13110】 SP110

Not used. Set to "0".

【#13111】 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)

【#13118(PR)】 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)

【#13129(PR)】 SP129

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.

【#13130(PR)】 SP130

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.

【#13131(PR)】 SP131

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.

【#13132(PR)】 SP132

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.

【#13133(PR)】 SP133

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.

【#13134(PR)】 SP134

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.

【#13135(PR)】 SP135

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.

【#13136(PR)】 SP136

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.

【#13137(PR)】 SP137

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.

【#13138(PR)】 SP138

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.

【#13139(PR)】 SP139

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.

【#13140(PR)】 SP140

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.

【#13141(PR)】 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.

【#13142(PR)】 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 [μ s] 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 333 μ s pulse-applied magnetic pole estimation in a low-speed coil and selecting the reverse polarity for the estimated polarity
SP142 = -(333+1000) = -1333

【#13143(PR)】 SP143

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.

【#13144(PR)】 SP144

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.

【#13145(PR)】 SP145

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.

【#13146(PR)】 SP146

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.

【#13147(PR)】 SP147

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.

【#13148(PR)】 SP148

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.

【#13149(PR)】 SP149

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.

【#13150(PR)】 SP150

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.

【#13151(PR)】 SP151

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.

【#13152(PR)】 SP152

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.

【#13153(PR)】 SP153

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.

【#13154(PR)】 SP154

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.

【#13155(PR)】 SP155

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.

【#13156(PR)】 SP156

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.

【#13157(PR)】 SP157

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.

【#13158(PR)】 SP158

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.

【#13159(PR)】 SP159

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.

【#13160(PR)】 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.

【#13161(PR)】 SP161

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.

【#13162(PR)】 SP162

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.

【#13163(PR)】 SP163

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.

【#13164(PR)】 SP164

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.

【#13165(PR)】 SP165

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.

【#13166(PR)】 SP166

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.

【#13167(PR)】 SP167

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.

【#13168(PR)】 SP168

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.

【#13169(PR)】 SP169

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.

【#13170(PR)】 SP170

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.

【#13171(PR)】 SP171

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.

【#13172(PR)】 SP172

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.

【#13173(PR)】 SP173

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.

【#13174(PR)】 SP174

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.

【#13175(PR)】 SP175

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.

【#13176(PR)】 SP176

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.

【#13177(PR)】 SP177

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.

【#13178(PR)】 SP178

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.

【#13179(PR)】 SP179

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.

【#13180(PR)】 SP180

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.

【#13181(PR)】 SP181

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.

【#13182(PR)】 SP182

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.

【#13183(PR)】 SP183

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.

【#13184(PR)】 SP184

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.

【#13185(PR)】 SP185

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.

【#13186(PR)】 SP186

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.

【#13187(PR)】 SP187

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.

【#13188(PR)】 SP188

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.

【#13189(PR)】 SP189

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.

【#13190(PR)】 SP190

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.

【#13191(PR)】 SP191

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.

【#13192(PR)】 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-DJ-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-DJ-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-DJ-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-DJ-SP Series.

---Setting range---
0 to 32767 (r/min)

【#13197】 SP197

Not used. Set to "0".

【#13198】 SP198

Not used. Set to "0".

【#13199】 SP199

Not used. Set to "0".

【#13200】 SP200

Not used. Set to "0".

【#13201】 SP201

Not used. Set to "0".

【#13202】 SP202

Not used. Set to "0".

【#13203】 SP203

Not used. Set to "0".

【#13204】 SP204

Not used. Set to "0".

【#13205】 SP205

Not used. Set to "0".

【#13206】 SP206

Not used. Set to "0".

【#13207】 SP207

Not used. Set to "0".

【#13208】 SP208

Not used. Set to "0".

【#13209】 SP209

Not used. Set to "0".

【#13210】 SP210

Not used. Set to "0".

【#13211】 SP211

Not used. Set to "0".

【#13212】 SP212

Not used. Set to "0".

【#13213】 SP213

Not used. Set to "0".

【#13214】 SP214

Not used. Set to "0".

【#13215】 SP215

Not used. Set to "0".

【#13216】 SP216

Not used. Set to "0".

【#13217】 SP217

Not used. Set to "0".

【#13218】 SP218

Not used. Set to "0".

【#13219】 SP219

Not used. Set to "0".

【#13220】 SP220

Not used. Set to "0".

【#13221】 SP221

Not used. Set to "0".

【#13222】 SP222

Not used. Set to "0".

【#13223】 SP223

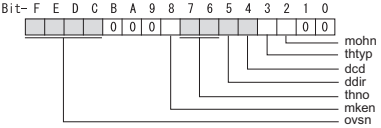
Not used. Set to "0".

【#13224】 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: Setting prohibited
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

bit 2 : mohn Thermistor temperature detection

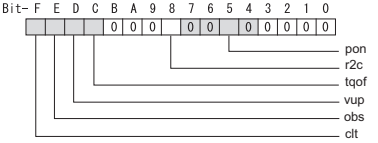
0: Normal 1: Disable (Except for TS5690/5691)

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 : clt Spindle monitor load inertia ratio

0: Normal 1: Display

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

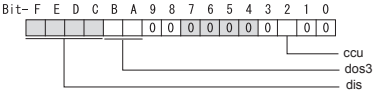
0: Normal 1: Enable

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
1: SLS (Safely Limited Speed) function door state signal
4: Proximity switch signal detection
Other settings: setting prohibited

bit B-A : dos3 Digital signal output 3 selection (MDS-DJ-SP)

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 :

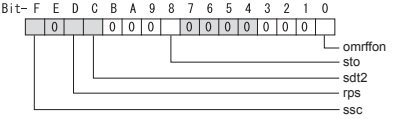
Not used. Set to "0".

【#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 : ssc SLS (Safely Limited Speed) function

0: Disable 1: Enable

bit 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

bit 7-1 :

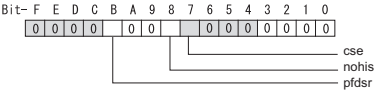
Not used. Set to "0".

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 : 8

bit A-9 :

Not used. Set to "0".

bit 8 : nohis History of communication error alarm between NC and DRV(34,36,38,39)

For C70, set "1".
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".

【#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".

【#13235(PR)】 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 (%)

【#13236(PR)】 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)

【#13237(PR)】 SP237 TCF Torque command filter

Set the filter for the torque command.
When not using, set to "0".
The standard value is "500" when using the motor side encoder TS5690 or TS5691.

---Setting range---
0 to 4500 (Hz)

【#13238】 SP238 SSCFEED Safely limited speed

Set the safely limited speed at the spindle end for the SLS (Safely Limited Speed) function.
When not using, set to "0".

---Setting range---
0 to 18000 (°/min)
However, when SP229/bitD is set to "1", the setting range is from -32768 to 32767 (100°/min).

【#13239】 SP239 SSCRPM Safely limited motor speed

Set the motor's safely limited speed for the SLS (Safely Limited Speed) function.
Set a value to hold the following relationship.

SP239=(SP238/360)×(SP057/SP061)
Only when the product is 0, set to "1".

When not using, set to "0".

Related parameters: SP229/bitD, SP229/bitF, SP238

---Setting range---
0 to 32767 (r/min)

【#13240(PR)】 SP240

Not used. Set to "0".

【#13241(PR)】 SP241

This is automatically set by the NC system.

【#13242(PR)】 SP242

This is automatically set by the NC system.

【#13243(PR)】 SP243

This is automatically set by the NC system.

【#13244(PR)】 SP244

This is automatically set by the NC system.

【#13245(PR)】 SP245

This is automatically set by the NC system.

【#13246(PR)】 SP246

This is automatically set by the NC system.

【#13247(PR)】 SP247

This is automatically set by the NC system.

【#13248(PR)】 SP248

This is automatically set by the NC system.

【#13249(PR)】 SP249

This is automatically set by the NC system.

【#13250(PR)】 SP250

This is automatically set by the NC system.

【#13251(PR)】 SP251

This is automatically set by the NC system.

【#13252(PR)】 SP252

This is automatically set by the NC system.

【#13253(PR)】 SP253

This is automatically set by the NC system.

【#13254(PR)】 SP254

This is automatically set by the NC system.

【#13255(PR)】 SP255

This is automatically set by the NC system.

【#13256(PR)】 SP256

This is automatically set by the NC system.

6. Multi-CPU Parameters

【#26701, 26711, 26721, 26731(PR)】 CPU specific send range(K) Cyclic transmission area size

Set the size of the cyclic transmission area to be allocated to each CPU module configuring the multi-CPU system. The area size for NC CPU should be 3 [K points].

---Setting range---
0 to 15 (K points)
(Count the number of points by word)

【#26702, 26712, 26722, 26732(PR)】 auto refresh area size Automatic refresh area size

Set the size of the automatic refresh area to be allocated to each CPU module configuring the multi-CPU system.
Set to "0" for NC CPU, as this CPU does not use the automatic refresh.
If any other CPU uses the automatic refresh, however, you need to set this parameter for such CPU.
If you set a value other than “0” for NC CPU, a self diagnosis error occurs when the power is turned OFF and ON.

---Setting range---
0 to 14335 (points)
(Count the number of points by word)

【#26703, 26713, 26723, 26733(PR)】 Restricted system area(K) System area size

Set the size of the system area to be allocated to each CPU module.
The area size for NC CPU should be 1 [K points].
(Default size of system area is 1K points.)

---Setting range---
0 to 2 (K points)

【#26704, 26714, 26724, 26734(PR)】 Unsynchronize CPU boot-up Unsynchronize Multi-CPU boot-ups

Select whether to synchronize the multi-CPU boot-ups.
0 : Synchronize
1 : Unsynchronize
(Note) Make sure that the value "0" means "synchronize", which is contrary to the setting in GX Works2 / GX Developer.

【#26741(PR)】 Command Slot No. Control signal input slot No.

Set the slot No. of the PLC CPU module to which the control signals are input.
0: CPU slot
1: Slot 0
2: Slot 1
3: Slot 2

【#26742(PR)】 G Device TOP number Control signal input device No.

Set the No. of the head device in shared memory to which the control signals are input.
When the setting value is less than 10000, it will be handled as 10000.

---Setting range---
10000 to 16144
* Set this within the setting range of the target CPU's shared memory.

7. FL-net 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.

【#29001(PR)】 IP Address FL-net module IP address

Set the IP address of the FL-net module.
Input a dot-delimited IP address.
Input a node number in the 4th digit.
The standard setting is "192.168.250.1".

---Setting range---
1st digit: 192 to 223
2nd digit: 0 to 255
3rd digit: 0 to 255
4th digit: 1 to 254

【#29002(PR)】 FL-net Unit Mode FL-net module operation mode

Set the FL-net module operation mode.
The standard setting is "0".
0: Online (Communicates with other nodes)
1: Offline (Disconnects the local node from the network.)
2: Loopback test
3: Hardware test

【#29003(PR)】 Node Name Local node name

Set the local node name.
Setting "0" clears the character string currently set.

---Setting range---
9 or less alphanumeric characters
0: Clear

【#29004(PR)】 Cyclic Data Area1 Addr. Cyclic data area 1: Head address

Set the offset from the head device in cyclic data area 1 (bit area) used by the local node.
The standard setting is "0".

---Setting range---
0000 to 01FF

【#29005(PR)】 Cyclic Data Area1 Size Cyclic data area 1: Size

Set the size of cyclic data area 1 (bit area) used by the local node.
The standard setting is "0".

---Setting range---
0000 to 0200

【#29006(PR)】 Cyclic Data Area2 Addr. Cyclic data area 2: Head address

Set the offset from the head device in cyclic data area 2 (bit area) used by the local node.
The standard setting is "0".

---Setting range---
0000 to 1FFF

【#29007(PR)】 Cyclic Data Area2 Size Cyclic data area 2: Size

Set the size of cyclic data area 2 (word area) used by the local node.
The standard setting is "0".

---Setting range---
0000 to 2000

【#29008(PR)】 Token Watch Time Out Token watch time-out time

Set the token watch time-out time.
The standard setting is "50".

---Setting range---
0 to 65535

【#29009(PR)】 Min. Permissible Frame Duration Minimum permissible frame interval

Set the minimum permissible frame interval.
The standard setting is "0".

---Setting range---
0 to 50

【#29010(PR)】 Message Data Unit Select (0:Word 1:Byte) Message data unit select

Select the data unit in treating message data.
The standard setting is "0".
0: Word unit
1: Byte unit

【#29012(PR)】 Status Data: Bit Area Specified Inform.
Status data: Bit area instruct information area

Set the device to store the following data:

bit9: buffer memory log information area clear
Instructs clearing of the buffer memory log information area (address: A80H to B38H).
0: No clear instruction / 1: Clear instruction

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29013(PR)】Status Data:Bit Area Local Node Inform.
Status data: Bit area local node information area

Set a device to store the following data:

<1st word: Local node information area>
bit3: Operation data; indicates node switch of module.
0: Online / 1: Other than online
bit6: Setting data; indicates node No. switch of module.
0: Normal / 1: Error
bit7: Indicates module type.
0: QJ71FL71-F01(10BASE5,10BASE-T) / 1: QJ71FL71-B2-F01(10BASE2)
bit8: Indicates local node communication (token participation) status.
0: Normal / 1: Error
bitA: Local node CPU status 1; indicates local node Qn(H)CPU self-diagnosis result.
0: Normal / 1: Warning
bitB: Local node CPU status 2; indicates local node Qn(H)CPU self-diagnosis result.
0: Normal / 1: Error

<2nd word: Local node information area>
bit1: Indicates parameter setting status from Qn(H)CPU.
0: Setting complete / 1: Setting not complete
bit2: Indicates receive parameter data.
0: Normal / 1: Error
bit8: Indicates local node receive signal wait status (waiting for network participation).
0: No receive signal wait / 1: Receive signal wait
bit9: Indicates token transmission monitoring time out error status.
0: Normal / 1: Error
bitA: Indicates whether or not local node No. duplicates other node No.
0: Normal / 1: Duplicate node No. detected
bitB: Area 1 address multiplexing detection signal; indicates whether or not local node common memory area 1 duplicates other node common memory area.
0: Normal / 1: Duplicate address detected
bitC: Area 2 address multiplexing detection signal; indicates whether or not local node common memory area 2 duplicates other node common memory area.
0: Normal / 1: Duplicate address detected
bitD: Indicates the local node communication status during data linking participation.
0: Communication valid / 1: Communication invalid

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29014(PR)】Status Data:Word Area Specified Inform.
Status data: Word area instruct information area

Set a device to store the following data:

<1st word: Instruct information area>
Other node No. setting for parameter use:
Indicates node No. if reading the parameter/ join node data for other node.
1 to 254: Node No.
bit15 (top bit): Select the information to read. (0: Parameter / 1: Join node data)

<2nd word: Instruct information area>
Other node No. setting for device profile:
Indicates node No. if reading device profile for other node.
1 to 254: Node No.

<3rd word: Instruct information area>
Other node No. setting (1) for log information:
Indicates node No. if clearing log information for other node.
1 to 255: Node No.

<4th word: Instruct information area>
Other node No. setting (2) for log information:
Indicates node No. if reading log information for other node.
1 to 254: Node No.

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29015(PR)】Status Data:Word Area Message Inform.
Status data: Word area message information area

Set a device to store the following data:

<1st word: Message information area>
Response message classification:
Indicates the message classification (status) of message transmission using message send area.
00(HEX): Normal message response or request message
01(HEX): Error message response
02(HEX): Not supported

<2nd word: Message information area>
Virtual address space data size:
Indicates data size when using virtual address space in the transmission of message using message send area.
Setting range: 0001 to FFFF (HEX)
Setting "0" makes the virtual address space unused.

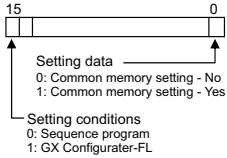
<3rd, 4th word: Message information area>
Virtual address space first address
Indicates the first address (32 bits) when using virtual address space in the transmission of message using message send area.
Setting range: 0 to FFFFFFFF (HEX)

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29016(PR)】Status Data:Word Area Local Node Inform.
Status data: Word area local node information area

Set a device to store the following data:

<1st word: Local node information area>
Stores the parameter information.
(This is enabled when "#29013 Status Data: Bit Area Local Node Inform." 2nd word area bit1 is set to "0".)



<2nd word: Local node information area>
Stores the data unit applied in the message data area.
0: Word unit
1: Byte unit

<13th word: Local node information area>
Indicates the node No. of the FL-net module.
1 to 249: Node No.

<14th word: Local node information area>
Indicates the mode switch status of the FL-net module.
0: Online
1: Offline
2: Loopback test
3: Hardware test
Others: Setting error

<15th, 16th word: Local node information area>
Indicates the IP address status of the FL-net module.

<17th word: Local node information area>
Indicates switches setting status.
0: Normal
1 and later: Error code

<18th word: Local node information area>
Indicates the Ethernet interface owned by the local node module.
bit0: 10BASE2 (0: No, 1: Yes)
bit1: 10BASE5 (0: No, 1: Yes)
bit2: 10BASE-T (0: No, 1: Yes)

<19th word: Local node information area>
Local node communication status: Indicates data link (cyclic transmission) of local node.
0: During data link
3: Disconnecting (Parameter error detection)
4: Disconnecting (Token monitoring time out)
5: Disconnecting (Node number multiplexing detection)
6: Disconnecting (Receive wait status)
7: Disconnecting (Invalid communication detected)
FE: Initializing
FF: Resetting

<20th word: Local node information area>
Indicates FL-net (OPCN-2) protocol version.

<21st word: Local node information area>
Indicates FL-net (OPCN-2) authorization version.

<22nd word: Local node information area>
Indicates results of local node CPU self diagnosis.
0: Normal
1 and later: Error code

<27th word: Local node information area>
Indicates the maximum No. of node normally communicating (token participation).

<29th word: Local node information area>
Indicates the parameter setting contents status.
0: Normal
1 and later: Error code

<30th word: Local node information area>
Indicates parameter read results.
0: Normal
1 and later: Error code

<31st word: Local node information area>
Indicates device profile read results.
0: Normal
1 and later: Error code

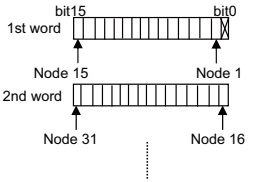
<32nd word: Local node information area>
Indicates log information clear results.
0: Normal
1 and later: Error code

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29017(PR)】Status Data:Word Area Other Node Inform.
Status data: Word area other node information area

Set a device to store the following data:

<1st to 16th word: Other node information area>
Participation node list:
Indicates the token participation status at the other node in bits.
0: Participation / 1: Release



<17th to 32nd word: Other node information area>
Other node network parameter setting status:
Indicates the parameter setting status at the other node in bits.
0: Setting / 1: No setting

<33rd to 48th word: Other node information area>
Other node CPU operation status:
Indicates the execution status of Qn(H)CPU, etc., at the other node.
0: RUN status (RUN, STEP_RUN) / 1: STOP status (STOP, PAUSE)

<49th to 64th word: Other node information area>
Other node CPU operation status (Low level error):
Indicates the results of self-diagnosis of Qn(H)CPU, etc., at the other node.
0: Normal / 1: Warning

<65th to 80th word: Other node information area>
Other node CPU operation status (Medium, high level errors):
Indicates the results of self-diagnosis of Qn(H)CPU, etc., at the other node.
0: Normal/ 1: Alarm

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29018(PR)】Status Data:Word Area Log status
Status data: Word area log information area

Set a device to store the following data:

<1st, 2nd word: Log information area>
Totaling socket sending count:
Indicates the accumulated count of sending to transmission line.

<3rd, 4th word: Log information area>
Totaling socket send error count:
Indicates the accumulated count of send errors detected at the transmission line.

<5th, 6th word: Log information area>
Ethernet send error count:
Indicates the accumulated count of send errors detected at the data link and physical layer.

<13th, 14th word: Log information area>
Total receive count:
Indicates the accumulated count of receive signals at the transmission line.

<15th, 16th word: Log information area>
Total receive error count:
Indicates the accumulated count of receive errors detected at the transmission line.

<17th, 18th word: Log information area>
Ethernet receive error count:
Indicates the accumulated count of receive errors detected at the data link and physical layer.

<25th, 26th word: Log information area>
Token send count:
Indicates the accumulated count of tokens sent (token + cyclic).

<27th, 28th word: Log information area>
Cyclic frame send count:
Indicates the accumulated count of cyclic frames sent.

<29th, 30th word: Log information area>
1:1 message frame send count:
Indicates the accumulated count of 1:1 message frames sent.

<31st, 32nd word: Log information area>
1:n message frame send count:
Indicates the accumulated count of 1:n (broadcast) message frames sent.

<37th, 38th word: Log information area>
Token receive count:
Indicates the accumulated count of local node address tokens (token + cyclic) received.

<39th, 40th word: Log information area>
Cyclic frame receive count:
Indicates the accumulated count of cyclic frames received.

<41st, 42nd word: Log information area>
1:1 message frame receive count:
Indicates the accumulated count of local node address 1:1 message frames received.

<43rd, 44th word: Log information area>
1:n message frame receive count:
Indicates the accumulated count of 1:n (broadcast) message frames received.

<49th, 50th word: Log information area>
Cyclic frame receive error count:
Indicates the accumulated count of cyclic frame receive error detection.

<51st, 52nd word: Log information area>
Cyclic address size error count:
Indicates the accumulated count of address size error detection in the cyclic frame.

<53rd, 54th word: Log information area>
Cyclic CBN error count:
Indicates the accumulated count of CBN (block No.) error detection in the cyclic frame.

<55th, 56th word: Log information area>
Cyclic TBN error count:
Indicates the accumulated count of TBN (total block No.) error detection in the cyclic frame.

<57th, 58th word: Log information area>
Cyclic BSIZE error count:
Indicates the accumulated count of BSIZE (data size including frame header) error in the cyclic frame.

<73rd, 74th word: Log information area>
Message transmission resend count:
Indicates the accumulated count of resends in the message frame.

<75th, 76th word: Log information area>
Message transmission resend over count:
Indicates the accumulated count of resend over in the message frame.

<87th, 88th word: Log information area>
Message transmission receive error count:
Indicates the accumulated count of message frame receive error detection.

<89th, 90th word: Log information area>
Message transmission communication No. error count:
Indicates the accumulated count of communication No. error detection in the message frame.

<91st, 92nd word: Log information area>
Message transmission resend recognition count:
Indicates the accumulated count of resend recognition in the message frame.

<97th, 98th word: Log information area>
ACK error count:
Indicates the accumulated count of ACK header error detection.

<99th, 100th word: Log information area>
Serial No. version error count:
Indicates the accumulated count of serial No. version error detection (mis-match detection).

<101st, 102nd word: Log information area>
Serial No. error count:
Indicates the accumulated count of serial No. error detection (non-continuous detection).

<103rd, 104th word: Log information area>
Node No. error count:
Indicates the accumulated count of node No. error detection.

<105th, 106th word: Log information area>
TCD error count:
Indicates the accumulated count of TCD (transaction code) error detection.

<121st, 122nd word: Log information area>
Token multiplexing recognition count:
Indicates the accumulated count of optional node address (including local node address) tokens detected while the token is being held.

<123rd, 124th word: Log information area>
Token destruction count:
Indicates the accumulated count of node address tokens having a value that is less than that of local node while the token is being held.

<125th, 126th word: Log information area>
Token resend count:
Indicates the accumulated count of token resends.

<133rd, 134th word: Log information area>
Token holding time-out count:
Indicates the accumulated count of time-out detections for token holding time-out time (value that does not exceed the token monitoring time-out time.)

<135th, 136th word: Log information area>
Token monitoring time-out count:
Indicates the accumulated count of time-out detections for token monitoring time-out time.

<145th, 146th word: Log information area>
Total operating time:
Indicates the total operation time.

<147th, 148th word: Log information area>
Frame wait status count:
Indicates the accumulated count that frame wait status has become.

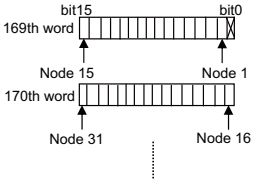
<149th, 150th word: Log information area>
Participation count:
Indicates the accumulated count of local node participation.

<151st, 152nd word: Log information area>
Self-release count:
Indicates the accumulated count of self release (when token holding time for local node up is generated 3 consecutive times).

<153rd, 154th word: Log information area>
Release-by-skip count:
Indicates the accumulated count of release by skip (local node address token is pulled out 3 consecutive times).

<155th, 156th word: Log information area>
Other node release count:
Indicates the accumulated count of detections of other node releases.

<169th to 184th word: Log information area>
Participation node list:
Indicates the token participation status at the other node in bits.
0: Release / 1: Participation



---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29019(PR)】 Status Data:Word Message Inform.
Status data: Message information area

Set a device to store the following data:

<1st word: Message information area>
Response message classification:
Stores the message classification (status) of message transmission using message receive area.
00(HEX): Normal message response or request message
01(HEX): Error message response
02(HEX): Not supported

<2nd word: Message information area>
Virtual address space data size:
Stores data size when using virtual address space in the transmission of message using message receive area.
Setting range: 0001 to FFFF (HEX)
Setting "0" makes the virtual address space unused.

<3rd, 4th word: Message information area>
Virtual address space first address
Stores the first address (32 bits) when using virtual address space in the transmission of message using message receive area.
Setting range: 0 to FFFFFFFF (HEX)

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29020(PR)】 Cyclic Data:Area1 Local Node Area Module side Transfer Cont.
Cyclic data: Area1 Local node area Module side transfer word count

Set the word count of the data which is transferred by the local node to cyclic data area 1 (bit area).
The standard setting is "512".
(Note) An error will occur when the buffer offset value exceeds "512" after the transfer size is added.

---Setting range---
1 to 512

【#29021(PR)】 Cyclic Data:Area1 Local Node Area Module side Buffer off.
Cyclic data: Area1 Local node area Module side buffer offset

Set the head offset of the buffer for setting the data which is transferred by the local node to the cyclic data area 1 (bit area).
The standard setting is "0".
(Note) An error will occur when the buffer offset value exceeds "512" after the transfer size is added.

---Setting range---
0 to 512

【#29022(PR)】 Cyclic Data:Area1 Local Node Area PLC side Device
Cyclic data: Area1 Local node area CPU side device

Set the internal device to store the data transferred by the local node to the cyclic data area 1 (bit area).

---Setting range---
CPU-side device

【#29023(PR)】 Cyclic Data:Area1 Other Node Area Module side Transfer Cont.
Cyclic data: Area1 Other node area Module side transfer word count

Set the word count of the data used for reading the other node data in cyclic data area1 (bit area).
The standard setting is "512".
(Note) An error will occur when the buffer offset value exceeds "512" after the transfer size is added.

---Setting range---
1 to 512

【#29024(PR)】 Cyclic Data:Area1 Other Node Area Module side Buffer off.
Cyclic data: Area1 Other node area Module side buffer offset

Set the word count of the data used for reading the other node data in cyclic data area1 (bit area).
The standard setting is "0".
(Note) An error will occur when the buffer offset value exceeds "512" after the transfer size is added.

---Setting range---
0 to 512

【#29025(PR)】 Cyclic Data:Area1 Other Node Area PLC side Device
Cyclic data: Area1 Other node area CPU side device

Set the internal device used for reading the other node data in cyclic data area 1 (bit area).

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29026(PR)】 Cyclic Data:Area1 Other Node Area Module side Transfer Cont.
Cyclic data: Area1 Other node area Module side transfer word count

Set the word count of the data used for reading the other node data in cyclic data area 1 (bit area).
The standard setting is "512".
(Note) An error will occur when the buffer offset value exceeds "512" after the transfer size is added.

---Setting range---
1 to 512

【#29027(PR)】 Cyclic Data:Area1 Other Node Area Module side Buffer off.
Cyclic data: Area1 Other node area Module side buffer offset

Set the head offset of the buffer used for reading the other node data in cyclic data area 1 (bit area).
The standard setting is "0".
(Note) An error will occur when the buffer offset value exceeds "512" after the transfer size is added.

---Setting range---
0 to 512

【#29028(PR)】 Cyclic Data:Area1 Other Node Area PLC side Device
Cyclic data: Area1 Other node area CPU side device

Set the internal device used for reading the other node data in cyclic data area 1 (bit area).

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29029(PR)】 Cyclic Data:Area2 Local Node Area Module side Transfer Cont.
Cyclic data: Area2 Local node area Module side transfer word count

Set the word count of the data which is transferred by the local node to cyclic data area 2 (word area).
The standard setting is "8192".
(Note) An error will occur when the value buffer offset value exceeds "8192" after the transfer size is added.

---Setting range---
1 to 8192

【#29030(PR)】 Cyclic Data:Area2 Local Node Area Module side Buffer off.
Cyclic data: Area2 Local node area Module side buffer offset

Set the head offset of the buffer for setting the data which is transferred by the local node to the cyclic data area 2 (word area).
The standard setting is "0".
(Note) An error will occur when the value buffer offset value exceeds "8192" after the transfer size is added.

---Setting range---
0 to 8192

【#29031(PR)】 Cyclic Data:Area2 Local Node Area PLC side Device
Cyclic data: Area2 Local node area CPU side device

Set the internal device to store the data transferred by the local node to cyclic data area 2 (word area).

---Setting range---
CPU-side device

【#29032(PR)】 Cyclic Data:Area2 Other Node Area Module side Transfer Cont.
Cyclic data: Area2 Other node area Module side transfer word count

Set the word count of the data used for reading the other node data in cyclic data area 2 (word area).
The standard setting is "8192".
(Note) An error will occur when the value buffer offset value exceeds "8192" after the transfer size is added.

---Setting range---
1 to 8192

【#29033(PR)】 Cyclic Data:Area2 Other Node Area Module side Buffer off.
Cyclic data: Area2 Other node area Module side buffer offset

Set the head offset of the buffer used for reading the other node data in cyclic data area 2 (word area).
The standard setting is "0".
(Note) An error will occur when the value buffer offset value exceeds "8192" after the transfer size is added.

---Setting range---
0 to 8192

【#29034(PR)】 Cyclic Data:Area2 Other Node Area PLC side Device
Cyclic data: Area2 Other node area CPU side device

Set the internal device used for reading the other node data in cyclic data area 2 (word area).

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29035(PR)】 Cyclic Data:Area2 Other Node Area Module side Transfer Cont.
Cyclic data: Area2 Other node area Module side transfer word count

Set the word count of the data used for reading the other node data in cyclic data area 2 (word area).
The standard setting is "8192".
(Note) An error will occur when the value buffer offset value exceeds "8192" after the transfer size is added.

---Setting range---
1 to 8192

【#29036(PR)】 Cyclic Data:Area2 Other Node Area Module side Buffer off.
Cyclic data: Area2 Other node area Module side buffer offset

Set the head offset of the buffer used for reading the other node data in cyclic data area 2 (word area).
The standard setting is "0".
(Note) An error will occur when the value buffer offset value exceeds "8192" after the transfer size is added.

---Setting range---
0 to 8192

【#29037(PR)】 Cyclic Data:Area2 Other Node Area PLC side Device
Cyclic data: Area2 Other node area CPU side device

Set the internal device used for reading the other node data in cyclic data area 2 (word area).

---Setting range---
Within the number of device points set in the PC parameter's device setting.

8. DeviceNet 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.

【#29041(PR)】 Parameter Saving Area Select Parameter saving area selection

Set the parameter area saved in the flash ROM.
When a value among "4" to "7" is set, auto communication start setting will also be saved.

---Setting range---
0 to 7

【#29042(PR)】 Constant Scan Constant scan time

Set the link scan time.

---Setting range---
0 to 65535

【#29043(PR)】 I/O data reception size Slave function reception bytes (input points)

Set the slave function I/O data reception size.
The standard setting is "8".

---Setting range---
0 to 128

【#29044(PR)】 I/O data transmission size Slave function transmission bytes (output points)

Set the slave function I/O data transmission size.
The standard setting is "8".

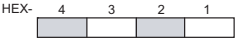
---Setting range---
0 to 128

【#29045(PR)】 Auto communication start Auto communication start

Select whether to automatically start the I/O communication.
This setting will be saved in the flash ROM when the power is turned OFF and ON or when the CPU module is reset.
0: Not automatically start
1: Automatically start

【#29051(PR)】Slave Node No. & Message Group Slave node No. and message group

Set the slave node No. and message group.
Set a hexadecimal number.



HEX-1,2 : 1st slave node No. (MAC ID)

00 to 3F(HEX) (0 to 63)

HEX-3.4 : Message group

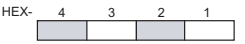
01(HEX): Node that supports UCMM and uses message group 3, 2, or 1
03(HEX): Node that supports UCMM and uses message group 1
04(HEX): Node that does not support UCMM (Group 2 dedicated server)
80(HEX): Reserved node

【#29052(PR)】 Slave Node Connection Type Slave node: Connection type

Select the connection type of I/O communication.
Set a hexadecimal number.
0001(HEX): Polling
0002(HEX): Bit strobe
0004(HEX): Change-of-state
0008(HEX): Cyclic

【#29053(PR)】 Byte module count Slave node: Byte module count

Set the number of byte modules of the slave node.
Set a hexadecimal number.



HEX-1,2 : Input byte module count

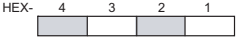
Set the number of input byte modules.

HEX-3,4 : Output byte module count

Set the number of output byte modules.

【#29054(PR)】 Word module count Slave node: Word module count

Set the number of word modules of the slave node.
Set a hexadecimal number.



HEX-1,2 : Input word module count

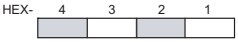
Set the number of input word modules.

HEX-3,4 : Output word module count

Set the number of output word modules.

【#29055(PR)】 Double-word module count Slave node: Double-word module count

Set the double-word module count of the slave node.
Set a hexadecimal number.



HEX-1,2 : Input double-word module count

Set the number of input double-word modules.

HEX-3,4 : Output double-word module count

Set the number of output double-word modules.

【#29056(PR)】 Expected packet rate Slave node: Expected packet rate

Set the expected packet rate of the slave node.
Setting details vary depending on the connection type.
The standard setting is "0".
"0" is regarded as 200(ms).
Other settings are regarded as "(Set value) - 1"(ms).

---Setting range---
0 to 65535(ms)

【#29057(PR)】 Watchdog timeout action Slave node: Watchdog timeout action

Set the operation during watchdog timeout at the slave node.
The standard setting is "0".

0000(HEX), 0001(HEX): TIMEOUT; the connection is placed in timeout state. It will not be recovered until an operator stops the communication and then resumes it.
0002(HEX): AUTO DELETE; the connection is automatically deleted. At this time the communication stops once, then resumes automatically. The output is cleared once.
0003(HEX): AUTO RESET; the communication continues while connection is maintained. The output is not cleared.

【#29058(PR)】 Production inhibit time Slave node: Production inhibit time

Set the production inhibit time.
Setting details vary depending on the connection type.
The standard setting is "0".
"0" is regarded as 10(ms).
Other settings are regarded as "(Set value) - 1"(ms).

---Setting range---
0 to 65535

【#29061(PR)】Master Function Comm.Status Master function communication status

Set a device to store the following data:

<Higher byte>
The master function I/O communication status is stored.
00(HEX): OFFLINE; being initialized
40(HEX): STOP; I/O communication being stopped
C0(HEX): OPERATE; I/O communication in progress

The communication status above varies according to the auto communication start setting (address: 0631H):
- When "0: Not automatically start" is set:
  Turning the power ON automatically changes the status from OFFLINE (00(HEX)) to STOP (40(HEX)).
  Turning ON the I/O communication request (Y11) changes the state to OPERATE (C0(HEX)).
- When "1: Automatically start" is set:
  Turning the power ON automatically changes the status from OFFLINE (00(HEX)) to OPERATE (C0(HEX)).

If a reset message is received from the network, the status automatically returns to OFFLINE (00(HEX)) and makes transitions from OFFLINE (00(HEX)) to OPERATE (C0(HEX)).

<Lower byte>
The network's communication status is stored.
Each bit is turned ON/OFF as follows, according to the communication status.

Bit	7	6	5	4	3	2	1	0

Bit7-4: Always sets to OFF.
Bit3: Network has a fatal problem and communication cannot be continued.
Bit2: Parameter error
Bit1: Always sets to OFF.
Bit0: There is a station with a communication error.

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29062(PR)】Master Function Error Inform. Master function error information

Set a device to store the following data:

<Higher byte>
The communication error code occurred in the master function is stored.

<Lower byte>
The node No. (MAC ID) of the node where the error occurred is stored.
FE, FF(HEX) (254, 255): Local node (QJ71DN91)
00 to 3F(HEX) (0 to 63): Node No. (MAC ID) of the slave node where the error occurred.

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29063(PR)】 Bus Error Counter Bus error counter

Set a device to store the following data:

- The number of times that the illegal frame count of the CAN chip (DeviceNet's communication chip) exceeded 96 is stored. When this value is large, it indicates that communication is unstable.

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29064(PR)】 Bus Off Counter Bus off counter

Set a device to store the following data:

- The number of times that the QJ71DN91 makes a transition to the Bus-off status is stored. When this value is large, it indicates that communication is unstable.

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29065(PR)】 Node Configuration Status Module side Transfer Cont. Each node configuration status read word count

Set a read word count of the data where the slave node parameter settings are saved.
The standard setting is "**4**".

---Setting range---
0 to 4

【#29066(PR)】Node Configuration Status PLC side Device
Each node configuration status read device

Set a device to store the following data:

Set the device where the slave node parameter settings are saved.
Bit settings 0: Parameter setting is not complete/ 1: Parameter setting is complete
<1st word>
bit0: 0th slave node
bit1: 1st slave node
:
bitF: 15th slave node
<2nd word>
bit0: 16th slave node
bit1: 17th slave node
:
bitF: 31st slave node
<3rd word>
bit0: 32nd slave node
bit1: 33rd slave node
:
bitF: 47th slave node
<4th word>
bit0: 48th slave node
bit1: 49th slave node
:
bitF: 63rd slave node
(Note) The bits' ON/OFF timing
When one of the followings has been executed and parameter check is completed, the bit corresponding to the specified slave node will be turned ON.
- Start the I/O communication.
- Save the master function parameters into the flash ROM.
Executing the above after cancelling the slave node setting in the master function parameter turns OFF the corresponding bit.
All bits will be turned OFF when the master node is turned OFF and ON or when the CPU module is reset.

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29067(PR)】Communication Status & Error Module side Transfer Cont
Each node communication status & error status read word count

Set a read word count of the data where the I/O communication status and I/O communication error status of the slave node are saved.
The standard setting is "8".

---Setting range---
1 to 8

【#29068(PR)】 Communication Status & Error PLC side Device
Each node communication status & error status read device

Set a device to store the following data:

The slave node I/O communication status is saved into 1st to 4th word.
All bits will be turned OFF when the "I/O communication in progress" (X01) has been turned OFF.
Bit settings: 0: Communication canceled / 1: Communication in progress
<1st word>
bit0: 0th slave node
bit1: 1st slave node
:
bitF: 15th slave node
<2nd word>
bit0: 16th slave node
bit1: 17th slave node
:
bitF: 31st slave node
<3rd word>
bit0: 32nd slave node
bit1: 33rd slave node
:
bitF: 47th slave node
<4th word>
bit0: 48th slave node
bit1: 49th slave node
:
bitF: 63rd slave node

The slave node I/O communication error status is saved into 5th to 8th word.
All bits will be turned OFF when the "I/O communication in progress" (X01) has been turned OFF.
However, when the bit corresponding to the node is ON in the down node detection disabling setting, the error of the node will not be detected.
Bit settings: 0: No communication error / 1: Communication error detected
<5th word>
bit0: 0th slave node
bit1: 1st slave node
:
bitF: 15th slave node
<6th word>
bit0: 16th slave node
bit1: 17th slave node
:
bitF: 31st slave node
<7th word>
bit0: 32nd slave node
bit1: 33rd slave node
:
bitF: 47th slave node
<8th word>
bit0: 48th slave node
bit1: 49th slave node
:
bitF: 63rd slave node

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29069(PR)】 Obstacle Status Module side Transfer Cont
Each node obstacle status read word count

Set a read word count of the data where the slave node communication error status is saved.
The standard setting is "**4**".

---Setting range---
1 to 4

【#29070(PR)】Obstacle Status PLC side Device
Each node obstacle status read device

Set a device to store the following data:

Slave node communication obstacle status is stored.
When the corresponding node communication error information read is executed in the message communication, the corresponding bit will be turned OFF.
Bit settings: 0: No obstacle information / 1: Obstacle information exists
<1st word>
bit0: 0th slave node
bit1: 1st slave node
:
bitF: 15th slave node
<2nd word>
bit0: 16th slave node
bit1: 17th slave node
:
bitF: 31st slave node
<3rd word>
bit0: 32nd slave node
bit1: 33rd slave node
:
bitF: 47th slave node
<4th word>
bit0: 48th slave node
bit1: 49th slave node
:
bitF: 63rd slave node

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29071(PR)】 Down Node Detect. Disable St. Module side Transfer Cont
Down node detection read word count

Set a read word count of the data where the down node detection disabled status is saved.
The standard setting is "4".

---Setting range---
1 to 4

【#29072(PR)】Down Node Detect. Disable St. PLC side Device
Down node detection read device

Set a device to store the following data:

The down node detection disabled status is stored.
Bit settings
0: The slave down signal (X04) is turned ON when the corresponding slave node is down.
1: The slave down signal (X04) is NOT turned ON when the corresponding slave node is down.
<1st word>
bit0: 0th slave node
bit1: 1st slave node
:
bitF: 15th slave node
<2nd word>
bit0: 16th slave node
bit1: 17th slave node
:
bitF: 31st slave node
<3rd word>
bit0: 32nd slave node
bit1: 33rd slave node
:
bitF: 47th slave node
<4th word>
bit0: 48th slave node
bit1: 49th slave node
:
bitF: 63rd slave node

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29073(PR)】 Present Link Scan Time PLC side Device Present link scan time

Set the device where the current link scan time is stored. (unit: ms)

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29074(PR)】 Minimum Link Scan Time PLC side Device Minimum link scan time

Set the device where the minimum link scan time since the power has been turned ON is stored. (unit: ms)

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29075(PR)】 Maximum Link Scan Time PLC side Device Maximum link scan time

Set the device where the maximum link scan time since the power has been turned ON is stored. (unit: ms)

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29076(PR)】 Slave Function Comm.Status PLC side Device Slave function communication

Set the device to store the following data:

Slave function I/O communication status is stored.

00(HEX): OFFLINE; being initialized; bus-off; network power OFF
40(HEX): STOP; I/O communication being stopped
80(HEX): READY; waiting to establish the connection from the master node
C0(HEX): OPERATE; I/O communication in progress

The communication status above varies according to the auto communication start setting (address: 0631H):
- When "0: Not automatically start" is set:
  Turning the power ON automatically changes the status from OFFLINE (00(HEX)) to STOP (40(HEX)).
  Turning ON the I/O communication request (Y11) changes the state to OPERATE (C0(HEX)).
  However, the status is READY (80(HEX)) until the I/O communication request is received from the master node.
- When "1: Automatically start" is set:
  Turning the power ON automatically changes the status from OFFLINE (00(HEX)) to OPERATE (C0(HEX)). However, the status is STOP (40(HEX)) until the I/O communication request is received from the master node.

If a reset message is received from the network, the status automatically returns to OFFLINE (00(HEX)) and makes transitions from OFFLINE (00(HEX)) to OPERATE (C0(HEX)).

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29077(PR)】 Slave Function Error Inform. PLC side Device Slave function error information

Set a device to store the following data:

<Higher byte>
The communication error code occurred in the slave function is stored.

<Lower byte>
The node No. (MAC ID) of the node where the error occurred is stored.
FE(HEX), FF(HEX) (254, 255): Local node (QJ71DN91)
00 to 3F(HEX) (0 to 63): Node No. (MAC ID) of the node where the error occurred.

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29078(PR)】 Master Func. IO Addr. Area Module side Transfer Cont.
Master function I/O address area read word count

Set a read word count of the data which stores the head address and the size (in word form) of the master function receive and transmit data used by each slave node.
The standard setting is "252".

---Setting range---
1 to 252

【#29079(PR)】 Master Func. IO Addr. Area PLC side Device
Master function I/O address area read device

Set the device to store the following data:

The data which stores the head address and size (in word form) of the master function receive and transmit data used by each slave node.

00(HEX): Input data head address of the 1st slave node
01(HEX): Input data size (word count) of the 1st slave node
02(HEX): Output data head address of the 1st slave node
03(HEX): Output data size (word count) of the 1st slave node
04(HEX): Input data head address of the 2nd slave node
:
:
FB(HEX): Output data size (word count) of the 63rd slave node

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29080(PR)】 Master Func. Receive Data Module side Transfer Cont.
Master function receive data read word count

Set a read word count of the data received from each slave node.
The standard setting is "256".

---Setting range---
1 to 256

【#29081(PR)】Master Func. Receive Data PLC side Device
Master function receive data read device

Set the device to read the data received from each slave node.

<Data configuration>
The data is aligned at the word boundaries of the slave nodes before stored.
Double-word data is stored in the order of lower word first and higher word next.
If there is an odd number of byte input modules, one byte of empty area will be inserted for alignment at the word boundary. Bit input modules are treated in the same way as the byte input modules.

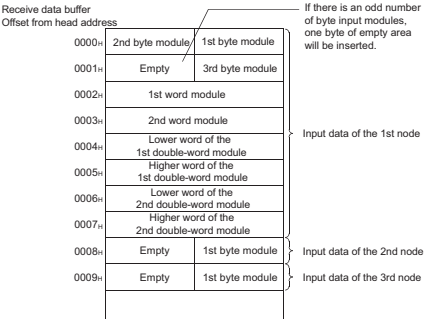
<Example>

Slave node configuration

1st node - Number of byte input modules = 3
Number of word input modules = 2
Number of double-word input modules = 2

2nd node - Number of byte input modules = 1

3rd node - Number of byte input modules = 1



---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29082(PR)】 Master Func. Transmit Data Module side Transfer Cont.
Master function transmit data write word count

Set a write word count of the data which is transmitted to each slave node.
The standard setting is "256".

---Setting range---
1 to 256

【#29083(PR)】Master Func. Transmit Data PLC side Device
Master function transmit data write device

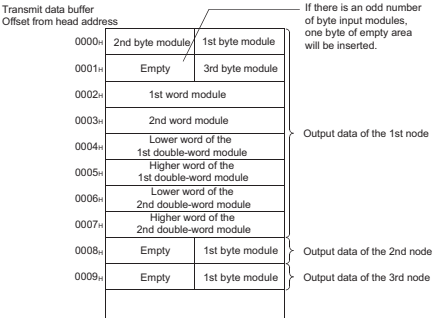
Set the device which stores the data to be transmitted to each slave node.

<Data configuration>
The data is aligned at the word boundaries of the slave nodes before stored.
Double-word data is stored in the order of lower word first and higher word next.
If there is an odd number of byte input modules, one byte of empty area will be inserted for alignment at the word boundary.

<Example>

Slave node configuration

1st node - Number of byte output modules = 3
Number of word output modules = 2
Number of double-word output modules = 2
2nd node - Number of byte output modules = 1
3rd node - Number of byte output modules = 1



---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29084(PR)】 Slave Func. Receive Data Module side Transfer Cont.
Slave function receive data read word count

Set a read word count of the data received from the master node.
The standard setting is "64".

---Setting range---
1 to 64

【#29085(PR)】Slave Func. Receive Data PLC side Device
Slave function receive data read device

Set the device to read the data received from the master node.

<Data configuration>
The data of the size that is set by the "slave function reception bytes" area becomes valid.

Receive data buffer
Offset from head address

0000H	2nd byte	1st byte
0001H	4th byte	3rd byte
	▪ ▪ ▪	▪ ▪ ▪
003FH	128th byte	127th byte

---Setting range---
Within the number of device points set in the PC parameter's device setting.

【#29086(PR)】 Slave Func. Transmit Data Module side Transfer Cont.
Slave function transmit data write word count

Set a write word count of the data to be transmitted to the master node.
The standard setting is "64".

---Setting range---
1 to 64

【#29087(PR)】Slave Func. Transmit Data PLC side Device
Slave function transmit data write device

Set the device which stores the data transmitted to the master data.

<Data configuration>
The data of the size that is set by the "slave function transmission bytes" area becomes valid.

Transmit data buffer
Offset from head address

0000_H	2nd byte	1st byte
0001_H	4th byte	3rd byte
	▪ ▪ ▪	▪ ▪ ▪
$003F_H$	128th byte	127th byte

---Setting range---
Within the number of device points set in the PC parameter's device setting.

9. Machine Error Compensation 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.

【#4000(PR)】 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+10(n-1)】 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.

---Setting range---
Axis name such as X, Y, Z, U, V, W, A, B, or C

【#4002+10(n-1)】 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.

---Setting range---
Axis name such as X, Y, Z, U, V, W, A, B, or C

【#4003+10(n-1)】 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.

---Setting range---
4101 to 5124

【#4004+10(n-1)】 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.

---Setting range---
4101 to 5124

【#4005+10(n-1)】 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.

---Setting range---
4101 to 5124

【#4006+10(n-1)】 sc Compensation scale factor <n-th axis>

Set the scale factor for the compensation amount.
When the compensation scale is set to "1", the compensation amount unit will be the same as the output unit.
Compensation amount unit = unit of output * compensation scale

---Setting range---
0 to 99

【#4007+10(n-1)】 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---
1 to 9999999 (μ m)

【#4101 - 5124】

Set the compensation amount for each axis.

---Setting range---
-128 to 127
(Note) The actual compensation amount will be the value obtained by multiplying the setting value with the compensation scale.

10. PLC Parameters

【#6000 - 6015】 T000-T015 10ms adding timer <10ms>

Set the time for the timer used in the PLC program (ladder).
(Note) This setting value is valid when parameter "#6449 bit0" in the following "[BIT SELECT]" is set to "0".

---Setting range---
0 to 32767 (x 10ms)

【#6016 - 6095】 T016-T095 100ms adding timer <100ms>

Set the time for the timer used in the PLC program (ladder).
(Note) This setting value is valid when parameter "#6449 bit0" in the following "[BIT SELECT]" is set to "0".

---Setting range---
0 to 32767 (x 100ms)

【#6096 - 6103】 T096-T103 100ms cumulative timer <100msINC>

Set the time for the timer used in the PLC program (ladder).
(Note) This setting value is valid when parameter "#6449 bit0" in the following "[BIT SELECT]" is set to "0".

---Setting range---
0 to 32767 (x 100ms)

【#6200 - 6223】 C000-C023 Counter

Set the time for the counter used in the PLC program (ladder).
(Note) This setting value is valid when parameter "#6449 bit1" in the following "[BIT SELECT]" is set to "0".

---Setting range---
0 to 32767

【#6301 - 6348】 R4500,R4501 - R4594,R4595 PLC constant

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.
Note that some parameters have limited uses.

---Setting range---
-99999999 to 99999999

【#6401,6402 - 6495,6496】 R4600-Low,R4600-High - R4647-Low,R4647-High Bit selection

This is the bit type parameter 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.
Note that some parameters have limited uses.
0 : OFF
1 : ON

【#6449】

bit7: Control unit overheat detected

Designate whether to detect the control unit overheat alarm or not.
0 : Detect
1 : Not detect

【#6451】

bit3: Key data via PLC

Validates the key data in the shared device G10212, which is set by the sequence programs.
If this parameter is valid, the key data, read out from the shared device on NC (G10208), must be returned to the shared device on PLC (G10212) even if the data will not be changed by sequence programs.
Unless the data is returned to PLC, keys are not available.
When the programs stop on PLC (including when STOP is selected with the RUN/STOP switch), key data is not accessed via PLC.
0 : Invalid
1 : Valid

【#6454】

bit0: Macro interface for respective part systems

Designate whether to use the macro interface for respective part systems or not.
0 : Conventional macro interface common to part systems.
1 : Available to respective part systems.

11. Macro List

【#7001】 M[01] Code

Set the M code used for calling out the macro with the M command.
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: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7003】 M[01] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7011】 M[02] Code

Set the M code used for calling out the macro with the M command.
This is valid when "#1195 Mmac" is set to "1".

---Setting range---
0 to 9999

【#7012】 M[02] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7013】 M[02] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7021】 M[03] Code

Set the M code used for calling out the macro with the M command.
This is valid when "#1195 Mmac" is set to "1".

---Setting range---
0 to 9999

【#7022】 M[03] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7023】 M[03] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7031】 M[04] Code

Set the M code used for calling out the macro with the M command.
This is valid when "#1195 Mmac" is set to "1".

---Setting range---
0 to 9999

【#7032】 M[04] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7033】 M[04] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7041】 M[05] Code

Set the M code used for calling out the macro with the M command.
This is valid when "#1195 Mmac" is set to "1".

---Setting range---
0 to 9999

【#7042】 M[05] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7043】 M[05] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7051】 M[06] Code

Set the M code used for calling out the macro with the M command.
This is valid when "#1195 Mmac" is set to "1".

---Setting range---
0 to 9999

【#7052】 M[06] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7053】 M[06] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7061】 M[07] Code

Set the M code used for calling out the macro with the M command.
This is valid when "#1195 Mmac" is set to "1".

---Setting range---
0 to 9999

【#7062】 M[07] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7063】 M[07] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7071】 M[08] Code

Set the M code used for calling out the macro with the M command.
This is valid when "#1195 Mmac" is set to "1".

---Setting range---
0 to 9999

【#7072】 M[08] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7073】 M[08] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7081】 M[09] Code

Set the M code used for calling out the macro with the M command.
This is valid when "#1195 Mmac" is set to "1".

---Setting range---
0 to 9999

【#7082】 M[09] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7083】 M[09] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7091】 M[10] Code

Set the M code used for calling out the macro with the M command.
This is valid when "#1195 Mmac" is set to "1".

---Setting range---
0 to 9999

【#7092】 M[10] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7093】 M[10] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#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”.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#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”.

---Setting range---
0 to 99999999

【#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.

---Setting range---
1 to 999

【#7202】 G[01] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7203】 G[01] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7211】 G[02] 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.

---Setting range---
1 to 999

【#7212】 G[02] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7213】 G[02] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7221】 G[03] 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.

---Setting range---
1 to 999

【#7222】 G[03] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7223】 G[03] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7231】 G[04] 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.

---Setting range---
1 to 999

【#7232】 G[04] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7233】 G[04] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7241】 G[05] 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.

---Setting range---
1 to 999

【#7242】 G[05] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7243】 G[05] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7251】 G[06] 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.

---Setting range---
1 to 999

【#7252】 G[06] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7253】 G[06] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7261】 G[07] 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.

---Setting range---
1 to 999

【#7262】 G[07] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7263】 G[07] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7271】 G[08] 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.

---Setting range---
1 to 999

【#7272】 G[08] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7273】 G[08] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7281】 G[09] 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.

---Setting range---
1 to 999

【#7282】 G[09] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7283】 G[09] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7291】 G[10] 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.

---Setting range---
1 to 999

【#7292】 G[10] Type

Set the macro call out type.

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#7293】 G[10] Program No.

Set the No. of the program to be called out.

---Setting range---
1 to 99999999

【#7302】 Smac Type

Set the type for when calling the macro with an S command.
This is valid when "#1196 Smac" is set to "1".

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#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.

---Setting range---
1 to 99999999

【#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".

0: M98 P △△△△ ; and equivalent value call
1: G65 P △△△△ ; and equivalent value call
2: G66 P △△△△ ; and equivalent value call
3: G66.1 P △△△△ ; and equivalent value call
others: M98 P △△△△ ; and equivalent value call

【#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".

---Setting range---
0 to 99999999

【#27000】 Nmac

Select whether to make the N code macro valid.
0 : Invalid
1 : Valid

【#27001】 N [01] Code

Set the N code for macro call with N command.
Wildcard character "," can be used.
(ex.) "5,,," : N5000 to N5999

When a same N code is designated, the priority will be given to the one registered first.

---Setting range---
0 to 99999
(Max. 5 digits including wildcard character ",".)

【#27002】 N [01] Program No.

Designate the program No. to call.

---Setting range---
0 to 99999999

【#27011】 N [02] Code

Set the N code for macro call with N command.
Wildcard character "," can be used.
(ex.) "5,,," : N5000 to N5999

When a same N code is designated, the priority will be given to the one registered first.

---Setting range---
0 to 99999
(Max. 5 digits including wildcard character ",".)

【#27012】 N [02] Program No.

Designate the program No. to call.

---Setting range---
0 to 99999999

【#27021】 N [03] Code

Set the N code for macro call with N command.
Wildcard character "," can be used.
(ex.) "5,,," : N5000 to N5999
When a same N code is designated, the priority will be given to the one registered first.

---Setting range---
0 to 99999
(Max. 5 digits including wildcard character ",".)

【#27022】 N [03] Program No.

Designate the program No. to call.

---Setting range---
0 to 99999999

【#27031】 N [04] Code

Set the N code for macro call with N command.
Wildcard character "," can be used.
(ex.) "5,,," : N5000 to N5999

When a same N code is designated, the priority will be given to the one registered first.

---Setting range---
0 to 99999
(Max. 5 digits including wildcard character ",".)

【#27032】 N [04] Program No.

Designate the program No. to call.

---Setting range---
0 to 99999999

【#27041】 N [05] Code

Set the N code for macro call with N command.
Wildcard character "," can be used.
(ex.) "5,,," : N5000 to N5999
When a same N code is designated, the priority will be given to the one registered first.

---Setting range---
0 to 99999
(Max. 5 digits including wildcard character ",".)

【#27042】 N [05] Program No.

Designate the program No. to call.

---Setting range---
0 to 99999999

【#27051】 N [06] Code

Set the N code for macro call with N command.
Wildcard character "," can be used.
(ex.) "5,,," : N5000 to N5999
When a same N code is designated, the priority will be given to the one registered first.

【#27052】 N [06] Program No.

Designate the program No. to call.

---Setting range---
0 to 99999999

【#27061】 N [07] Code

Set the N code for macro call with N command.
Wildcard character "," can be used.
(ex.) "5,,," : N5000 to N5999

When a same N code is designated, the priority will be given to the one registered first.

---Setting range---
0 to 99999
(Max. 5 digits including wildcard character ",".)

【#27062】 N [07] Program No.

Designate the program No. to call.

---Setting range---
0 to 99999999

【#27071】 N [08] Code

Set the N code for macro call with N command.
Wildcard character "," can be used.
(ex.) "5,,," : N5000 to N5999
When a same N code is designated, the priority will be given to the one registered first.

---Setting range---
0 to 99999
(Max. 5 digits including wildcard character ",".)

【#27072】 N [08] Program No.

Designate the program No. to call.

---Setting range---
0 to 99999999

12. Position Switches

【#7500】 Pcheck

Not used. Set to "0".

【#7501】 <axis> Axis name PSW1

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7502】 <dog1> Imaginary dog position 1 PSW1

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X660
Part system 2 device: X6E0

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7503】 <dog2> Imaginary dog position 2 PSW1

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X660
Part system 2 device: X6E0

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7504】 <check> Selection of area check method PSW1

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 point.
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.

【#7511】 <axis> Axis name PSW2

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7512】 <dog1> Imaginary dog position 1 PSW2

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X661
Part system 2 device: X6E1

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7513】 <dog2> Imaginary dog position 2 PSW2

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X661
Part system 2 device: X6E1

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7514】 <check> Selection of area check method PSW2

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 point.
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.

【#7521】 <axis> Axis name PSW3

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7522】 <dog1> Imaginary dog position 1 PSW3

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X662
Part system 2 device: X6E2

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7523】 <dog2> Imaginary dog position 2 PSW3

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X662
Part system 2 device: X6E2

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7524】 <check> Selection of area check method PSW3

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 point.
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.

【#7531】 <axis> Axis name PSW4

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7532】 <dog1> Imaginary dog position 1 PSW4

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X663
Part system 2 device: X6E3

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7533】 <dog2> Imaginary dog position 2 PSW4

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X663
Part system 2 device: X6E3

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7534】 <check> Selection of area check method PSW4

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 point.
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.

【#7541】 <axis> Axis name PSW5

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7542】 <dog1> Imaginary dog position 1 PSW5

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X664
Part system 2 device: X6E4

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7543】 <dog2> Imaginary dog position 2 PSW5

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X664
Part system 2 device: X6E4

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7544】 <check> Selection of area check method PSW5

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 point.
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.

【#7551】 <axis> Axis name PSW6

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7552】 <dog1> Imaginary dog position 1 PSW6

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X665
Part system 2 device: X6E5

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7553】 <dog2> Imaginary dog position 2 PSW6

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X665
Part system 2 device: X6E5

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7554】 <check> Selection of area check method PSW6

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 point.
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.

【#7561】 <axis> Axis name PSW7

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7562】 <dog1> Imaginary dog position 1 PSW7

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X666
Part system 2 device: X6E6

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7563】 <dog2> Imaginary dog position 2 PSW7

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X666
Part system 2 device: X6E6

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7564】 <check> Selection of area check method PSW7

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 point.
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.

【#7571】 <axis> Axis name PSW8

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7572】 <dog1> Imaginary dog position 1 PSW8

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X667
Part system 2 device: X6E7

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7573】 <dog2> Imaginary dog position 2 PSW8

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X667
Part system 2 device: X6E7

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7574】 <check> Selection of area check method PSW8

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 point.

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.

【#7581】 <axis> Axis name PSW9

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7582】 <dog1> Imaginary dog position 1 PSW9

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X668
Part system 2 device: X6E8

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7583】 <dog2> Imaginary dog position 2 PSW9

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X668
Part system 2 device: X6E8

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7584】 <check> Selection of area check method PSW9

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 point.

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.

【#7591】 <axis> Axis name PSW10

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7592】 <dog1> Imaginary dog position 1 PSW10

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X669
Part system 2 device: X6E9

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7593】 <dog2> Imaginary dog position 2 PSW10

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X669
Part system 2 device: X6E9

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7594】 <check> Selection of area check method PSW10

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 point.

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.

【#7601】 <axis> Axis name PSW11

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7602】 <dog1> Imaginary dog position 1 PSW11

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66A
Part system 2 device: X6EA

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7603】 <dog2> Imaginary dog position 2 PSW11

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66A
Part system 2 device: X6EA

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7604】 <check> Selection of area check method PSW11

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 point.
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.

【#7611】 <axis> Axis name PSW12

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7612】 <dog1> Imaginary dog position 1 PSW12

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66B
Part system 2 device: X6EB

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7613】 <dog2> Imaginary dog position 2 PSW12

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66B
Part system 2 device: X6EB

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7614】 <check> Selection of area check method PSW12

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 point.
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.

【#7621】 <axis> Axis name PSW13

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7622】 <dog1> Imaginary dog position 1 PSW13

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66C
Part system 2 device: X6EC

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7623】 <dog2> Imaginary dog position 2 PSW13

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66C
Part system 2 device: X6EC

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7624】 <check> Selection of area check method PSW13

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 point.
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.

【#7631】 <axis> Axis name PSW14

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7632】 <dog1> Imaginary dog position 1 PSW14

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66D
Part system 2 device: X6ED

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7633】 <dog2> Imaginary dog position 2 PSW14

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66D
Part system 2 device: X6ED

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7634】 <check> Selection of area check method PSW14

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 point.
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.

【#7641】 <axis> Axis name PSW15

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7642】 <dog1> Imaginary dog position 1 PSW15

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66E
Part system 2 device: X6EE

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7643】 <dog2> Imaginary dog position 2 PSW15

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66E
Part system 2 device: X6EE

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7644】 <check> Selection of area check method PSW15

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 point.
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.

【#7651】 <axis> Axis name PSW16

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)
PLC axis: PLC No. (1 to 8)

【#7652】 <dog1> Imaginary dog position 1 PSW16

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66F
Part system 2 device: X6EF

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7653】 <dog2> Imaginary dog position 2 PSW16

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X66F
Part system 2 device: X6EF

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7654】 <check> Selection of area check method PSW16

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 point.
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.

【#7661】 <axis> Axis name PSW17

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)

【#7662】 <dog1> Imaginary dog position 1 PSW17

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X678
Part system 2 device: X6F8

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7663】 <dog2> Imaginary dog position 2 PSW17

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X678
Part system 2 device: X6F8

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7664】 <check> Selection of area check method PSW17

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 point.
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.

【#7671】 <axis> Axis name PSW18

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)

【#7672】 <dog1> Imaginary dog position 1 PSW18

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X679
Part system 2 device: X6F9

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7673】 <dog2> Imaginary dog position 2 PSW18

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X679
Part system 2 device: X6F9

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7674】 <check> Selection of area check method PSW18

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 point.
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.

【#7681】 <axis> Axis name PSW19

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)

【#7682】 <dog1> Imaginary dog position 1 PSW19

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67A
Part system 2 device: X6FA

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7683】 <dog2> Imaginary dog position 2 PSW19

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67A
Part system 2 device: X6FA

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7684】 <check> Selection of area check method PSW19

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 point.
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.

【#7691】 <axis> Axis name PSW20

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)

【#7692】 <dog1> Imaginary dog position 1 PSW20

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67B
Part system 2 device: X6FB

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7693】 <dog2> Imaginary dog position 2 PSW20

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67B
Part system 2 device: X6FB

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7694】 <check> Selection of area check method PSW20

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 point.
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.

【#7701】 <axis> Axis name PSW21

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)

【#7702】 <dog1> Imaginary dog position 1 PSW21

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67C
Part system 2 device: X6FC

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7703】 <dog2> Imaginary dog position 2 PSW21

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67C
Part system 2 device: X6FC

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7704】 <check> Selection of area check method PSW21

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 point.
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.

【#7711】 <axis> Axis name PSW22

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)

【#7712】 <dog1> Imaginary dog position 1 PSW22

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67D
Part system 2 device: X6FD

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7713】 <dog2> Imaginary dog position 2 PSW22

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67D
Part system 2 device: X6FD

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7714】 <check> Selection of area check method PSW22

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 point.
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.

【#7721】 <axis> Axis name PSW23

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)

【#7722】 <dog1> Imaginary dog position 1 PSW23

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67E
Part system 2 device: X6FE

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7723】 <dog2> Imaginary dog position 2 PSW23

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67E
Part system 2 device: X6FE

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7724】 <check> Selection of area check method PSW23

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 point.
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.

【#7731】 <axis> Axis name PSW24

Specify the name of the axis for which a position switch is provided.

---Setting range---
NC axis: axis name (X, Y, Z, U, V, W, A, B, or C)

【#7732】 <dog1> Imaginary dog position 1 PSW24

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67F
Part system 2 device: X6FF

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7733】 <dog2> Imaginary dog position 2 PSW24

When the machine enters the range between imaginary dog positions 1 and 2, a signal is output to the PLC.
Part system 1 device: X67F
Part system 2 device: X6FF

---Setting range---
-99999.999 to 99999.999 (0.001mm)

【#7734】 <check> Selection of area check method PSW24

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 point.
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.

13. PLC Axis Indexing Parameters

【#12800(PR)】 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---
0 to 6

【#12801(PR)】 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

【#12802(PR)】 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

【#12803(PR)】 Cont2 Control parameter 2

The bits that are not explained here must be set to "0".

bit4:

0: Uniform assignment
1: Arbitrary coordinate assignment

【#12804(PR)】 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 arbitrary coordinate assignment or with the arbitrary coordinate designation method.

---Setting range---
0.000 to 99999.999 (mm)

【#12805】 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)】 Aspeedn Operation parameter group n Automatic operation speed

Set the feedrate during automatic operation when "operation parameter group n" is selected.
"#12810 Aspeed1" is regarded as the clamp value for the automatic operation speeds and manual operation speeds of all operation groups.
A speed exceeding "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 1000000 (°/min or mm/min)

【#12811+10(n-1)】 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 1000000 (°/min or mm/min)

【#12812+10(n-1)】 timen.1 Operation parameter group n Acceleration/deceleration time constant 1

Set the linear acceleration/deceleration time for "Operation parameter group n automatic operation speed" (clamp speed) when "operation parameter group n" is selected.
S-pattern acceleration/deceleration will be carried out when "F" is set to "#12818+10(n-1) smgstn".
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_Aspeed n".
Setting "0" cancels acceleration/deceleration: The axis will move with the time constant "0".

---Setting range---
0 to 4000 (ms)

【#12813+10(n-1)】 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)】 TLn Operation parameter group n Torque limit value

Set the motor output torque limit value when "operation parameter group n" is selected.
At the default value, the torque is limited at the maximum torque of the motor specifications.
Set the default value when torque limit is not especially required.
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)】 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.

---Setting range---
0 to 32767(° or mm)

【#12816+10(n-1)】 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)】 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)

【#12818+10(n-1)(PR)】 smgstn Operation parameter group n Acceleration/Deceleration type

Select the acceleration/deceleration type when "operation parameter group n" is selected.
1: Linear acceleration/deceleration
F: S-pattern acceleration/deceleration

【#12850】 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】 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】 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】 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】 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】 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 coordinate of each station 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】 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】 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】 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】 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】 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】 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】 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】 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】 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】 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】 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】 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】 PSW01-1 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】 PSW01-2 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】 PSW02-1 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】 PSW02-2 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】 PSW03-1 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】 PSW03-2 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】 PSW04-1 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】 PSW04-2 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】 PSW05-1 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】 PSW05-2 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】 PSW06-1 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】 PSW06-2 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】 PSW07-1 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】 PSW07-2 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】 PSW08-1 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】 PSW08-2 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】 PSW09-1 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】 PSW09-2 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】 PSW10-1 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】 PSW10-2 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】 PSW11-1 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】 PSW11-2 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】 PSW12-1 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】 PSW12-2 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】 PSW13-1 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】 PSW13-2 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】 PSW14-1 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】 PSW14-2 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】 PSW15-1 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】 PSW15-2 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)

III PLC Devices

Refer to "C70 PLC Interface Manual"(IB-1500263) for each signal's details.

1. Bit Type Input Signals (CNC->PLC)

1.1 System State

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
10000	X300				10000	X308		
	X301					X309		
	X302					X30A		
	X303					X30B		
	X304					X30C		
	X305					X30D		
	X306					X30E		
	X307					X30F		

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
10001	X310	CNOP	24 hours continuous operation		10001	X318	SKIP1C	SKIP1 Input signal state
	X311	SSUCHK	Dual signals unconfirmed after compare error			X319	SKIP2C	SKIP2 Input signal state
	X312	NOFFCHK	Output OFF check not complete			X31A	SKIP3C	SKIP3 Input signal state
	X313	*PSDNTF	Power shutoff notification			X31B	SKIP4C	SKIP4 Input signal state
	X314					X31C		
	X315					X31D		
	X316					X31E		
	X317					X31F		

Common		abbrev.	Signal name
Sharing G	Internal		
10002	X320	MA	Controller ready completion
	X321	SA	Servo ready completion
	X322		
	X323		
	X324		
	X325		
	X326		
	X327		

Common		abbrev.	Signal name
Sharing G	Internal		
10002	X328		
	X329	DROPNS	Door open enable
	X32A	SPSYN1	In spindle synchronization
	X32B	FSPRV	Spindle rotation speed synchronization completion
	X32C	FSPPH	Spindle phase synchronization completion
	X32D	SPCMP	Chuck close confirmation
	X32E	BATWR	Battery warning
	X32F	BATAL	Battery alarm

Common		abbrev.	Signal name
Sharing G	Internal		
10003	X330	AL1	NC alarm 1
	X331	AL2	NC alarm 2 (Servo alarm)
	X332		
	X333		
	X334		
	X335		
	X336		
	X337		

Common		abbrev.	Signal name
Sharing G	Internal		
10003	X338	WNG	In door interlock
	X339	MSON	Macro single valid
	X33A	PARACHG	Power OFF required after parameter change
	X33B	EDITDO	Edited data in processing
	X33C	EDITERR	Edited data error
	X33D		
	X33E	SMPFIN	NC data sampling completed
	X33F	ATS	ATS valid

Common		abbrev.	Signal name
Sharing G	Internal		
10004	X340		
	X341		
	X342		
	X343		
	X344		
	X345		
	X346		
	X347		

Common		abbrev.	Signal name
Sharing G	Internal		
10004	X348		
	X349		
	X34A		
	X34B		
	X34C		
	X34D		
	X34E		
	X34F		

Common		abbrev.	Signal name
Sharing G	Internal		
10005	X350	DLOAD0	Download in progress
	X351	DLDFIN	Download completed
	X352	DLDERR	Download error
	X353		
	X354		
	X355		
	X356		
	X357		

Common		abbrev.	Signal name
Sharing G	Internal		
10005	X358		
	X359		
	X35A		
	X35B		
	X35C		
	X35D		
	X35E		
	X35F		

Common		abbrev.	Signal name
Sharing G	Internal		
10006	X360	PSWP1	PLC axis position switch 1
	X361	PSWP2	PLC axis position switch 2
	X362	PSWP3	PLC axis position switch 3
	X363	PSWP4	PLC axis position switch 4
	X364	PSWP5	PLC axis position switch 5
	X365	PSWP6	PLC axis position switch 6
	X366	PSWP7	PLC axis position switch 7
	X367	PSWP8	PLC axis position switch 8

Common		abbrev.	Signal name
Sharing G	Internal		
10006	X368	PSWP9	PLC axis position switch 9
	X369	PSWP10	PLC axis position switch 10
	X36A	PSWP11	PLC axis position switch 11
	X36B	PSWP12	PLC axis position switch 12
	X36C	PSWP13	PLC axis position switch 13
	X36D	PSWP14	PLC axis position switch 14
	X36E	PSWP15	PLC axis position switch 15
	X36F	PSWP16	PLC axis position switch 16

Common		abbrev.	Signal name
Sharing G	Internal		
10007	X370		
	X371		
	X372		
	X373		
	X374		
	X375		
	X376		
	X377		

Common		abbrev.	Signal name
Sharing G	Internal		
10007	X378		
	X379		
	X37A		
	X37B		
	X37C		
	X37D		
	X37E		
	X37F		

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
10008	X380	APLCIN1	APLC input signal 1	10008	X388	APLCIN9	APLC input signal 9
	X381	APLCIN2	APLC input signal 2		X389	APLCIN10	APLC input signal 10
	X382	APLCIN3	APLC input signal 3		X38A	APLCIN11	APLC input signal 11
	X383	APLCIN4	APLC input signal 4		X38B	APLCIN12	APLC input signal 12
	X384	APLCIN5	APLC input signal 5		X38C	APLCIN13	APLC input signal 13
	X385	APLCIN6	APLC input signal 6		X38D	APLCIN14	APLC input signal 14
	X386	APLCIN7	APLC input signal 7		X38E	APLCIN15	APLC input signal 15
	X387	APLCIN8	APLC input signal 8		X38F	APLCIN16	APLC input signal 16

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
10009	X390	APLCIN17	APLC input signal 17	10009	X398	APLCIN25	APLC input signal 25
	X391	APLCIN18	APLC input signal 18		X399	APLCIN26	APLC input signal 26
	X392	APLCIN19	APLC input signal 19		X39A	APLCIN27	APLC input signal 27
	X393	APLCIN20	APLC input signal 20		X39B	APLCIN28	APLC input signal 28
	X394	APLCIN21	APLC input signal 21		X39C	APLCIN29	APLC input signal 29
	X395	APLCIN22	APLC input signal 22		X39D	APLCIN30	APLC input signal 30
	X396	APLCIN23	APLC input signal 23		X39E	APLCIN31	APLC input signal 31
	X397	APLCIN24	APLC input signal 24		X39F	APLCIN32	APLC input signal 32

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
10010	X3A0			10010	X3A8		
	X3A1				X3A9		
	X3A2				X3AA		
	X3A3				X3AB		
	X3A4				X3AC		
	X3A5				X3AD		
	X3A6				X3AE		
	X3A7				X3AF		

Common		abbrev.	Signal name
Sharing G	Internal		
10011	X3B0		
	X3B1		
	X3B2		
	X3B3		
	X3B4		
	X3B5		
	X3B6		
	X3B7		

Common		abbrev.	Signal name
Sharing G	Internal		
10011	X3B8		
	X3B9		
	X3BA		
	X3BB		
	X3BC		
	X3BD		
	X3BE		
	X3BF		

Common		abbrev.	Signal name
Sharing G	Internal		
10012	X3C0		
	X3C1		
	X3C2		
	X3C3		
	X3C4		
	X3C5		
	X3C6		
	X3C7		

Common		abbrev.	Signal name
Sharing G	Internal		
10012	X3C8		
	X3C9		
	X3CA		
	X3CB		
	X3CC		
	X3CD		
	X3CE		
	X3CF		

Common		abbrev.	Signal name
Sharing G	Internal		
10013	X3D0		
	X3D1		
	X3D2		
	X3D3		
	X3D4		
	X3D5		
	X3D6		
	X3D7		

Common		abbrev.	Signal name
Sharing G	Internal		
10013	X3D8		
	X3D9		
	X3DA		
	X3DB		
	X3DC		
	X3DD		
	X3DE		
	X3DF		

Common		abbrev.	Signal name
Sharing G	Internal		
10014	X3E0		
	X3E1		
	X3E2		
	X3E3		
	X3E4		
	X3E5		
	X3E6		
	X3E7		

Common		abbrev.	Signal name
Sharing G	Internal		
10014	X3E8		
	X3E9		
	X3EA		
	X3EB		
	X3EC		
	X3ED		
	X3EE		
	X3EF		

Common		abbrev.	Signal name
Sharing G	Internal		
10015	X3F0		
	X3F1		
	X3F2		
	X3F3		
	X3F4		
	X3F5		
	X3F6		
	X3F7		

Common		abbrev.	Signal name
Sharing G	Internal		
10015	X3F8		
	X3F9		
	X3FA		
	X3FB		
	X3FC		
	X3FD		
	X3FE		
	X3FF		

1.2 Axis State

1st axis	2nd axis	3rd axis	4th axis	5th axis	6th axis	7th axis	8th axis	abbrev.	Signal name
G10016	G10018	G10020	G10022	G10024	G10026	G10028	G10030	<- Sharing G	
X400	X420	X440	X460	X480	X4A0	X4C0	X4E0	RDYn	Servo ready
X401	X421	X441	X461	X481	X4A1	X4C1	X4E1	AXn	Axis selection
X402	X422	X442	X462	X482	X4A2	X4C2	X4E2	MVPn	In axis plus motion
X403	X423	X443	X463	X483	X4A3	X4C3	X4E3	MVMn	In axis minus motion
X404	X424	X444	X464	X484	X4A4	X4C4	X4E4	ZP1n	1st reference position reached
X405	X425	X445	X465	X485	X4A5	X4C5	X4E5	ZP2n	2nd reference position reached
X406	X426	X446	X466	X486	X4A6	X4C6	X4E6	ZP3n	3rd reference position reached
X407	X427	X447	X467	X487	X4A7	X4C7	X4E7	ZP4n	4th reference position reached
X408	X428	X448	X468	X488	X4A8	X4C8	X4E8	NRFn	Near reference position
X409	X429	X449	X469	X489	X4A9	X4C9	X4E9	ARRFn	NC axis up-to-speed
X40A	X42A	X44A	X46A	X48A	X4AA	X4CA	X4EA	ZSFn	Zero point initialization set completed
X40B	X42B	X44B	X46B	X48B	X4AB	X4CB	X4EB	ZSEn	Zero point initialization set error completed
X40C	X42C	X44C	X46C	X48C	X4AC	X4CC	X4EC	ZSn	In zero point initialization
X40D	X42D	X44D	X46D	X48D	X4AD	X4CD	X4ED	ZLSn	Zero point initialization incomplete
X40E	X42E	X44E	X46E	X48E	X4AE	X4CE	X4EE	ILIn	In current limit
X40F	X42F	X44F	X46F	X48F	X4AF	X4CF	X4EF	ILAn	Current limit reached

1st axis	2nd axis	3rd axis	4th axis	5th axis	6th axis	7th axis	8th axis	abbrev.	Signal name
G10017	G10019	G10021	G10023	G10025	G10027	G10029	G10031	<- Sharing G	
X410	X430	X450	X470	X490	X4B0	X4D0	X4F0		
X411	X431	X451	X471	X491	X4B1	X4D1	X4F1	INPn	In-position
X412	X432	X452	X472	X492	X4B2	X4D2	X4F2	MSOEn	In multi-step speed monitor
X413	X433	X453	X473	X493	X4B3	X4D3	X4F3	MSOMO1n	Multi-step speed monitor mode output 1
X414	X434	X454	X474	X494	X4B4	X4D4	X4F4	MSOMO2n	Multi-step speed monitor mode output 2
X415	X435	X455	X475	X495	X4B5	X4D5	X4F5		
X416	X436	X456	X476	X496	X4B6	X4D6	X4F6	AXCHGISn	Axis switching invalid status
X417	X437	X457	X477	X497	X4B7	X4D7	X4F7	PLCMODn	In PLC axis control
X418	X438	X458	X478	X498	X4B8	X4D8	X4F8	SOSEn	In stop observation
X419	X439	X459	X479	X499	X4B9	X4D9	X4F9	NOBRTS	Brake test not complete
X41A	X43A	X45A	X47A	X49A	X4BA	X4DA	X4FA	BRTSNC	In brake test NC side
X41B	X43B	X45B	X47B	X49B	X4BB	X4DB	X4FB	BRTSPLC	In brake test PLC side
X41C	X43C	X45C	X47C	X49C	X4BC	X4DC	X4FC		
X41D	X43D	X45D	X47D	X49D	X4BD	X4DD	X4FD		
X41E	X43E	X45E	X47E	X49E	X4BE	X4DE	X4FE		
X41F	X43F	X45F	X47F	X49F	X4BF	X4DF	X4FF		

9th axis	10th axis	11th axis	12th axis	13th axis	14th axis	15th axis	16th axis	abbrev.	Signal name
G10032	G10034	G10036	G10038	G10040	G10042	G10044	G10046	<- Sharing G	
X500	X520	X540	X560	X580	X5A0	X5C0	X5E0	RDYn	Servo ready
X501	X521	X541	X561	X581	X5A1	X5C1	X5E1	AXn	Axis selection
X502	X522	X542	X562	X582	X5A2	X5C2	X5E2	MVPn	In plus motion
X503	X523	X543	X563	X583	X5A3	X5C3	X5E3	MVMn	In minus motion
X504	X524	X544	X564	X584	X5A4	X5C4	X5E4	ZP1n	1st reference position reached
X505	X525	X545	X565	X585	X5A5	X5C5	X5E5	ZP2n	2nd reference position reached
X506	X526	X546	X566	X586	X5A6	X5C6	X5E6	ZP3n	3rd reference position reached
X507	X527	X547	X567	X587	X5A7	X5C7	X5E7	ZP4n	4th reference position reached
X508	X528	X548	X568	X588	X5A8	X5C8	X5E8	NRFn	Near reference position
X509	X529	X549	X569	X589	X5A9	X5C9	X5E9	ARRFn	NC axis up-to-speed
X50A	X52A	X54A	X56A	X58A	X5AA	X5CA	X5EA	ZSFn	Zero point initialization set completed
X50B	X52B	X54B	X56B	X58B	X5AB	X5CB	X5EB	ZSEn	Zero point initialization set error completed
X50C	X52C	X54C	X56C	X58C	X5AC	X5CC	X5EC	ZSn	In zero point initialization
X50D	X52D	X54D	X56D	X58D	X5AD	X5CD	X5ED	ZLSn	Zero point initialization incomplete
X50E	X52E	X54E	X56E	X58E	X5AE	X5CE	X5EE	ILIn	In current limit
X50F	X52F	X54F	X56F	X58F	X5AF	X5CF	X5EF	ILAn	Current limit reached

9th axis	10th axis	11th axis	12th axis	13th axis	14th axis	15th axis	16th axis	abbrev.	Signal name
G10033	G10035	G10037	G10039	G10041	G10043	G10045	G10047	<- Sharing G	
X510	X530	X550	X570	X590	X5B0	X5D0	X5F0	UCLPn	Unclamp command
X511	X531	X551	X571	X591	X5B1	X5D1	X5F1	INPn	In-position
X512	X532	X552	X572	X592	X5B2	X5D2	X5F2	MSOEn	In multi-step speed monitor
X513	X533	X553	X573	X593	X5B3	X5D3	X5F3	MSOMO1n	Multi-step speed monitor mode output 1
X514	X534	X554	X574	X594	X5B4	X5D4	X5F4	MSOMO2n	Multi-step speed monitor mode output 2
X515	X535	X555	X575	X595	X5B5	X5D5	X5F5		
X516	X536	X556	X576	X596	X5B6	X5D6	X5F6	AXCHGISn	Axis switching invalid status
X517	X537	X557	X577	X597	X5B7	X5D7	X5F7	PLCMODn	In PLC axis control
X518	X538	X558	X578	X598	X5B8	X5D8	X5F8		
X519	X539	X559	X579	X599	X5B9	X5D9	X5F9		
X51A	X53A	X55A	X57A	X59A	X5BA	X5DA	X5FA		
X51B	X53B	X55B	X57B	X59B	X5BB	X5DB	X5FB		
X51C	X53C	X55C	X57C	X59C	X5BC	X5DC	X5FC		
X51D	X53D	X55D	X57D	X59D	X5BD	X5DD	X5FD		
X51E	X53E	X55E	X57E	X59E	X5BE	X5DE	X5FE		
X51F	X53F	X55F	X57F	X59F	X5BF	X5DF	X5FF		

1.3 Part System State

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
G10048	G10056	G10064	G10072	G10080	G10088	G10096	<- Sharing G	
X600	X680	X700	X780	X800	X880	X900	JOn	In jog mode
X601	X681	X701	X781	X801	X881	X901	HOn	In handle mode
X602	X682	X702	X782	X802	X882	X902	SOn	In incremental mode
X603	X683	X703	X783	X803	X883	X903	PTPOn	In manual arbitrary feed mode
X604	X684	X704	X784	X804	X884	X904	ZRNOn	In reference position return mode
X605	X685	X705	X785	X805	X885	X905	ASTOn	In automatic initial set mode
X606	X686	X706	X786	X806	X886	X906		
X607	X687	X707	X787	X807	X887	X907		
X608	X688	X708	X788	X808	X888	X908	MEMOn	In memory mode
X609	X689	X709	X789	X809	X889	X909		
X60A	X68A	X70A	X78A	X80A	X88A	X90A		
X60B	X68B	X70B	X78B	X80B	X88B	X90B	DOn	In MDI mode
X60C	X68C	X70C	X78C	X80C	X88C	X90C		
X60D	X68D	X70D	X78D	X80D	X88D	X90D		
X60E	X68E	X70E	X78E	X80E	X88E	X90E		
X60F	X68F	X70F	X78F	X80F	X88F	X90F		

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
G10049	G10057	G10065	G10073	G10081	G10089	G10097	<- Sharing G	
X610	X690	X710	X790	X810	X890	X910		
X611	X691	X711	X791	X811	X891	X911		
X612	X692	X712	X792	X812	X892	X912	OPn	In automatic operation "run"
X613	X693	X713	X793	X813	X893	X913	STLn	In automatic operation "start"
X614	X694	X714	X794	X814	X894	X914	SPLn	In automatic operation "pause"
X615	X695	X715	X795	X815	X895	X915	RSTn	In "reset"
X616	X696	X716	X796	X816	X896	X916	CXNn	In manual arbitrary feed
X617	X697	X717	X797	X817	X897	X917	RWDn	In rewind
X618	X698	X718	X798	X818	X898	X918	DENn	Motion command completion
X619	X699	X719	X799	X819	X899	X919	TIMPn	All axes in-position
X61A	X69A	X71A	X79A	X81A	X89A	X91A	TSMZn	All axes smoothing zero
X61B	X69B	X71B	X79B	X81B	X89B	X91B		
X61C	X69C	X71C	X79C	X81C	X89C	X91C	CXFINn	Manual arbitrary feed completion
X61D	X69D	X71D	X79D	X81D	X89D	X91D	ETSEn	External search finished
X61E	X69E	X71E	X79E	X81E	X89E	X91E		
X61F	X69F	X71F	X79F	X81F	X89F	X91F		

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
G10050	G10058	G10066	G10074	G10082	G10090	G10098	<- Sharing G	
X620	X6A0	X720	X7A0	X820	X8A0	X920	RPNn	In rapid traverse
X621	X6A1	X721	X7A1	X821	X8A1	X921	CUTn	In cutting feed
X622	X6A2	X722	X7A2	X822	X8A2	X922	TAPn	In tapping
X623	X6A3	X723	X7A3	X823	X8A3	X923	THRDn	In thread cutting
X624	X6A4	X724	X7A4	X824	X8A4	X924	SYNn	In synchronous feed
X625	X6A5	X725	X7A5	X825	X8A5	X925	CSSn	In constant surface speed
X626	X6A6	X726	X7A6	X826	X8A6	X926	SKIPn	In skip
X627	X6A7	X727	X7A7	X827	X8A7	X927	ZRNNn	In reference position return
X628	X6A8	X728	X7A8	X828	X8A8	X928	INCHn	In inch unit selection
X629	X6A9	X729	X7A9	X829	X8A9	X929		
X62A	X6AA	X72A	X7AA	X82A	X8AA	X92A	F1DNn	F 1-digit commanded
X62B	X6AB	X72B	X7AB	X82B	X8AB	X92B	TLFOn	In tool life management
X62C	X6AC	X72C	X7AC	X82C	X8AC	X92C		
X62D	X6AD	X72D	X7AD	X82D	X8AD	X92D		
X62E	X6AE	X72E	X7AE	X82E	X8AE	X92E	TLOVn	Tool life over
X62F	X6AF	X72F	X7AF	X82F	X8AF	X92F		

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
G10051	G10059	G10067	G10075	G10083	G10091	G10099	<- Sharing G	
X630	X6B0	X730	X7B0	X830	X8B0	X930		
X631	X6B1	X731	X7B1	X831	X8B1	X931		
X632	X6B2	X732	X7B2	X832	X8B2	X932	AL3n	NC alarm 3 (Program error)
X633	X6B3	X733	X7B3	X833	X8B3	X933	AL4n	NC alarm 4 (Operation error)
X634	X6B4	X734	X7B4	X834	X8B4	X934		
X635	X6B5	X735	X7B5	X835	X8B5	X935	SSEn	Search & start (error)
X636	X6B6	X736	X7B6	X836	X8B6	X936	SSGn	Search & start (search)
X637	X6B7	X737	X7B7	X837	X8B7	X937	ASLEn	Illegal axis selected
X638	X6B8	X738	X7B8	X838	X8B8	X938	F11n	F 1-digit No. code 1
X639	X6B9	X739	X7B9	X839	X8B9	X939	F12n	F 1-digit No. code 2
X63A	X6BA	X73A	X7BA	X83A	X8BA	X93A	F14n	F 1-digit No. code 4
X63B	X6BB	X73B	X7BB	X83B	X8BB	X93B		
X63C	X6BC	X73C	X7BC	X83C	X8BC	X93C		Waiting between part systems
X63D	X6BD	X73D	X7BD	X83D	X8BD	X93D		
X63E	X6BE	X73E	X7BE	X83E	X8BE	X93E	VAMODOn	In hypothetical axis command mode
X63F	X6BF	X73F	X7BF	X83F	X8BF	X93F	HSST	In high-speed synchronous tapping

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
G10052	G10060	G10068	G10076	G10084	G10092	G10100	<- Sharing G	
X640	X6C0	X740	X7C0	X840	X8C0	X940	DM00n	M code independent output M00
X641	X6C1	X741	X7C1	X841	X8C1	X941	DM01n	M code independent output M01
X642	X6C2	X742	X7C2	X842	X8C2	X942	DM02n	M code independent output M02
X643	X6C3	X743	X7C3	X843	X8C3	X943	DM30n	M code independent output M30
X644	X6C4	X744	X7C4	X844	X8C4	X944	MF1n	M function strobe 1
X645	X6C5	X745	X7C5	X845	X8C5	X945	MF2n	M function strobe 2
X646	X6C6	X746	X7C6	X846	X8C6	X946	MF3n	M function strobe 3
X647	X6C7	X747	X7C7	X847	X8C7	X947	MF4n	M function strobe 4
X648	X6C8	X748	X7C8	X848	X8C8	X948		
X649	X6C9	X749	X7C9	X849	X8C9	X949	MMSn	Manual numerical command
X64A	X6CA	X74A	X7CA	X84A	X8CA	X94A		
X64B	X6CB	X74B	X7CB	X84B	X8CB	X94B	tCPn	Tool change position return completion
X64C	X6CC	X74C	X7CC	X84C	X8CC	X94C	tCRQn	New tool change
X64D	X6CD	X74D	X7CD	X84D	X8CD	X94D		
X64E	X6CE	X74E	X7CE	X84E	X8CE	X94E		
X64F	X6CF	X74F	X7CF	X84F	X8CF	X94F		

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
G10053	G10061	G10069	G10077	G10085	G10093	G10101	<- Sharing G	
X650	X6D0	X750	X7D0	X850	X8D0	X950	TF1n	T function strobe 1
X651	X6D1	X751	X7D1	X851	X8D1	X951		
X652	X6D2	X752	X7D2	X852	X8D2	X952		
X653	X6D3	X753	X7D3	X853	X8D3	X953		
X654	X6D4	X754	X7D4	X854	X8D4	X954	BF1n	2nd M function strobe 1
X655	X6D5	X755	X7D5	X855	X8D5	X955		
X656	X6D6	X756	X7D6	X856	X8D6	X956		
X657	X6D7	X757	X7D7	X857	X8D7	X957		
X658	X6D8	X758	X7D8	X858	X8D8	X958	SF1n	S function strobe 1
X659	X6D9	X759	X7D9	X859	X8D9	X959	SF2n	S function strobe 2
X65A	X6DA	X75A	X7DA	X85A	X8DA	X95A	SF3n	S function strobe 3
X65B	X6DB	X75B	X7DB	X85B	X8DB	X95B	SF4n	S function strobe 4
X65C	X6DC	X75C	X7DC	X85C	X8DC	X95C	SF5n	S function strobe 5
X65D	X6DD	X75D	X7DD	X85D	X8DD	X95D	SF6n	S function strobe 6
X65E	X6DE	X75E	X7DE	X85E	X8DE	X95E	SF7n	S function strobe 7
X65F	X6DF	X75F	X7DF	X85F	X8DF	X95F		

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
G10054	G10062	G10070	G10078	G10086	G10094	G10102	<- Sharing G	
X660	X6E0	X760	X7E0	X860	X8E0	X960	PSW1n	Position switch 1
X661	X6E1	X761	X7E1	X861	X8E1	X961	PSW2n	Position switch 2
X662	X6E2	X762	X7E2	X862	X8E2	X962	PSW3n	Position switch 3
X663	X6E3	X763	X7E3	X863	X8E3	X963	PSW4n	Position switch 4
X664	X6E4	X764	X7E4	X864	X8E4	X964	PSW5n	Position switch 5
X665	X6E5	X765	X7E5	X865	X8E5	X965	PSW6n	Position switch 6
X666	X6E6	X766	X7E6	X866	X8E6	X966	PSW7n	Position switch 7
X667	X6E7	X767	X7E7	X867	X8E7	X967	PSW8n	Position switch 8
X668	X6E8	X768	X7E8	X868	X8E8	X968		
X669	X6E9	X769	X7E9	X869	X8E9	X969		
X66A	X6EA	X76A	X7EA	X86A	X8EA	X96A		
X66B	X6EB	X76B	X7EB	X86B	X8EB	X96B		
X66C	X6EC	X76C	X7EC	X86C	X8EC	X96C	DLWAITn	Waiting for data to be downloaded
X66D	X6ED	X76D	X7ED	X86D	X8ED	X96D	TRVEn	Tap retract possible
X66E	X6EE	X76E	X7EE	X86E	X8EE	X96E	PCNTn	No. of work machining over
X66F	X6EF	X76F	X7EF	X86F	X8EF	X96F		Power shutoff movement over

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
G10055	G10063	G10071	G10079	G10087	G10095	G10103	<- Sharing G	
X670	X6F0	X770	X7F0	X870	X8F0	X970	PSW9n	Position switch 9
X671	X6F1	X771	X7F1	X871	X8F1	X971	PSW10n	Position switch 10
X672	X6F2	X772	X7F2	X872	X8F2	X972	PSW11n	Position switch 11
X673	X6F3	X773	X7F3	X873	X8F3	X973	PSW12n	Position switch 12
X674	X6F4	X774	X7F4	X874	X8F4	X974	PSW13n	Position switch 13
X675	X6F5	X775	X7F5	X875	X8F5	X975	PSW14n	Position switch 14
X676	X6F6	X776	X7F6	X876	X8F6	X976	PSW15n	Position switch 15
X677	X6F7	X777	X7F7	X877	X8F7	X977	PSW16n	Position switch 16
X678	X6F8	X778	X7F8	X878	X8F8	X978	PSW17n	Position switch 17
X679	X6F9	X779	X7F9	X879	X8F9	X979	PSW18n	Position switch 18
X67A	X6FA	X77A	X7FA	X87A	X8FA	X97A	PSW19n	Position switch 19
X67B	X6FB	X77B	X7FB	X87B	X8FB	X97B	PSW20n	Position switch 20
X67C	X6FC	X77C	X7FC	X87C	X8FC	X97C	PSW21n	Position switch 21
X67D	X6FD	X77D	X7FD	X87D	X8FD	X97D	PSW22n	Position switch 22
X67E	X6FE	X77E	X7FE	X87E	X8FE	X97E	PSW23n	Position switch 23
X67F	X6FF	X77F	X7FF	X87F	X8FF	X97F	PSW24n	Position switch 24

1.4 Spindle State

1st SP	2nd SP	3rd SP	4th SP	5th SP	6th SP	7th SP	abbrev.	Signal name
G10104	G10107	G10110	G10113	G10116	G10119	G10122	<- Sharing G	
X980	X9B0	X9E0	XA10	XA40	XA70	XAA0		
X981	X9B1	X9E1	XA11	XA41	XA71	XAA1		
X982	X9B2	X9E2	XA12	XA42	XA72	XAA2		
X983	X9B3	X9E3	XA13	XA43	XA73	XAA3		
X984	X9B4	X9E4	XA14	XA44	XA74	XAA4	SIGEn	S command gear No. illegal
X985	X9B5	X9E5	XA15	XA45	XA75	XAA5	SOVEn	S command max./min. command value over
X986	X9B6	X9E6	XA16	XA46	XA76	XAA6	SNGEn	S command no gear selected
X987	X9B7	X9E7	XA17	XA47	XA77	XAA7		
X988	X9B8	X9E8	XA18	XA48	XA78	XAA8		
X989	X9B9	X9E9	XA19	XA49	XA79	XAA9		
X98A	X9BA	X9EA	XA1A	XA4A	XA7A	XAAA		
X98B	X9BB	X9EB	XA1B	XA4B	XA7B	XAAB	SUPPn	Spindle speed upper limit over
X98C	X9BC	X9EC	XA1C	XA4C	XA7C	XAAC	SLOWn	Spindle speed lower limit over
X98D	X9BD	X9ED	XA1D	XA4D	XA7D	XAAD	GR1n	Spindle gear shift command 1
X98E	X9BE	X9EE	XA1E	XA4E	XA7E	XAAE	GR2n	Spindle gear shift command 2
X98F	X9BF	X9EF	XA1F	XA4F	XA7F	XAAF		

1st SP	2nd SP	3rd SP	4th SP	5th SP	6th SP	7th SP	abbrev.	Signal name
G10105	G10108	G10111	G10114	G10117	G10120	G10123	<- Sharing G	
X990	X9C0	X9F0	XA20	XA50	XA80	XAB0		
X991	X9C1	X9F1	XA21	XA51	XA81	XAB1	CDOn	Current detection
X992	X9C2	X9F2	XA22	XA52	XA82	XAB2	VROn	Speed detection
X993	X9C3	X9F3	XA23	XA53	XA83	XAB3	FLOn	In spindle alarm
X994	X9C4	X9F4	XA24	XA54	XA84	XAB4	ZSOn	Zero speed
X995	X9C5	X9F5	XA25	XA55	XA85	XAB5	USOn	Spindle up-to-speed
X996	X9C6	X9F6	XA26	XA56	XA86	XAB6	ORAOn	Spindle in-position
X997	X9C7	X9F7	XA27	XA57	XA87	XAB7	LCSAn	In L coil selection
X998	X9C8	X9F8	XA28	XA58	XA88	XAB8	SMAn	Spindle ready-ON
X999	X9C9	X9F9	XA29	XA59	XA89	XAB9	SSAn	Spindle servo-ON
X99A	X9CA	X9FA	XA2A	XA5A	XA8A	XABA		
X99B	X9CB	X9FB	XA2B	XA5B	XA8B	XABB	SSRNn	In spindle forward run
X99C	X9CC	X9FC	XA2C	XA5C	XA8C	XABC	SSRIn	In spindle reverse run
X99D	X9CD	X9FD	XA2D	XA5D	XA8D	XABD	SZPHn	Z-phase passed
X99E	X9CE	X9FE	XA2E	XA5E	XA8E	XABE	SIMPn	Position loop in-position
X99F	X9CF	X9FF	XA2F	XA5F	XA8F	XABF	STLQn	In spindle torque limit

1st SP	2nd SP	3rd SP	4th SP	5th SP	6th SP	7th SP	abbrev.	Signal name
G10106	G10109	G10112	G10115	G10118	G10121	G10124	<- Sharing G	
X9A0	X9D0	XA00	XA30	XA60	XA90	XAC0		
X9A1	X9D1	XA01	XA31	XA61	XA91	XAC1		
X9A2	X9D2	XA02	XA32	XA62	XA92	XAC2		
X9A3	X9D3	XA03	XA33	XA63	XA93	XAC3		
X9A4	X9D4	XA04	XA34	XA64	XA94	XAC4		
X9A5	X9D5	XA05	XA35	XA65	XA95	XAC5		
X9A6	X9D6	XA06	XA36	XA66	XA96	XAC6		
X9A7	X9D7	XA07	XA37	XA67	XA97	XAC7		
X9A8	X9D8	XA08	XA38	XA68	XA98	XAC8		
X9A9	X9D9	XA09	XA39	XA69	XA99	XAC9	SMSOEn	In spindle multi-step speed monitor
X9AA	X9DA	XA0A	XA3A	XA6A	XA9A	XACA	SMSOMO1n	In spindle multi-step speed monitor output 1
X9AB	X9DB	XA0B	XA3B	XA6B	XA9B	XACB	SMSOMO2n	In spindle multi-step speed monitor output 2
X9AC	X9DC	XA0C	XA3C	XA6C	XA9C	XACC		
X9AD	X9DD	XA0D	XA3D	XA6D	XA9D	XACD	SSOSEn	In spindle stop observation
X9AE	X9DE	XA0E	XA3E	XA6E	XA9E	XACE		
X9AF	X9DF	XA0F	XA3F	XA6F	XA9F	XACF		

2. Data Type Input Signals (CNC->PLC)

2.1 System State

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
10200	R0			10210	R10		1st handle pulse counter
10201	R1			10211	R11		2nd handle pulse counter
10202	R2			10212	R12		3rd handle pulse counter
10203	R3			10213	R13		
10204	R4			10214	R14		
10205	R5			10215	R15		
10206	R6			10216	R16		CRT display information
10207	R7			10217	R17		
10208	R8		KEYIN	10218	R18		
10209	R9	SMODEN	Speed monitor door open possible	10219	R19		

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
10220	R20			10230	R30		User macro output #1135
10221	R21		Emergency stop cause	10231	R31		(Controller -> PLC)
10222	R22			10232	R32		CNC software version code
10223	R23			10233	R33		
10224	R24		User macro output #1132	10234	R34		
10225	R25		(Controller -> PLC)	10235	R35		
10226	R26		User macro output #1133	10236	R36		
10227	R27		(Controller -> PLC)	10237	R37		
10228	R28		User macro output #1134	10238	R38		
10229	R29		(Controller -> PLC)	10239	R39		

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
10240	R40		Battery drop cause	10250	R50		
10241	R41		Temperature warning cause	10251	R51		
10242	R42			10252	R52		
10243	R43			10253	R53		
10244	R44			10254	R54		
10245	R45			10255	R55		Spindle synchronization phase error output
10246	R46			10256	R56		Spindle synchronization Phase error monitor
10247	R47			10257	R57		Spindle synchronization Phase error monitor (lower limit)
10248	R48		Spindle synchronization phase error 1	10258	R58		Spindle synchronization Phase error monitor (upper limit)
10249	R49		Spindle synchronization phase error 2	10259	R59		Spindle synchronization Phase offset data

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
10260	R60		APLC input data 1	10270	R70		
10261	R61		APLC input data 2	10271	R71		
10262	R62		APLC input data 3	10272	R72		
10263	R63		APLC input data 4	10273	R73		
10264	R64		APLC input data 5	10274	R74		
10265	R65		APLC input data 6	10275	R75		
10266	R66		APLC input data 7	10276	R76		
10267	R67		APLC input data 8	10277	R77		
10268	R68		APLC input data 9	10278	R78		
10269	R69		APLC input data 10	10279	R79		

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
10280	R80	NCVERR	ZR device No. at occurrence of NC exclusive instruction (DDWR/DDRD) error	10290	R90		GOT window Data changeover completion
10281	R81			10291	R91		
10282	R82	ZRECVNO	Common variable No. at occurrence of ZR device error	10292	R92		
10283	R83	ZRECVFC	Error cause at occurrence of ZR device error	10293	R93		
10284	R84			10294	R94		
10285	R85			10295	R95		
10286	R86			10296	R96		
10287	R87			10297	R97		Encoder communication alarm
10288	R88			10298	R98		Insulation degradation monitor: Warning output
10289	R89			10299	R99		Insulation degradation monitor: Limit value alarm output

2.2 Part System State

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
10300	R100	10400	R200	10500	R300	10600	R400	10700	R500	10800	R600	10900	R700		External search status
10301	R101	10401	R201	10501	R301	10601	R401	10701	R501	10801	R601	10901	R701		
10302	R102	10402	R202	10502	R302	10602	R402	10702	R502	10802	R602	10902	R702		
10303	R103	10403	R203	10503	R303	10603	R403	10703	R503	10803	R603	10903	R703		
10304	R104	10404	R204	10504	R304	10604	R404	10704	R504	10804	R604	10904	R704		M code data 1
10305	R105	10405	R205	10505	R305	10605	R405	10705	R505	10805	R605	10905	R705		
10306	R106	10406	R206	10506	R306	10606	R406	10706	R506	10806	R606	10906	R706		M code data 2
10307	R107	10407	R207	10507	R307	10607	R407	10707	R507	10807	R607	10907	R707		
10308	R108	10408	R208	10508	R308	10608	R408	10708	R508	10808	R608	10908	R708		M code data 3
10309	R109	10409	R209	10509	R309	10609	R409	10709	R509	10809	R609	10909	R709		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
10310	R110	10410	R210	10510	R310	10610	R410	10710	R510	10810	R610	10910	R710		M code data 4
10311	R111	10411	R211	10511	R311	10611	R411	10711	R511	10811	R611	10911	R711		
10312	R112	10412	R212	10512	R312	10612	R412	10712	R512	10812	R612	10912	R712		S code data 1
10313	R113	10413	R213	10513	R313	10613	R413	10713	R513	10813	R613	10913	R713		
10314	R114	10414	R214	10514	R314	10614	R414	10714	R514	10814	R614	10914	R714		S code data 2
10315	R115	10415	R215	10515	R315	10615	R415	10715	R515	10815	R615	10915	R715		
10316	R116	10416	R216	10516	R316	10616	R416	10716	R516	10816	R616	10916	R716		S code data 3
10317	R117	10417	R217	10517	R317	10617	R417	10717	R517	10817	R617	10917	R717		
10318	R118	10418	R218	10518	R318	10618	R418	10718	R518	10818	R618	10918	R718		S code data 4
10319	R119	10419	R219	10519	R319	10619	R419	10719	R519	10819	R619	10919	R719		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
10320	R120	10420	R220	10520	R320	10620	R420	10720	R520	10820	R620	10920	R720		T code data 1
10321	R121	10421	R221	10521	R321	10621	R421	10721	R521	10821	R621	10921	R721		
10322	R122	10422	R222	10522	R322	10622	R422	10722	R522	10822	R622	10922	R722		
10323	R123	10423	R223	10523	R323	10623	R423	10723	R523	10823	R623	10923	R723		
10324	R124	10424	R224	10524	R324	10624	R424	10724	R524	10824	R624	10924	R724		
10325	R125	10425	R225	10525	R325	10625	R425	10725	R525	10825	R625	10925	R725		
10326	R126	10426	R226	10526	R326	10626	R426	10726	R526	10826	R626	10926	R726		
10327	R127	10427	R227	10527	R327	10627	R427	10727	R527	10827	R627	10927	R727		
10328	R128	10428	R228	10528	R328	10628	R428	10728	R528	10828	R628	10928	R728		2nd M function data 1
10329	R129	10429	R229	10529	R329	10629	R429	10729	R529	10829	R629	10929	R729		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
10330	R130	10430	R230	10530	R330	10630	R430	10730	R530	10830	R630	10930	R730		
10331	R131	10431	R231	10531	R331	10631	R431	10731	R531	10831	R631	10931	R731		
10332	R132	10432	R232	10532	R332	10632	R432	10732	R532	10832	R632	10932	R732		
10333	R133	10433	R233	10533	R333	10633	R433	10733	R533	10833	R633	10933	R733		
10334	R134	10434	R234	10534	R334	10634	R434	10734	R534	10834	R634	10934	R734		
10335	R135	10435	R235	10535	R335	10635	R435	10735	R535	10835	R635	10935	R735		
10336	R136	10436	R236	10536	R336	10636	R436	10736	R536	10836	R636	10936	R736		Tool No.
10337	R137	10437	R237	10537	R337	10637	R437	10737	R537	10837	R637	10937	R737		
10338	R138	10438	R238	10538	R338	10638	R438	10738	R538	10838	R638	10938	R738		Group in tool life management
10339	R139	10439	R239	10539	R339	10639	R439	10739	R539	10839	R639	10939	R739		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
10340	R140	10440	R240	10540	R340	10640	R440	10740	R540	10840	R640	10940	R740		No. of work machining (current value)
10341	R141	10441	R241	10541	R341	10641	R441	10741	R541	10841	R641	10941	R741		
10342	R142	10442	R242	10542	R342	10642	R442	10742	R542	10842	R642	10942	R742		Near reference position (per reference position)
10343	R143	10443	R243	10543	R343	10643	R443	10743	R543	10843	R643	10943	R743		
10344	R144	10444	R244	10544	R344	10644	R444	10744	R544	10844	R644	10944	R744		Tool life usage data
10345	R145	10445	R245	10545	R345	10645	R445	10745	R545	10845	R645	10945	R745		
10346	R146	10446	R246	10546	R346	10646	R446	10746	R546	10846	R646	10946	R746		No. of work machining (maximum value)
10347	R147	10447	R247	10547	R347	10647	R447	10747	R547	10847	R647	10947	R747		
10348	R148	10448	R248	10548	R348	10648	R448	10748	R548	10848	R648	10948	R748		
10349	R149	10449	R249	10549	R349	10649	R449	10749	R549	10849	R649	10949	R749		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
10350	R150	10450	R250	10550	R350	10650	R450	10750	R550	10850	R650	10950	R750		
10351	R151	10451	R251	10551	R351	10651	R451	10751	R551	10851	R651	10951	R751		
10352	R152	10452	R252	10552	R352	10652	R452	10752	R552	10852	R652	10952	R752		
10353	R153	10453	R253	10553	R353	10653	R453	10753	R553	10853	R653	10953	R753		
10354	R154	10454	R254	10554	R354	10654	R454	10754	R554	10854	R654	10954	R754		
10355	R155	10455	R255	10555	R355	10655	R455	10755	R555	10855	R655	10955	R755		
10356	R156	10456	R256	10556	R356	10656	R456	10756	R556	10856	R656	10956	R756		Error code output
10357	R157	10457	R257	10557	R357	10657	R457	10757	R557	10857	R657	10957	R757		
10358	R158	10458	R258	10558	R358	10658	R458	10758	R558	10858	R658	10958	R758		
10359	R159	10459	R259	10559	R359	10659	R459	10759	R559	10859	R659	10959	R759		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
10360	R160	10460	R260	10560	R360	10660	R460	10760	R560	10860	R660	10960	R760		Error code output extension
10361	R161	10461	R261	10561	R361	10661	R461	10761	R561	10861	R661	10961	R761		
10362	R162	10462	R262	10562	R362	10662	R462	10762	R562	10862	R662	10962	R762		
10363	R163	10463	R263	10563	R363	10663	R463	10763	R563	10863	R663	10963	R763		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
10364	R164	10464	R264	10564	R364	10664	R464	10764	R564	10864	R664	10964	R764		S code data 5
10365	R165	10465	R265	10565	R365	10665	R465	10765	R565	10865	R665	10965	R765		
10366	R166	10466	R266	10566	R366	10666	R466	10766	R566	10866	R666	10966	R766		S code data 6
10367	R167	10467	R267	10567	R367	10667	R467	10767	R567	10867	R667	10967	R767		
10368	R168	10468	R268	10568	R368	10668	R468	10768	R568	10868	R668	10968	R768		S code data 7
10369	R169	10469	R269	10569	R369	10669	R469	10769	R569	10869	R669	10969	R769		
10370	R170	10470	R270	10570	R370	10670	R470	10770	R570	10870	R670	10970	R770		User Macro output #1132 (Controller -> PLC)
10371	R171	10471	R271	10571	R371	10671	R471	10771	R571	10871	R671	10971	R771		
10372	R172	10472	R272	10572	R372	10672	R472	10772	R572	10872	R672	10972	R772		User Macro output #1133 (Controller -> PLC)
10373	R173	10473	R273	10573	R373	10673	R473	10773	R573	10873	R673	10973	R773		
10374	R174	10474	R274	10574	R374	10674	R474	10774	R574	10874	R674	10974	R774		User Macro output #1134 (Controller -> PLC)
10375	R175	10475	R275	10575	R375	10675	R475	10775	R575	10875	R675	10975	R775		
10376	R176	10476	R276	10576	R376	10676	R476	10776	R576	10876	R676	10976	R776		User Macro output #1135 (Controller -> PLC)
10377	R177	10477	R277	10577	R377	10677	R477	10777	R577	10877	R677	10977	R777		
10378	R178	10478	R278	10578	R378	10678	R478	10778	R578	10878	R678	10978	R778		
10379	R179	10479	R279	10579	R379	10679	R479	10779	R579	10879	R679	10979	R779		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
10380	R180	10480	R280	10580	R380	10680	R480	10780	R580	10880	R680	10980	R780		Chopping status
10381	R181	10481	R281	10581	R381	10681	R481	10781	R581	10881	R681	10981	R781		Chopping error No.
10382	R182	10482	R282	10582	R382	10682	R482	10782	R582	10882	R682	10982	R782		Chopping axis
10383	R183	10483	R283	10583	R383	10683	R483	10783	R583	10883	R683	10983	R783		
10384	R184	10484	R284	10584	R384	10684	R484	10784	R584	10884	R684	10984	R784		
10385	R185	10485	R285	10585	R385	10685	R485	10785	R585	10885	R685	10985	R785		
10386	R186	10486	R286	10586	R386	10686	R486	10786	R586	10886	R686	10986	R786		
10387	R187	10487	R287	10587	R387	10687	R487	10787	R587	10887	R687	10987	R787		
10388	R188	10488	R288	10588	R388	10688	R488	10788	R588	10888	R688	10988	R788		
10389	R189	10489	R289	10589	R389	10689	R489	10789	R589	10889	R689	10989	R789		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
10390	R190	10490	R290	10590	R390	10690	R490	10790	R590	10890	R690	10990	R790		
10391	R191	10491	R291	10591	R391	10691	R491	10791	R591	10891	R691	10991	R791		
10392	R192	10492	R292	10592	R392	10692	R492	10792	R592	10892	R692	10992	R792		
10393	R193	10493	R293	10593	R393	10693	R493	10793	R593	10893	R693	10993	R793		
10394	R194	10494	R294	10594	R394	10694	R494	10794	R594	10894	R694	10994	R794		
10395	R195	10495	R295	10595	R395	10695	R495	10795	R595	10895	R695	10995	R795		
10396	R196	10496	R296	10596	R396	10696	R496	10796	R596	10896	R696	10996	R796		
10397	R197	10497	R297	10597	R397	10697	R497	10797	R597	10897	R697	10997	R797		
10398	R198	10498	R298	10598	R398	10698	R498	10798	R598	10898	R698	10998	R798		
10399	R199	10499	R299	10599	R399	10699	R499	10799	R599	10899	R699	10999	R799		

2.3 Axis State

1st axis		2nd axis		3rd axis		4th axis		5th axis		6th axis		7th axis		8th axis		abbrev.	Signal name
Shar-ing G	Inter-nal	Sha-ring G	Internal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal		
11000	R800	11010	R810	11020	R820	11030	R830	11040	R840	11050	R850	11060	R860	11070	R870		Thermal expansion compensa-tion amount
11001	R801	11011	R811	11021	R821	11031	R831	11041	R841	11051	R851	11061	R861	11071	R871		
11002	R802	11012	R812	11022	R822	11032	R832	11042	R842	11052	R852	11062	R862	11072	R872		Machine position n-th axis
11003	R803	11013	R813	11023	R823	11033	R833	11043	R843	11053	R853	11063	R863	11073	R873		
11004	R804	11014	R814	11024	R824	11034	R834	11044	R844	11054	R854	11064	R864	11074	R874		Feedback machine position n-th axis
11005	R805	11015	R815	11025	R825	11035	R835	11045	R845	11055	R855	11065	R865	11075	R875		
11006	R806	11016	R816	11026	R826	11036	R836	11046	R846	11056	R856	11066	R866	11076	R876		
11007	R807	11017	R817	11027	R827	11037	R837	11047	R847	11057	R857	11067	R867	11077	R877		
11008	R808	11018	R818	11028	R828	11038	R838	11048	R848	11058	R858	11068	R868	11078	R878		
11009	R809	11019	R819	11029	R829	11039	R839	11049	R849	11059	R859	11069	R869	11079	R879		

9th axis		10th axis		11th axis		12th axis		13th axis		14th axis		15th axis		16th axis		abbrev.	Signal name
Shar-ing G	Inter-nal	Sha-ring G	Internal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal		
11080	R880	11090	R890	11100	R900	11110	R910	11120	R920	11130	R930	11140	R940	11150	R950		Thermal expansion compensa-tion amount
11081	R881	11091	R891	11101	R901	11111	R911	11121	R921	11131	R931	11141	R941	11151	R951		
11082	R882	11092	R892	11102	R902	11112	R912	11122	R922	11132	R932	11142	R942	11152	R952		Machine position n-th axis
11083	R883	11093	R893	11103	R903	11113	R913	11123	R923	11133	R933	11143	R943	11153	R953		
11084	R884	11094	R894	11104	R904	11114	R914	11124	R924	11134	R934	11144	R944	11154	R954		Feedback machine position n-th axis
11085	R885	11095	R895	11105	R905	11115	R915	11125	R925	11135	R935	11145	R945	11155	R955		
11086	R886	11096	R896	11106	R906	11116	R916	11126	R926	11136	R936	11146	R946	11156	R956		
11087	R887	11097	R897	11107	R907	11117	R917	11127	R927	11137	R937	11147	R947	11157	R957		
11088	R888	11098	R898	11108	R908	11118	R918	11128	R928	11138	R938	11148	R948	11158	R958		
11089	R889	11099	R899	11109	R909	11119	R919	11129	R929	11139	R939	11149	R949	11159	R959		

2.4 Spindle State

1st SP		2nd SP		3rd SP		4th SP		5th SP		6th SP		7th SP		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
11160	**R1600**	**11190**	**R1630**	**11220**	**R1660**	**11250**	**R1690**	**11280**	**R1720**	**11310**	**R1750**	**11340**	**R1780**	SRPMINn	Spindle command rotation speed input
11161	R1601	11191	R1631	11221	R1661	11251	R1691	11281	R1721	11311	R1751	11341	R1781		
11162	R1602	11192	R1632	11222	R1662	11252	R1692	11282	R1722	11312	R1752	11342	R1782	SRPMn	Spindle command final data (Rotation speed)
11163	R1603	11193	R1633	11223	R1663	11253	R1693	11283	R1723	11313	R1753	11343	R1783		
11164	R1604	11194	R1634	11224	R1664	11254	R1694	11284	R1724	11314	R1754	11344	R1784	SBINn	Spindle command final data (12-bit binary)
11165	R1605	11195	R1635	11225	R1665	11255	R1695	11285	R1725	11315	R1755	11345	R1785		
11166	R1606	11196	R1636	11226	R1666	11256	R1696	11286	R1726	11316	R1756	11346	R1786	SREALn	Spindle actual speed
11167	R1607	11197	R1637	11227	R1667	11257	R1697	11287	R1727	11317	R1757	11347	R1787		
11168	R1608	11198	R1638	11228	R1668	11258	R1698	11288	R1728	11318	R1758	11348	R1788		
11169	R1609	11199	R1639	11229	R1669	11259	R1699	11289	R1729	11319	R1759	11349	R1789		

1st SP		2nd SP		3rd SP		4th SP		5th SP		6th SP		7th SP		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
11170	R1610	11200	R1640	11230	R1670	11260	R1700	11290	R1730	11320	R1760	11350	R1790		
11171	R1611	11201	R1641	11231	R1671	11261	R1701	11291	R1731	11321	R1761	11351	R1791		Spindle motor temperature
11172	R1612	11202	R1642	11232	R1672	11262	R1702	11292	R1732	11322	R1762	11352	R1792		
11173	R1613	11203	R1643	11233	R1673	11263	R1703	11293	R1733	11323	R1763	11353	R1793		
11174	R1614	11204	R1644	11234	R1674	11264	R1704	11294	R1734	11324	R1764	11354	R1794		
11175	R1615	11205	R1645	11235	R1675	11265	R1705	11295	R1735	11325	R1765	11355	R1795		
11176	R1616	11206	R1646	11236	R1676	11266	R1706	11296	R1736	11326	R1766	11356	R1796		
11177	R1617	11207	R1647	11237	R1677	11267	R1707	11297	R1737	11327	R1767	11357	R1797		
11178	R1618	11208	R1648	11238	R1678	11268	R1708	11298	R1738	11328	R1768	11358	R1798		
11179	R1619	11209	R1649	11239	R1679	11269	R1709	11299	R1739	11329	R1769	11359	R1799		

1st SP		2nd SP		3rd SP		4th SP		5th SP		6th SP		7th SP		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
11180	R1620	11210	R1650	11240	R1680	11270	R1710	11300	R1740	11330	R1770	11360	R1800		
11181	R1621	11211	R1651	11241	R1681	11271	R1711	11301	R1741	11331	R1771	11361	R1801		
11182	R1622	11212	R1652	11242	R1682	11272	R1712	11302	R1742	11332	R1772	11362	R1802		
11183	R1623	11213	R1653	11243	R1683	11273	R1713	11303	R1743	11333	R1773	11363	R1803		
11184	R1624	11214	R1654	11244	R1684	11274	R1714	11304	R1744	11334	R1774	11364	R1804		
11185	R1625	11215	R1655	11245	R1685	11275	R1715	11305	R1745	11335	R1775	11365	R1805		
11186	R1626	11216	R1656	11246	R1686	11276	R1716	11306	R1746	11336	R1776	11366	R1806		
11187	R1627	11217	R1657	11247	R1687	11277	R1717	11307	R1747	11337	R1777	11367	R1807		
11188	R1628	11218	R1658	11248	R1688	11278	R1718	11308	R1748	11338	R1778	11368	R1808		
11189	R1629	11219	R1659	11249	R1689	11279	R1719	11309	R1749	11339	R1779	11369	R1809		

3. Bit Type Output Signals (PLC->CNC)

3.1 System Command

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+000	Y300				+000	Y308		
	Y301					Y309		
	Y302					Y30A		
	Y303					Y30B		
	Y304					Y30C		
	Y305					Y30D		
	Y306					Y30E		
	Y307					Y30F		

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+001	Y310	MCT	Contactor shutoff test		+001	Y318	*KEY1	Data protect key 1
	Y311	CHKTRG	Dual signals check start			Y319	*KEY2	Data protect key 2
	Y312	OFFCHK	Output OFF check			Y31A	*KEY3	Data protect key 3
	Y313					Y31B		
	Y314	RHD1	Integration time input 1			Y31C		
	Y315	RHD2	Integration time input 2			Y31D	CRTFN	CRT changeover completion
	Y316					Y31E	DISP1	Display changeover $1
	Y317					Y31F	DISP2	Display changeover $2

Common		abbrev.	Signal name
Sharing G	Internal		
+002	Y320		
	Y321	SMPTRG	NC data sampling trigger
	Y322	HISAVE	Saving operation history data
	Y323	EDITOK	Edited data recovery confirmation
	Y324		
	Y325		
	Y326		
	Y327	QEMG	PLC emergency stop

Common		abbrev.	Signal name
Sharing G	Internal		
+002	Y328	DOOR1	Door open I
	Y329	DOOR2	Door open II
	Y32A		
	Y32B	PABMI	PLC axis control buffering mode valid
	Y32C		
	Y32D	PCH1	PLC axis 1st handle valid
	Y32E	PCH2	PLC axis 2nd handle valid
	Y32F	PCH3	PLC axis 3rd handle valid

Common		abbrev.	Signal name
Sharing G	Internal		
+003	Y330	SSYNI	Spindle synchronization cancel
	Y331	SPCMPC	Chuck close
	Y332	SPSY	Spindle synchronization
	Y333	SPPHS	Spindle phase synchronization
	Y334	SPSDR	Spindle synchronous rotation direction
	Y335	SSPHM	Phase shift calculation request
	Y336	SSPHF	Phase offset request
	Y337	SPDRPO	Error temporary cancel

Common		abbrev.	Signal name
Sharing G	Internal		
+003	Y338	*PCD1	PLC axis near point detection 1st axis
	Y339	*PCD2	PLC axis near point detection 2nd axis
	Y33A	*PCD3	PLC axis near point detection 3rd axis
	Y33B	*PCD4	PLC axis near point detection 4th axis
	Y33C	*PCD5	PLC axis near point detection 5th axis
	Y33D	*PCD6	PLC axis near point detection 6th axis
	Y33E	*PCD7	PLC axis near point detection 7th axis
	Y33F	*PCD8	PLC axis near point detection 8th axis

Common		abbrev.	Signal name
Sharing G	Internal		
+004	Y340	PLCAE1	PLC axis control valid 1st axis
	Y341	PLCAE2	PLC axis control valid 2nd axis
	Y342	PLCAE3	PLC axis control valid 3rd axis
	Y343	PLCAE4	PLC axis control valid 4th axis
	Y344	PLCAE5	PLC axis control valid 5th axis
	Y345	PLCAE6	PLC axis control valid 6th axis
	Y346	PLCAE7	PLC axis control valid 7th axis
	Y347	PLCAE8	PLC axis control valid 8th axis

Common		abbrev.	Signal name
Sharing G	Internal		
+004	Y348		
	Y349		
	Y34A		
	Y34B		
	Y34C		
	Y34D		
	Y34E		
	Y34F		

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+005	Y350	DLDREQ	Download request		+005	Y358		
	Y351					Y359		
	Y352					Y35A		
	Y353					Y35B		
	Y354					Y35C		
	Y355					Y35D		
	Y356					Y35E		
	Y357					Y35F		

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+006	Y360				+006	Y368		
	Y361					Y369		
	Y362					Y36A		
	Y363					Y36B		
	Y364					Y36C		
	Y365					Y36D		
	Y366					Y36E		
	Y367					Y36F		

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+007	Y370				+007	Y378		
	Y371					Y379		
	Y372					Y37A		
	Y373					Y37B		
	Y374					Y37C		
	Y375					Y37D		
	Y376					Y37E		
	Y377					Y37F		

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
+008	Y380	APLCOUT1	APLC output signal 1	+008	Y388	APLCOUT9	APLC output signal 9
	Y381	APLCOUT2	APLC output signal 2		Y389	APLCOUT10	APLC output signal 10
	Y382	APLCOUT3	APLC output signal 3		Y38A	APLCOUT11	APLC output signal 11
	Y383	APLCOUT4	APLC output signal 4		Y38B	APLCOUT12	APLC output signal 12
	Y384	APLCOUT5	APLC output signal 5		Y38C	APLCOUT13	APLC output signal 13
	Y385	APLCOUT6	APLC output signal 6		Y38D	APLCOUT14	APLC output signal 14
	Y386	APLCOUT7	APLC output signal 7		Y38E	APLCOUT15	APLC output signal 15
	Y387	APLCOUT8	APLC output signal 8		Y38F	APLCOUT16	APLC output signal 16

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
+009	Y390	APLCOUT17	APLC output signal 17	+009	Y398	APLCOUT25	APLC output signal 25
	Y391	APLCOUT18	APLC output signal 18		Y399	APLCOUT26	APLC output signal 26
	Y392	APLCOUT19	APLC output signal 19		Y39A	APLCOUT27	APLC output signal 27
	Y393	APLCOUT20	APLC output signal 20		Y39B	APLCOUT28	APLC output signal 28
	Y394	APLCOUT21	APLC output signal 21		Y39C	APLCOUT29	APLC output signal 29
	Y395	APLCOUT22	APLC output signal 22		Y39D	APLCOUT30	APLC output signal 30
	Y396	APLCOUT23	APLC output signal 23		Y39E	APLCOUT31	APLC output signal 31
	Y397	APLCOUT24	APLC output signal 24		Y39F	APLCOUT32	APLC output signal 32

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
+010	Y3A0	PSKIP1	PLC skip 1	+010	Y3A8	PSKIP9	PLC skip 9
	Y3A1	PSKIP2	PLC skip 2		Y3A9	PSKIP10	PLC skip 10
	Y3A2	PSKIP3	PLC skip 3		Y3AA	PSKIP11	PLC skip 11
	Y3A3	PSKIP4	PLC skip 4		Y3AB	PSKIP12	PLC skip 12
	Y3A4	PSKIP5	PLC skip 5		Y3AC	PSKIP13	PLC skip 13
	Y3A5	PSKIP6	PLC skip 6		Y3AD	PSKIP14	PLC skip 14
	Y3A6	PSKIP7	PLC skip 7		Y3AE	PSKIP15	PLC skip 15
	Y3A7	PSKIP8	PLC skip 8		Y3AF	PSKIP16	PLC skip 16

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+011	Y3B0	PSKIP17	PLC skip 17		+011	Y3B8	PSKIP25	PLC skip 25
	Y3B1	PSKIP18	PLC skip 18			Y3B9	PSKIP26	PLC skip 26
	Y3B2	PSKIP19	PLC skip 19			Y3BA	PSKIP27	PLC skip 27
	Y3B3	PSKIP20	PLC skip 20			Y3BB	PSKIP28	PLC skip 28
	Y3B4	PSKIP21	PLC skip 21			Y3BC	PSKIP29	PLC skip 29
	Y3B5	PSKIP22	PLC skip 22			Y3BD	PSKIP30	PLC skip 30
	Y3B6	PSKIP23	PLC skip 23			Y3BE	PSKIP31	PLC skip 31
	Y3B7	PSKIP24	PLC skip 24			Y3BF	PSKIP32	PLC skip 32

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+012	Y3C0				+012	Y3C8		
	Y3C1					Y3C9		
	Y3C2					Y3CA		
	Y3C3					Y3CB		
	Y3C4					Y3CC		
	Y3C5					Y3CD		
	Y3C6					Y3CE		
	Y3C7					Y3CF		

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+013	Y3D0				+013	Y3D8		
	Y3D1					Y3D9		
	Y3D2					Y3DA		
	Y3D3					Y3DB		
	Y3D4					Y3DC		
	Y3D5					Y3DD		
	Y3D6					Y3DE		
	Y3D7					Y3DF		

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+014	Y3E0				+014	Y3E8		
	Y3E1					Y3E9		
	Y3E2					Y3EA		
	Y3E3					Y3EB		
	Y3E4					Y3EC		
	Y3E5					Y3ED		
	Y3E6					Y3EE		
	Y3E7					Y3EF		

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+015	Y3F0				+015	Y3F8		
	Y3F1					Y3F9		
	Y3F2					Y3FA		
	Y3F3					Y3FB		
	Y3F4					Y3FC		
	Y3F5					Y3FD		
	Y3F6					Y3FE		
	Y3F7					Y3FF		

3.2 Axis Command

1st axis	2nd axis	3rd axis	4th axis	5th axis	6th axis	7th axis	8th axis	abbrev.	Signal name
+016	+019	+022	+025	+028	+031	+034	+037	<- Sharing G	
Y400	Y430	Y460	Y490	Y4C0	Y4F0	Y520	Y550	DTCHn	Control axis detach
Y401	Y431	Y461	Y491	Y4C1	Y4F1	Y521	Y551	*SVFn	Servo OFF
Y402	Y432	Y462	Y492	Y4C2	Y4F2	Y522	Y552	MIn	Mirror image
Y403	Y433	Y463	Y493	Y4C3	Y4F3	Y523	Y553	*+EDTn	External deceleration +
Y404	Y434	Y464	Y494	Y4C4	Y4F4	Y524	Y554	*-EDTn	External deceleration -
Y405	Y435	Y465	Y495	Y4C5	Y4F5	Y525	Y555	*+AITn	Automatic interlock +
Y406	Y436	Y466	Y496	Y4C6	Y4F6	Y526	Y556	*-AITn	Automatic interlock -
Y407	Y437	Y467	Y497	Y4C7	Y4F7	Y527	Y557	*+MITn	Manual interlock +
Y408	Y438	Y468	Y498	Y4C8	Y4F8	Y528	Y558	*-MITn	Manual interlock -
Y409	Y439	Y469	Y499	Y4C9	Y4F9	Y529	Y559	AMLKn	Automatic machine lock
Y40A	Y43A	Y46A	Y49A	Y4CA	Y4FA	Y52A	Y55A	MMLKn	Manual machine lock
Y40B	Y43B	Y46B	Y49B	Y4CB	Y4FB	Y52B	Y55B	+Jn	Feed axis selection +
Y40C	Y43C	Y46C	Y49C	Y4CC	Y4FC	Y52C	Y55C	-Jn	Feed axis selection -
Y40D	Y43D	Y46D	Y49D	Y4CD	Y4FD	Y52D	Y55D	MAEn	Manual/Automatic simultaneous valid
Y40E	Y43E	Y46E	Y49E	Y4CE	Y4FE	Y52E	Y55E	DTCH2n	Control axis detach 2
Y40F	Y43F	Y46F	Y49F	Y4CF	Y4FF	Y52F	Y55F		

1st axis	2nd axis	3rd axis	4th axis	5th axis	6th axis	7th axis	8th axis	abbrev.	Signal name
+017	+020	+023	+026	+029	+032	+035	+038	<- Sharing G	
Y410	Y440	Y470	Y4A0	Y4D0	Y500	Y530	Y560	ILCn	Current limit changeover
Y411	Y441	Y471	Y4A1	Y4D1	Y501	Y531	Y561	DORn	Droop release request
Y412	Y442	Y472	Y4A2	Y4D2	Y502	Y532	Y562	AZSn	Zero point initialization set mode
Y413	Y443	Y473	Y4A3	Y4D3	Y503	Y533	Y563	ZSTn	Zero point initialization set start
Y414	Y444	Y474	Y4A4	Y4D4	Y504	Y534	Y564		
Y415	Y445	Y475	Y4A5	Y4D5	Y505	Y535	Y565		
Y416	Y446	Y476	Y4A6	Y4D6	Y506	Y536	Y566	MSORn	Multi-step speed monitor request
Y417	Y447	Y477	Y4A7	Y4D7	Y507	Y537	Y567	MSOMI1n	Multi-step speed monitor mode input 1
Y418	Y448	Y478	Y4A8	Y4D8	Y508	Y538	Y568	MSOMI2n	Multi-step speed monitor mode input 2
Y419	Y449	Y479	Y4A9	Y4D9	Y509	Y539	Y569		
Y41A	Y44A	Y47A	Y4AA	Y4DA	Y50A	Y53A	Y56A	CNT0n	Counter zero
Y41B	Y44B	Y47B	Y4AB	Y4DB	Y50B	Y53B	Y56B	CHGPLCn	PLC axis switching
Y41C	Y44C	Y47C	Y4AC	Y4DC	Y50C	Y53C	Y56C	SOSRn	Stop observation request
Y41D	Y44D	Y47D	Y4AD	Y4DD	Y50D	Y53D	Y56D	BRTSST	Brake test start
Y41E	Y44E	Y47E	Y4AE	Y4DE	Y50E	Y53E	Y56E		
Y41F	Y44F	Y47F	Y4AF	Y4DF	Y50F	Y53F	Y56F		

1st axis	2nd axis	3rd axis	4th axis	5th axis	6th axis	7th axis	8th axis	abbrev.	Signal name
+018	+021	+024	+027	+030	+033	+036	+039	<- Sharing G	
Y420	Y450	Y480	Y4B0	Y4E0	Y510	Y540	Y570		
Y421	Y451	Y481	Y4B1	Y4E1	Y511	Y541	Y571		
Y422	Y452	Y482	Y4B2	Y4E2	Y512	Y542	Y572		
Y423	Y453	Y483	Y4B3	Y4E3	Y513	Y543	Y573		
Y424	Y454	Y484	Y4B4	Y4E4	Y514	Y544	Y574		
Y425	Y455	Y485	Y4B5	Y4E5	Y515	Y545	Y575		
Y426	Y456	Y486	Y4B6	Y4E6	Y516	Y546	Y576		
Y427	Y457	Y487	Y4B7	Y4E7	Y517	Y547	Y577		
Y428	Y458	Y488	Y4B8	Y4E8	Y518	Y548	Y578		
Y429	Y459	Y489	Y4B9	Y4E9	Y519	Y549	Y579		
Y42A	Y45A	Y48A	Y4BA	Y4EA	Y51A	Y54A	Y57A		
Y42B	Y45B	Y48B	Y4BB	Y4EB	Y51B	Y54B	Y57B		
Y42C	Y45C	Y48C	Y4BC	Y4EC	Y51C	Y54C	Y57C		
Y42D	Y45D	Y48D	Y4BD	Y4ED	Y51D	Y54D	Y57D		
Y42E	Y45E	Y48E	Y4BE	Y4EE	Y51E	Y54E	Y57E		
Y42F	Y45F	Y48F	Y4BF	Y4EF	Y51F	Y54F	Y57F		

9th axis	10th axis	11th axis	12th axis	13th axis	14th axis	15th axis	16th axis	abbrev.	Signal name
+040	+043	+046	+049	+052	+055	+058	+061	<- Sharing G	
Y580	Y5B0	Y5E0	Y610	Y640	Y670	Y6A0	Y6D0	DTCHn	Control axis detach
Y581	Y5B1	Y5E1	Y611	Y641	Y671	Y6A1	Y6D1	*SVFn	Servo OFF
Y582	Y5B2	Y5E2	Y612	Y642	Y672	Y6A2	Y6D2	MIn	Mirror image
Y583	Y5B3	Y5E3	Y613	Y643	Y673	Y6A3	Y6D3	*+EDTn	External deceleration +
Y584	Y5B4	Y5E4	Y614	Y644	Y674	Y6A4	Y6D4	*-EDTn	External deceleration -
Y585	Y5B5	Y5E5	Y615	Y645	Y675	Y6A5	Y6D5	*+AITn	Automatic interlock +
Y586	Y5B6	Y5E6	Y616	Y646	Y676	Y6A6	Y6D6	*-AITn	Automatic interlock -
Y587	Y5B7	Y5E7	Y617	Y647	Y677	Y6A7	Y6D7	*+MITn	Manual interlock +
Y588	Y5B8	Y5E8	Y618	Y648	Y678	Y6A8	Y6D8	*-MITn	Manual interlock -
Y589	Y5B9	Y5E9	Y619	Y649	Y679	Y6A9	Y6D9	AMLKn	Automatic machine lock
Y58A	Y5BA	Y5EA	Y61A	Y64A	Y67A	Y6AA	Y6DA	MMLKn	Manual machine lock
Y58B	Y5BB	Y5EB	Y61B	Y64B	Y67B	Y6AB	Y6DB	+Jn	Feed axis selection +
Y58C	Y5BC	Y5EC	Y61C	Y64C	Y67C	Y6AC	Y6DC	-Jn	Feed axis selection -
Y58D	Y5BD	Y5ED	Y61D	Y64D	Y67D	Y6AD	Y6DD	MAEn	Manual/Automatic simultaneous valid
Y58E	Y5BE	Y5EE	Y61E	Y64E	Y67E	Y6AE	Y6DE	DTCH2n	Control axis detach 2
Y58F	Y5BF	Y5EF	Y61F	Y64F	Y67F	Y6AF	Y6DF		

9th axis	10th axis	11th axis	12th axis	13th axis	14th axis	15th axis	16th axis	abbrev.	Signal name
+041	+044	+047	+050	+053	+056	+059	+062	<- Sharing G	
Y590	Y5C0	Y5F0	Y620	Y650	Y680	Y6B0	Y6E0	ILCn	Current limit changeover
Y591	Y5C1	Y5F1	Y621	Y651	Y681	Y6B1	Y6E1	DORn	Droop release request
Y592	Y5C2	Y5F2	Y622	Y652	Y682	Y6B2	Y6E2	AZSn	Zero point initialization set mode
Y593	Y5C3	Y5F3	Y623	Y653	Y683	Y6B3	Y6E3	ZSTn	Zero point initialization set start
Y594	Y5C4	Y5F4	Y624	Y654	Y684	Y6B4	Y6E4		
Y595	Y5C5	Y5F5	Y625	Y655	Y685	Y6B5	Y6E5	UCLPFn	Unclamp completion
Y596	Y5C6	Y5F6	Y626	Y656	Y686	Y6B6	Y6E6	MSORn	Multi-step speed monitor request
Y597	Y5C7	Y5F7	Y627	Y657	Y687	Y6B7	Y6E7	MSOMI1n	Multi-step speed monitor mode input 1
Y598	Y5C8	Y5F8	Y628	Y658	Y688	Y6B8	Y6E8	MSOMI2n	Multi-step speed monitor mode input 2
Y599	Y5C9	Y5F9	Y629	Y659	Y689	Y6B9	Y6E9		
Y59A	Y5CA	Y5FA	Y62A	Y65A	Y68A	Y6BA	Y6EA	CNT0n	Counter zero
Y59B	Y5CB	Y5FB	Y62B	Y65B	Y68B	Y6BB	Y6EB	CHGPLCn	PLC axis switching
Y59C	Y5CC	Y5FC	Y62C	Y65C	Y68C	Y6BC	Y6EC		
Y59D	Y5CD	Y5FD	Y62D	Y65D	Y68D	Y6BD	Y6ED		
Y59E	Y5CE	Y5FE	Y62E	Y65E	Y68E	Y6BE	Y6EE		
Y59F	Y5CF	Y5FF	Y62F	Y65F	Y68F	Y6BF	Y6EF		

9th axis	10th axis	11th axis	12th axis	13th axis	14th axis	15th axis	16th axis	abbrev.	Signal name
+042	+045	+048	+051	+054	+057	+060	+063	<- Sharing G	
Y5A0	Y5D0	Y600	Y630	Y660	Y690	Y6C0	Y6F0		
Y5A1	Y5D1	Y601	Y631	Y661	Y691	Y6C1	Y6F1		
Y5A2	Y5D2	Y602	Y632	Y662	Y692	Y6C2	Y6F2		
Y5A3	Y5D3	Y603	Y633	Y663	Y693	Y6C3	Y6F3		
Y5A4	Y5D4	Y604	Y634	Y664	Y694	Y6C4	Y6F4		
Y5A5	Y5D5	Y605	Y635	Y665	Y695	Y6C5	Y6F5		
Y5A6	Y5D6	Y606	Y636	Y666	Y696	Y6C6	Y6F6		
Y5A7	Y5D7	Y607	Y637	Y667	Y697	Y6C7	Y6F7		
Y5A8	Y5D8	Y608	Y638	Y668	Y698	Y6C8	Y6F8		
Y5A9	Y5D9	Y609	Y639	Y669	Y699	Y6C9	Y6F9		
Y5AA	Y5DA	Y60A	Y63A	Y66A	Y69A	Y6CA	Y6FA		
Y5AB	Y5DB	Y60B	Y63B	Y66B	Y69B	Y6CB	Y6FB		
Y5AC	Y5DC	Y60C	Y63C	Y66C	Y69C	Y6CC	Y6FC		
Y5AD	Y5DD	Y60D	Y63D	Y66D	Y69D	Y6CD	Y6FD		
Y5AE	Y5DE	Y60E	Y63E	Y66E	Y69E	Y6CE	Y6FE		
Y5AF	Y5DF	Y60F	Y63F	Y66F	Y69F	Y6CF	Y6FF		

3.3 Part System Command

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+064	+078	+092	+106	+120	+134	+148	<- Sharing G	
Y700	Y7E0	Y8C0	Y9A0	YA80	YB60	YC40	Jn	Jog mode
Y701	Y7E1	Y8C1	Y9A1	YA81	YB61	YC41	Hn	Handle mode
Y702	Y7E2	Y8C2	Y9A2	YA82	YB62	YC42	Sn	Incremental mode
Y703	Y7E3	Y8C3	Y9A3	YA83	YB63	YC43	PTPn	Manual arbitrary feed mode
Y704	Y7E4	Y8C4	Y9A4	YA84	YB64	YC44	ZRNn	Reference position return mode
Y705	Y7E5	Y8C5	Y9A5	YA85	YB65	YC45	ASTn	Automatic initialization mode
Y706	Y7E6	Y8C6	Y9A6	YA86	YB66	YC46		
Y707	Y7E7	Y8C7	Y9A7	YA87	YB67	YC47		
Y708	Y7E8	Y8C8	Y9A8	YA88	YB68	YC48	MEMn	Program operation mode (Memory mode)
Y709	Y7E9	Y8C9	Y9A9	YA89	YB69	YC49	FTPn	FTP mode
Y70A	Y7EA	Y8CA	Y9AA	YA8A	YB6A	YC4A	EDTn	EDIT mode
Y70B	Y7EB	Y8CB	Y9AB	YA8B	YB6B	YC4B	Dn	MDI mode
Y70C	Y7EC	Y8CC	Y9AC	YA8C	YB6C	YC4C		
Y70D	Y7ED	Y8CD	Y9AD	YA8D	YB6D	YC4D		
Y70E	Y7EE	Y8CE	Y9AE	YA8E	YB6E	YC4E		
Y70F	Y7EF	Y8CF	Y9AF	YA8F	YB6F	YC4F		

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+065	+079	+093	+107	+121	+135	+149	<- Sharing G	
Y710	Y7F0	Y8D0	Y9B0	YA90	YB70	YC50	STn	Automatic operation "start" command (Cycle start)
Y711	Y7F1	Y8D1	Y9B1	YA91	YB71	YC51	*SPn	Automatic operation "pause" command (Feed hold)
Y712	Y7F2	Y8D2	Y9B2	YA92	YB72	YC52	SBKn	Single block
Y713	Y7F3	Y8D3	Y9B3	YA93	YB73	YC53	*BSLn	Block start interlock
Y714	Y7F4	Y8D4	Y9B4	YA94	YB74	YC54	*CSLn	Cutting block start interlock
Y715	Y7F5	Y8D5	Y9B5	YA95	YB75	YC55	DRNn	Dry run
Y716	Y7F6	Y8D6	Y9B6	YA96	YB76	YC56		
Y717	Y7F7	Y8D7	Y9B7	YA97	YB77	YC57	ERDn	Error detect
Y718	Y7F8	Y8D8	Y9B8	YA98	YB78	YC58	NRST1n	NC reset 1
Y719	Y7F9	Y8D9	Y9B9	YA99	YB79	YC59	NRST2n	NC reset 2
Y71A	Y7FA	Y8DA	Y9BA	YA9A	YB7A	YC5A	RRWn	Reset & rewind
Y71B	Y7FB	Y8DB	Y9BB	YA9B	YB7B	YC5B	*CDZn	Chamfering
Y71C	Y7FC	Y8DC	Y9BC	YA9C	YB7C	YC5C	ARSTn	Automatic restart
Y71D	Y7FD	Y8DD	Y9BD	YA9D	YB7D	YC5D	EXTSSn	External search strobe
Y71E	Y7FE	Y8DE	Y9BE	YA9E	YB7E	YC5E	FIN1n	M function finish 1
Y71F	Y7FF	Y8DF	Y9BF	YA9F	YB7F	YC5F	FIN2n	M function finish 2

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+066	+080	+094	+108	+122	+136	+150	<- Sharing G	
Y720	Y800	Y8E0	Y9C0	YAA0	YB80	YC60	TLMn	Tool length measurement 1
Y721	Y801	Y8E1	Y9C1	YAA1	YB81	YC61	TLMSn	Tool length measurement 2
Y722	Y802	Y8E2	Y9C2	YAA2	YB82	YC62	SYCMn	Synchronization correction mode
Y723	Y803	Y8E3	Y9C3	YAA3	YB83	YC63	SRN	Program restart
Y724	Y804	Y8E4	Y9C4	YAA4	YB84	YC64		
Y725	Y805	Y8E5	Y9C5	YAA5	YB85	YC65	UITn	Macro interrupt
Y726	Y806	Y8E6	Y9C6	YAA6	YB86	YC66	RTn	Rapid traverse
Y727	Y807	Y8E7	Y9C7	YAA7	YB87	YC67		
Y728	Y808	Y8E8	Y9C8	YAA8	YB88	YC68	ABSn	Manual absolute
Y729	Y809	Y8E9	Y9C9	YAA9	YB89	YC69		
Y72A	Y80A	Y8EA	Y9CA	YAAA	YB8A	YC6A		
Y72B	Y80B	Y8EB	Y9CB	YAAB	YB8B	YC6B	CRQn	Recalculation request
Y72C	Y80C	Y8EC	Y9CC	YAAC	YB8C	YC6C	PDISPn	Program display during operation
Y72D	Y80D	Y8ED	Y9CD	YAAD	YB8D	YC6D	BDT1n	Optional block skip 1
Y72E	Y80E	Y8EE	Y9CE	YAAE	YB8E	YC6E		
Y72F	Y80F	Y8EF	Y9CF	YAAF	YB8F	YC6F		

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+067	+081	+095	+109	+123	+137	+151	<- Sharing G	
Y730	Y810	Y8F0	Y9D0	YAB0	YB90	YC70	ZSL1n	Reference position selection code 1
Y731	Y811	Y8F1	Y9D1	YAB1	YB91	YC71	ZSL2n	Reference position selection code 2
Y732	Y812	Y8F2	Y9D2	YAB2	YB92	YC72		
Y733	Y813	Y8F3	Y9D3	YAB3	YB93	YC73		
Y734	Y814	Y8F4	Y9D4	YAB4	YB94	YC74		
Y735	Y815	Y8F5	Y9D5	YAB5	YB95	YC75		
Y736	Y816	Y8F6	Y9D6	YAB6	YB96	YC76		
Y737	Y817	Y8F7	Y9D7	YAB7	YB97	YC77	Mn	Reference position selection method
Y738	Y818	Y8F8	Y9D8	YAB8	YB98	YC78	BDT2n	Optional block skip 2
Y739	Y819	Y8F9	Y9D9	YAB9	YB99	YC79	BDT3n	Optional block skip 3
Y73A	Y81A	Y8FA	Y9DA	YABA	YB9A	YC7A	BDT4n	Optional block skip 4
Y73B	Y81B	Y8FB	Y9DB	YABB	YB9B	YC7B	BDT5n	Optional block skip 5
Y73C	Y81C	Y8FC	Y9DC	YABC	YB9C	YC7C	BDT6n	Optional block skip 6
Y73D	Y81D	Y8FD	Y9DD	YABD	YB9D	YC7D	BDT7n	Optional block skip 7
Y73E	Y81E	Y8FE	Y9DE	YABE	YB9E	YC7E	BDT8n	Optional block skip 8
Y73F	Y81F	Y8FF	Y9DF	YABF	YB9F	YC7F	BDT9n	Optional block skip 9

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+068	+082	+096	+110	+124	+138	+152	<- Sharing G	
Y740	Y820	Y900	Y9E0	YAC0	YBA0	YC80	HS1In	1st handle axis selection code 1
Y741	Y821	Y901	Y9E1	YAC1	YBA1	YC81	HS1I2n	1st handle axis selection code 2
Y742	Y822	Y902	Y9E2	YAC2	YBA2	YC82	HS1I4n	1st handle axis selection code 4
Y743	Y823	Y903	Y9E3	YAC3	YBA3	YC83	HS1I8n	1st handle axis selection code 8
Y744	Y824	Y904	Y9E4	YAC4	YBA4	YC84	HS1I16n	1st handle axis selection code 16
Y745	Y825	Y905	Y9E5	YAC5	YBA5	YC85		
Y746	Y826	Y906	Y9E6	YAC6	YBA6	YC86		
Y747	Y827	Y907	Y9E7	YAC7	YBA7	YC87	HS1Sn	1st handle valid
Y748	Y828	Y908	Y9E8	YAC8	YBA8	YC88	HS2In	2nd handle axis selection code 1
Y749	Y829	Y909	Y9E9	YAC9	YBA9	YC89	HS2I2n	2nd handle axis selection code 2
Y74A	Y82A	Y90A	Y9EA	YACA	YBAA	YC8A	HS2I4n	2nd handle axis selection code 4
Y74B	Y82B	Y90B	Y9EB	YACB	YBAB	YC8B	HS2I8n	2nd handle axis selection code 8
Y74C	Y82C	Y90C	Y9EC	YACC	YBAC	YC8C	HS2I16n	2nd handle axis selection code 16
Y74D	Y82D	Y90D	Y9ED	YACD	YBAD	YC8D		
Y74E	Y82E	Y90E	Y9EE	YACE	YBAE	YC8E		
Y74F	Y82F	Y90F	Y9EF	YACF	YBAF	YC8F	HS2Sn	2nd handle valid

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+069	+083	+097	+111	+125	+139	+153	<- Sharing G	
Y750	Y830	Y910	Y9F0	YAD0	YBB0	YC90	HS31n	3rd handle axis selection code 1
Y751	Y831	Y911	Y9F1	YAD1	YBB1	YC91	HS32n	3rd handle axis selection code 2
Y752	Y832	Y912	Y9F2	YAD2	YBB2	YC92	HS34n	3rd handle axis selection code 4
Y753	Y833	Y913	Y9F3	YAD3	YBB3	YC93	HS38n	3rd handle axis selection code 8
Y754	Y834	Y914	Y9F4	YAD4	YBB4	YC94	HS316n	3rd handle axis selection code 16
Y755	Y835	Y915	Y9F5	YAD5	YBB5	YC95		
Y756	Y836	Y916	Y9F6	YAD6	YBB6	YC96		
Y757	Y837	Y917	Y9F7	YAD7	YBB7	YC97	HS3Sn	3rd handle valid
Y758	Y838	Y918	Y9F8	YAD8	YBB8	YC98	OVCn	Override cancel
Y759	Y839	Y919	Y9F9	YAD9	YBB9	YC99	OVSLn	Manual override method selection
Y75A	Y83A	Y91A	Y9FA	YADA	YBBA	YC9A	AFLn	Miscellaneous function lock
Y75B	Y83B	Y91B	Y9FB	YADB	YBBB	YC9B		
Y75C	Y83C	Y91C	Y9FC	YADC	YBBC	YC9C	TRVn	Tap retract
Y75D	Y83D	Y91D	Y9FD	YADD	YBBD	YC9D	RTNn	Reference position retract
Y75E	Y83E	Y91E	Y9FE	YADE	YBBE	YC9E		
Y75F	Y83F	Y91F	Y9FF	YADF	YBBF	YC9F	SPOFFMn	Spindle OFF mode

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+070	+084	+098	+112	+126	+140	+154	<- Sharing G	
Y760	Y840	Y920	YA00	YAE0	YBC0	YCA0	*FV11n	Cutting feedrate override code 1
Y761	Y841	Y921	YA01	YAE1	YBC1	YCA1	*FV12n	Cutting feedrate override code 2
Y762	Y842	Y922	YA02	YAE2	YBC2	YCA2	*FV14n	Cutting feedrate override code 4
Y763	Y843	Y923	YA03	YAE3	YBC3	YCA3	*FV18n	Cutting feedrate override code 8
Y764	Y844	Y924	YA04	YAE4	YBC4	YCA4	*FV116n	Cutting feedrate override code 16
Y765	Y845	Y925	YA05	YAE5	YBC5	YCA5		
Y766	Y846	Y926	YA06	YAE6	YBC6	YCA6	FV2En	2nd cutting feedrate override valid
Y767	Y847	Y927	YA07	YAE7	YBC7	YCA7	FVSn	Cutting feedrate override method selection
Y768	Y848	Y928	YA08	YAE8	YBC8	YCA8	ROV1n	Rapid traverse override code 1
Y769	Y849	Y929	YA09	YAE9	YBC9	YCA9	ROV2n	Rapid traverse override code 2
Y76A	Y84A	Y92A	YA0A	YAEA	YBCA	YCAA		
Y76B	Y84B	Y92B	YA0B	YAEB	YBCB	YCAB		
Y76C	Y84C	Y92C	YA0C	YAEC	YBCC	YCAC		
Y76D	Y84D	Y92D	YA0D	YAED	YBCD	YCAD		
Y76E	Y84E	Y92E	YA0E	YAEE	YBCE	YCAE		
Y76F	Y84F	Y92F	YA0F	YAEF	YBCF	YCAF	ROVSn	Rapid traverse override method selection

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+071	+085	+099	+113	+127	+141	+155	<- Sharing G	
Y770	Y850	Y930	YA10	YAF0	YBD0	YCB0	*JV1n	Manual feedrate code 1
Y771	Y851	Y931	YA11	YAF1	YBD1	YCB1	*JV2n	Manual feedrate code 2
Y772	Y852	Y932	YA12	YAF2	YBD2	YCB2	*JV4n	Manual feedrate code 4
Y773	Y853	Y933	YA13	YAF3	YBD3	YCB3	*JV8n	Manual feedrate code 8
Y774	Y854	Y934	YA14	YAF4	YBD4	YCB4	*JV16n	Manual feedrate code 16
Y775	Y855	Y935	YA15	YAF5	YBD5	YCB5		
Y776	Y856	Y936	YA16	YAF6	YBD6	YCB6		
Y777	Y857	Y937	YA17	YAF7	YBD7	YCB7	JVSn	Manual feedrate method selection
Y778	Y858	Y938	YA18	YAF8	YBD8	YCB8	PCF1n	Feedrate least increment code 1
Y779	Y859	Y939	YA19	YAF9	YBD9	YCB9	PCF2n	Feedrate least increment code 2
Y77A	Y85A	Y93A	YA1A	YAFA	YBDA	YCBA	JSYNn	Jog synchronous feed valid
Y77B	Y85B	Y93B	YA1B	YAFB	YBDB	YCBB	JHANn	Jog handle synchronous
Y77C	Y85C	Y93C	YA1C	YAFC	YBDC	YCBC		
Y77D	Y85D	Y93D	YA1D	YAFD	YBDD	YCBD	ILM1n	Current limit mode 1
Y77E	Y85E	Y93E	YA1E	YAFE	YBDE	YCBE	ILM2n	Current limit mode 2
Y77F	Y85F	Y93F	YA1F	YAFF	YBDF	YCBF		

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+072	+086	+100	+114	+128	+142	+156	<- Sharing G	
Y780	Y860	Y940	YA20	YB00	YBE0	YCC0	MP1n	Handle/incremental feed magnification code 1
Y781	Y861	Y941	YA21	YB01	YBE1	YCC1	MP2n	Handle/incremental feed magnification code 2
Y782	Y862	Y942	YA22	YB02	YBE2	YCC2	MP4n	Handle/incremental feed magnification code 4
Y783	Y863	Y943	YA23	YB03	YBE3	YCC3		
Y784	Y864	Y944	YA24	YB04	YBE4	YCC4		
Y785	Y865	Y945	YA25	YB05	YBE5	YCC5		
Y786	Y866	Y946	YA26	YB06	YBE6	YCC6	MPPn	Magnification valid for each handle
Y787	Y867	Y947	YA27	YB07	YBE7	YCC7	MPSn	Handle/incremental feed magnification method selection
Y788	Y868	Y948	YA28	YB08	YBE8	YCC8	TAL1n	Tool alarm 1/Tool skip 1
Y789	Y869	Y949	YA29	YB09	YBE9	YCC9	TAL2n	Tool alarm 2
Y78A	Y86A	Y94A	YA2A	YB0A	YBEA	YCCA	TCEFn	Usage data count valid
Y78B	Y86B	Y94B	YA2B	YB0B	YBEB	YCCB	TLF1n	Tool life management input
Y78C	Y86C	Y94C	YA2C	YB0C	YBEC	YCCC	TCRTn	Tool change reset
Y78D	Y86D	Y94D	YA2D	YB0D	YBED	YCCD		
Y78E	Y86E	Y94E	YA2E	YB0E	YBEE	YCCE		
Y78F	Y86F	Y94F	YA2F	YB0F	YBEF	YCCF		

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+073	+087	+101	+115	+129	+143	+157	<- Sharing G	
Y790	Y870	Y950	YA30	YB10	YBF0	YCD0	CX11n	Manual arbitrary feed 1st axis selection code 1
Y791	Y871	Y951	YA31	YB11	YBF1	YCD1	CX12n	Manual arbitrary feed 1st axis selection code 2
Y792	Y872	Y952	YA32	YB12	YBF2	YCD2	CX14n	Manual arbitrary feed 1st axis selection code 4
Y793	Y873	Y953	YA33	YB13	YBF3	YCD3	CX18n	Manual arbitrary feed 1st axis selection code 8
Y794	Y874	Y954	YA34	YB14	YBF4	YCD4	CX116n	Manual arbitrary feed 1st axis selection code 16
Y795	Y875	Y955	YA35	YB15	YBF5	YCD5		
Y796	Y876	Y956	YA36	YB16	YBF6	YCD6		
Y797	Y877	Y957	YA37	YB17	YBF7	YCD7	CX1Sn	Manual arbitrary feed 1st axis valid
Y798	Y878	Y958	YA38	YB18	YBF8	YCD8	CX21n	Manual arbitrary feed 2nd axis selection code 1
Y799	Y879	Y959	YA39	YB19	YBF9	YCD9	CX22n	Manual arbitrary feed 2nd axis selection code 2
Y79A	Y87A	Y95A	YA3A	YB1A	YBFA	YCDA	CX24n	Manual arbitrary feed 2nd axis selection code 4
Y79B	Y87B	Y95B	YA3B	YB1B	YBFB	YCDB	CX28n	Manual arbitrary feed 2nd axis selection code 8
Y79C	Y87C	Y95C	YA3C	YB1C	YBFC	YCDC	CX216n	Manual arbitrary feed 2nd axis selection code 16
Y79D	Y87D	Y95D	YA3D	YB1D	YBFD	YCDD		
Y79E	Y87E	Y95E	YA3E	YB1E	YBFE	YCDE		
Y79F	Y87F	Y95F	YA3F	YB1F	YBFF	YCDF	CX2Sn	Manual arbitrary feed 2nd axis valid

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+074	+088	+102	+116	+130	+144	+158	<- Sharing G	
Y7A0	Y880	Y960	YA40	YB20	YC00	YCE0	CX31n	Manual arbitrary feed 3rd axis selection code 1
Y7A1	Y881	Y961	YA41	YB21	YC01	YCE1	CX32n	Manual arbitrary feed 3rd axis selection code 2
Y7A2	Y882	Y962	YA42	YB22	YC02	YCE2	CX34n	Manual arbitrary feed 3rd axis selection code 4
Y7A3	Y883	Y963	YA43	YB23	YC03	YCE3	CX38n	Manual arbitrary feed 3rd axis selection code 8
Y7A4	Y884	Y964	YA44	YB24	YC04	YCE4	CX316n	Manual arbitrary feed 3rd axis selection code 16
Y7A5	Y885	Y965	YA45	YB25	YC05	YCE5		
Y7A6	Y886	Y966	YA46	YB26	YC06	YCE6		
Y7A7	Y887	Y967	YA47	YB27	YC07	YCE7	CX3Sn	Manual arbitrary feed 3rd axis valid
Y7A8	Y888	Y968	YA48	YB28	YC08	YCE8	CXS1n	Manual arbitrary feed smoothing off
Y7A9	Y889	Y969	YA49	YB29	YC09	YCE9	CXS2n	Manual arbitrary feed axis independent
Y7AA	Y88A	Y96A	YA4A	YB2A	YC0A	YCEA	CXS3n	Manual arbitrary feed EX.F/MODAL.F
Y7AB	Y88B	Y96B	YA4B	YB2B	YC0B	YCEB	CXS4n	Manual arbitrary feed G0/G1
Y7AC	Y88C	Y96C	YA4C	YB2C	YC0C	YCEC	CXS5n	Manual arbitrary feed MC/WK
Y7AD	Y88D	Y96D	YA4D	YB2D	YC0D	YCED	CXS6n	Manual arbitrary feed ABS/INC
Y7AE	Y88E	Y96E	YA4E	YB2E	YC0E	YCEE	CXS7n	Manual arbitrary feed stop
Y7AF	Y88F	Y96F	YA4F	YB2F	YC0F	YCEF	CXS8n	Manual arbitrary feed strobe

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+075	+089	+103	+117	+131	+145	+159	<- Sharing G	
Y7B0	Y890	Y970	YA50	YB30	YC10	YCF0	*ZRITn	2nd reference position return interlock
Y7B1	Y891	Y971	YA51	YB31	YC11	YCF1		
Y7B2	Y892	Y972	YA52	YB32	YC12	YCF2	RSSTn	Search & start
Y7B3	Y893	Y973	YA53	YB33	YC13	YCF3		
Y7B4	Y894	Y974	YA54	YB34	YC14	YCF4		
Y7B5	Y895	Y975	YA55	YB35	YC15	YCF5		
Y7B6	Y896	Y976	YA56	YB36	YC16	YCF6		Inclined axis control:no z axis compensation
Y7B7	Y897	Y977	YA57	YB37	YC17	YCF7		
Y7B8	Y898	Y978	YA58	YB38	YC18	YCF8	VAMODn	Hypothetical axis command mode
Y7B9	Y899	Y979	YA59	YB39	YC19	YCF9		Synchronous tapping command polarity reversal
Y7BA	Y89A	Y97A	YA5A	YB3A	YC1A	YCFA	CHPSn	Chopping
Y7BB	Y89B	Y97B	YA5B	YB3B	YC1B	YCFB		Chopping parameter valid
Y7BC	Y89C	Y97C	YA5C	YB3C	YC1C	YCFC		Compensation method selection
Y7BD	Y89D	Y97D	YA5D	YB3D	YC1D	YCFD		
Y7BE	Y89E	Y97E	YA5E	YB3E	YC1E	YCFE		Operation mode selection
Y7BF	Y89F	Y97F	YA5F	YB3F	YC1F	YCFF		Rapid traverse override valid

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+076	+090	+104	+118	+132	+146	+160	<- Sharing G	
Y7C0	Y8A0	Y980	YA60	YB40	YC20	Y000		1st spindle multiple-spindle synchronous tapping enabled
Y7C1	Y8A1	Y981	YA61	YB41	YC21	Y001		2nd spindle multiple-spindle synchronous tapping enabled
Y7C2	Y8A2	Y982	YA62	YB42	YC22	Y002		3rd spindle multiple-spindle synchronous tapping enabled
Y7C3	Y8A3	Y983	YA63	YB43	YC23	Y003		4th spindle multiple-spindle synchronous tapping enabled
Y7C4	Y8A4	Y984	YA64	YB44	YC24	Y004		5th spindle multiple-spindle synchronous tapping enabled
Y7C5	Y8A5	Y985	YA65	YB45	YC25	Y005		6th spindle multiple-spindle synchronous tapping enabled
Y7C6	Y8A6	Y986	YA66	YB46	YC26	Y006		7th spindle multiple-spindle synchronous tapping enabled
Y7C7	Y8A7	Y987	YA67	YB47	YC27	Y007		Multiple-spindle synchronous tapping enabled
Y7C8	Y8A8	Y988	YA68	YB48	YC28	Y008		
Y7C9	Y8A9	Y989	YA69	YB49	YC29	Y009		
Y7CA	Y8AA	Y98A	YA6A	YB4A	YC2A	Y00A		
Y7CB	Y8AB	Y98B	YA6B	YB4B	YC2B	Y00B		
Y7CC	Y8AC	Y98C	YA6C	YB4C	YC2C	Y00C		
Y7CD	Y8AD	Y98D	YA6D	YB4D	YC2D	Y00D		
Y7CE	Y8AE	Y98E	YA6E	YB4E	YC2E	Y00E		
Y7CF	Y8AF	Y98F	YA6F	YB4F	YC2F	Y00F		

$1	$2	$3	$4	$5	$6	$7	abbrev.	Signal name
+077	+091	+105	+119	+133	+147	+161	<- Sharing G	
Y7D0	Y8B0	Y990	YA70	YB50	YC30	YD10		
Y7D1	Y8B1	Y991	YA71	YB51	YC31	YD11		
Y7D2	Y8B2	Y992	YA72	YB52	YC32	YD12		
Y7D3	Y8B3	Y993	YA73	YB53	YC33	YD13		
Y7D4	Y8B4	Y994	YA74	YB54	YC34	YD14		
Y7D5	Y8B5	Y995	YA75	YB55	YC35	YD15		
Y7D6	Y8B6	Y996	YA76	YB56	YC36	YD16		
Y7D7	Y8B7	Y997	YA77	YB57	YC37	YD17		
Y7D8	Y8B8	Y998	YA78	YB58	YC38	YD18		
Y7D9	Y8B9	Y999	YA79	YB59	YC39	YD19		
Y7DA	Y8BA	Y99A	YA7A	YB5A	YC3A	YD1A		
Y7DB	Y8BB	Y99B	YA7B	YB5B	YC3B	YD1B		
Y7DC	Y8BC	Y99C	YA7C	YB5C	YC3C	YD1C		
Y7DD	Y8BD	Y99D	YA7D	YB5D	YC3D	YD1D		
Y7DE	Y8BE	Y99E	YA7E	YB5E	YC3E	YD1E		
Y7DF	Y8BF	Y99F	YA7F	YB5F	YC3F	YD1F		

3.4 Spindle Command

1st SP	2nd SP	3rd SP	4th SP	5th SP	6th SP	7th SP	abbrev.	Signal name
+162	+165	+168	+171	+174	+177	+180	<- Sharing G	
YD20	YD50	YD80	YDB0	YDE0	YE10	YE40		
YD21	YD51	YD81	YDB1	YDE1	YE11	YE41		
YD22	YD52	YD82	YDB2	YDE2	YE12	YE42		
YD23	YD53	YD83	YDB3	YDE3	YE13	YE43		
YD24	YD54	YD84	YDB4	YDE4	YE14	YE44		
YD25	YD55	YD85	YDB5	YDE5	YE15	YE45		
YD26	YD56	YD86	YDB6	YDE6	YE16	YE46	GFINn	Gear shift completion
YD27	YD57	YD87	YDB7	YDE7	YE17	YE47		
YD28	YD58	YD88	YDB8	YDE8	YE18	YE48	SP1n	Spindle override code 1
YD29	YD59	YD89	YDB9	YDE9	YE19	YE49	SP2n	Spindle override code 2
YD2A	YD5A	YD8A	YDBA	YDEA	YE1A	YE4A	SP4n	Spindle override code 4
YD2B	YD5B	YD8B	YDBB	YDEB	YE1B	YE4B		
YD2C	YD5C	YD8C	YDBC	YDEC	YE1C	YE4C		
YD2D	YD5D	YD8D	YDBD	YDED	YE1D	YE4D		
YD2E	YD5E	YD8E	YDBE	YDEE	YE1E	YE4E		
YD2F	YD5F	YD8F	YDBF	YDEF	YE1F	YE4F	SPSn	Spindle override method selection

1st SP	2nd SP	3rd SP	4th SP	5th SP	6th SP	7th SP	abbrev.	Signal name
+163	+166	+169	+172	+175	+178	+181	<- Sharing G	
YD30	YD60	YD90	YDC0	YDF0	YE20	YE50	GI1n	Spindle gear selection code 1
YD31	YD61	YD91	YDC1	YDF1	YE21	YE51	GI2n	Spindle gear selection code 2
YD32	YD62	YD92	YDC2	YDF2	YE22	YE52		
YD33	YD63	YD93	YDC3	YDF3	YE23	YE53		
YD34	YD64	YD94	YDC4	YDF4	YE24	YE54	SSTPn	Spindle stop
YD35	YD65	YD95	YDC5	YDF5	YE25	YE55	SSFTn	Spindle gear shift
YD36	YD66	YD96	YDC6	YDF6	YE26	YE56	SORCn	Spindle orientation
YD37	YD67	YD97	YDC7	YDF7	YE27	YE57		
YD38	YD68	YD98	YDC8	YDF8	YE28	YE58	SRNn	Spindle forward run start
YD39	YD69	YD99	YDC9	YDF9	YE29	YE59	SRIn	Spindle reverse run start
YD3A	YD6A	YD9A	YDCA	YDFA	YE2A	YE5A		
YD3B	YD6B	YD9B	YDCB	YDFB	YE2B	YE5B		
YD3C	YD6C	YD9C	YDCC	YDFC	YE2C	YE5C	WRNn	Spindle forward run index
YD3D	YD6D	YD9D	YDCD	YDFD	YE2D	YE5D	WRIn	Spindle reverse run index
YD3E	YD6E	YD9E	YDCE	YDFE	YE2E	YE5E	ORCn	Spindle orientation command
YD3F	YD6F	YD9F	YDCF	YDFF	YE2F	YE5F	LRSLn	L coil selection

1st SP	2nd SP	3rd SP	4th SP	5th SP	6th SP	7th SP	abbrev.	Signal name
+164	+167	+170	+173	+176	+179	+182	<- Sharing G	
YD40	YD70	YDA0	YDD0	YE00	YE30	YE60		
YD41	YD71	YDA1	YDD1	YE01	YE31	YE61		
YD42	YD72	YDA2	YDD2	YE02	YE32	YE62		
YD43	YD73	YDA3	YDD3	YE03	YE33	YE63		
YD44	YD74	YDA4	YDD4	YE04	YE34	YE64		
YD45	YD75	YDA5	YDD5	YE05	YE35	YE65	TL1n	Spindle torque limit 1
YD46	YD76	YDA6	YDD6	YE06	YE36	YE66	TL2n	Spindle torque limit 2
YD47	YD77	YDA7	YDD7	YE07	YE37	YE67	TL3n	Spindle torque limit 3
YD48	YD78	YDA8	YDD8	YE08	YE38	YE68		
YD49	YD79	YDA9	YDD9	YE09	YE39	YE69	SMSORn	Spindle multi-step monitor request
YD4A	YD7A	YDAA	YDDA	YE0A	YE3A	YE6A	SMSOMI1n	Spindle multi-step speed monitor mode input 1
YD4B	YD7B	YDAB	YDDB	YE0B	YE3B	YE6B	SMSOMI2n	Spindle multi-step speed monitor mode input 2
YD4C	YD7C	YDAC	YDDC	YE0C	YE3C	YE6C		
YD4D	YD7D	YDAD	YDDD	YE0D	YE3D	YE6D	SSOSRn	Spindle stop observation request
YD4E	YD7E	YDAE	YDDE	YE0E	YE3E	YE6E		
YD4F	YD7F	YDAF	YDDF	YE0F	YE3F	YE6F	ESSCn	External axis speed clamp

4. Data Type Output Signals (PLC->CNC)

4.1 System Command

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
+200	R2300			+210	R2310		PLC axis droop release invalid axis
+201	R2301			+211	R2311		
+202	R2302			+212	R2312		KEYOUT
+203	R2303			+213	R2313		
+204	R2304			+214	R2314		
+205	R2305			+215	R2315		
+206	R2306			+216	R2316		
+207	R2307			+217	R2317		Displayed part system switch
+208	R2308			+218	R2318		
+209	R2309	SMOD	Speed monitor mode	+219	R2319		

Common		abbrev.	Signal name	Common		abbrev.	Signal name
Sharing G	Internal			Sharing G	Internal		
+220	R2320			+230	R2330		User macro input #1035 (PLC -> Controller)
+221	R2321			+231	R2331		
+222	R2322			+232	R2332		PLC version code
+223	R2323			+233	R2333		
+224	R2324		User macro input #1032 (PLC -> Controller)	+234	R2334		
+225	R2325			+235	R2335		
+226	R2326		User macro input #1033 (PLC -> Controller)	+236	R2336		
+227	R2327			+237	R2337		
+228	R2328		User macro input #1034 (PLC -> Controller)	+238	R2338		
+229	R2329			+239	R2339		

Common		abbrev.	Signal name
Sharing G	Internal		
+240	R2340		1st axis index
+241	R2341		2nd axis index
+242	R2342		3rd axis index
+243	R2343		4th axis index
+244	R2344		5th axis index
+245	R2345		6th axis index
+246	R2346		7th axis index
+247	R2347		8th axis index
+248	R2348		9th axis index
+249	R2349		10th axis index

Common		abbrev.	Signal name
Sharing G	Internal		
+250	R2350		11th axis index
+251	R2351		12th axis index
+252	R2352		13th axis index
+253	R2353		14th axis index
+254	R2354		15th axis index
+255	R2355		16th axis index
+256	R2356		
+257	R2357		Spindle synchronization Basic spindle selection
+258	R2358		Spindle synchronization Synchronous spindle selection
+259	R2359		Spindle synchronization Phase shift amount

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+260	R2360		PLC version code (method 2)		+270	R2370		
+261	R2361				+271	R2371		
+262	R2362				+272	R2372		
+263	R2363				+273	R2373		
+264	R2364				+274	R2374		
+265	R2365				+275	R2375		
+266	R2366				+276	R2376		
+267	R2367				+277	R2377		
+268	R2368				+278	R2378		
+269	R2369				+279	R2379		

Common		abbrev.	Signal name		Common		abbrev.	Signal name
Sharing G	Internal				Sharing G	Internal		
+280	R2380		APLC output data 1		+290	R2390		GOT window Data changeover request
+281	R2381		APLC output data 2		+291	R2391		
+282	R2382		APLC output data 3		+292	R2392		
+283	R2383		APLC output data 4		+293	R2393		
+284	R2384		APLC output data 5		+294	R2394		
+285	R2385		APLC output data 6		+295	R2395		
+286	R2386		APLC output data 7		+296	R2396		
+287	R2387		APLC output data 8		+297	R2397		
+288	R2388		APLC output data 9		+298	R2398		
+289	R2389		APLC output data 10		+299	R2399		

4.2 Part System Command

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+300	R2400	+400	R2500	+500	R2600	+600	R2700	+700	R2800	+800	R2900	+900	R3000		1st cutting feedrate override
+301	R2401	+401	R2501	+501	R2601	+601	R2701	+701	R2801	+801	R2901	+901	R3001		2nd cutting feedrate override
+302	R2402	+402	R2502	+502	R2602	+602	R2702	+702	R2802	+802	R2902	+902	R3002		Rapid traverse override
+303	R2403	+403	R2503	+503	R2603	+603	R2703	+703	R2803	+803	R2903	+903	R3003		
+304	R2404	+404	R2504	+504	R2604	+604	R2704	+704	R2804	+804	R2904	+904	R3004		Manual feedrate
+305	R2405	+405	R2505	+505	R2605	+605	R2705	+705	R2805	+805	R2905	+905	R3005		
+306	R2406	+406	R2506	+506	R2606	+606	R2706	+706	R2806	+806	R2906	+906	R3006		
+307	R2407	+407	R2507	+507	R2607	+607	R2707	+707	R2807	+807	R2907	+907	R3007		
+308	R2408	+408	R2508	+508	R2608	+608	R2708	+708	R2808	+808	R2908	+908	R3008		1st handle/incremental feed magnification
+309	R2409	+409	R2509	+509	R2609	+609	R2709	+709	R2809	+809	R2909	+909	R3009		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+310	R2410	+410	R2510	+510	R2610	+610	R2710	+710	R2810	+810	R2910	+910	R3010		2nd handle feed magnification
+311	R2411	+411	R2511	+511	R2611	+611	R2711	+711	R2811	+811	R2911	+911	R3011		
+312	R2412	+412	R2512	+512	R2612	+612	R2712	+712	R2812	+812	R2912	+912	R3012		3rd handle feed magnification
+313	R2413	+413	R2513	+513	R2613	+613	R2713	+713	R2813	+813	R2913	+913	R3013		
+314	R2414	+414	R2514	+514	R2614	+614	R2714	+714	R2814	+814	R2914	+914	R3014		Manual arbitrary feed 1st axis travel amount
+315	R2415	+415	R2515	+515	R2615	+615	R2715	+715	R2815	+815	R2915	+915	R3015		
+316	R2416	+416	R2516	+516	R2616	+616	R2716	+716	R2816	+816	R2916	+916	R3016		Manual arbitrary feed 2nd axis travel amount
+317	R2417	+417	R2517	+517	R2617	+617	R2717	+717	R2817	+817	R2917	+917	R3017		
+318	R2418	+418	R2518	+518	R2618	+618	R2718	+718	R2818	+818	R2918	+918	R3018		Manual arbitrary feed 3rd axis travel amount
+319	R2419	+419	R2519	+519	R2619	+619	R2719	+719	R2819	+819	R2919	+919	R3019		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+320	R2420	+420	R2520	+520	R2620	+620	R2720	+720	R2820	+820	R2920	+920	R3020		OT ignored
+321	R2421	+421	R2521	+521	R2621	+621	R2721	+721	R2821	+821	R2921	+921	R3021		Near-point dog ignored
+322	R2422	+422	R2522	+522	R2622	+622	R2722	+722	R2822	+822	R2922	+922	R3022		
+323	R2423	+423	R2523	+523	R2623	+623	R2723	+723	R2823	+823	R2923	+923	R3023		
+324	R2424	+424	R2524	+524	R2624	+624	R2724	+724	R2824	+824	R2924	+924	R3024		
+325	R2425	+425	R2525	+525	R2625	+625	R2725	+725	R2825	+825	R2925	+925	R3025		
+326	R2426	+426	R2526	+526	R2626	+626	R2726	+726	R2826	+826	R2926	+926	R3026		
+327	R2427	+427	R2527	+527	R2627	+627	R2727	+727	R2827	+827	R2927	+927	R3027		
+328	R2428	+428	R2528	+528	R2628	+628	R2728	+728	R2828	+828	R2928	+928	R3028		
+329	R2429	+429	R2529	+529	R2629	+629	R2729	+729	R2829	+829	R2929	+929	R3029		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+330	R2430	+430	R2530	+530	R2630	+630	R2730	+730	R2830	+830	R2930	+930	R3030		Tool group No. designation
+331	R2431	+431	R2531	+531	R2631	+631	R2731	+731	R2831	+831	R2931	+931	R3031		
+332	R2432	+432	R2532	+532	R2632	+632	R2732	+732	R2832	+832	R2932	+932	R3032		Synchronization control operation method
+333	R2433	+433	R2533	+533	R2633	+633	R2733	+733	R2833	+833	R2933	+933	R3033		Droop release invalid axis
+334	R2434	+434	R2534	+534	R2634	+634	R2734	+734	R2834	+834	R2934	+934	R3034		Each axis reference position selection
+335	R2435	+435	R2535	+535	R2635	+635	R2735	+735	R2835	+835	R2935	+935	R3035		
+336	R2436	+436	R2536	+536	R2636	+636	R2736	+736	R2836	+836	R2936	+936	R3036		
+337	R2437	+437	R2537	+537	R2637	+637	R2737	+737	R2837	+837	R2937	+937	R3037		
+338	R2438	+438	R2538	+538	R2638	+638	R2738	+738	R2838	+838	R2938	+938	R3038		Search & start program No.
+339	R2439	+439	R2539	+539	R2639	+639	R2739	+739	R2839	+839	R2939	+939	R3039		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+340	R2440	+440	R2540	+540	R2640	+640	R2740	+740	R2840	+840	R2940	+940	R3040		
+341	R2441	+441	R2541	+541	R2641	+641	R2741	+741	R2841	+841	R2941	+941	R3041		
+342	R2442	+442	R2542	+542	R2642	+642	R2742	+742	R2842	+842	R2942	+942	R3042		
+343	R2443	+443	R2543	+543	R2643	+643	R2743	+743	R2843	+843	R2943	+943	R3043		
+344	R2444	+444	R2544	+544	R2644	+644	R2744	+744	R2844	+844	R2944	+944	R3044		
+345	R2445	+445	R2545	+545	R2645	+645	R2745	+745	R2845	+845	R2945	+945	R3045		
+346	R2446	+446	R2546	+546	R2646	+646	R2746	+746	R2846	+846	R2946	+946	R3046		Workpiece coordinate offset measurement compensation No.
+347	R2447	+447	R2547	+547	R2647	+647	R2747	+747	R2847	+847	R2947	+947	R3047		
+348	R2448	+448	R2548	+548	R2648	+648	R2748	+748	R2848	+848	R2948	+948	R3048		Selected tool No.
+349	R2449	+449	R2549	+549	R2649	+649	R2749	+749	R2849	+849	R2949	+949	R3049		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+350	R2450	+450	R2550	+550	R2650	+650	R2750	+750	R2850	+850	R2950	+950	R3050		
+351	R2451	+451	R2551	+551	R2651	+651	R2751	+751	R2851	+851	R2951	+951	R3051		
+352	R2452	+452	R2552	+552	R2652	+652	R2752	+752	R2852	+852	R2952	+952	R3052		
+353	R2453	+453	R2553	+553	R2653	+653	R2753	+753	R2853	+853	R2953	+953	R3053		
+354	R2454	+454	R2554	+554	R2654	+654	R2754	+754	R2854	+854	R2954	+954	R3054		
+355	R2455	+455	R2555	+555	R2655	+655	R2755	+755	R2855	+855	R2955	+955	R3055		
+356	R2456	+456	R2556	+556	R2656	+656	R2756	+756	R2856	+856	R2956	+956	R3056		
+357	R2457	+457	R2557	+557	R2657	+657	R2757	+757	R2857	+857	R2957	+957	R3057		
+358	R2458	+458	R2558	+558	R2658	+658	R2758	+758	R2858	+858	R2958	+958	R3058		
+359	R2459	+459	R2559	+559	R2659	+659	R2759	+759	R2859	+859	R2959	+959	R3059		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+360	R2460	+460	R2560	+560	R2660	+660	R2760	+760	R2860	+860	R2960	+960	R3060		
+361	R2461	+461	R2561	+561	R2661	+661	R2761	+761	R2861	+861	R2961	+961	R3061		External search device No.
+362	R2462	+462	R2562	+562	R2662	+662	R2762	+762	R2862	+862	R2962	+962	R3062		External search program No.
+363	R2463	+463	R2563	+563	R2663	+663	R2763	+763	R2863	+863	R2963	+963	R3063		
+364	R2464	+464	R2564	+564	R2664	+664	R2764	+764	R2864	+864	R2964	+964	R3064		External search sequence No.
+365	R2465	+465	R2565	+565	R2665	+665	R2765	+765	R2865	+865	R2965	+965	R3065		
+366	R2466	+466	R2566	+566	R2666	+666	R2766	+766	R2866	+866	R2966	+966	R3066		External search block No.
+367	R2467	+467	R2567	+567	R2667	+667	R2767	+767	R2867	+867	R2967	+967	R3067		
+368	R2468	+468	R2568	+568	R2668	+668	R2768	+768	R2868	+868	R2968	+968	R3068		
+369	R2469	+469	R2569	+569	R2669	+669	R2769	+769	R2869	+869	R2969	+969	R3069		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+370	R2470	+470	R2570	+570	R2670	+670	R2770	+770	R2870	+870	R2970	+970	R3070		User Macro input #1032 (PLC -> Controller)
+371	R2471	+471	R2571	+571	R2671	+671	R2771	+771	R2871	+871	R2971	+971	R3071		
+372	R2472	+472	R2572	+572	R2672	+672	R2772	+772	R2872	+872	R2972	+972	R3072		User Macro input #1033 (PLC -> Controller)
+373	R2473	+473	R2573	+573	R2673	+673	R2773	+773	R2873	+873	R2973	+973	R3073		
+374	R2474	+474	R2574	+574	R2674	+674	R2774	+774	R2874	+874	R2974	+974	R3074		User Macro input #1034 (PLC -> Controller)
+375	R2475	+475	R2575	+575	R2675	+675	R2775	+775	R2875	+875	R2975	+975	R3075		
+376	R2476	+476	R2576	+576	R2676	+676	R2776	+776	R2876	+876	R2976	+976	R3076		User Macro input #1035 (PLC -> Controller)
+377	R2477	+477	R2577	+577	R2677	+677	R2777	+777	R2877	+877	R2977	+977	R3077		
+378	R2478	+478	R2578	+578	R2678	+678	R2778	+778	R2878	+878	R2978	+978	R3078		
+379	R2479	+479	R2579	+579	R2679	+679	R2779	+779	R2879	+879	R2979	+979	R3079		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+380	R2480	+480	R2580	+580	R2680	+680	R2780	+780	R2880	+880	R2980	+980	R3080	CHPOVn	Chopping override
+381	R2481	+481	R2581	+581	R2681	+681	R2781	+781	R2881	+881	R2981	+981	R3081		Chopping axis selection
+382	R2482	+482	R2582	+582	R2682	+682	R2782	+782	R2882	+882	R2982	+982	R3082		Upper dead point designation (L)
+383	R2483	+483	R2583	+583	R2683	+683	R2783	+783	R2883	+883	R2983	+983	R3083		Upper dead point designation (H)
+384	R2484	+484	R2584	+584	R2684	+684	R2784	+784	R2884	+884	R2984	+984	R3084		Lower dead point designation (L)
+385	R2485	+485	R2585	+585	R2685	+685	R2785	+785	R2885	+885	R2985	+985	R3085		Lower dead point designation (H)
+386	R2486	+486	R2586	+586	R2686	+686	R2786	+786	R2886	+886	R2986	+986	R3086		Number of cycles designation
+387	R2487	+487	R2587	+587	R2687	+687	R2787	+787	R2887	+887	R2987	+987	R3087		Data No.
+388	R2488	+488	R2588	+588	R2688	+688	R2788	+788	R2888	+888	R2988	+988	R3088		
+389	R2489	+489	R2589	+589	R2689	+689	R2789	+789	R2889	+889	R2989	+989	R3089		

$1		$2		$3		$4		$5		$6		$7		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+390	R2490	+490	R2590	+590	R2690	+690	R2790	+790	R2890	+890	R2990	+990	R3090		
+391	R2491	+491	R2591	+591	R2691	+691	R2791	+791	R2891	+891	R2991	+991	R3091		
+392	R2492	+492	R2592	+592	R2692	+692	R2792	+792	R2892	+892	R2992	+992	R3092		
+393	R2493	+493	R2593	+593	R2693	+693	R2793	+793	R2893	+893	R2993	+993	R3093		
+394	R2494	+494	R2594	+594	R2694	+694	R2794	+794	R2894	+894	R2994	+994	R3094		
+395	R2495	+495	R2595	+595	R2695	+695	R2795	+795	R2895	+895	R2995	+995	R3095		
+396	R2496	+496	R2596	+596	R2696	+696	R2796	+796	R2896	+896	R2996	+996	R3096		
+397	R2497	+497	R2597	+597	R2697	+697	R2797	+797	R2897	+897	R2997	+997	R3097		
+398	R2498	+498	R2598	+598	R2698	+698	R2798	+798	R2898	+898	R2998	+998	R3098		
+399	R2499	+499	R2599	+599	R2699	+699	R2799	+799	R2899	+899	R2999	+999	R3099		

4.3 Axis Command

1st axis		2nd axis		3rd axis		4th axis		5th axis		6th axis		7th axis		8th axis		abbrev.	Signal name
Shar-ing G	Inter-nal	Sha-ring G	Internal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal		
+1000	R3100	+1010	R3110	+1020	R3120	+1030	R3130	+1040	R3140	+1050	R3150	+1060	R3160	+1070	R3170		External machine coordinate system compensation data
+1001	R3101	+1011	R3111	+1021	R3121	+1031	R3131	+1041	R3141	+1051	R3151	+1061	R3161	+1071	R3171		
+1002	R3102	+1012	R3112	+1022	R3122	+1032	R3132	+1042	R3142	+1052	R3152	+1062	R3162	+1072	R3172		Thermal expansion offset compensation amount
+1003	R3103	+1013	R3113	+1023	R3123	+1033	R3133	+1043	R3143	+1053	R3153	+1063	R3163	+1073	R3173		Thermal expansion max. compensation amount
+1004	R3104	+1014	R3114	+1024	R3124	+1034	R3134	+1044	R3144	+1054	R3154	+1064	R3164	+1074	R3174		External deceleration speed selection
+1005	R3105	+1015	R3115	+1025	R3125	+1035	R3135	+1045	R3145	+1055	R3155	+1065	R3165	+1075	R3175		
+1006	R3106	+1016	R3116	+1026	R3126	+1036	R3136	+1046	R3146	+1056	R3156	+1066	R3166	+1076	R3176		
+1007	R3107	+1017	R3117	+1027	R3127	+1037	R3137	+1047	R3147	+1057	R3157	+1067	R3167	+1077	R3177		
+1008	R3108	+1018	R3118	+1028	R3128	+1038	R3138	+1048	R3148	+1058	R3158	+1068	R3168	+1078	R3178		
+1009	R3109	+1019	R3119	+1029	R3129	+1039	R3139	+1049	R3149	+1059	R3159	+1069	R3169	+1079	R3179		

9th axis		10th axis		11th axis		12th axis		13th axis		14th axis		15th axis		16th axis		abbrev.	Signal name
Shar-ing G	Inter-nal	Sha-ring G	Internal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal	Shar-ing G	Inter-nal		
+1080	R3180	+1090	R3190	+1100	R3200	+1110	R3210	+1120	R3220	+1130	R3230	+1140	R3240	+1150	R3250		External machine coordinate system compensation data
+1081	R3181	+1091	R3191	+1101	R3201	+1111	R3211	+1121	R3221	+1131	R3231	+1141	R3241	+1151	R3251		
+1082	R3182	+1092	R3192	+1102	R3202	+1112	R3212	+1122	R3222	+1132	R3232	+1142	R3242	+1152	R3252		Thermal expansion offset compensation amount
+1083	R3183	+1093	R3193	+1103	R3203	+1113	R3213	+1123	R3223	+1133	R3233	+1143	R3243	+1153	R3253		Thermal expansion max. compensation amount
+1084	R3184	+1094	R3194	+1104	R3204	+1114	R3214	+1124	R3224	+1134	R3234	+1144	R3244	+1154	R3254		External deceleration speed selection
+1085	R3185	+1095	R3195	+1105	R3205	+1115	R3215	+1125	R3225	+1135	R3235	+1145	R3245	+1155	R3255		
+1086	R3186	+1096	R3196	+1106	R3206	+1116	R3216	+1126	R3226	+1136	R3236	+1146	R3246	+1156	R3256		
+1087	R3187	+1097	R3197	+1107	R3207	+1117	R3217	+1127	R3227	+1137	R3237	+1147	R3247	+1157	R3257		
+1088	R3188	+1098	R3198	+1108	R3208	+1118	R3218	+1128	R3228	+1138	R3238	+1148	R3248	+1158	R3258		
+1089	R3189	+1099	R3199	+1109	R3209	+1119	R3219	+1129	R3229	+1139	R3239	+1149	R3249	+1159	R3259		

4.4 Spindle Command

1st SP		2nd SP		3rd SP		4th SP		5th SP		6th SP		7th SP		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+1160	R3900	+1190	R3930	+1220	R3960	+1250	R3990	+1280	R4020	+1310	R4050	+1340	R4080	SRPMOTn	Spindle command rotation speed output
+1161	R3901	+1191	R3931	+1221	R3961	+1251	R3991	+1281	R4021	+1311	R4051	+1341	R4081		
+1162	R3902	+1192	R3932	+1222	R3962	+1252	R3992	+1282	R4022	+1312	R4052	+1342	R4082		
+1163	R3903	+1193	R3933	+1223	R3963	+1253	R3993	+1283	R4023	+1313	R4053	+1343	R4083		
+1164	R3904	+1194	R3934	+1224	R3964	+1254	R3994	+1284	R4024	+1314	R4054	+1344	R4084		
+1165	R3905	+1195	R3935	+1225	R3965	+1255	R3995	+1285	R4025	+1315	R4055	+1345	R4085		
+1166	R3906	+1196	R3936	+1226	R3966	+1256	R3996	+1286	R4026	+1316	R4056	+1346	R4086		
+1167	R3907	+1197	R3937	+1227	R3967	+1257	R3997	+1287	R4027	+1317	R4057	+1347	R4087		
+1168	R3908	+1198	R3938	+1228	R3968	+1258	R3998	+1288	R4028	+1318	R4058	+1348	R4088		
+1169	R3909	+1199	R3939	+1229	R3969	+1259	R3999	+1289	R4029	+1319	R4059	+1349	R4089		

1st SP		2nd SP		3rd SP		4th SP		5th SP		6th SP		7th SP		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+1170	R3910	+1200	R3940	+1230	R3970	+1260	R4000	+1290	R4030	+1320	R4060	+1350	R4090		S command override
+1171	R3911	+1201	R3941	+1231	R3971	+1261	R4001	+1291	R4031	+1321	R4061	+1351	R4091		Multi-point orientation position data
+1172	R3912	+1202	R3942	+1232	R3972	+1262	R4002	+1292	R4032	+1322	R4062	+1352	R4092		
+1173	R3913	+1203	R3943	+1233	R3973	+1263	R4003	+1293	R4033	+1323	R4063	+1353	R4093		
+1174	R3914	+1204	R3944	+1234	R3974	+1264	R4004	+1294	R4034	+1324	R4064	+1354	R4094		
+1175	R3915	+1205	R3945	+1235	R3975	+1265	R4005	+1295	R4035	+1325	R4065	+1355	R4095		
+1176	R3916	+1206	R3946	+1236	R3976	+1266	R4006	+1296	R4036	+1326	R4066	+1356	R4096		
+1177	R3917	+1207	R3947	+1237	R3977	+1267	R4007	+1297	R4037	+1327	R4067	+1357	R4097		
+1178	R3918	+1208	R3948	+1238	R3978	+1268	R4008	+1298	R4038	+1328	R4068	+1358	R4098		
+1179	R3919	+1209	R3949	+1239	R3979	+1269	R4009	+1299	R4039	+1329	R4069	+1359	R4099		

1st SP		2nd SP		3rd SP		4th SP		5th SP		6th SP		7th SP		abbrev.	Signal name
Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal	Sharing G	Inter-nal		
+1180	R3920	+1210	R3950	+1240	R3980	+1270	R4010	+1300	R4040	+1330	R4070	+1360	R4100		
+1181	R3921	+1211	R3951	+1241	R3981	+1271	R4011	+1301	R4041	+1331	R4071	+1361	R4101		
+1182	R3922	+1212	R3952	+1242	R3982	+1272	R4012	+1302	R4042	+1332	R4072	+1362	R4102		
+1183	R3923	+1213	R3953	+1243	R3983	+1273	R4013	+1303	R4043	+1333	R4073	+1363	R4103		
+1184	R3924	+1214	R3954	+1244	R3984	+1274	R4014	+1304	R4044	+1334	R4074	+1364	R4104		
+1185	R3925	+1215	R3955	+1245	R3985	+1275	R4015	+1305	R4045	+1335	R4075	+1365	R4105		
+1186	R3926	+1216	R3956	+1246	R3986	+1276	R4016	+1306	R4046	+1336	R4076	+1366	R4106		
+1187	R3927	+1217	R3957	+1247	R3987	+1277	R4017	+1307	R4047	+1337	R4077	+1367	R4107		
+1188	R3928	+1218	R3958	+1248	R3988	+1278	R4018	+1308	R4048	+1338	R4078	+1368	R4108		
+1189	R3929	+1219	R3959	+1249	R3989	+1279	R4019	+1309	R4049	+1339	R4079	+1369	R4109		

5. Each Application

5.1 PLC Axis State

Sharing G	Internal	abbrev.	Signal details		Sharing G	Internal	abbrev.	Signal details	
11370	R1900		Status	1st PLC axis	11378	R1908		Status	2nd PLC axis
11371	R1901		Alarm details		11379	R1909		Alarm details	
11372	R1902		Machine position		11380	R1910		Machine position	
11373	R1903				11381	R1911			
11374	R1904		Remaining distance		11382	R1912		Remaining distance	
11375	R1905				11383	R1913			
11376	R1906		Status 2		11384	R1914		Status 2	
11377	R1907				11385	R1915			

Sharing G	Internal	abbrev.	Signal details		Sharing G	Internal	abbrev.	Signal details	
11386	R1916		Status	3rd PLC axis	11394	R1924		Status	4th PLC axis
11387	R1917		Alarm details		11395	R1925		Alarm details	
11388	R1918		Machine position		11396	R1926		Machine position	
11389	R1919				11397	R1927			
11390	R1920		Remaining distance		11398	R1928		Remaining distance	
11391	R1921				11399	R1929			
11392	R1922		Status 2		11400	R1930		Status 2	
11393	R1923				11401	R1931			

Sharing G	Internal	abbrev.	Signal details		Sharing G	Internal	abbrev.	Signal details	
11402	R1932		Status	5th PLC axis	11410	R1940		Status	6th PLC axis
11403	R1933		Alarm details		11411	R1941		Alarm details	
11404	R1934		Machine position		11412	R1942		Machine position	
11405	R1935				11413	R1943			
11406	R1936		Remaining distance		11414	R1944		Remaining distance	
11407	R1937				11415	R1945			
11408	R1938		Status 2		11416	R1946		Status 2	
11409	R1939				11417	R1947			

Sharing G	Internal	abbrev.	Signal details
11418	R1948		Status
11419	R1949		Alarm details
11420	R1950		Machine position
11421	R1951		
11422	R1952		Remaining distance
11423	R1953		
11424	R1954		Status 2
11425	R1955		

Signal details
7th PLC axis

Sharing G	Internal	Abbrev.	Signal details		Sharing G	Internal	Abbrev.	Signal details	
11426	R1956		Status	For buffering mode	11434	R1964		Status	For buffering mode
11427	R1957		Alarm details		11435	R1965		Alarm details	
11428	R1958		Mashine position	Data A	11436	R1966		Machine position	Data B
11429	R1959				11437	R1967			
11430	R1960		Remaining distance		11438	R1968		Remaining distance	
11431	R1961				11439	R1969			
11432	R1962				11440	R1970			
11433	R1963				11441	R1971			

Sharing G	Internal	Abbrev.	Signal details		Sharing G	Internal	Abbrev.	Signal details	
11442	R1972		Status	For buffering mode	12660	R1980		Status	8th PLC axis
11443	R1973		Alarm details		12661	R1981		Alarm detailis	
11444	R1974		Machine position	Data C	12662	R1982		Machine position	
11445	R1975				12663	R1983			
11446	R1976		Remaining distance		12664	R1984		Remaining distance	
11447	R1977				12665	R1985			
11448	R1978				12666	R1986		Status 2	
11449	R1979				12667	R1987			

5.2 PLC Axis Control

Sharing G	Internal	abbrev.	Signal details		Sharing G	Internal	abbrev.	Signal details	
+1370	R4200		Axis designation	1st PLC axis	+1378	R4208		Axis designation	2nd PLC axis
+1371	R4201		Operation mode		+1379	R4209		Operation mode	
+1372	R4202		Feedrate		+1380	R4210		Feedrate	
+1373	R4203				+1381	R4211			
+1374	R4204		Movement data		+1382	R4212		Movement data	
+1375	R4205				+1383	R4213			
+1376	R4206		Control signals		+1384	R4214		Control signals	
+1377	R4207		External deceleration speed selection/Multi-step speed monitor signal input		+1385	R4215		External deceleration speed selection/Multi-step speed monitor signal input	

Sharing G	Internal	abbrev.	Signal details		Sharing G	Internal	abbrev.	Signal details	
+1386	R4216		Axis designation	3rd PLC axis	+1394	R4224		Axis designation	4th PLC axis
+1387	R4217		Operation mode		+1395	R4225		Operation mode	
+1388	R4218		Feedrate		+1396	R4226		Feedrate	
+1389	R4219				+1397	R4227			
+1390	R4220		Movement data		+1398	R4228		Movement data	
+1391	R4221				+1399	R4229			
+1392	R4222		Control signals		+1400	R4230		Control signals	
+1393	R4223		External deceleration speed selection/Multi-step speed monitor signal input		+1401	R4231		External deceleration speed selection/Multi-step speed monitor signal input	

Sharing G	Internal	abbrev.	Signal details	
+1402	R4232		Axis designation	5th PLC axis
+1403	R4233		Operation mode	
+1404	R4234		Feedrate	
+1405	R4235			
+1406	R4236		Movement data	
+1407	R4237			
+1408	R4238		Control signals	
+1409	R4239		External deceleration speed selection/Multi-step speed monitor signal input	

Sharing G	Internal	abbrev.	Signal details	
+1410	R4240		Axis designation	6th PLC axis
+1411	R4241		Operation mode	
+1412	R4242		Feedrate	
+1413	R4243			
+1414	R4244		Movement data	
+1415	R4245			
+1416	R4246		Control signals	
+1417	R4247		External deceleration speed selection/Multi-step speed monitor signal input	

Sharing G	Internal	abbrev.	Signal details	
+1418	R4248		Axis designation	7th PLC axis
+1419	R4249		Operation mode	
+1420	R4250		Feedrate	
+1421	R4251			
+1422	R4252		Movement data	
+1423	R4253			
+1424	R4254		Control signals	
+1425	R4255		External deceleration speed selection/Multi-step speed monitor signal input	

Sharing G	Internal	abbrev.	Signal details	
+1426	R4256		Axis designation	1st PLC axis Data A
+1427	R4257		Operation mode	
+1428	R4258		Feedrate	
+1429	R4259			
+1430	R4260		Movement data	
+1431	R4261			
+1432	R4262		Control signals	
+1433	R4263		External deceleration speed selection signal	

Sharing G	Internal	abbrev.	Signal details	
+1434	R4264		Axis designation	1st PLC axis Data B
+1435	R4265		Operation mode	
+1436	R4266		Feedrate	
+1437	R4267			
+1438	R4268		Movement data	
+1439	R4269			
+1440	R4270		Control signals	
+1441	R4271		External deceleration speed selection signal	

Sharing G	Internal	abbrev.	Signal details	
+1442	R4272		Axis designation	1st PLC axis Data C
+1443	R4273		Operation mode	
+1444	R4274		Feedrate	
+1445	R4275			
+1446	R4276		Movement data	
+1447	R4277			
+1448	R4278		Control signals	
+1449	R4279		External deceleration speed selection signal	

Sharing G	Internal	abbrev.	Signal details	
+2660	R4280		Axis designation	8th PLC axis
+2661	R4281		Operation mode	
+2662	R4282		Feedrate	
+2663	R4283			
+2664	R4284		Movement data	
+2665	R4285			
+2666	R4286		Control signals	
+2667	R4287		External deceleration speed selection signal /Multi-step speed monitor input	

5.3 Window Result Information

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12270	R9000		Read result 1		12280	R9010		Read result 11	
12271	R9001		Read result 2		12281	R9011		Read result 12	
12272	R9002		Read result 3		12282	R9012		Read result 13	
12273	R9003		Read result 4		12283	R9013		Read result 14	
12274	R9004		Read result 5		12284	R9014		Read result 15	
12275	R9005		Read result 6		12285	R9015		Read result 16	
12276	R9006		Read result 7		12286	R9016		Read result 17	
12277	R9007		Read result 8		12287	R9017		Read result 18	
12278	R9008		Read result 9		12288	R9018		Read result 19	
12279	R9009		Read result 10		12289	R9019		Read result 20	

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12290	R9020		Write result 1		12300	R9030		Write result 11	
12291	R9021		Write result 2		12301	R9031		Write result 12	
12292	R9022		Write result 3		12302	R9032		Write result 13	
12293	R9023		Write result 4		12303	R9033		Write result 14	
12294	R9024		Write result 5		12304	R9034		Write result 15	
12295	R9025		Write result 6		12305	R9035		Write result 16	
12296	R9026		Write result 7		12306	R9036		Write result 17	
12297	R9027		Write result 8		12307	R9037		Write result 18	
12298	R9028		Write result 9		12308	R9038		Write result 19	
12299	R9029		Write result 10		12309	R9039		Write result 20	

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12310	R9040		Read window data 1	1st	12318	R9048		Read window data 2	1st
12311	R9041			Read data	12319	R9049			Read data
12312	R9042			2nd	12320	R9050			2nd
12313	R9043			Read data	12321	R9051			Read data
12314	R9044			3rd	12322	R9052			3rd
12315	R9045			Read data	12323	R9053			Read data
12316	R9046			4th	12324	R9054			4th
12317	R9047			Read data	12325	R9055			Read data

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12326	R9056		Read window data 3	1st	12334	R9064		Read window data 4	1st
12327	R9057			Read data	12335	R9065			Read data
12328	R9058			2nd	12336	R9066			2nd
12329	R9059			Read data	12337	R9067			Read data
12330	R9060			3rd	12338	R9068			3rd
12331	R9061			Read data	12339	R9069			Read data
12332	R9062			4th	12340	R9070			4th
12333	R9063			Read data	12341	R9071			Read data

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12342	R9072		Read window data 5	1st	12350	R9080		Read window data 6	1st
12343	R9073			Read data	12351	R9081			Read data
12344	R9074			2nd	12352	R9082			2nd
12345	R9075			Read data	12353	R9083			Read data
12346	R9076			3rd	12354	R9084			3rd
12347	R9077			Read data	12355	R9085			Read data
12348	R9078			4th	12356	R9086			4th
12349	R9079			Read data	12357	R9087			Read data

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12358	R9088		Read window data 7	1st	12366	R9096		Read window data 8	1st
12359	R9089			Read data	12367	R9097			Read data
12360	R9090			2nd	12368	R9098			2nd
12361	R9091			Read data	12369	R9099			Read data
12362	R9092			3rd	12370	R9100			3rd
12363	R9093			Read data	12371	R9101			Read data
12364	R9094			4th	12372	R9102			4th
12365	R9095			Read data	12373	R9103			Read data

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12374	R9104		Read window data 9	1st	12382	R9112		Read window data 10	1st
12375	R9105			Read data	12383	R9113			Read data
12376	R9106			2nd	12384	R9114			2nd
12377	R9107			Read data	12385	R9115			Read data
12378	R9108			3rd	12386	R9116			3rd
12379	R9109			Read data	12387	R9117			Read data
12380	R9110			4th	12388	R9118			4th
12381	R9111			Read data	12389	R9119			Read data

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12390	R9120		Read window data 11	1st	12398	R9128		Read window data 12	1st
12391	R9121			Read data	12399	R9129			Read data
12392	R9122			2nd	12400	R9130			2nd
12393	R9123			Read data	12401	R9131			Read data
12394	R9124			3rd	12402	R9132			3rd
12395	R9125			Read data	12403	R9133			Read data
12396	R9126			4th	12404	R9134			4th
12397	R9127			Read data	12405	R9135			Read data

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12406	R9136		Read window data 13	1st	12414	R9144		Read window data 14	1st
12407	R9137			Read data	12415	R9145			Read data
12408	R9138			2nd	12416	R9146			2nd
12409	R9139			Read data	12417	R9147			Read data
12410	R9140			3rd	12418	R9148			3rd
12411	R9141			Read data	12419	R9149			Read data
12412	R9142			4th	12420	R9150			4th
12413	R9143			Read data	12421	R9151			Read data

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12422	R9152		Read window data 15	1st	12430	R9160		Read window data 16	1st
12423	R9153			Read data	12431	R9161			Read data
12424	R9154			2nd	12432	R9162			2nd
12425	R9155			Read data	12433	R9163			Read data
12426	R9156			3rd	12434	R9164			3rd
12427	R9157			Read data	12435	R9165			Read data
12428	R9158			4th	12436	R9166			4th
12429	R9159			Read data	12437	R9167			Read data

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12438	R9168		Read window data 17	1st	12446	R9176		Read window data 18	1st
12439	R9169			Read data	12447	R9177			Read data
12440	R9170			2nd	12448	R9178			2nd
12441	R9171			Read data	12449	R9179			Read data
12442	R9172			3rd	12450	R9180			3rd
12443	R9173			Read data	12451	R9181			Read data
12444	R9174			4th	12452	R9182			4th
12445	R9175			Read data	12453	R9183			Read data

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
12454	R9184		Read window data 19	1st	12462	R9192		Read window data 20	1st
12455	R9185			Read data	12463	R9193			Read data
12456	R9186			2nd	12464	R9194			2nd
12457	R9187			Read data	12465	R9195			Read data
12458	R9188			3rd	12466	R9196			3rd
12459	R9189			Read data	12467	R9197			Read data
12460	R9190			4th	12468	R9198			4th
12461	R9191			Read data	12469	R9199			Read data

5.4 Window Command

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2100	R8500		Read control window 1	Section No.	+2108	R8508		Read control window 2	Section No.
+2101	R8501			Section sub-ID No.	+2109	R8509			Section sub-ID No.
+2102	R8502			Sub-section No.	+2110	R8510			Sub-section No.
+2103	R8503			Data No.	+2111	R8511			Data No.
+2104	R8504			Read method	+2112	R8512			Read method
+2105	R8505			Number to be read	+2113	R8513			Number to be read
+2106	R8506				+2114	R8514			
+2107	R8507			Control signal	+2115	R8515			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2116	R8516		Read control window 3	Section No.	+2124	R8524		Read control window 4	Section No.
+2117	R8517			Section sub-ID No.	+2125	R8525			Section sub-ID No.
+2118	R8518			Sub-section No.	+2126	R8526			Sub-section No.
+2119	R8519			Data No.	+2127	R8527			Data No.
+2120	R8520			Read method	+2128	R8528			Read method
+2121	R8521			Number to be read	+2129	R8529			Number to be read
+2122	R8522				+2130	R8530			
+2123	R8523			Control signal	+2131	R8531			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2132	R8532		Read control window 5	Section No.	+2140	R8540		Read control window 6	Section No.
+2133	R8533			Section sub-ID No.	+2141	R8541			Section sub-ID No.
+2134	R8534			Sub-section No.	+2142	R8542			Sub-section No.
+2135	R8535			Data No.	+2143	R8543			Data No.
+2136	R8536			Read method	+2144	R8544			Read method
+2137	R8537			Number to be read	+2145	R8545			Number to be read
+2138	R8538				+2146	R8546			
+2139	R8539			Control signal	+2147	R8547			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2148	R8548		Read control window 7	Section No.	+2156	R8556		Read control window 8	Section No.
+2149	R8549			Section sub-ID No.	+2157	R8557			Section sub-ID No.
+2150	R8550			Sub-section No.	+2158	R8558			Sub-section No.
+2151	R8551			Data No.	+2159	R8559			Data No.
+2152	R8552			Read method	+2160	R8560			Read method
+2153	R8553			Number to be read	+2161	R8561			Number to be read
+2154	R8554				+2162	R8562			
+2155	R8555			Control signal	+2163	R8563			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2164	R8564		Read control window 9	Section No.	+2172	R8572		Read control window 10	Section No.
+2165	R8565			Section sub-ID No.	+2173	R8573			Section sub-ID No.
+2166	R8566			Sub-section No.	+2174	R8574			Sub-section No.
+2167	R8567			Data No.	+2175	R8575			Data No.
+2168	R8568			Read method	+2176	R8576			Read method
+2169	R8569			Number to be read	+2177	R8577			Number to be read
+2170	R8570				+2178	R8578			
+2171	R8571			Control signal	+2179	R8579			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2180	R8580		Read control window 11	Section No.	+2188	R8588		Read control window 12	Section No.
+2181	R8581			Section sub-ID No.	+2189	R8589			Section sub-ID No.
+2182	R8582			Sub-section No.	+2190	R8590			Sub-section No.
+2183	R8583			Data No.	+2191	R8591			Data No.
+2184	R8584			Read method	+2192	R8592			Read method
+2185	R8585			Number to be read	+2193	R8593			Number to be read
+2186	R8586				+2194	R8594			
+2187	R8587			Control signal	+2195	R8595			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2196	R8596		Read control window 13	Section No.	+2204	R8604		Read control window 14	Section No.
+2197	R8597			Section sub-ID No.	+2205	R8605			Section sub-ID No.
+2198	R8598			Sub-section No.	+2206	R8606			Sub-section No.
+2199	R8599			Data No.	+2207	R8607			Data No.
+2200	R8600			Read method	+2208	R8608			Read method
+2201	R8601			Number to be read	+2209	R8609			Number to be read
+2202	R8602				+2210	R8610			
+2203	R8603			Control signal	+2211	R8611			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2212	R8612		Read control window 15	Section No.	+2220	R8620		Read control window 16	Section No.
+2213	R8613			Section sub-ID No.	+2221	R8621			Section sub-ID No.
+2214	R8614			Sub-section No.	+2222	R8622			Sub-section No.
+2215	R8615			Data No.	+2223	R8623			Data No.
+2216	R8616			Read method	+2224	R8624			Read method
+2217	R8617			Number to be read	+2225	R8625			Number to be read
+2218	R8618				+2226	R8626			
+2219	R8619			Control signal	+2227	R8627			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2228	R8628		Read control window 17	Section No.	+2236	R8636		Read control window 18	Section No.
+2229	R8629			Section sub-ID No.	+2237	R8637			Section sub-ID No.
+2230	R8630			Sub-section No.	+2238	R8638			Sub-section No.
+2231	R8631			Data No.	+2239	R8639			Data No.
+2232	R8632			Read method	+2240	R8640			Read method
+2233	R8633			Number to be read	+2241	R8641			Number to be read
+2234	R8634				+2242	R8642			
+2235	R8635			Control signal	+2243	R8643			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2244	R8644		Read control window 19	Section No.	+2252	R8652		Read control window 20	Section No.
+2245	R8645			Section sub-ID No.	+2253	R8653			Section sub-ID No.
+2246	R8646			Sub-section No.	+2254	R8654			Sub-section No.
+2247	R8647			Data No.	+2255	R8655			Data No.
+2248	R8648			Read method	+2256	R8656			Read method
+2249	R8649			Number to be read	+2257	R8657			Number to be read
+2250	R8650				+2258	R8658			
+2251	R8651			Control signal	+2259	R8659			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2260	R8660		Write data 1	1st Write data	+2268	R8668		Write control window 1	Section No.
+2261	R8661				+2269	R8669			Section sub-ID No.
+2262	R8662			2nd Write data	+2270	R8670			Sub-section No.
+2263	R8663				+2271	R8671			Data No.
+2264	R8664			3rd Write data	+2272	R8672			Write method
+2265	R8665				+2273	R8673			Number to be written
+2266	R8666			4th Write data	+2274	R8674			
+2267	R8667				+2275	R8675			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2276	R8676		Write data 2	1st Write data	+2284	R8684		Write control window 2	Section No.
+2277	R8677				+2285	R8685			Section sub-ID No.
+2278	R8678			2nd Write data	+2286	R8686			Sub-section No.
+2279	R8679				+2287	R8687			Data No.
+2280	R8680			3rd Write data	+2288	R8688			Write method
+2281	R8681				+2289	R8689			Number to be written
+2282	R8682			4th Write data	+2290	R8690			
+2283	R8683				+2291	R8691			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2292	R8692		Write data 3	1st Write data	+2300	R8700		Write control window 3	Section No.
+2293	R8693				+2301	R8701			Section sub-ID No.
+2294	R8694			2nd Write data	+2302	R8702			Sub-section No.
+2295	R8695				+2303	R8703			Data No.
+2296	R8696			3rd Write data	+2304	R8704			Write method
+2297	R8697				+2305	R8705			Number to be written
+2298	R8698			4th Write data	+2306	R8706			
+2299	R8699				+2307	R8707			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2308	R8708		Write data 4	1st Write data	+2316	R8716		Write control window 4	Section No.
+2309	R8709				+2317	R8717			Section sub-ID No.
+2310	R8710			2nd Write data	+2318	R8718			Sub-section No.
+2311	R8711				+2319	R8719			Data No.
+2312	R8712			3rd Write data	+2320	R8720			Write method
+2313	R8713				+2321	R8721			Number to be written
+2314	R8714			4th Write data	+2322	R8722			
+2315	R8715				+2323	R8723			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2324	R8724		Write data 5	1st Write data	+2332	R8732		Write control window 5	Section No.
+2325	R8725				+2333	R8733			Section sub-ID No.
+2326	R8726			2nd Write data	+2334	R8734			Sub-section No.
+2327	R8727				+2335	R8735			Data No.
+2328	R8728			3rd Write data	+2336	R8736			Write method
+2329	R8729				+2337	R8737			Number to be written
+2330	R8730			4th Write data	+2338	R8738			
+2331	R8731				+2339	R8739			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2340	R8740		Write data 6	1st Write data	+2348	R8748		Write control window 6	Section No.
+2341	R8741				+2349	R8749			Section sub-ID No.
+2342	R8742			2nd Write data	+2350	R8750			Sub-section No.
+2343	R8743				+2351	R8751			Data No.
+2344	R8744			3rd Write data	+2352	R8752			Write method
+2345	R8745				+2353	R8753			Number to be written
+2346	R8746			4th Write data	+2354	R8754			
+2347	R8747				+2355	R8755			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2356	R8756		Write data 7	1st Write data	+2364	R8764		Write control window 7	Section No.
+2357	R8757				+2365	R8765			Section sub-ID No.
+2358	R8758			2nd Write data	+2366	R8766			Sub-section No.
+2359	R8759				+2367	R8767			Data No.
+2360	R8760			3rd Write data	+2368	R8768			Write method
+2361	R8761				+2369	R8769			Number to be written
+2362	R8762			4th Write data	+2370	R8770			
+2363	R8763				+2371	R8771			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2372	R8772		Write data 8	1st Write data	+2380	R8780		Write control window 8	Section No.
+2373	R8773				+2381	R8781			Section sub-ID No.
+2374	R8774			2nd Write data	+2382	R8782			Sub-section No.
+2375	R8775				+2383	R8783			Data No.
+2376	R8776			3rd Write data	+2384	R8784			Write method
+2377	R8777				+2385	R8785			Number to be written
+2378	R8778			4th Write data	+2386	R8786			
+2379	R8779				+2387	R8787			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2388	R8788		Write data 9	1st Write data	+2396	R8796		Write control window 9	Section No.
+2389	R8789				+2397	R8797			Section sub-ID No.
+2390	R8790			2nd Write data	+2398	R8798			Sub-section No.
+2391	R8791				+2399	R8799			Data No.
+2392	R8792			3rd Write data	+2400	R8800			Write method
+2393	R8793				+2401	R8801			Number to be written
+2394	R8794			4th Write data	+2402	R8802			
+2395	R8795				+2403	R8803			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2404	R8804		Write data 10	1st Write data	+2412	R8812		Write control window 10	Section No.
+2405	R8805				+2413	R8813			Section sub-ID No.
+2406	R8806			2nd Write data	+2414	R8814			Sub-section No.
+2407	R8807				+2415	R8815			Data No.
+2408	R8808			3rd Write data	+2416	R8816			Write method
+2409	R8809				+2417	R8817			Number to be written
+2410	R8810			4th Write data	+2418	R8818			
+2411	R8811				+2419	R8819			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2420	R8820		Write data 11	1st Write data	+2428	R8828		Write control window 11	Section No.
+2421	R8821				+2429	R8829			Section sub-ID No.
+2422	R8822			2nd Write data	+2430	R8830			Sub-section No.
+2423	R8823				+2431	R8831			Data No.
+2424	R8824			3rd Write data	+2432	R8832			Write method
+2425	R8825				+2433	R8833			Number to be written
+2426	R8826			4th Write data	+2434	R8834			
+2427	R8827				+2435	R8835			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2436	R8836		Write data 12	1st Write data	+2444	R8844		Write control window 12	Section No.
+2437	R8837				+2445	R8845			Section sub-ID No.
+2438	R8838			2nd Write data	+2446	R8846			Sub-section No.
+2439	R8839				+2447	R8847			Data No.
+2440	R8840			3rd Write data	+2448	R8848			Write method
+2441	R8841				+2449	R8849			Number to be written
+2442	R8842			4th Write data	+2450	R8850			
+2443	R8843				+2451	R8851			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2452	R8852		Write data 13	1st Write data	+2460	R8860		Write control window 13	Section No.
+2453	R8853				+2461	R8861			Section sub-ID No.
+2454	R8854			2nd Write data	+2462	R8862			Sub-section No.
+2455	R8855				+2463	R8863			Data No.
+2456	R8856			3rd Write data	+2464	R8864			Write method
+2457	R8857				+2465	R8865			Number to be written
+2458	R8858			4th Write data	+2466	R8866			
+2459	R8859				+2467	R8867			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2468	R8868		Write data 14	1st Write data	+2476	R8876		Write control window 14	Section No.
+2469	R8869				+2477	R8877			Section sub-ID No.
+2470	R8870			2nd Write data	+2478	R8878			Sub-section No.
+2471	R8871				+2479	R8879			Data No.
+2472	R8872			3rd Write data	+2480	R8880			Write method
+2473	R8873				+2481	R8881			Number to be written
+2474	R8874			4th Write data	+2482	R8882			
+2475	R8875				+2483	R8883			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2484	R8884		Write data 15	1st Write data	+2492	R8892		Write control window 15	Section No.
+2485	R8885				+2493	R8893			Section sub-ID No.
+2486	R8886			2nd Write data	+2494	R8894			Sub-section No.
+2487	R8887				+2495	R8895			Data No.
+2488	R8888			3rd Write data	+2496	R8896			Write method
+2489	R8889				+2497	R8897			Number to be written
+2490	R8890			4th Write data	+2498	R8898			
+2491	R8891				+2499	R8899			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2500	R8900		Write data 16	1st Write data	+2508	R8908		Write control window 16	Section No.
+2501	R8901				+2509	R8909			Section sub-ID No.
+2502	R8902			2nd Write data	+2510	R8910			Sub-section No.
+2503	R8903				+2511	R8911			Data No.
+2504	R8904			3rd Write data	+2512	R8912			Write method
+2505	R8905				+2513	R8913			Number to be written
+2506	R8906			4th Write data	+2514	R8914			
+2507	R8907				+2515	R8915			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2516	R8916		Write data 17	1st Write data	+2524	R8924		Write control window 17	Section No.
+2517	R8917				+2525	R8925			Section sub-ID No.
+2518	R8918			2nd Write data	+2526	R8926			Sub-section No.
+2519	R8919				+2527	R8927			Data No.
+2520	R8920			3rd Write data	+2528	R8928			Write method
+2521	R8921				+2529	R8929			Number to be written
+2522	R8922			4th Write data	+2530	R8930			
+2523	R8923				+2531	R8931			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2532	R8932		Write data 18	1st Write data	+2540	R8940		Write control window 18	Section No.
+2533	R8933				+2541	R8941			Section sub-ID No.
+2534	R8934			2nd Write data	+2542	R8942			Sub-section No.
+2535	R8935				+2543	R8943			Data No.
+2536	R8936			3rd Write data	+2544	R8944			Write method
+2537	R8937				+2545	R8945			Number to be written
+2538	R8938			4th Write data	+2546	R8946			
+2539	R8939				+2547	R8947			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2548	R8948		Write data 19	1st Write data	+2556	R8956		Write control window 19	Section No.
+2549	R8949				+2557	R8957			Section sub-ID No.
+2550	R8950			2nd Write data	+2558	R8958			Sub-section No.
+2551	R8951				+2559	R8959			Data No.
+2552	R8952			3rd Write data	+2560	R8960			Write method
+2553	R8953				+2561	R8961			Number to be written
+2554	R8954			4th Write data	+2562	R8962			
+2555	R8955				+2563	R8963			Control signal

Sharing G	Internal	abbrev.	Signal name		Sharing G	Internal	abbrev.	Signal name	
+2564	R8964		Write data 20	1st Write data	+2572	R8972		Write control window 20	Section No.
+2565	R8965				+2573	R8973			Section sub-ID No.
+2566	R8966			2nd Write data	+2574	R8974			Sub-section No.
+2567	R8967				+2575	R8975			Data No.
+2568	R8968			3rd Write data	+2576	R8976			Write method
+2569	R8969				+2577	R8977			Number to be written
+2570	R8970			4th Write data	+2578	R8978			
+2571	R8971				+2579	R8979			Control signal

5.5 Data Registered to Magazine for M System

Magazine	No.1 magazine		No.2 magazine		No.3 magazine		Remarks
T4-digit/T8-digit specifications	T4-digit	T8-digit	T4-digit	T8-digit	T4-digit	T8-digit	(data type)
ATC control parameter	G11450	←	←	←	←	←	
	R4700	←	←	←	←	←	
Number of tool parameter	G11460	←	G11461	←	G11462	←	Binary
	R4710	←	R4711	←	R4712	←	
Pointer designation	G11465	←	G11466	←	G11467	←	Binary
	R4715	←	R4716	←	R4717	←	
Spindle tool	G11470	G11470 G11471	G11480	G11480 G11481	-	-	BCD
	R4720	R4720 R4721	R4730	R4730 R4731	-	-	
Standby 1 tool	G11471	G11472 G11473	G11481	G11482 G11483	-	-	BCD
	R4721	R4722 R4723	R4731	R4732 R4733	-	-	
Standby 2 tool	G11472	G11474 G11475	G11482	G11484 G11485	-	-	BCD
	R4722	R4724 R4725	R4732	R4734 R4735	-	-	
Standby 3 tool	G11473	G11476 G11477	G11483	G11486 G11487	-	-	BCD
	R4723	R4726 R4727	R4733	R4736 R4737	-	-	
Standby 4 tool	G11474	G11478 G11479	G11484	G11488 G11489	-	-	BCD
	R4724	R4728 R4729	R4734	R4738 R4739	-	-	
AUX data	G11498	←	←	←	←	←	Binary
	R4748	←	←	←	←	←	

Magazine		No.1 magazine		No.2 magazine		No.3 magazine		Remarks
T4-digit/T8-digit specifications		T4-digit	T8-digit	T4-digit	T8-digit	T4-digit	T8-digit	(data type)
Magazine tool data	MG1	G11500	G11500 G11501	G11740	G11740 G11741	G11980	G11980 G11981	BCD
		R4750	R4750 R4751	R4990	R4990 R4991	R5230	R5230 R5231	
	MG2	G11501	G11502 G11503	G11741	G11742 G11743	G11981	G11982 G11983	BCD
		R4751	R4752 R4753	R4991	R4992 R4993	R5231	R5232 R5233	
	MG3	G11502	G11504 G11505	G11742	G11744 G11745	G11982	G11984 G11985	BCD
		R4752	R4754 R4755	R4992	R4994 R4995	R5232	R5234 R5235	
	:	:	:	:	:	:	:	:
	MG79	G11578	G11656 G11657	G11818	G11896 G11897	G12058	G12136 G12137	BCD
		R4828	R4906 R4907	R5068	R5146 R5147	R5308	R5386 R5387	
	MG80	G11579	G11658 G11659	G11819	G11898 G11899	G12059	G12138 G12139	BCD
		R4829	R4908 R4909	R5069	R5148 R5149	R5309	R5388 R5389	
Magazine tool data (Aux. D)	DN01	G11660	←	G11900	←	G12140	←	BCD
		R4910	←	R5150	←	R5390	←	
	DN02	G11661	←	G11901	←	G12141	←	BCD
		R4911	←	R5151	←	R5391	←	
	DN03	G11662	←	G11902	←	G12142	←	BCD
		R4912	←	R5152	←	R5392	←	
	:	:	:	:	:	:	:	:
	DN79	G11738	←	G11978	←	G12218	←	BCD
		R4988	←	R5228	←	R5468	←	
	DN80	G11739	←	G11979	←	G12219	←	BCD
		R4989	←	R5229	←	R5469	←	

5.6 Tool Life Management (M System)

Sharing G	Internal	abbrev.	Signal name	Remarks
11450	R6720		T life mgmt Spindle tool No.	PLC -> CNC
11451	R6721			
11452	R6722		T life mgmt Standby tool No.	
11453	R6723			

Sharing G	Internal	abbrev.	Signal name	Remarks
12220	R6724		Spare tool: Group No.	CNC -> PLC
12221	R6725			
12222	R6726		Spare tool: Tool No.	
12223	R6727			
12224	R6728		Spare tool: Tool data flag/status	
12225	R6729		Spare tool: Auxiliary data	
12226	R6730		Spare tool: Life data	
12227	R6731		Spare tool: Usage data	
12228	R6732		Spare tool: Length compensation amount	
12229	R6733			
12230	R6734		Spare tool: Radius compensation amount	
12231	R6735			
12232	R6736			
12233	R6737			
12234	R6738			
12235	R6739			
12236	R6740			
12237	R6741			
12238	R6742			
12239	R6743			
12240	R6744			
12241	R6745			
12242	R6746			
12243	R6747			

Sharing G	Internal	abbrev.	Signal name		Remarks
12244	R6748		Active tool: Group No.	CNC -> PLC	
12245	R6749				
12246	R6750		Active tool: Tool No.		
12247	R6751				
12248	R6752		Active tool: Tool data flag/status		
12249	R6753		Active tool: Auxiliary data		
12250	R6754		Active tool: Life data		
12251	R6755		Active tool: Usage data		
12252	R6756		Active tool: Length compensation amount		
12253	R6757				
12254	R6758		Active tool: Radius compensation amount		
12255	R6759				
12256	R6760				
12257	R6761				
12258	R6762				
12259	R6763				
12260	R6764				
12261	R6765				
12262	R6766				
12263	R6767				
12264	R6768				
12265	R6769				
12266	R6770				
12267	R6771				

5.7 Safety Observing

CNC -> PLC				PLC -> CNC			
Device		abbrev.	Signal name	Device		abbrev.	Signal name
Shar-ing G	Inter-nal			Shar-ing G	Inter-nal		
12470	R2150	SU_NC1	CNC side dual signal Module 1(L)	+2580	R4450	SU_PC1	PLC side dual signal Module 1(L)
12471	R2151	SU_NC1	CNC side dual signal Module 1(H)	+2581	R4451	SU_PC1	PLC side dual signal Module 1(H)
12472	R2152	SU_NC2	CNC side dual signal Module 2(L)	+2582	R4452	SU_PC2	PLC side dual signal Module 2(L)
12473	R2153	SU_NC2	CNC side dual signal Module 2(H)	+2583	R4453	SU_PC2	PLC side dual signal Module 2(H)
12474	R2154	SU_NC3	CNC side dual signal Module 3(L)	+2584	R4454	SU_PC3	PLC side dual signal Module 3(L)
12475	R2155	SU_NC3	CNC side dual signal Module 3(H)	+2585	R4455	SU_PC3	PLC side dual signal Module 3(H)
12476	R2156			+2586	R4456		
12477	R2157			+2587	R4457		
12478	R2158			+2588	R4458		
12479	R2159			+2589	R4459		

CNC -> PLC				PLC -> CNC			
Device		abbrev.	Signal name	Device		abbrev.	Signal name
Shar-ing G	Inter-nal			Shar-ing G	Inter-nal		
12480	R2160	SU_NER1	CNC side dual signal error Module 1(L)	+2590	R4460	SU_PER1	PLC side dual signal error Module 1(L)
12481	R2161	SU_NER1	CNC side dual signal error Module 1(H)	+2591	R4461	SU_PER1	PLC side dual signal error Module 1(H)
12482	R2162	SU_NER2	CNC side dual signal error Module 2(L)	+2592	R4462	SU_PER2	PLC side dual signal error Module 2(L)
12483	R2163	SU_NER2	CNC side dual signal error Module 2(H)	+2593	R4463	SU_PER2	PLC side dual signal error Module 2(H)
12484	R2164	SU_NER3	CNC side dual signal error Module 3(L)	+2594	R4464	SU_PER3	PLC side dual signal error Module 3(L)
12485	R2165	SU_NER3	CNC side dual signal error Module 3(H)	+2595	R4465	SU_PER3	PLC side dual signal error Module 3(H)
12486	R2166			+2596	R4466		
12487	R2167			+2597	R4467		
12488	R2168			+2598	R4468		
12489	R2169			+2599	R4469		

CNC -> PLC			
Device		abbrev.	Signal name
Shar-ing G	Inter-nal		
12490	R2170	SU_NO1	CNC side dual signal output Module 1
12491	R2171	SU_NO2	CNC side dual signal output Module 2
12492	R2172	SU_NO3	CNC side dual signal output Module 3
12493	R2173		
12494	R2174	SU_NOER1	CNC side dual signal output error Module 1
12495	R2175	SU_NOER1	CNC side dual signal output error Module 2
12496	R2176	SU_NOER1	CNC side dual signal output error Module 3
12497	R2177		
12498	R2178		
12499	R2179	SU_NST2	CNC side dual signal compare status 2

PLC -> CNC			
Device		abbrev.	Signal name
Shar-ing G	Inter-nal		
+2600	R4470	SU_PO1	PLC side dual signal output Module 1
+2601	R4471	SU_PO2	PLC side dual signal output Module 2
+2602	R4472	SU_PO3	PLC side dual signal output Module 3
+2603	R4473		
+2604	R4474	SU_POER1	PLC side dual signal output error Module 1
+2605	R4475	SU_POER2	PLC side dual signal output error Module 2
+2606	R4476	SU_POER3	PLC side dual signal output error Module 3
+2607	R4477		
+2608	R4478		
+2609	R4479	SU_PST2	PLC side dual signal compare status 2

CNC -> PLC				PLC -> CNC			
Device		abbrev.	Signal name	Device		abbrev.	Signal name
Shar-ing G	Inter-nal			Shar-ing G	Inter-nal		
12500	R2180	SU_NLT	CNC side safety compare activity check information	+2610	R4480	SU_PLT	PLC side safety compare activity check information
12501	R2181	SU_NST	CNC side dual signal compare status	+2611	R4481	SU_PST	PLC side dual signal compare status
12502	R2182	SU_NGDV	CNC side head G No.	+2612	R4482	SU_NGDV	PLC side head G No.
12503	R2183	SU_NDLY	CNC side dual signal compare mismatch allowance time	+2613	R4483	SU_PDLY	PLC side dual signal compare mismatch allowance time
12504	R2184	SU_NDV1	CNC side dual signal head device No. 1	+2614	R4484	SU_PDV1	PLC side dual signal head device No. 1
12505	R2185	SU_NDV2	CNC side dual signal head device No. 2	+2615	R4485	SU_PDV2	PLC side dual signal head device No. 2
12506	R2186	SU_NDV3	CNC side dual signal head device No. 3	+2616	R4486	SU_PDV3	PLC side dual signal head device No. 3
12507	R2187			+2617	R4487		
12508	R2188	SU_NNUM	No. of dual signal modules on CNC side	+2618	R4488	SU_PNUM	No. of dual signal modules on PLC side
12509	R2189			+2619	R4489		

CNC -> PLC				PLC -> CNC			
Device		abbrev.	Signal name	Device		abbrev.	Signal name
Shar-ing G	Inter-nal			Shar-ing G	Inter-nal		
12510	R2190			+2620	R4490	SU_POP	PLC side safety operation status
12511	R2191			+2621	R4491		
12512	R2192			+2622	R4492		
12513	R2193			+2623	R4493		
12514	R2194			+2624	R4494		
12515	R2195			+2625	R4495		
12516	R2196			+2626	R4496		
12517	R2197			+2627	R4497		
12518	R2198			+2628	R4498		
12519	R2199			+2629	R4499		

5.8 PLC Constants

Device		abbrev.	Contents	Device		abbrev.	Contents
Sharing G	Internal			Sharing G	Internal		
12520	R4500		#6301(Low-order side)	12530	R4510		#6306(Low-order side)
12521	R4501		(High-order side)	12531	R4511		(High-order side)
12522	R4502		#6302(Low-order side)	12532	R4512		#6307(Low-order side)
12523	R4503		(High-order side)	12533	R4513		(High-order side)
12524	R4504		#6303(Low-order side)	12534	R4514		#6308(Low-order side)
12525	R4505		(High-order side)	12535	R4515		(High-order side)
12526	R4506		#6304(Low-order side)	12536	R4516		#6309(Low-order side)
12527	R4507		(High-order side)	12537	R4517		(High-order side)
12528	R4508		#6305(Low-order side)	12538	R4518		#6310(Low-order side)
12529	R4509		(High-order side)	12539	R4519		(High-order side)

Device		abbrev.	Contents	Device		abbrev.	Contents
Sharing G	Internal			Sharing G	Internal		
12540	R4520		#6311(Low-order side)	12550	R4530		#6316(Low-order side)
12541	R4521		(High-order side)	12551	R4531		(High-order side)
12542	R4522		#6312(Low-order side)	12552	R4532		#6317(Low-order side)
12543	R4523		(High-order side)	12553	R4533		(High-order side)
12544	R4524		#6313(Low-order side)	12554	R4534		#6318(Low-order side)
12545	R4525		(High-order side)	12555	R4535		(High-order side)
12546	R4526		#6314(Low-order side)	12556	R4536		#6319(Low-order side)
12547	R4527		(High-order side)	12557	R4537		(High-order side)
12548	R4528		#6315(Low-order side)	12558	R4538		#6320(Low-order side)
12549	R4529		(High-order side)	12559	R4539		(High-order side)

Device		abbrev.	Contents		Device		abbrev.	Contents
Sharing G	Internal				Sharing G	Internal		
12560	R4540		#6321(Low-order side)		12570	R4550		#6326(Low-order side)
12561	R4541		(High-order side)		12571	R4551		(High-order side)
12562	R4542		#6322(Low-order side)		12572	R4552		#6327(Low-order side)
12563	R4543		(High-order side)		12573	R4553		(High-order side)
12564	R4544		#6323(Low-order side)		12574	R4554		#6328(Low-order side)
12565	R4545		(High-order side)		12575	R4555		(High-order side)
12566	R4546		#6324(Low-order side)		12576	R4556		#6329(Low-order side)
12567	R4547		(High-order side)		12577	R4557		(High-order side)
12568	R4548		#6325(Low-order side)		12578	R4558		#6330(Low-order side)
12569	R4549		(High-order side)		12579	R4559		(High-order side)

Device		abbrev.	Contents		Device		abbrev.	Contents
Sharing G	Internal				Sharing G	Internal		
12580	R4560		#6331(Low-order side)		12590	R4570		#6336(Low-order side)
12581	R4561		(High-order side)		12591	R4571		(High-order side)
12582	R4562		#6332(Low-order side)		12592	R4572		#6337(Low-order side)
12583	R4563		(High-order side)		12593	R4573		(High-order side)
12584	R4564		#6333(Low-order side)		12594	R4574		#6338(Low-order side)
12585	R4565		(High-order side)		12595	R4575		(High-order side)
12586	R4566		#6334(Low-order side)		12596	R4576		#6339(Low-order side)
12587	R4567		(High-order side)		12597	R4577		(High-order side)
12588	R4568		#6335(Low-order side)		12598	R4578		#6340(Low-order side)
12589	R4569		(High-order side)		12599	R4579		(High-order side)

Device		abbrev.	Contents
Sharing G	Internal		
12600	R4580		#6341(Low-order side)
12601	R4581		(High-order side)
12602	R4582		#6342(Low-order side)
12603	R4583		(High-order side)
12604	R4584		#6343(Low-order side)
12605	R4585		(High-order side)
12606	R4586		#6344(Low-order side)
12607	R4587		(High-order side)
12608	R4588		#6345(Low-order side)
12609	R4589		(High-order side)

Device		abbrev.	Contents
Sharing G	Internal		
12610	R4590		#6346(Low-order side)
12611	R4591		(High-order side)
12612	R4592		#6347(Low-order side)
12613	R4593		(High-order side)
12614	R4594		#6348(Low-order side)
12615	R4595		(High-order side)

5.9 PLC Bit Selection

Device			abbrev.	Contents	Device			abbrev.	Contents
Sharing G	Internal				Sharing G	Internal			
12616	R4600	(High-order side)		#6401	12621	R4605	(High-order side)		#6411
		(Low-order side)		#6402			(Low-order side)		#6412
12617	R4601	(High-order side)		#6403	12622	R4606	(High-order side)		#6413
		(Low-order side)		#6404			(Low-order side)		#6414
12618	R4602	(High-order side)		#6405	12623	R4607	(High-order side)		#6415
		(Low-order side)		#6406			(Low-order side)		#6416
12619	R4603	(High-order side)		#6407	12624	R4608	(High-order side)		#6417
		(Low-order side)		#6408			(Low-order side)		#6418
12620	R4604	(High-order side)		#6409	1265	R4609	(High-order side)		#6419
		(Low-order side)		#6410			(Low-order side)		#6420

Device			abbrev.	Contents	Device			abbrev.	Contents
Sharing G	Internal				Sharing G	Internal			
12626	R4610	(High-order side)		#6421	12631	R4615	(High-order side)		#6431
		(Low-order side)		#6422			(Low-order side)		#6432
12627	R4611	(High-order side)		#6423	12632	R4616	(High-order side)		#6433
		(Low-order side)		#6424			(Low-order side)		#6434
12628	R4612	(High-order side)		#6425	12633	R4617	(High-order side)		#6435
		(Low-order side)		#6426			(Low-order side)		#6436
12629	R4613	(High-order side)		#6427	12634	R4618	(High-order side)		#6437
		(Low-order side)		#6428			(Low-order side)		#6438
12630	R4614	(High-order side)		#6429	12635	R4619	(High-order side)		#6439
		(Low-order side)		#6430			(Low-order side)		#6440

Device			abbrev.	Contents
Sharing G	Internal			
12636	R4620	(High-order side)		#6441
		(Low-order side)		#6442
12637	R4621	(High-order side)		#6443
		(Low-order side)		#6444
12638	R4622	(High-order side)		#6445
		(Low-order side)		#6446
12639	R4623	(High-order side)		#6447
		(Low-order side)		#6448

5.10 PLC Axis Indexing Interface

Operation command PLC CPU -> CNC CPU (R4300 to R4345)

PLC indexing axis								Abbrev.	Signal name
1st axis	2nd axis	3rd axis	4th axis	5th axis	6th axis	7th axis	8th axis		
G+2680	G+2686	G+2692	G+2698	G+2704	G+2710	G+2716	G+2722	AUXCM4	PLC axis indexing control command 4
R4300	R4306	R4312	R4318	R4324	R4330	R4336	R4342		
G+2681	G+2687	G+2693	G+2699	G+2705	G+2711	G+2717	G+2723	AUXCM3	PLC axis indexing control command 3
R4301	R4307	R4313	R4319	R4325	R4331	R4337	R4343		
G+2682	G+2688	G+2694	G+2700	G+2706	G+2712	G+2718	G+2724	AUXCM2	PLC axis indexing control command 2
R4302	R4308	R4314	R4320	R4326	R4332	R4338	R4344		
G+2683	G+2689	G+2695	G+2701	G+2707	G+2713	G+2719	G+2725	AUXCM1	PLC axis indexing control command 1
R4303	R4309	R4315	R4321	R4327	R4333	R4339	R4345		
G+2684	G+2690	G+2696	G+2702	G+2708	G+2714	G+2720	G+2726		PLC axis indexing control command position (L)
R4304	R4310	R4316	R4322	R4328	R4334	R4340	R4346		
G+2685	G+2691	G+2697	G+2703	G+2709	G+2715	G+2721	G+2727		PLC axis indexing control command position (H)
R4305	R4311	R4317	R4323	R4329	R4335	R4341	R4347		

Operation status signal CNC CPU -> PLC CPU (R2000 to R2045)

PLC indexing axis								Abbrev.	Signal name
1st axis	2nd axis	3rd axis	4th axis	5th axis	6th axis	7th axis	8th axis		
G12680	G12686	G12692	G12698	G12704	G12710	G12716	G12722	AUXST4	PLC axis indexing control status 4
R2000	R2006	R2012	R2018	R2024	R2030	R2036	R2042		
G12681	G12687	G12693	G12699	G12705	G12711	G12717	G12723	AUXST3	PLC axis indexing control status 3
R2001	R2007	R2013	R2019	R2025	R2031	R2037	R2043		
G12682	G12688	G12694	G12700	G12706	G12712	G12718	G12724	AUXST2	PLC axis indexing control status 2
R2002	R2008	R2014	R2020	R2026	R2032	R2038	R2044		
G12683	G12689	G12695	G12701	G12707	G12713	G12719	G12725	AUXST1	PLC axis indexing control status 1
R2003	R2009	R2015	R2021	R2027	R2033	R2039	R2045		
G12684	G12690	G12696	G12702	G12708	G12714	G12720	G12726		PLC axis indexing control machine position (L)
R2004	R2010	R2016	R2022	R2028	R2034	R2040	R2046		
G12685	G12691	G12697	G12703	G12709	G12715	G12721	G12727		PPLC axis indexing control machine position (H)
R2005	R2011	R2017	R2023	R2029	R2035	R2041	R2047		

6. Special Relay/Register Signals

6.1 Special Relay

Device	abbrev.	Signal name		Device	abbrev.	Signal name
SM0		Diagnosis error		SM10		
SM1		Self-diagnosis error		SM11		
SM2				SM12	CARRY	Carry flag
SM3				SM13		
SM4				SM14		
SM5				SM15		
SM6				SM16	THER	Temperature rise
SM7				SM17		
SM8				SM18		
SM9				SM19		

Device	abbrev.	Signal name		Device	abbrev.	Signal name
SM20				SM30		
SM21				SM31		
SM22				SM32	ON	Always ON
SM23	QSTOP	PLC STOP		SM33	OFF	Always OFF
SM24				SM34	BSCN	Only 1 scan ON after RUN
SM25				SM35	ASCN	Only 1 scan OFF after RUN
SM26				SM36	01CLK	0.1-second clock
SM27				SM37	02CLK	0.2-second clock
SM28				SM38	1CLK	1-second clock
SM29				SM39	2CLK	2-second clock

Device	abbrev.	Signal name		Device	abbrev.	Signal name
SM40	2NCLK	2n-second clock		SM50		**(APLC data protect avoidance mode)**
SM41				SM51		Battery low latch
SM42				SM52		Battery low
SM43				SM53		AC/DC DOWN detection
SM44				SM54		
SM45				SM55		
SM46				SM56		Calculation error
SM47				SM57		
SM48				SM58		Battery low warning latch
SM49				SM59		Battery low warning

Device	abbrev.	Signal name		Device	abbrev.	Signal name
SM60				SM70		(APLC data protect avoidance mode)
SM61				SM71		
SM62				SM72		
SM63				SM73		
SM64	DSPRQ	Tool registration and Life screen display request		SM74		
SM65	LSTIN	Life management data setting prohibited		SM75		
SM66				SM76		
SM67				SM77		
SM68				SM78		
SM69		(Data protect avoidance mode)		SM79		

Device	abbrev.	Signal name		Device	abbrev.	Signal name
SM80				SM90		
SM81				SM91		
SM82		Model judgment code (for GOT)		SM92		
SM83		Model judgment code (for GOT)		SM93		
SM84		Version information (for GOT)		SM94		
SM85				SM95		
SM86				SM96		
SM87				SM97		
SM88				SM98		
SM89				SM99		

Device	abbrev.	Signal name		Device	abbrev.	Signal name
SM100				SM110		
SM101				SM111		
SM102				SM112		CPU No. 1 reset flag
SM103				SM113		CPU No. 2 reset flag
SM104				SM114		CPU No. 3 reset flag
SM105				SM115		CPU No. 4 reset flag
SM106				SM116		CPU No. 1 error flag
SM107				SM117		CPU No. 2 error flag
SM108				SM118		CPU No. 3 error flag
SM109				SM119		CPU No. 4 error flag

Device	abbrev.	Signal name
SM120		Cyclic transmission receive error detection flag
SM121		Cyclic transmission receive error detection counter valid flag
SM122		
SM123		
SM124		
SM125		
SM126		
SM127		

Device	abbrev.	Signal name
SM240		CPU No. 1 reset flag (same as SM112)
SM241		CPU No. 2 reset flag (same as SM113)
SM242		CPU No. 3 reset flag (same as SM114)
SM243		CPU No. 4 reset flag (same as SM115)
SM244		CPU No. 1 error flag (same as SM116)
SM245		CPU No. 2 error flag (same as SM117)
SM246		CPU No. 3 error flag (same as SM118)
SM247		CPU No. 4 error flag (same as SM119)

Device	abbrev.	Signal name
SM412		1-second clock (same as SM38)

6.2 Special Register

Device	abbrev.	Signal name	Device	abbrev.	Signal name
SD0		Diagnosis error	SD10		Error common information (continuation)
SD1		Diagnosis error occurrence time Year/Month	SD11		
SD2		Diagnosis error occurrence time Date/Hour	SD12		
SD3		Diagnosis error occurrence time Minute/Second	SD13		
SD4		Error information class	SD14		
SD5		Error common information	SD15		
SD6			SD16		Error individual information
SD7			SD17		
SD8			SD18		
SD9			SD19		

Device	abbrev.	Signal name	Device	abbrev.	Signal name
SD20		Error individual information (continuation)	SD30		Writing translation error step No.
SD21			SD31		Writing translation error No.
SD22			SD32		
SD23			SD33		
SD24			SD34		1-second counter
SD25			SD35	SCAN	Scan counter
SD26			SD36		
SD27			SD37	SCTCR	Current scan time
SD28			SD38	SCTMI	Minimum scan time
SD29			SD39	SCTMX	Maximum scan time

Device	abbrev.	Signal name		Device	abbrev.	Signal name
SD40		2n-second clock set		SD50		
SD41				SD51		Battery low latch
SD42				SD52		Battery low
SD43				SD53		AC/DC DOWN detection
SD44				SD54		
SD45				SD55		
SD46				SD56		
SD47				SD57		
SD48				SD58		
SD49				SD59		

Device	abbrev.	Signal name		Device	abbrev.	Signal name
SD60				SD70		Cyclic transmission receive error detection counter for CPU No.3
SD61				SD71		Cyclic transmission receive error detection counter for CPU No.4
SD62		Clock data Year/Month		SD72		
SD63		Clock data Date/Hour		SD73		
SD64		Clock data Minute/Second		SD74		
SD65		Clock data Week		SD75		
SD66		Multi-CPU No.		SD76		
SD67		Cyclic transmission receive error threshold frequency setting		SD77		
SD68		Cyclic transmission receive error detection counter for CPU No.1		SD78		
SD69		Cyclic transmission receive error detection counter for CPU No.2		SD79		

Device	abbrev.	Signal name		Device	abbrev.	Signal name
SD80				SD90		
SD81				SD91		
SD82		Model judgment code (for GOT)		SD92		
SD83		Model judgment code (for GOT)		SD93		
SD84		Version information (for GOT)		SD94		
SD85				SD95		
SD86				SD96		
SD87				SD97		
SD88				SD98		
SD89				SD99		

Device	abbrev.	Signal name		Device	abbrev.	Signal name
SD100				SD110		
SD101				SD111		
SD102				SD112		
SD103				SD113		
SD104				SD114		
SD105				SD115		
SD106				SD116		
SD107				SD117		
SD108				SD118		
SD109				SD119		

Device	abbrev.	Signal name
SD120		
SD121		
SD122		
SD123		
SD124		
SD125		
SD126		
SD127		

Device	abbrev.	Signal name
SD200		Switch status (without internal device assignment)
SD201		LED status
SD203		CPU operation status
SD204		LED display color

Device	abbrev.	Signal name
SD210		Clock data Year/Month (same as SD62)
SD211		Clock data Date/Hour (same as SD63)
SD212		Clock data Minute/Second (same as SD64)
SD213		Clock data Week (same as SD65)

Device	abbrev.	Signal name		Device	abbrev.	Signal name
				SD290		Device allocation: Number of points allocated for X
				SD291		Device allocation: Number of points allocated for Y
				SD292		Device allocation: Number of points allocated for M
				SD293		Device allocation: Number of points allocated for L
				SD294		Device allocation: Number of points allocated for B
				SD295		Device allocation: Number of points allocated for F
				SD296		Device allocation: Number of points allocated for SB
				SD297		Device allocation: Number of points allocated for V
SD288		Number of points allocated for B (for extension) 1		SD298		Device allocation: Number of points allocated for S
SD289		Number of points allocated for B (for extension) 2		SD299		Device allocation: Number of points allocated for T

Device	abbrev.	Signal name		Device	abbrev.	Signal name
SD300		Device allocation: Number of points allocated for ST				
SD301		Device allocation: Number of points allocated for C				
SD302		Device allocation: Number of points allocated for D				
SD303		Device allocation: Number of points allocated for W				
SD304		Device allocation: Number of points allocated for SW				
				SD395		Multi-CPU No. (same as SD66)

Device	abbrev.	Signal name
SD412		1-second counter (same as SD34)
SD414		2n-second clock set (same as SD40)

Device	abbrev.	Signal name
SD420		Scan counter (same as SD35)

Device	abbrev.	Signal name
SD520		Current scan time (ms unit) (same as SD37)
SD524		Minimum scan time (ms unit) (same as SD38)
SD526		Maximum scan time (ms unit) (same as SD39)

Revision History

Date of revision	Manual No.	Revision details
Jan. 2013	IB(NA)1501089-A	First edition created.
Sep. 2014	IB(NA)1501089-B	Revised the contents to correspond to C70 S/W version DD.

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.

Duplication Prohibited

MITSUBISHI CNC

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