MITSUBISHI ELECTRIC

Changes for the Better

MITSUBISHI CNC

Setup Manual

C70

IB-1500265(ENG)-L

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INTRODUCTION

This manual is the setup manual required to use the C70.
This manual is prepared on the assumption that your machine is provided with all of the C70 functions.
Confirm the functions available for your NC before proceeding to operation by referring to the specification issued by the machine tool builder.

Notes on Reading This Manual

(1) This manual explains general parameters as viewed from the NC.
For information about each machine tool, refer to manuals issued from the machine tool builder.
If the descriptions relating to "restrictions" and "allowable conditions" conflict between this manual and the machine tool builder's instruction manual, the later has priority over the former.
(2) This manual is intended to contain as much descriptions as possible even about special operations.
The operations to which no reference is made in this manual should be considered impossible.

⚠ CAUTION

⚠ If the descriptions relating to the "restrictions" and "allowable conditions" conflict between this manual and the machine tool builder's instruction manual, the latter has priority over the former.

⚠ The operations to which no reference is made in this manual should be considered "impossible".

⚠ This manual is complied on the assumption that your machine is provided with all optional functions. Confirm the functions available for your machine before proceeding to operation by referring to the specification issued by the machine tool builder.

⚠ In some NC system versions, there may be cases that different pictures appear on the screen, the machine operates in a different way or some function is not activated.

Precautions for Safety

Always read the specifications issued by the machine tool builder, this manual, related manuals and attached documents before installation, operation, programming, maintenance or inspection to ensure correct use.
Understand this numerical controller, safety items and cautions before using the unit.
This manual ranks the safety precautions into "DANGER", "WARNING" and "CAUTION".

⚠**DANGER**	When the user may be subject to imminent fatalities or major injuries if handling is mistaken.
⚠**WARNING**	When the user may be subject to fatalities or major injuries if handling is mistaken.
⚠**CAUTION**	When the user may be subject to injuries or when physical damage may occur if handling is mistaken.

Note that even items ranked as "⚠ CAUTION", may lead to major results depending on the situation.
In any case, important information that must always be observed is described.

⚠DANGER

Not applicable in this manual.

⚠WARNING

1. Items related to operation

⚠ If the operation start position is set in a block which is in the middle of the program and the program is started, the program before the set block is not executed. Please confirm that G and F modal and coordinate values are appropriate. If there are coordinate system shift commands or M, S, T and B commands before the block set as the start position, carry out the required commands using the MDI, etc. If the program is run from the set block without carrying out these operations, there is a danger of interference with the machine or of machine operation at an unexpected speed, which may result in breakage of tools or machine tool or may cause damage to the operators.

⚠ Under the constant surface speed control (during G96 modal), if the axis targeted for the constant surface speed control moves toward the spindle center, the spindle rotation speed will increase and may exceed the allowable speed of the workpiece or chuck, etc. In this case, the workpiece, etc. may jump out during machining, which may result in breakage of tools or machine tool or may cause damage to the operators.

⚠ CAUTION

1. Items related to product and manual

⚠ If the descriptions relating to the "restrictions" and "allowable conditions" conflict between this manual and the machine tool builder's instruction manual, the latter has priority over the former.

⚠ The operations to which no reference is made in this manual should be considered impossible.

⚠ This manual is complied on the assumption that your machine is provided with all optional functions. Confirm the functions available for your machine before proceeding to operation by referring to the specification issued by the machine tool builder.

⚠ In some NC system versions, there may be cases that different pictures appear on the screen, the machine operates in a different way on some function is not activated.

2. Items related to faults and abnormalities

❗ If the battery low alarm is output, save the machining programs, tool data and parameters to an input/output device, and then replace the battery. If the BATTERY alarm occurs, the machining programs, tool data and parameters may be damaged. After replacing the battery, reload each data item.

3. Items related to connection

⚠ Incorrect connections may damage the devices, so connect the cables to the specified connectors.

⚠ When connecting to a personal computer and a unit with the RS-232/USB interface, an electric shock or a unit failure may occur.
Operate these correctly according to the manual of a unit and a personal computer.
Observe the following cautions when a personal computer in an AC power supply is used.

(1) For a personal computer that uses a 3-pin power plug or power plug with a ground lead type, make sure to use a plug socket including a ground input electrode or ground the earth lead, respectively.
And, ensure to ground a personal computer and a unit. (Ground resistance: 100Ω or less)

(2) For a personal computer that uses a 2-pin power plug without ground lead, make sure to connect the unit to the personal computer according to the following procedures.
And, it is recommended to supply the same power supply line to a personal computer and the unit.
   (a) Pull out the power plug of the personal computer from the AC outlet.
   (b) Confirm that the power plug of the personal computer has been pulled out from the AC outlet, and connect RS-232/USB cables, the extension cable or the bus connection cable of a GOT.
   (c) Insert the power plug of the personal computer into the AC outlet.

4. Items related to setup

❗ Always set the stored stroke limit. Setting no limits could result in collision with the machine end.

5. Items related to servo/spindle parameters

⚠ Do not make remarkable adjustments or changes of the parameters as the operation may became unstable.

⚠ In the explanation on bits, set all bits not used, including blank bits, to "0".

[Continued on next page]

⚠ CAUTION

[Continued]

6. Items related to maintenance

⚠ Periodically back up the programs, tool data and parameters to avoid potential data loss. Also, back up those data before maintenance and inspections.

⚠ Do not short-circuit, charge, overheat, incinerate or disassemble the battery.

⚠ Do not replace parts or devices while the power is ON.

⚠ Collect and dispose of the spent batteries and the backlights for LCD according to the local laws.

Disposal

(Note) This symbol mark is for EU countries only.
This symbol mark is according to the directive 2006/66/EC Article 20 Information for end-users and Annex II.

Your MITSUBISHI ELECTRIC product is designed and manufactured with high quality materials and components which can be recycled and/or reused.
This symbol means that batteries and accumulators, at their end-of-life, should be disposed of separately from your household waste.
If a chemical symbol is printed beneath the symbol shown above, this chemical symbol means that the battery or accumulator contains a heavy metal at a certain concentration. This will be indicated as follows:
Hg: mercury (0,0005%), Cd: cadmium (0,002%), Pb: lead (0,004%)
In the European Union there are separate collection systems for used batteries and accumulators.
Please, dispose of batteries and accumulators correctly at your local community waste collection/ recycling centre.

Please, help us to conserve the environment we live in!

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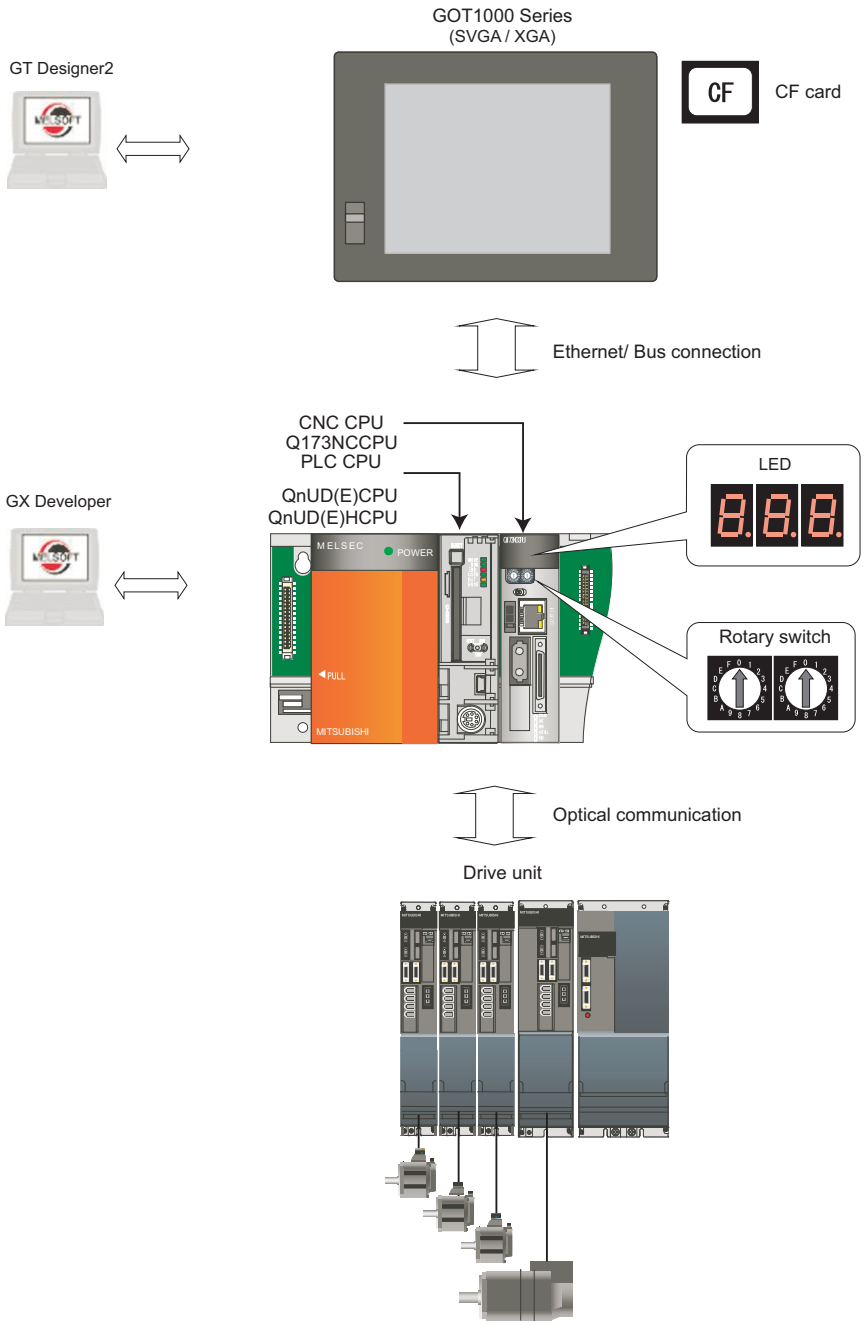
1

Outline

This manual explains the procedures to setup C70.
Procedures when setting up again (with backup files of parameters and so on) are different from those of initial setup.
For initial setup, see the chapter of "Flow of the initial setup".
When setting up with the backup file, see the chapter of "Data Restoration".

1.1 Hardware and Device Configuration

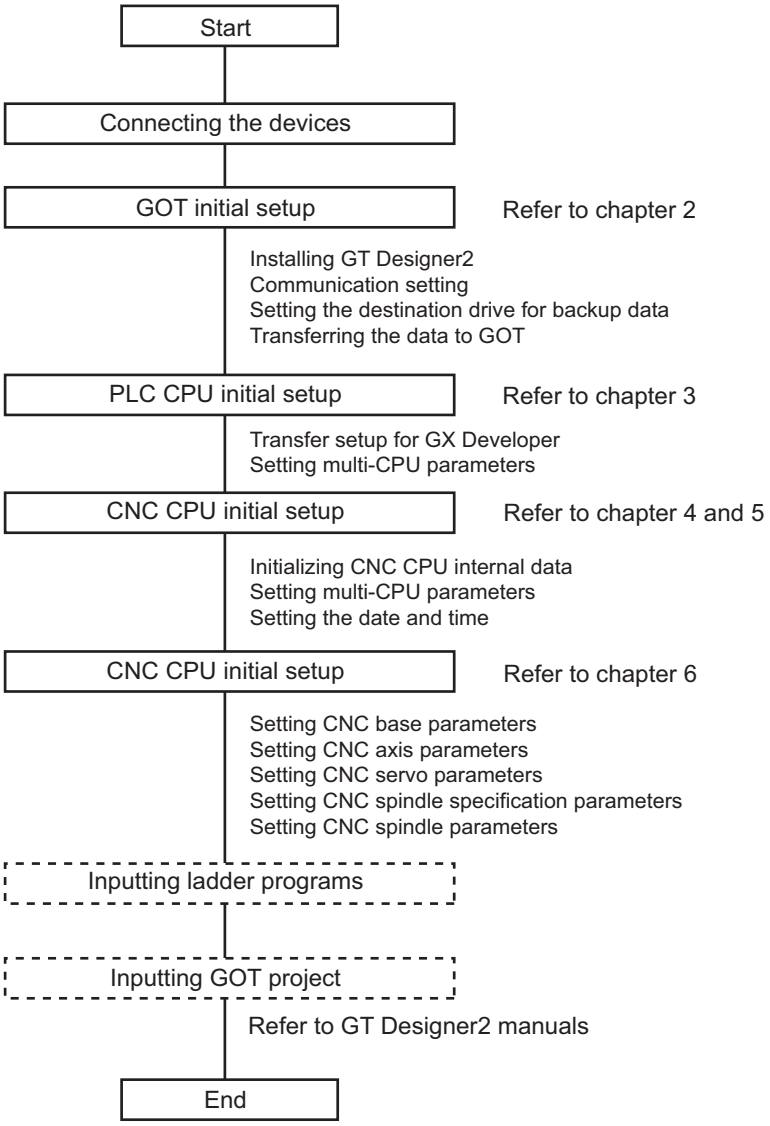
Here are the names of the hardware used in this manual.



(Note 1) GT Designer2 Version 2.60N or later (Version 2.96A or later if the GOT is GT16) is required.
GX Developer Version8.48A or later is required.
(Note 2) Ethernet communication with GOT1000 series GT15 requires the Ethernet communication unit (GT15-J71E71-100).
(Note 3) Q bus communication requires a bus communication unit (GT15-QBUS/GT15-QBUS2).

1.2 Flow of the Initial Setup

The following shows the overall flow of the initial setup.



Refer to the following chapters for setting the machine control functions.

- Setting the Position Detection System
- Deceleration Check
- Setting the Tool Entry Prohibited Range

1 Outline

2

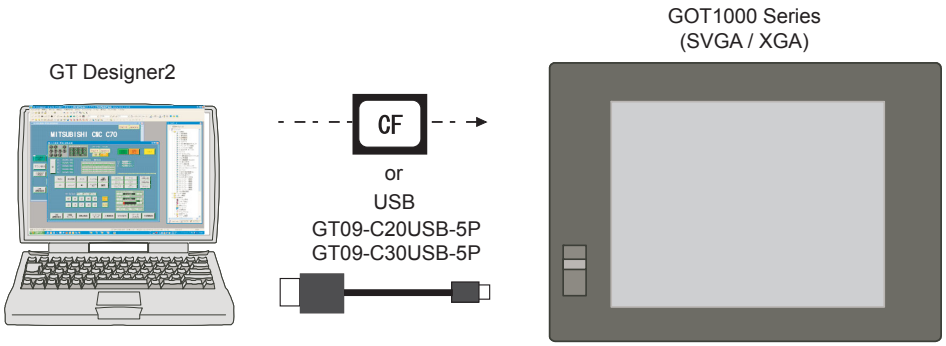
GOT Initial Setup

Transfer the project data, where required settings have been made, to GOT.

2.1 Installing GT Designer2

(1) Install GT Designer2 to the personal computer.
(Note) GT Designer2 Version 2.60N or later (Version 2.96A or later if the GOT is GT16) is required.

(2) Connect the personal computer to GOT with a USB cable or prepare a CF card.



(Note 1) When connected to the GOT for the first time, the "Found New Hardware Wizard" screen may appear. Make a selection for the "What do you want the wizard to do?" question, and click "Next" to install the hardware.
If you select "Install from a list or specific location" for the "What do you want the wizard to do?" question,
select as below: C:MELSEC\Easysocket\USBDrivers\ECUsbd.sys

(Note 2) Format a CF card in FAT(FAT16) format with the personal computer before using the card. Data may not be transferred to GOT if the memory card has any folder/file which is not related to GOT.

2.2 Making Communication Settings

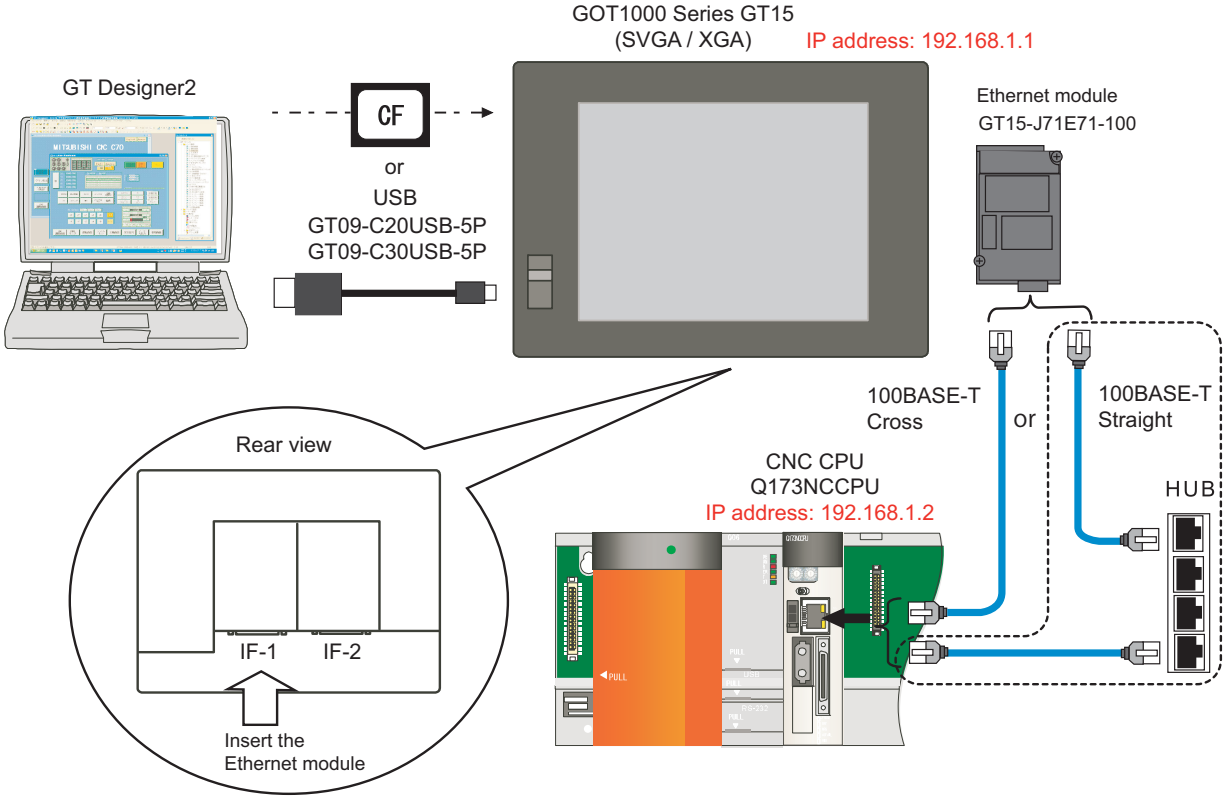
Make communication settings on a GT Designer2 project.
Refer to the following according to the connection type you use.

- **Ethernet connection (for GT15): Section 2.2.1**
- **Ethernet connection (for GT16): Section 2.2.2**
- **Bus connection (for GT15/GT16): Section 2.2.3**

2.2.1 Setting Ethernet Connection (for GT15)

This section explains the setting procedure for Ethernet connection of GOT1000 Series GT15.
Mount the Ethernet communication unit on the GOT rear slot IF-1, and then connect it with the CNC CPU module with an Ethernet cable.
The following two IP addresses need to be set in order to establish the Ethernet connection.

GOT's IP address (192.168.1.1 in this manual)
CNC CPU module's IP address (192.168.1.2)



(Note 1) When connecting to a personal computer and a module with USB interface, an electric shock or a module failure may occur depending on the model of a personal computer or the service condition.
Be sure to refer to "Items related to connection" on "Precautions for Safety" before connecting them.

(Note 2) When mounting the module on the GOT rear slot IF-2, set the "Extend I/F-2" items in later communication setting.

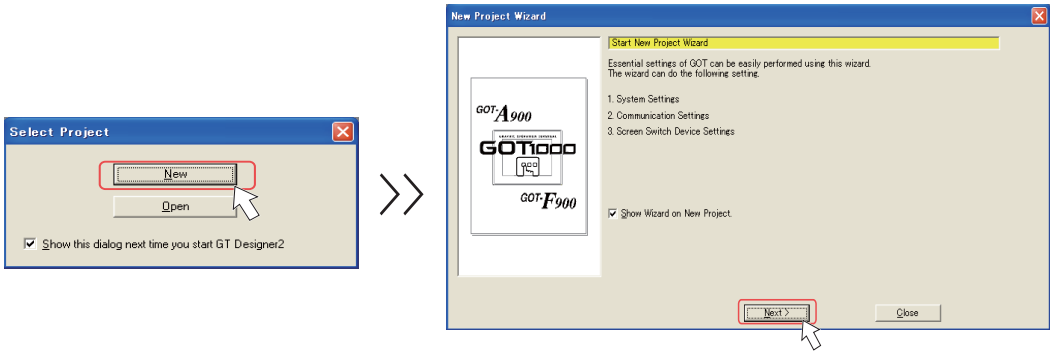
(Note 3) Unless there is a specific reason, set the CNC CPU default IP address (192.168.1.2). If any other IP adress is set, the backup data created with GOT backup and restore function cannot be restored to the replaced CNC CPU module, which has a default IP address.

<Setting in GT Designer2's "New Project Wizard">

In this method, the communication settings are saved in a newly created project by the GT Designer2 project wizard.

(Note) Depending on your GT Designer2's setting, "New Project Wizard" may not appear. For how to display "New Project Wizard", refer to "GT Designer2 Version2 Basic Operation/Data Transfer Manual (SH(NA)-080529)".

(1) Start GT Designer2, and click "New" in the "Select Project" dialog box to display "New Project Wizard". Click "Next >".

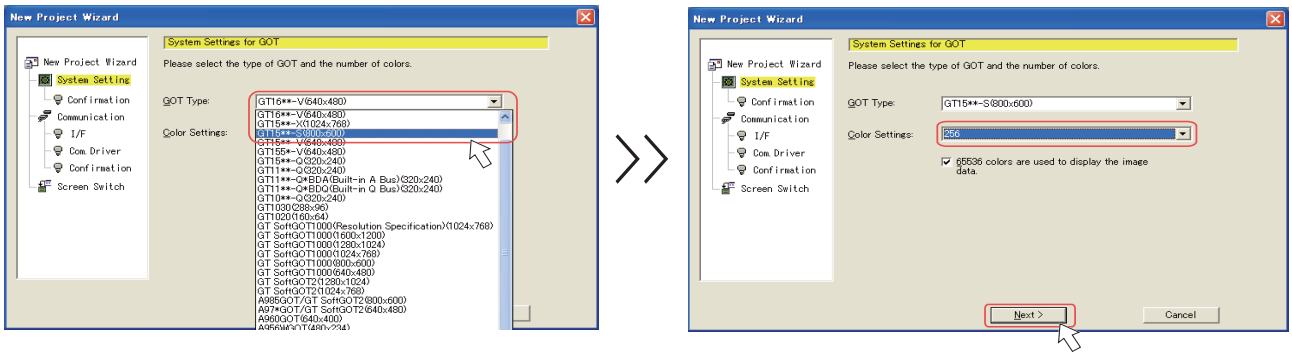


(2) Select the following item from among the pull-down menu.

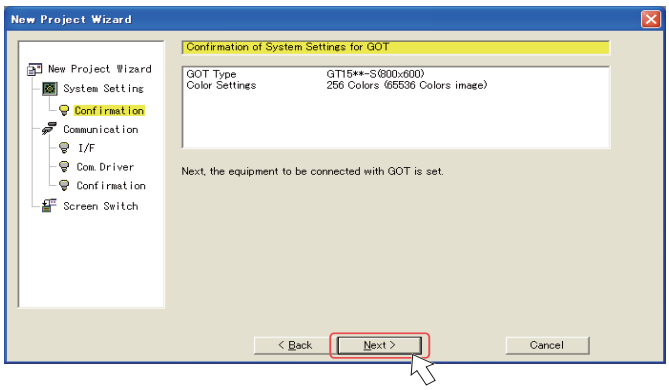
GOT type: Select the model name of the GOT to use ("GT15-...")**

Color Settings: Select the number of colors

Check the setting. If correct, click "Next >".

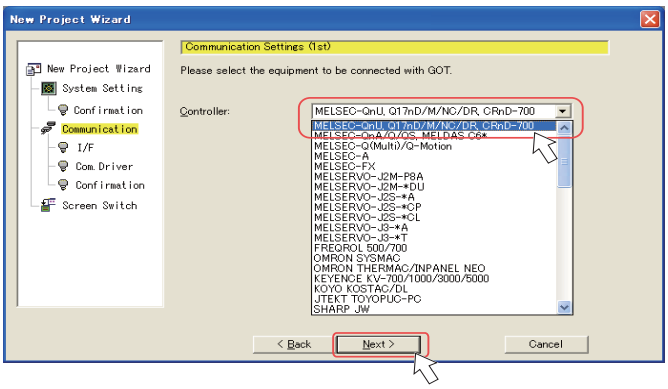


(3) Check the settings. If correct, click "Next >".



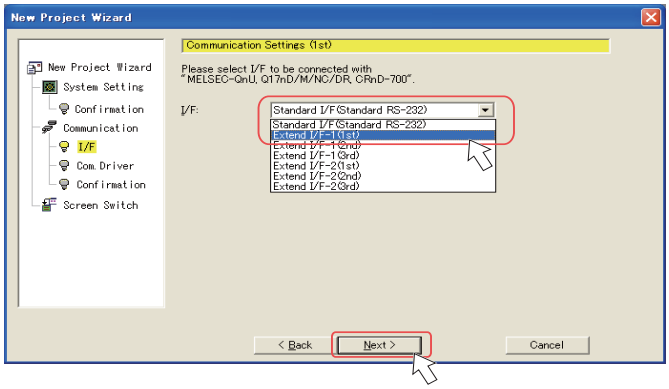
(4) Select the following item from among the pull-down menu, and click "Next >".

Communication Driver: MELSEC-QnU, Q17nD/M/NC/DR, CRnD-700



(5) Select the following item from among the pull-down menu, and click "Next >".

I/F: Extend I/F-1(1st)

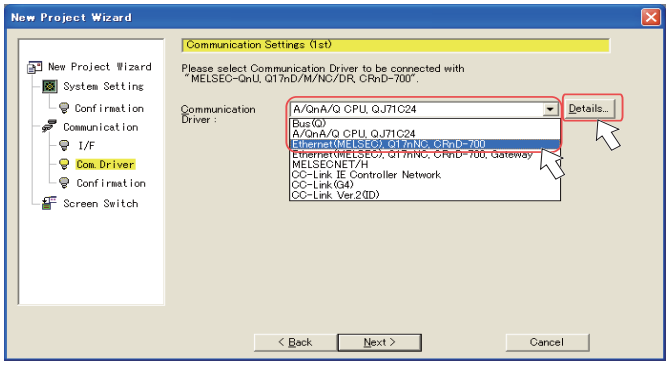


(Note) Select "Extend I/F-2(1st)" when the Ethernet communication unit is mounted on the GOT rear slot IF-2.

(6) Select the following item from among the pull-down menu.

Communication driver: Ethernet(MELSEC), Q17nNC, CRnD-700

Then click "Details".



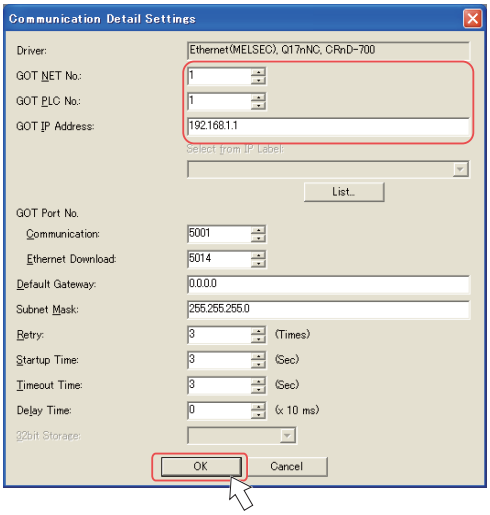
Set the following values in the "Communication Detail Settings" dialog box.
(GOT's Ethernet settings)

GOT NET No.: 1

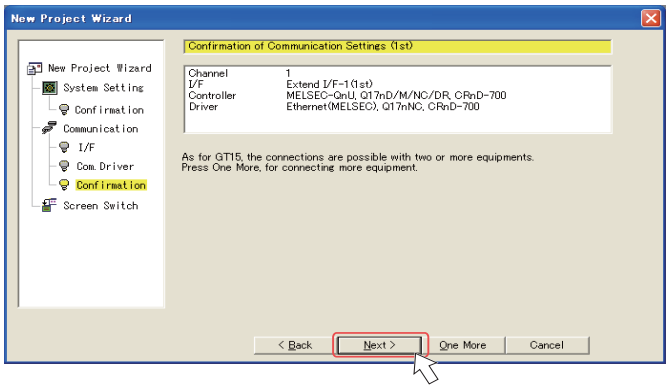
GOT PC No.: 1

GOT IP Address: GOT's own IP address (Example: 192.168.1.1)

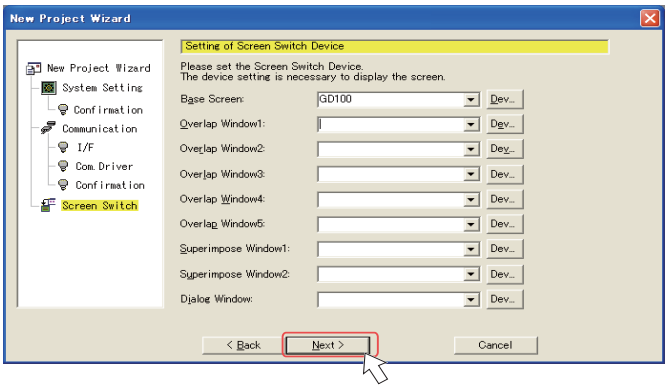
After setting, click "OK" to confirm the setting values.



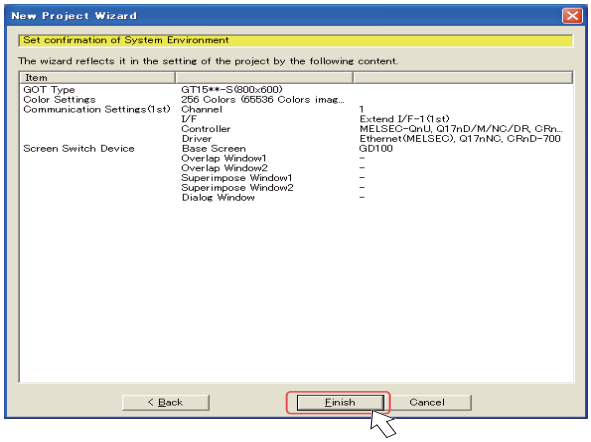
(7) Check the settings. If correct, click "Next >".



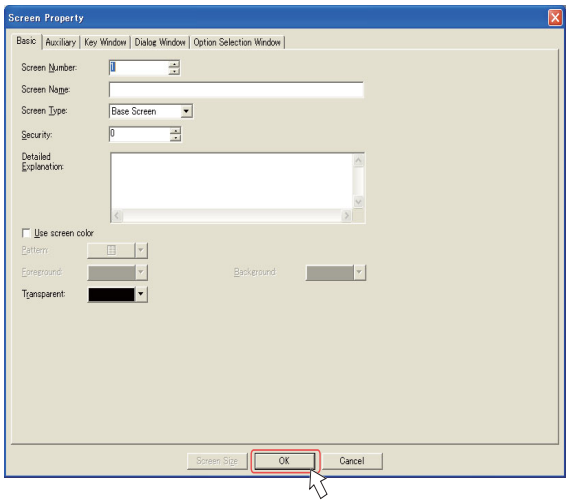
Click "Next >".



(8) Check the setting. If correct, click "Finish >".

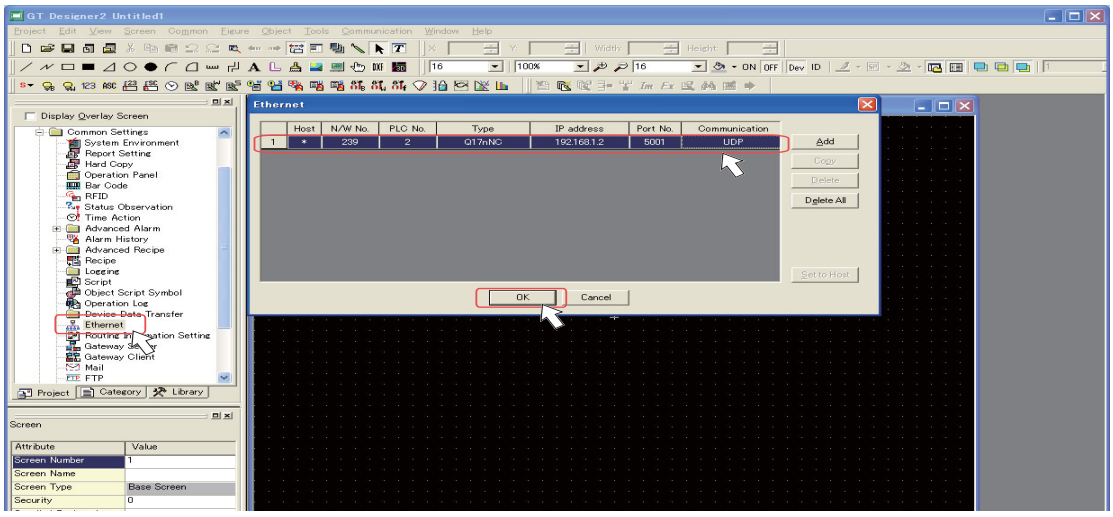


(9) When the "Screen Property" window appears, click "OK". The base screen will appear.



(10) Select "Ethernet" from "Common Settings", and then set the following data. Click "OK" after setting the data.

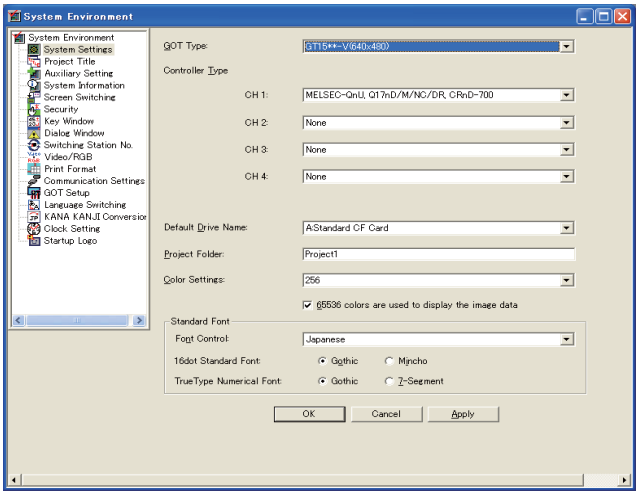
N/W No.: 239 (fixed value of CNC CPU module)
PC No.: 2
Type: Q17nNC
IP address: CNC CPU module's IP address (Example: 192.168.1.2)



<Setting system environment separately by GT Designer2>

This is how to set without "New Project Wizard".

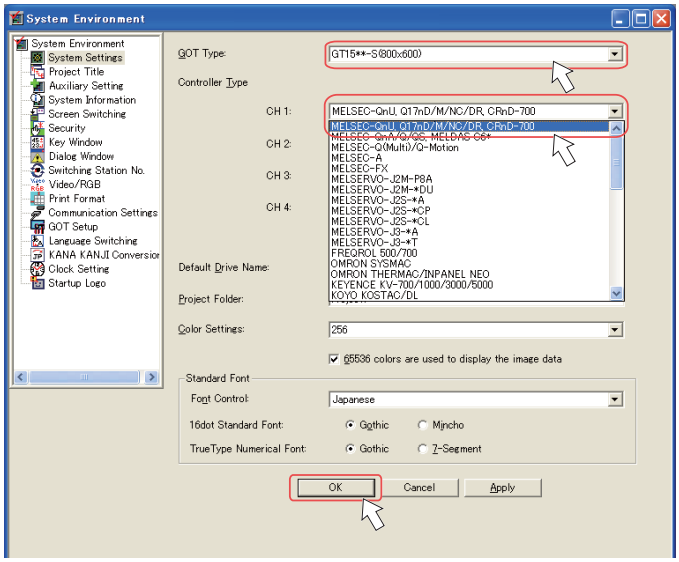
(1) Start GT Designer2. Select "New". Or open the project which is already created. The "System Environment"-"System Settings" dialog box will appear.



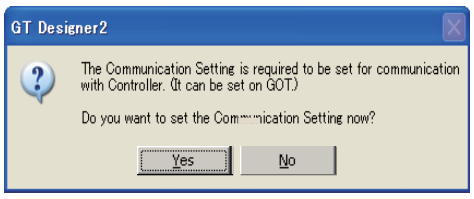
(2) Select the following items from among the pull-down menu, and click "OK".

GOT type: Select the model name of the GOT to use ("GT15-...")**

Controller type: MELSEC-QnU, Q17nD/M/NC/DR, CRnD-700



A dialog box appears to confirm the communication setting. Click "Yes".



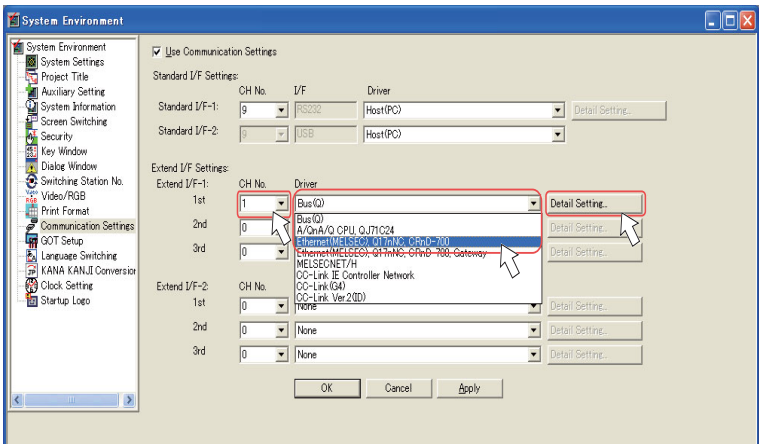
(3) The "System Environment" dialog box now displays "Communication Settings". Confirm "Use Communication Settings" is checked, and select the following items of the extended I/F setting from among the pull-down menu.

Extend I/F-1 1st

CH No.: 1

Driver: Ethernet(MELSEC), Q17nNC, CRnD-700

Then click "Detail Setting...".



(Note) Select "Extend I/F-2(1st)" when the Ethernet communication unit is mounted on the GOT rear slot IF-2.

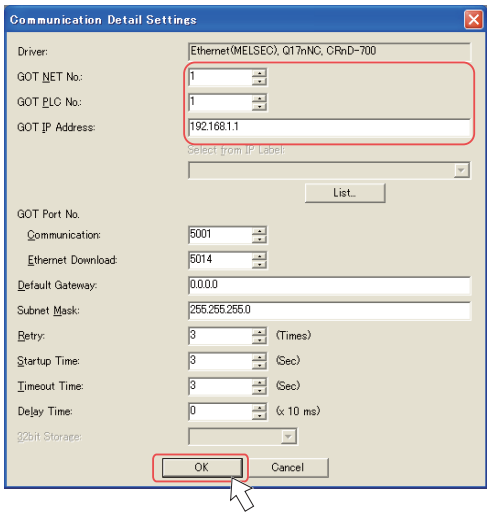
(4) Set the following values in the "Communication Detail Settings" dialog box.

GOT NET No.: 1

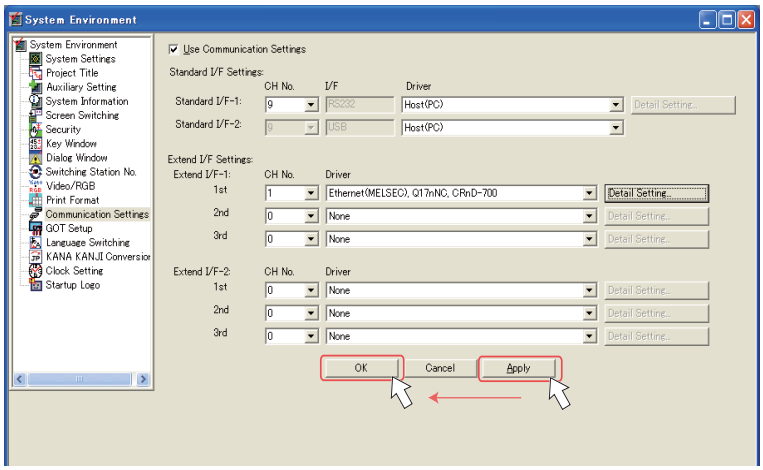
GOT PC No.: 1

GOT IP Address: GOT's own IP address (Example: 192.168.1.1)

After setting, click "OK" to confirm the setting values.



(5) Click "Apply" then "OK" in the "System Environment" dialog box.



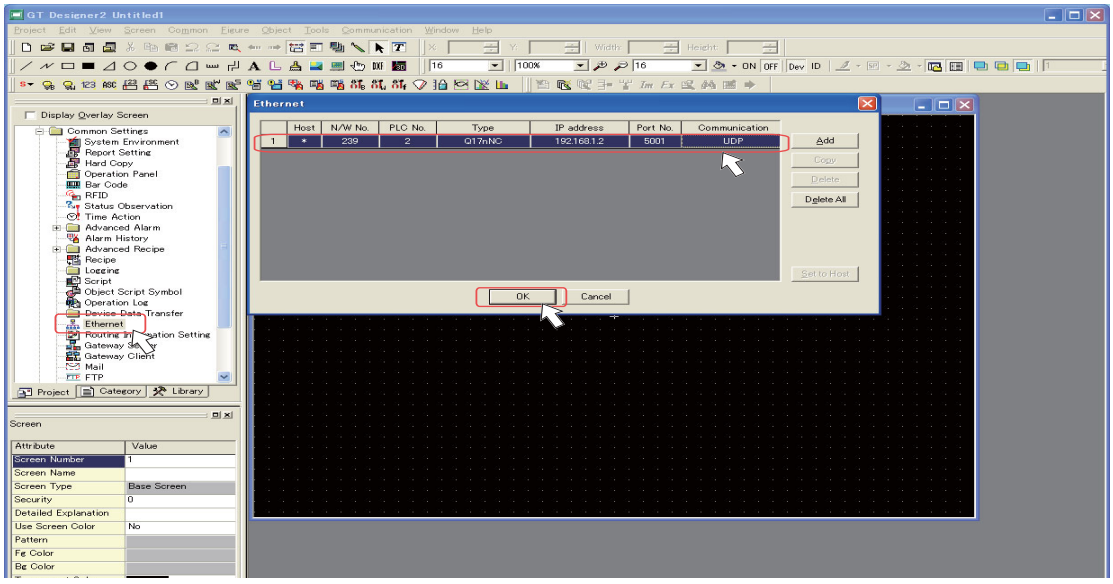
(6) Select "Ethernet" from "Common Settings", and then set the following data. Click "OK" after setting the data.

N/W No.: 239 (fixed value of CNC CPU module)

PC No.: 2

Type: Q17nNC

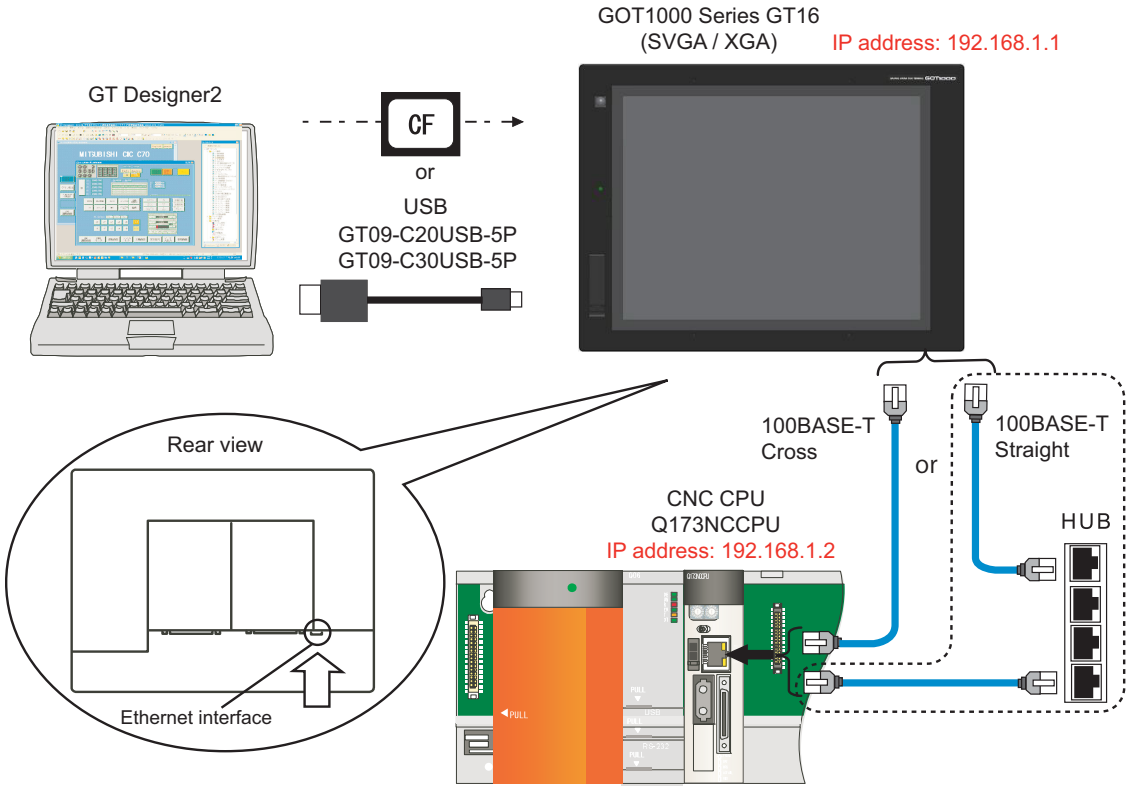
IP address: CNC CPU module's IP address (Example: 192.168.1.2)



2.2.2 Setting Ethernet Connection (for GT16)

This section explains the setting procedure for Ethernet connection of GOT1000 Series GT16.
Connect a Ethernet cable to the CNC CPU module and the GOT Ethernet interface.
The following two IP addresses need to be set in order to establish the Ethernet connection.

GOT's IP address (192.168.1.1 in this manual)
CNC CPU module's IP address (192.168.1.2)

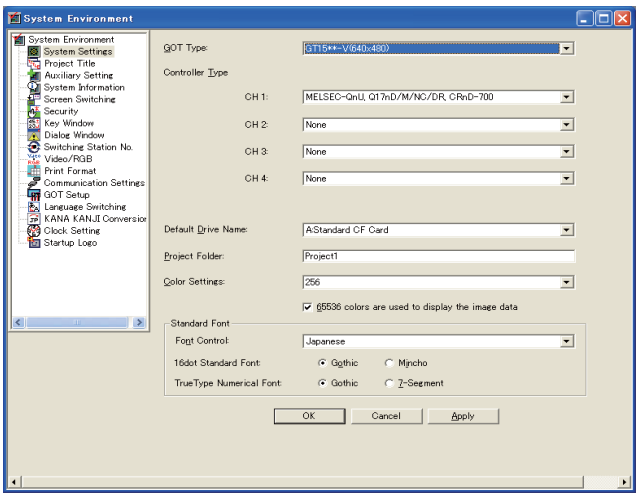


(Note 1) When connecting to a personal computer and a module with USB interface, an electric shock or a module failure may occur depending on the model of a personal computer or the service condition.
Be sure to refer to "Items related to connection" on "Precautions for Safety" before connecting them.

(Note 2) Unless there is a specific reason, set the CNC CPU default IP address (192.168.1.2). If any other IP adress is set, the backup data created with GOT backup and restore function cannot be restored to the replaced CNC CPU module, which has a default IP address.

This is how to set without "New Project Wizard" on GT Designer2.

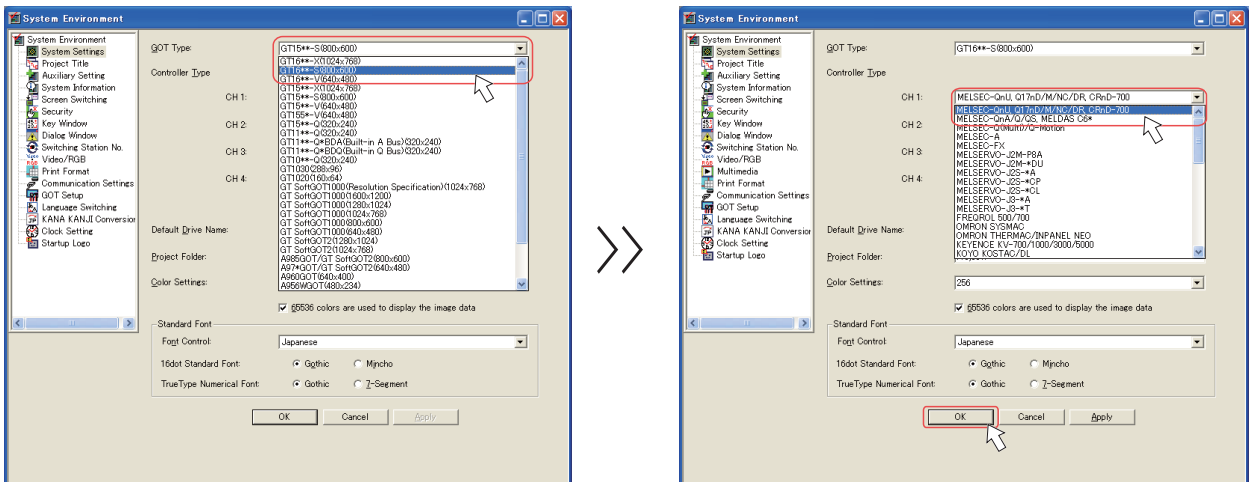
(1) Start GT Designer2. Select "New". Or open the project which is already created. The "System Environment"-"System Settings" dialog box will appear.



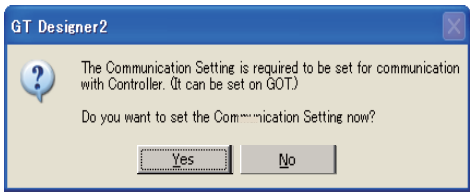
(2) Select the following items from among the pull-down menu, and click "OK".

GOT type: Select the model name of the GOT to use ("GT16-...")**

Controller type: MELSEC-QnU, Q17nD/M/NC/DR, CRnD-700



A dialog box appears to confirm the communication setting. Click "Yes".



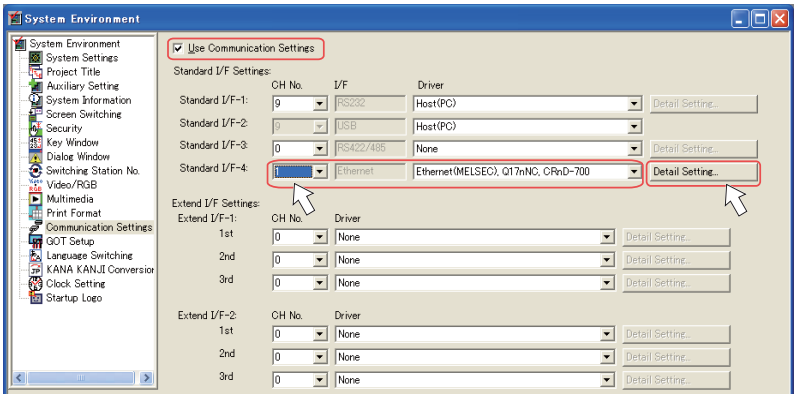
(3) The "System Environment" dialog box now displays "Communication Settings".
Confirm "Use Communication Settings" is checked, and select the following items of the standard I/F setting from among the pull-down menu.

Standard I/F-4

CH No.: 1

Driver: By setting "1" to "Ethernet (MELSEC), Q17nNC, CRnD-700 (CH No.)", the driver will be automatically set.)

Then click "Detail Setting...".



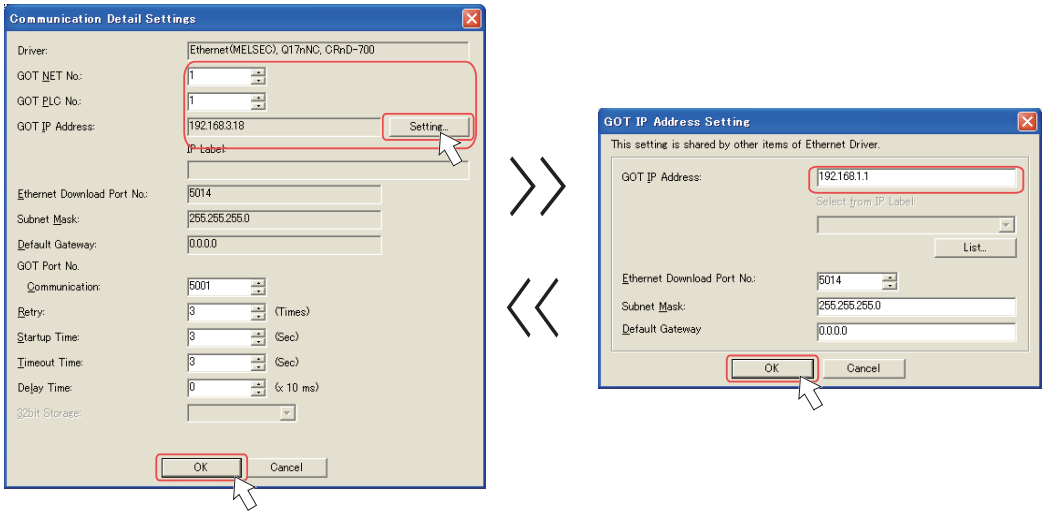
(4) Set the following values in the "Communication Detail Settings" dialog box.

GOT NET No.: 1

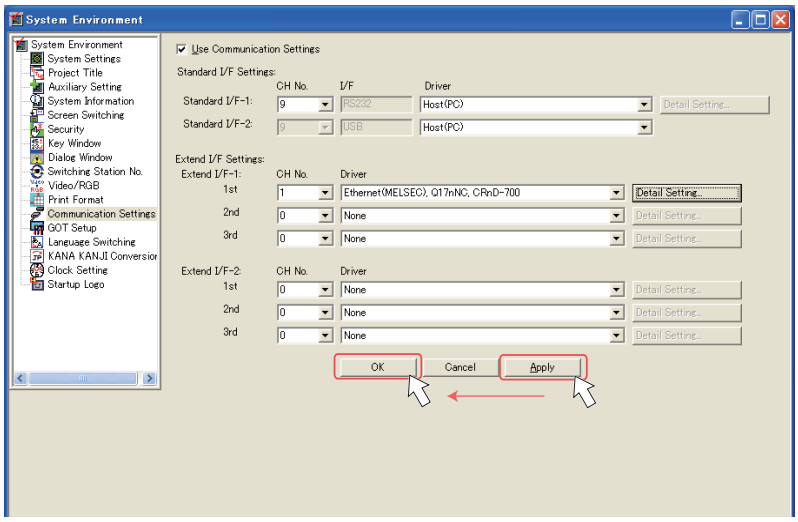
GOT PC No.: 1

GOT IP Address: GOT's own IP address (Example: 192.168.1.1)

After setting, click "OK" to confirm the setting values.



(5) Click "Apply" then "OK" in the "System Environment" dialog box.



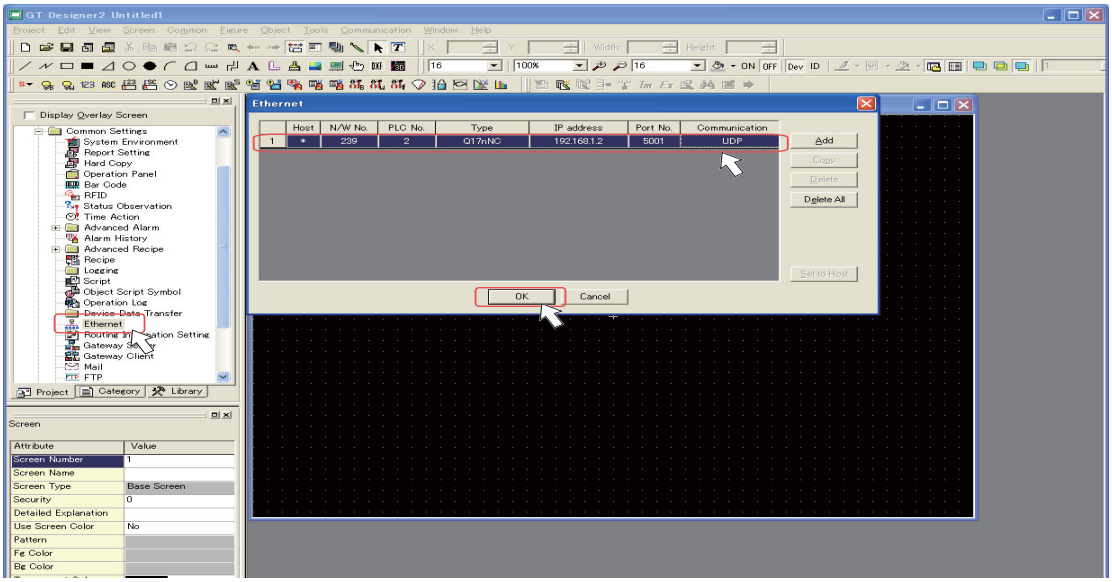
(6) Select "Ethernet" from "Common Settings", and then set the following data. Click "OK" after setting the data.

N/W No.: 239 (fixed value of CNC CPU module)

PC No.: 2

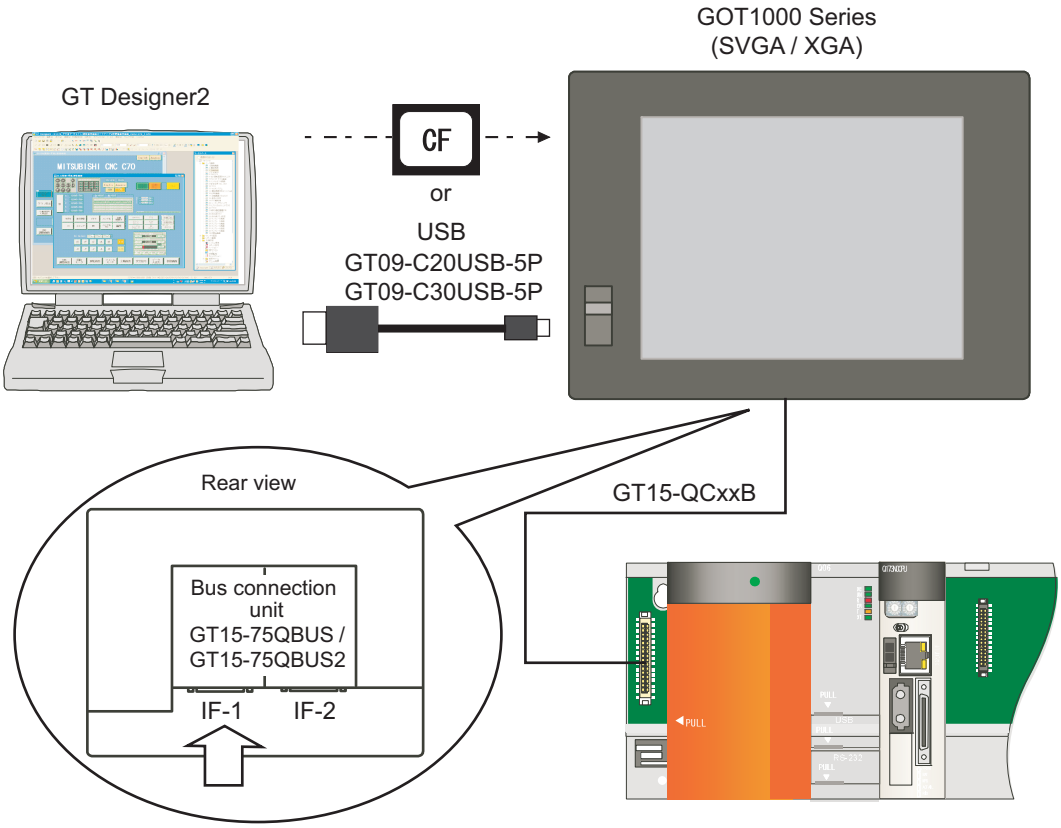
Type: Q17nNC

IP address: CNC CPU module's IP address (Example: 192.168.1.2)



2.2.3 Setting a bus connection

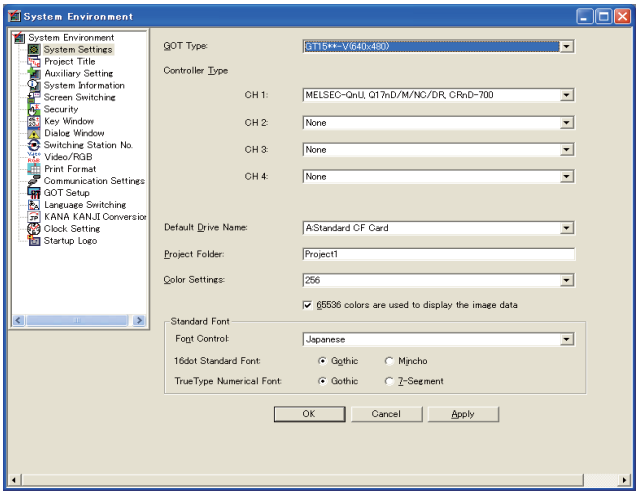
This section explains the setting procedure for bus connection of GOT1000 Series GT15/16.
Mount the bus communication unit on the GOT rear slot, and then connect it with the bus connection cable.



(Note) Mount the bus communication unit GT15-QBUS on the GOT rear slot IF-1. When mounting the unit on the GOT rear slot IF-2, set the "Extend I/F-2" items in later communication setting.

This is how to set without "New Project Wizard" on GT Designer2.
The following example is for GT15. The same setting procedure applies for GT16.

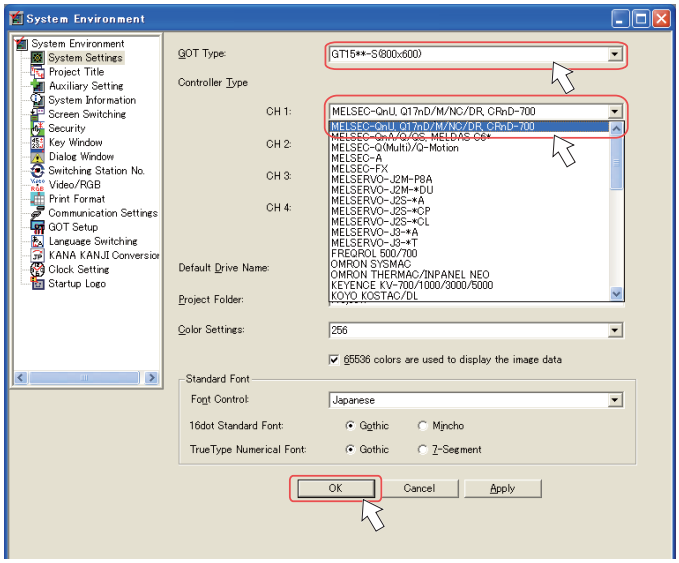
(1) Start GT Designer2. Select "New". Or open the project which is already created. The "System Environment"-"System Settings" dialog box will appear.



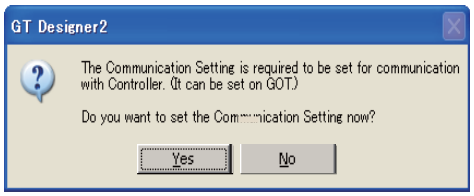
(2) Select the following items from among the pull-down menu, and click "OK".

GOT type: Select the model name of the GOT to use ("GT15-..."/"GT16**-...")**

Controller type: MELSEC-QnU, Q17nD/M/NC/DR, CRnD-700



A dialog box appears to confirm the communication setting. Click "Yes".



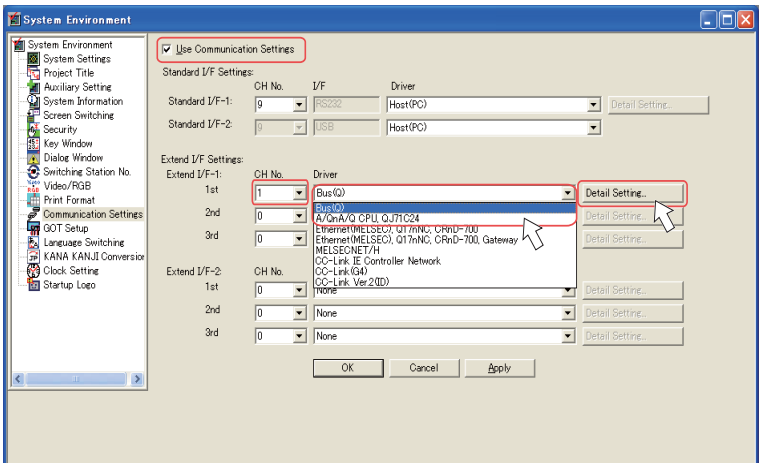
(3) The "System Environment" dialog box now displays "Communication Settings". Confirm "Use Communication Settings" is checked, and select the following items of the extended I/F setting from among the pull-down menu.

Extend I/F-1 1st

CH No.: 「1」

Driver: "Bus Q"

Then click "Detail Setting...".

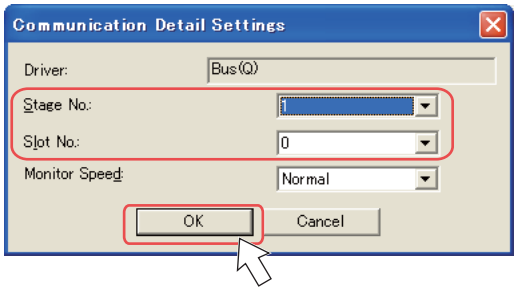


(Note) Select "Extend I/F-2(1st)" when the bus communication unit is mounted on the GOT rear slot IF-2.

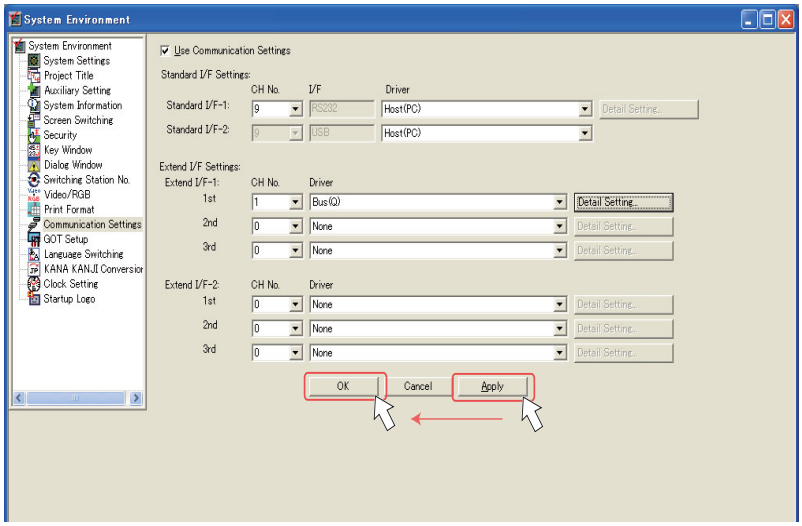
(4) Check the settings are same as below, and click "OK".

Stage No.: 1

Slot No.: 0



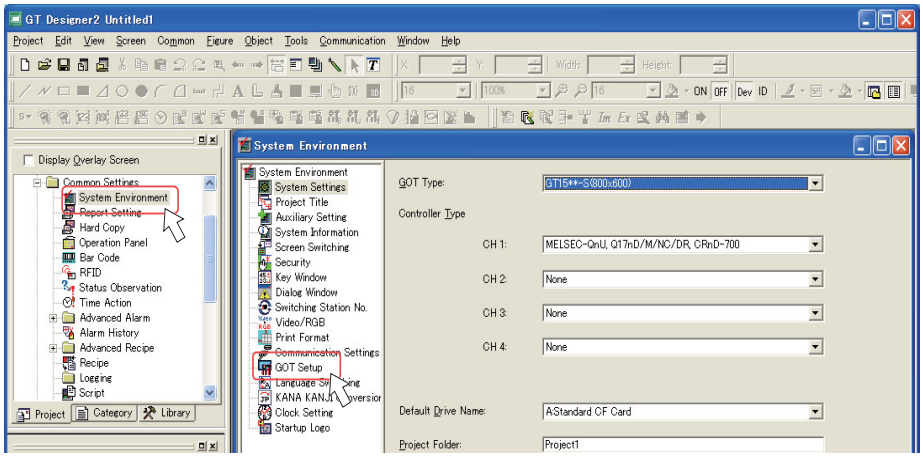
(5) Click "Apply" then "OK". Close the "System Environment" dialog box.



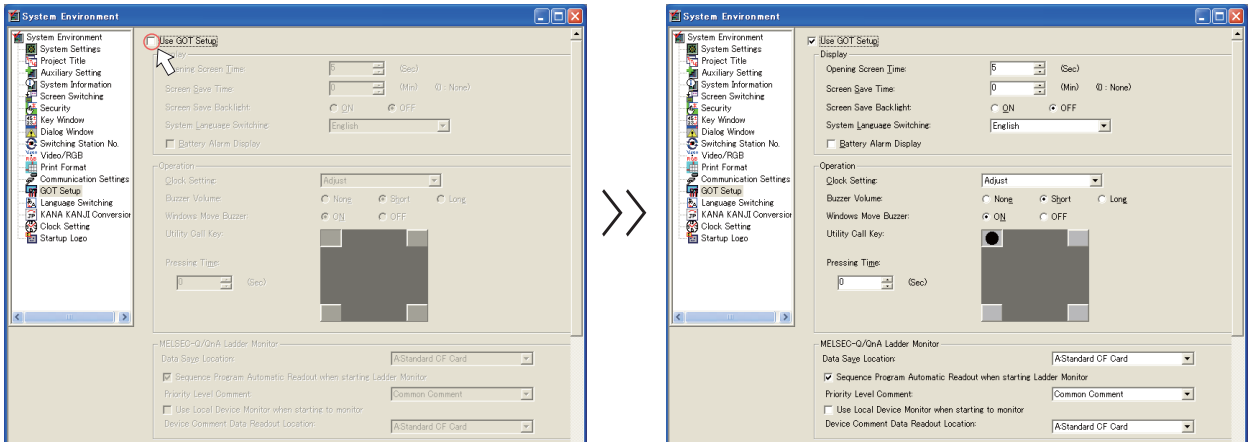
2.3 Setting the Saving Destination Drive for Backup Data

A saving destination drive for backup data (Refer to"Data Backup and Restoration") needs to be set on the GT Designer2 project.
"A: Standard CF Card" or "E: USB Drive" (GT16 only) can be chosen.

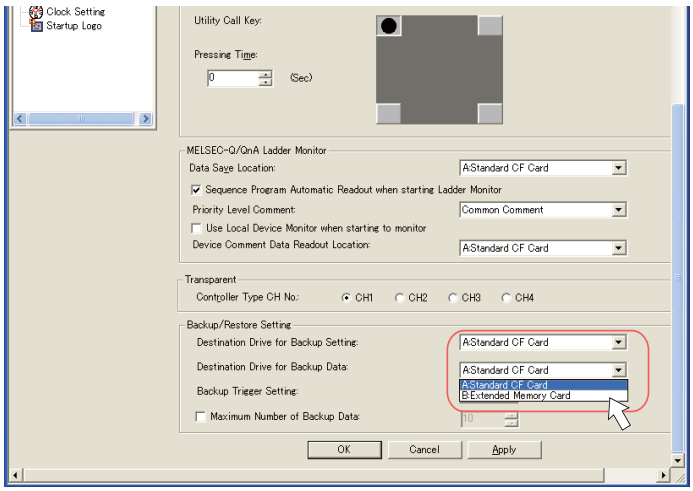
(1) Open the GT Designer2 project with a personal computer, and then double click the "GOT Setup" from "System Environment".



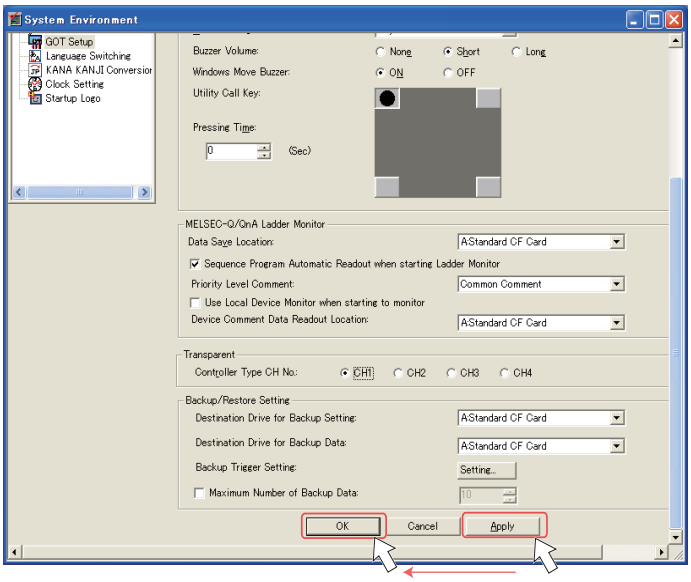
(2) Check the "Use GOT Setup" check box, then grey out items are available to set.



(3) Scroll the screen to select "Destination Drive for Backup Setting" and "Destination Drive for Backup Data" in the "Backup/Restore Setting".



(4) Click "Apply" then "OK". Close the "System Environment" dialog box.



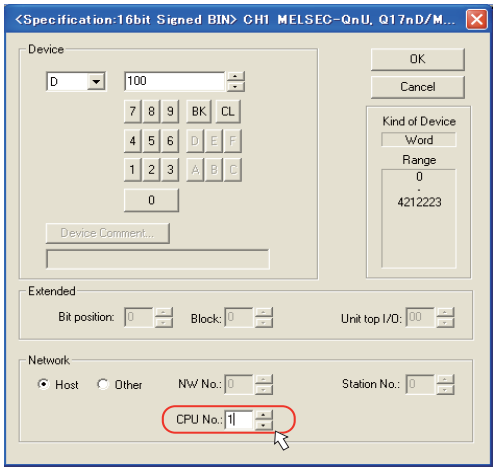
(Note) For details, refer to the "GT Designer2 Version2 Screen Design Manual" (SH(NA)-080530), Section 3.

2.4 Creating a GOT screen

Create a screen to display on GOT in the GT Designer2 project data. This manual explains precautions for device setting and how to set a special function switch.
For details, refer to the "GT Designer2 Version2 Screen Design Manual" (SH(NA)-080530).

2.4.1 Precautions for Device Settings

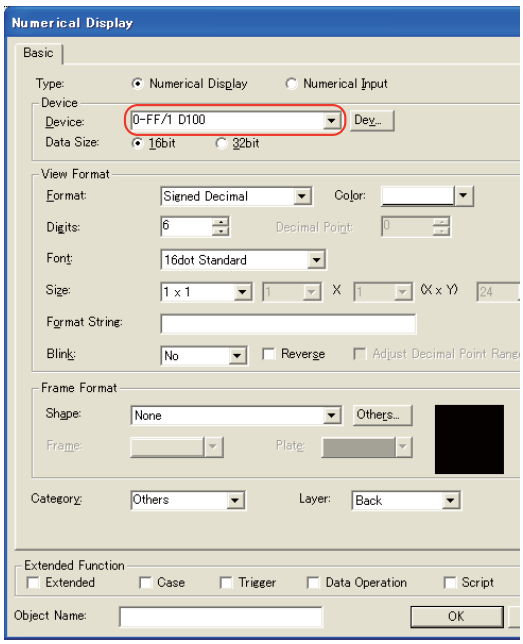
When setting the device which is not GOT device (GS/GD/GB) for the objects such as switch, lamp or numerical display, the referred CPU (PLC CPU, CNC CPU) needs to be designated.
Set the "CPU No." on the device detail setting screen.
Select "1" for referring the PLC CPU (CPU No.1), or select "2" for referring the CNC CPU (CPU No.2).



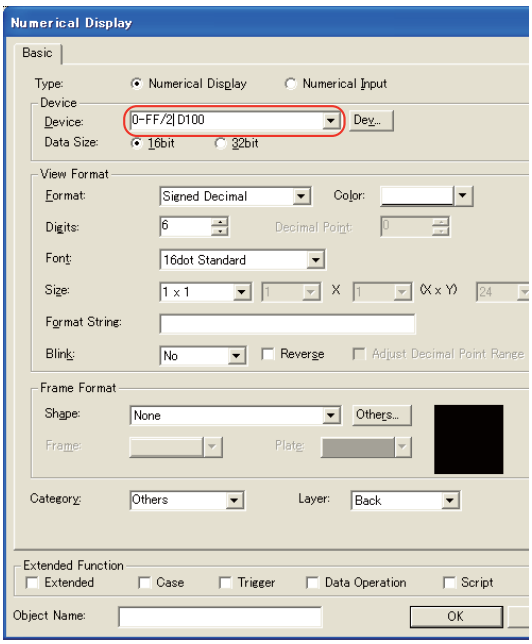
After being set, the device will be displayed as follow.

0-FF/(No.) (Device No.)

(Example 1) When referring to PLC CPU D100: "0-FF/1 D100"



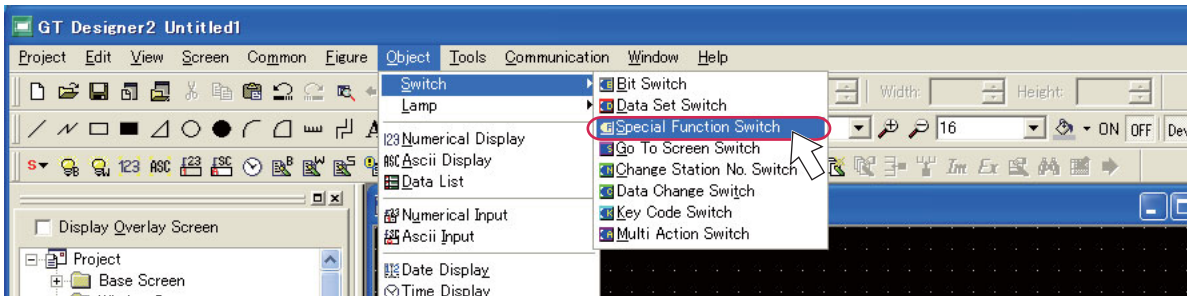
(Example 2) When referring to CNC CPU D100: "0-FF/2 D100"



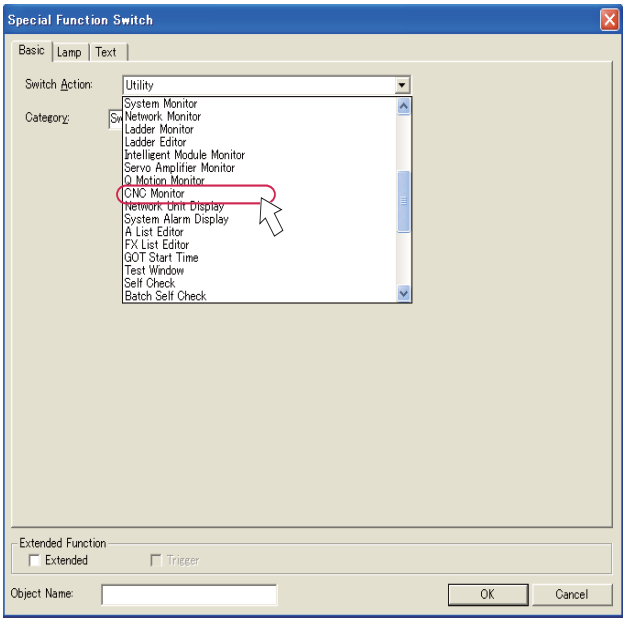
2.4.2 Special Function Switch

"Special Function Switch" allows to make a button to display CNC monitor, ladder monitor, etc.

(1) Select [Object] - [Switch] - [Special Function Switch].

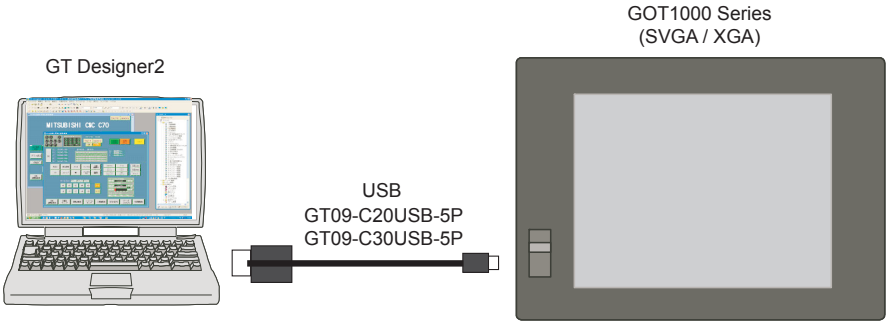


(2) Create a switch then double click it. Select the screen to display from "Switch Action" in "Basic" tab. To display CNC monitor, select "CNC Monitor". To display ladder monitor, select "Ladder monitor".



2.5 Transferring the Data to GOT (Using an USB cable)

Install OS on GOT and then transfer the project data, where required settings have been made, to GOT.
This section explains the procedure when using an USB cable.
When using a CF card, refer to "Transferring the Data to GOT (Using a CF card)".

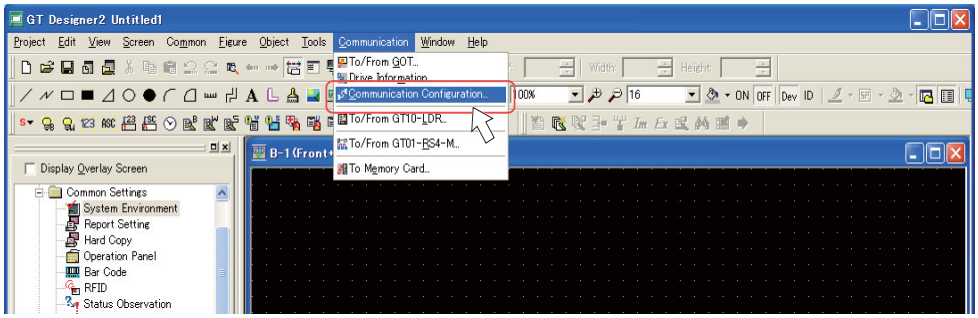


2.5.1 Installing OS on GOT

OS, including standard monitor OS and communication driver, is necessary to make GOT operate. Make sure to install them before downloading the created project data.
See below for the details of each data. For details, refer to the "GT Designer2 Version2 Basic Operation/Data Transfer Manual" (SH(NA)-080529), Section 8.

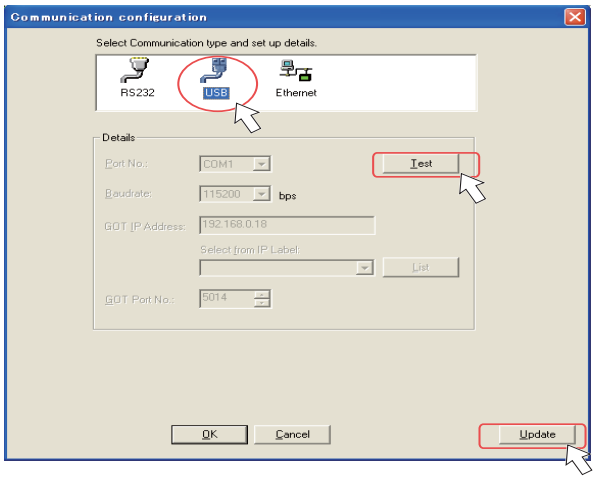
Data type	Outline	Storage destination (Drive in GOT)
BootOS	The software required to control the GOT hardware and make a communication between the PC and GOT. (Note) Factory-installed. Reinstallation is not generally required.	C: Built-in Flash Memory
OS(Standard monitor OS)	The software for operating the monitor function, touch key control, system screen and guidance display function and other features.	A: Standard CF Card or C: Built-in Flash Memory
Project data	User screen data, common settings, comment, High Quality font, True Type font, etc.	A: Standard CF Card or C: Built-in Flash Memory

(1) Turn ON the GOT, start GT Designer2 on the personal computer, and select [Communication]-[Communication Configuration...] from the menu bar.

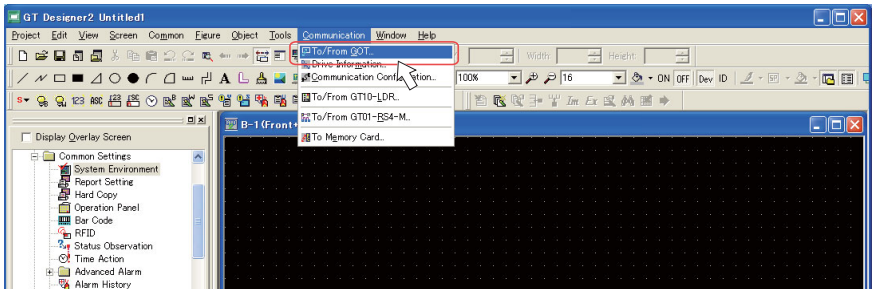


(Note) At starting GT Designer2, if the "New Project Wizard" dialog box appears, close the dialog box.

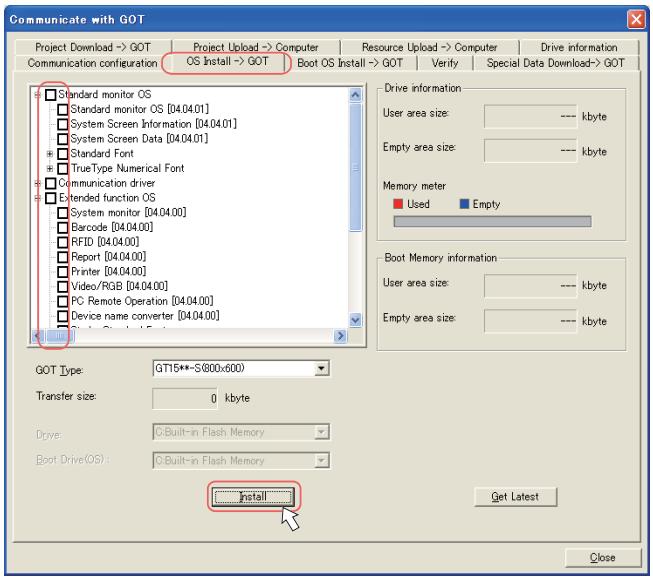
(2) Select "USB" for the communication type in the dialog box. Click "Test". Confirm the message "Successfully connected with the GOT", and click "Update".



(3) Select [To/From GOT...] from the [Communication] menu.



(4) Click the "OS Install -> GOT" tab in the "Communicate with GOT" dialog box. Check the check boxes of the necessary functions, and click the "Install" button.



Items	For Ethernet connection	For bus connection
Standard monitor OS	All	
Communication Driver	For GT15: "Ethernet(MELSEC), Q17nNC, CRnD-700" under "Bus/Network Group" For GT16: "Ethernet(MELSEC), Q17nNC, CRnD-700" under "Ethernet Connection"	"Bus(Q)" under "Bus/Network Group"
Extended function OS	"System monitor", "Backup/Restore", "CNC data input/output", "GOT platform library" (This is required for CNC data input/output. This is automatically selected when "CNC data input/output" is selected.)	
Option OS	"Ladder monitor for MELSEC-Q/QnA" under "Ladder monitor", "Ladder editor", and "CNC monitor"	

(Note) Note that "Ethernet connection" and "Bus/Network Group" are on the different trees in the communication driver setting for GT16.

The following shows the "Extended function OS" and "Option OS". "CNC monitor", "CNC data input/output", and "GOT platform library" must be selected. Select other functions as needed.

- Functions required to operate CNC

CNC monitor (Option OS)

This function is required for starting up the CNC, adjustment, or diagnosis when alarm occurs.
This enables the position display of axes controlled by CNC, alarm diagnosis, and machining program editing.

CNC data input/output (Extended function OS)

This function enables to input and output machining programs or CNC parameters between the GOT memory card (CF card or USB memory) and CNC.

Backup/ Restore (Extended function OS)

This function enables PLC/CNC CPU data backup and restoration. GT15 uses a CF card in the GOT rear slot, and GT16 uses a CF card in the GOT rear slot or USB memory in the front slot.

- Functions required to operate PLC

CNC monitor (Option OS)

This function enables to display the sequence program of PLC CPU in ladder format.
The operating status of the sequence circuit can be checked.

Ladder editor (Option OS)

This function enables to monitor and edit the sequence circuit.
This allows operation check and modification of the sequence circuit without connecting to a personal computer (GX Developer).
A CF card needs to be mounted on GOT.

System monitor (Extended function OS)

This function enables to monitor the state of device signal.

For details, refer to the <"GOT1000 series Extended function OS/Option OS Manual"> (SH(NA)-080541).

(5) The GOT automatically restarts after the installation is completed.

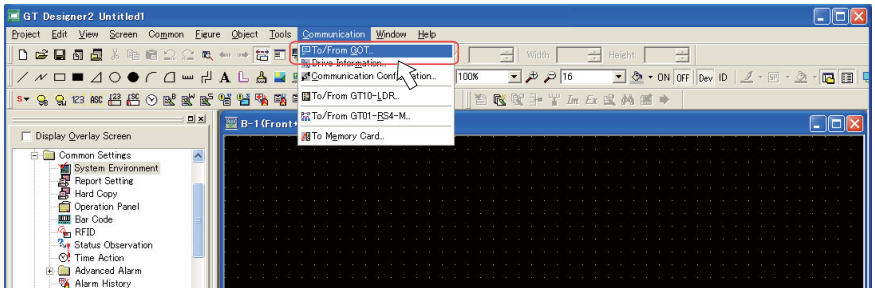
(Note) For details about standard functions (standard monitor OS), communication drive and BootOS installation, refer to the "GT Designer2 Version2 Basic Operation/Data Transfer Manual" (SH(NA)-080529), Section 8.

2.5.2 Transferring the Project Data to GOT

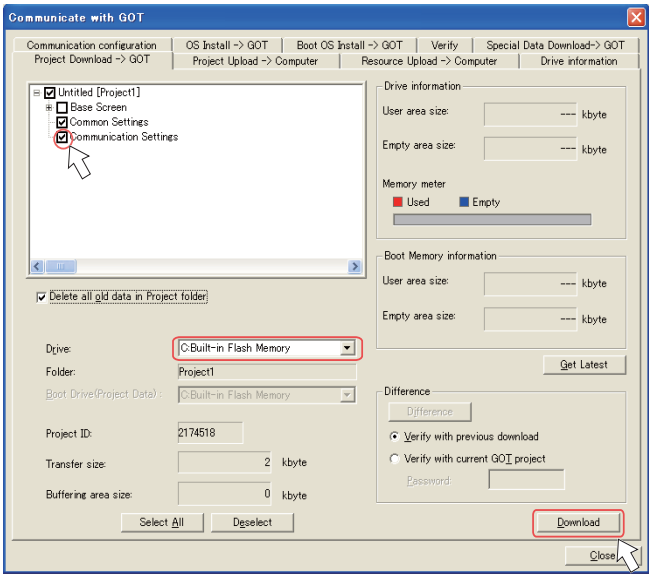
Transfer the project data, where required settings have been made, to GOT.

(Note) When using a CF card, refer to "Transferring the Data to GOT (Using a CF card)".

(1) Select [To/From GOT...] from the [Communication] menu.



(2) Select the "Project Download -> GOT" tab on the "Communicate with GOT" dialog box, and check the "Communication Settings" check box. In "Drive" field, select a destination drive to transfer the project data. Click "Download" to transfer the data to the GOT.
The GOT automatically restarts after the data is transferred.



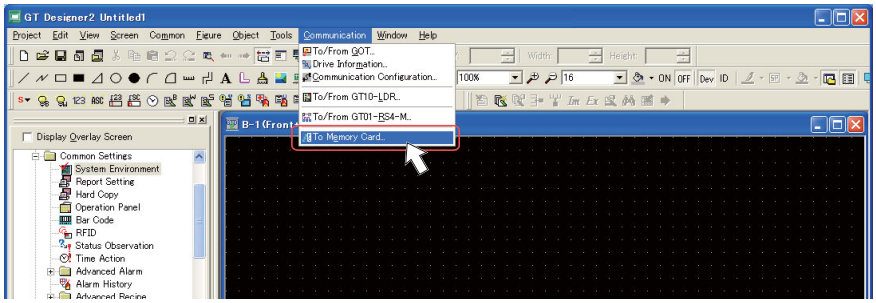
(Note) If OS data and project data (drawing data) are larger than the capacity of built-in flash memory, select "A: Standard CF card" for "Drive" to store the project data in a CF card. Confirm that a CF card is inserted on the GOT rear slot when selecting "A: Standard CF card".

2.6 Transferring the Data to GOT (Using a CF card)

A CF card is also available for installing OS and transferring the project data.
Write OS and the project data into the CF card, and transfer the data to GOT.

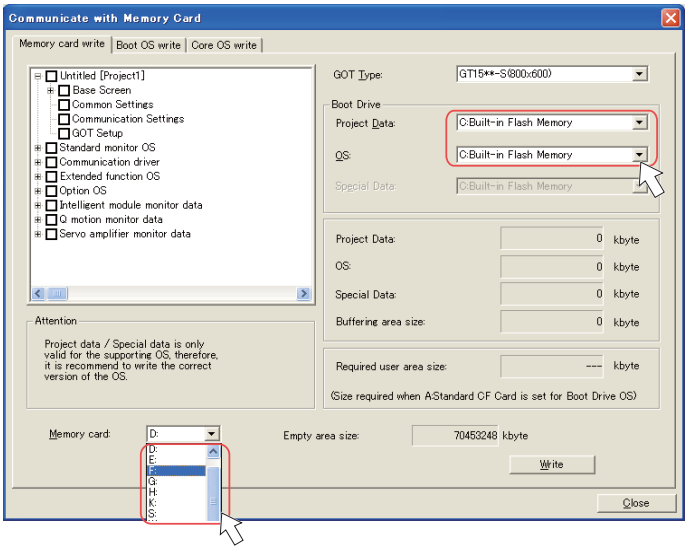
2.6.1 Writing the Data into a CF card

(1) Mount a CF card in the personal computer.
Start GT Designer2 on the personal computer, and open the project. Select [Communication]-[To Memory Card...] from the menu bar.



(Note) At starting GT Designer2, if the "New Project Wizard" dialog box appears, close the dialog box.

(2) Select and set "Boot Drive" and "Memory card".
For "Boot Drive", select the drive on GOT for booting with the project data and OS.
For "Memory card", select the drive assigned to the CF card in the personal computer.

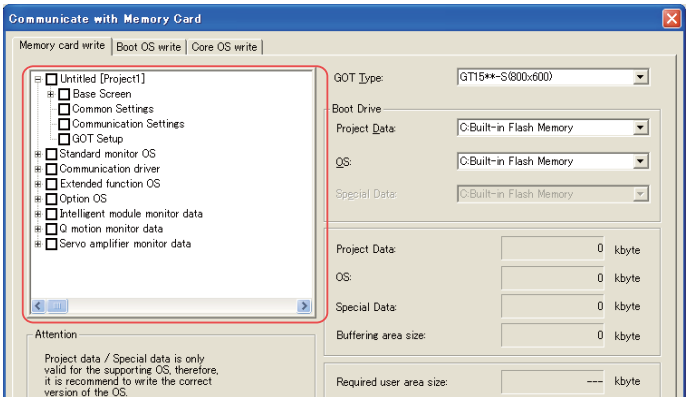


(Note) The following two options are available for "Boot Drive":

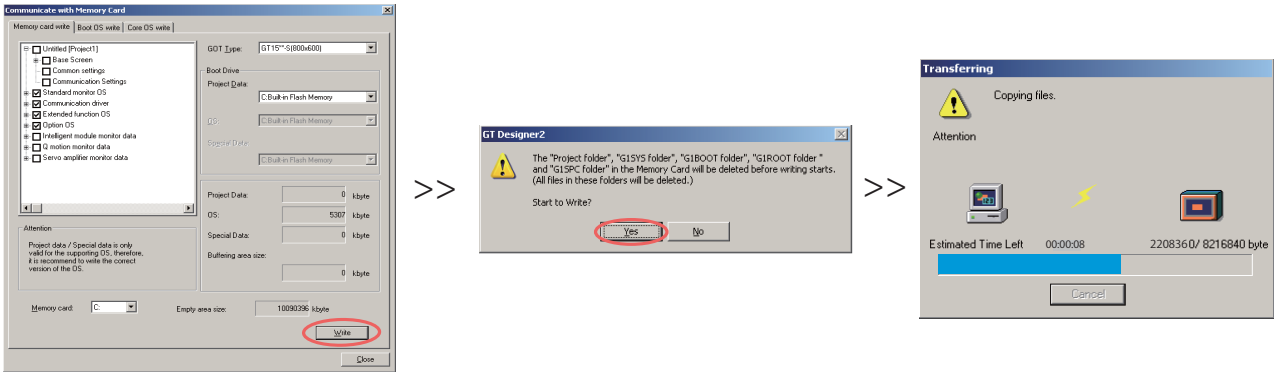
Project data	OS
A: Standard CF Card	A: Standard CF Card
C: Built-in Flash Memory	C: Built-in Flash Memory

If OS data and project data (drawing data) are larger than the capacity of built-in flash memory, select "A: Standard CF card" for "Boot Drive".
For details, refer to the "GT Designer2 Version2 Basic Operation/Data Transfer Manual" (SH(NA)-080529), Section 8.

(3) Check the check boxes of the necessary functions. Refer to "Installing OS on GOT" for the function details.



(4) Click "Write". By clicking "Yes" of the confirmation window, writing in the Standard CF card will start.

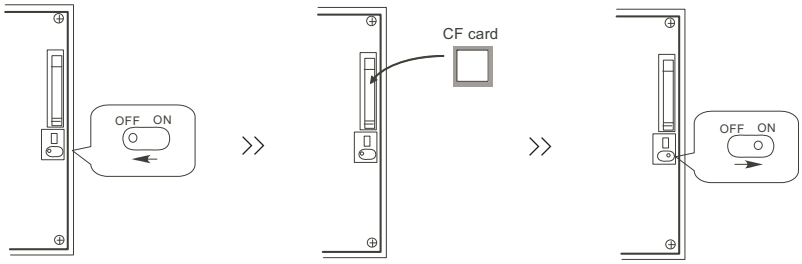


(5) On the completion window, click "OK", and remove the CF card from the personal computer.
(Note) At removing a CF card, refer to your personal computer's specification and instruction.

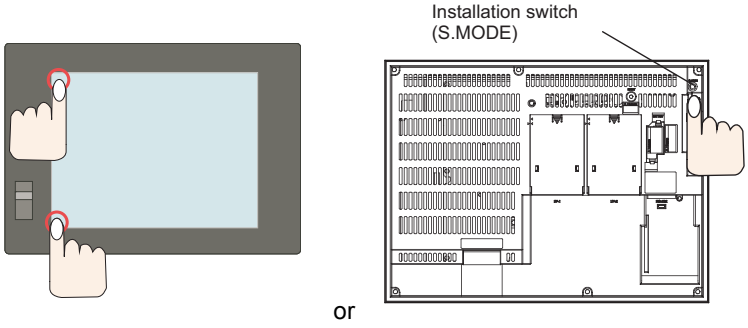
2.6.2 OS Installation and Project Data Transfer from the CF Card to GOT

Install the standard monitor OS and so on and transfer the data from the CF card.

(1) Turn the GOT OFF and set "OFF" the CF card access switch on the back of GOT. Insert the CF card which contains the data into the slot, and set the CF access switch to "ON".



(2) Keep touching the GOT screen's left top and bottom during turning ON.
When using GT1595-X or GT16, keep pressing the installation switch (S.MODE switch) on the back of the GOT during turning the GOT ON.



The data in the CF card is transferred to the GOT.

(3) The GOT automatically restarts after the data transfer. (If the standard monitor OS has already been installed, touching the button will restart the GOT.)

(4) Confirm that the GOT is successfully restarted, and set the GOT's CF card access switch to "OFF". Confirm that the CF card access LED is OFF, and remove the CF card from the GOT's CF card interface.

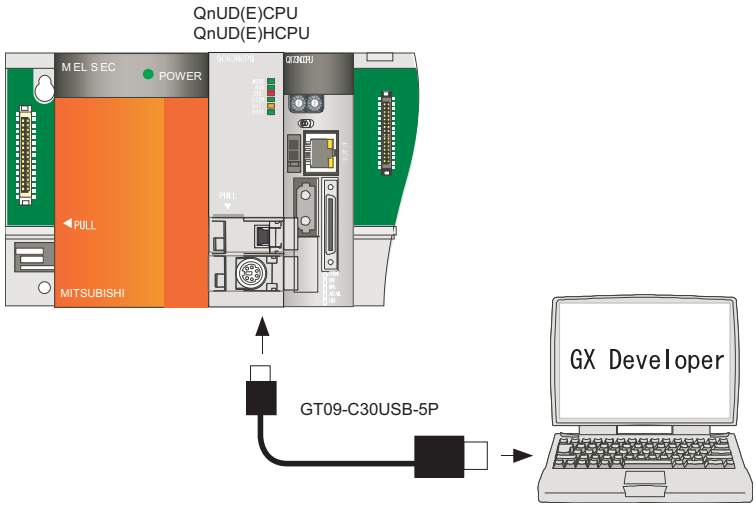
(Note) For details, refer to the "GT Designer2 Version2 Basic Operation/Data Transfer Manual" (SH(NA)-080529), Section 8.

3

PLC CPU Initial Setup

3.1 Connecting the Devices Necessary for Setup

Connect the personal computer in which the sequence program development/maintenance tool GX Developer is installed to the PLC CPU with USB or RS-232C.



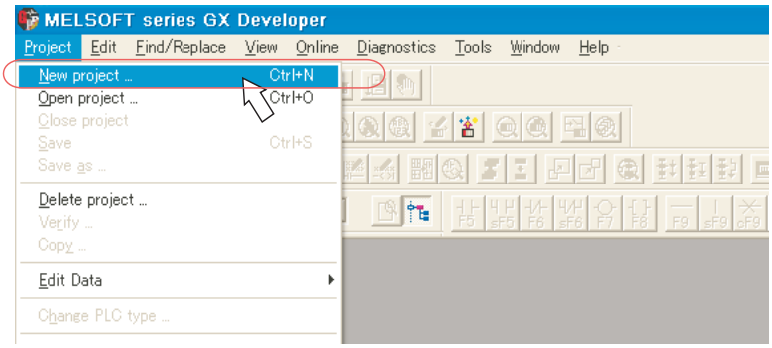
(Note 1) GX Developer Version8.48A or later is required.

(Note 2) When connecting to a personal computer and a module with USB interface, an electric shock or a module failure may occur depending on the model of a personal computer or the service condition.
Be sure to refer to "Items related to connection" on "Precautions for Safety" before connecting them.

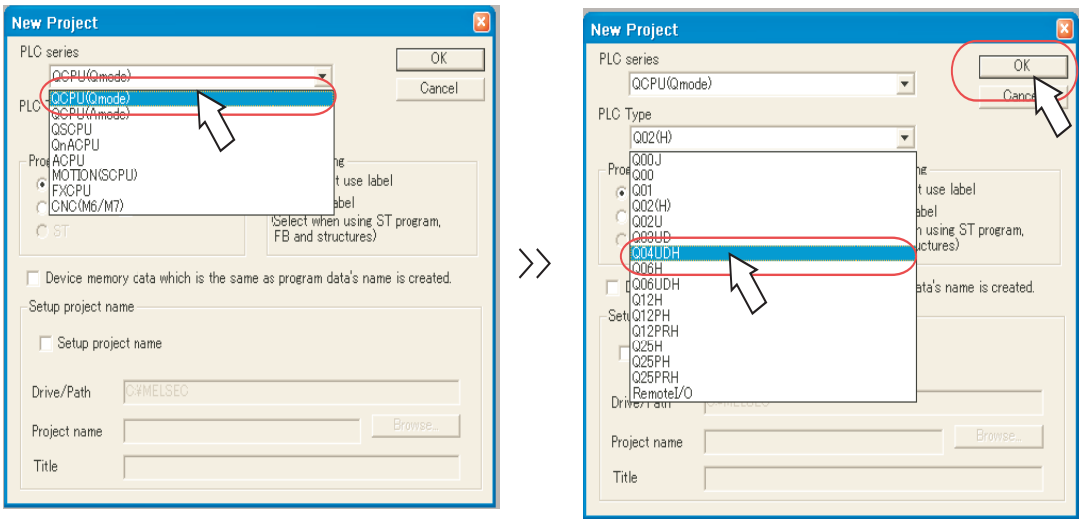
3.2 Setting the Connection to GX Developer

In order to setup GX Developer and PLC CPU, it is necessary to open a project on GX Developer.

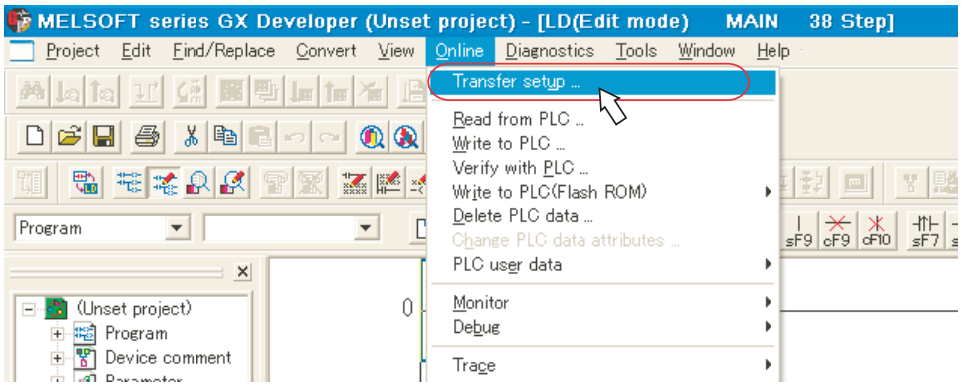
(1) Turn ON the PLC CPU. Start GX Developer, and select [New project] from the [Project] menu. If a project is already created, open it. ([Project]-->[Open project])



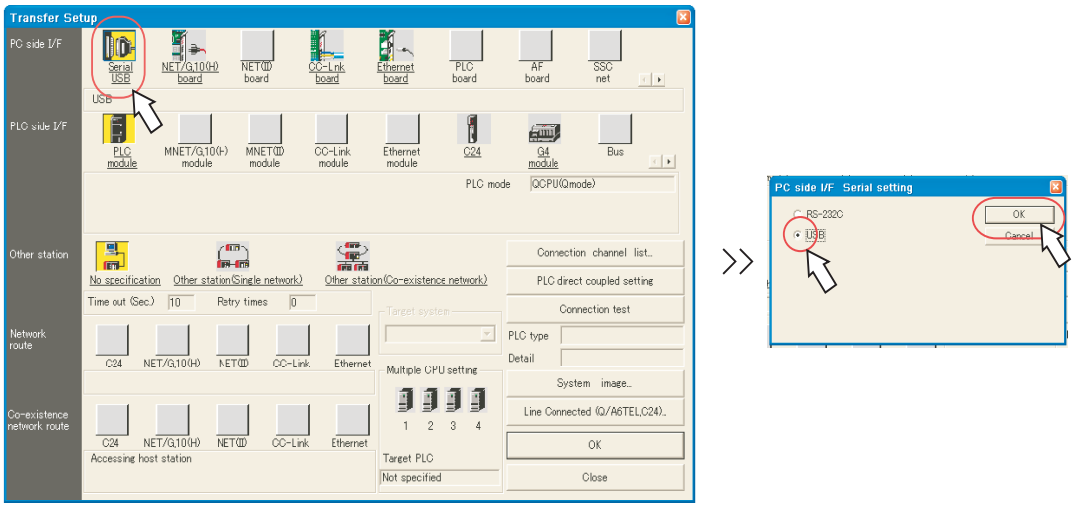
(2) If "New project" is selected, the "New project" dialogue box will appear. In "PLC series", select "QCPU (Qmode)", and in "PLC Type", select the PLC CPU type to connect. Click "OK".



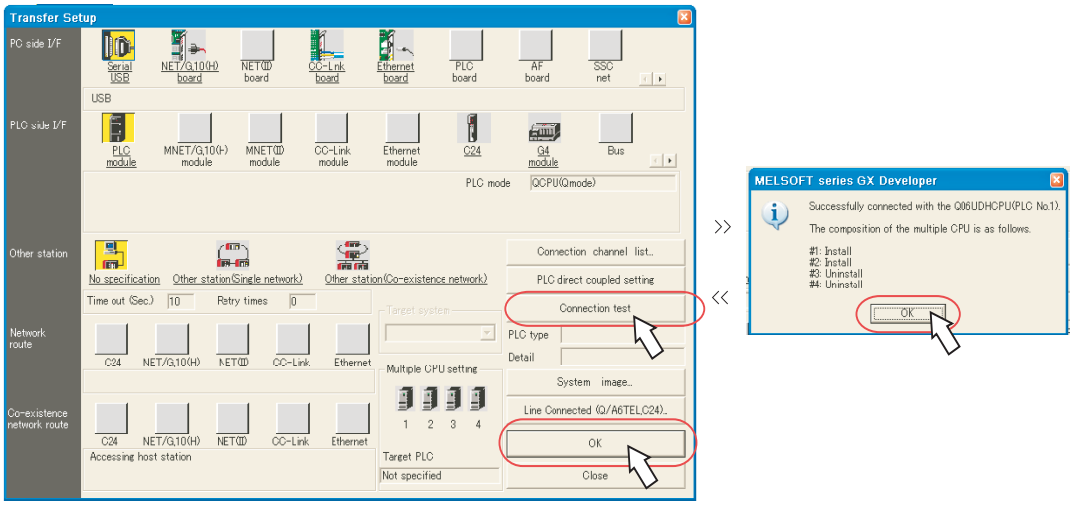
(3) From the menu, select [Online]--->[Transfer setup...].



(4) Double-click "Serial USB" on the "Transfer setup" screen, and select the connection method (USB or RS-232C).

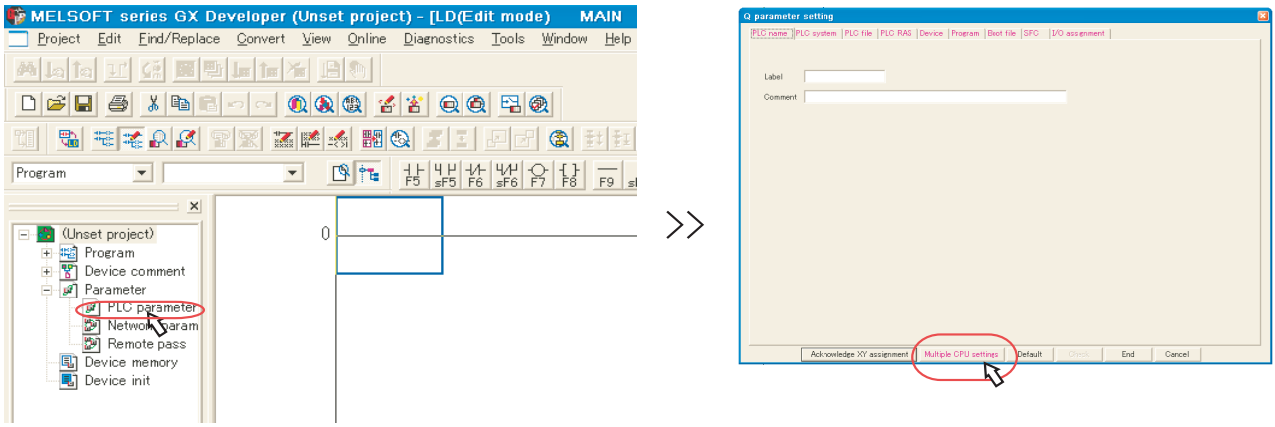


(5) Click "Connection test" to execute the test. After confirming the message "Successfully connected", click "OK". Click "OK" of the "Transfer setup" screen, and close the window.

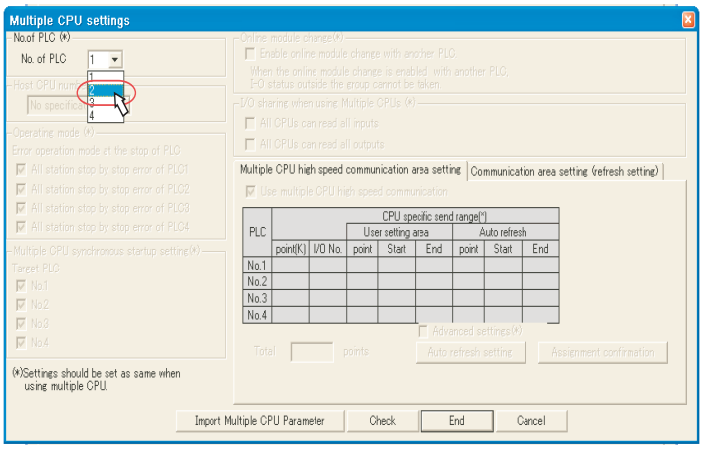


3.3 Setting Multi-CPU Parameters

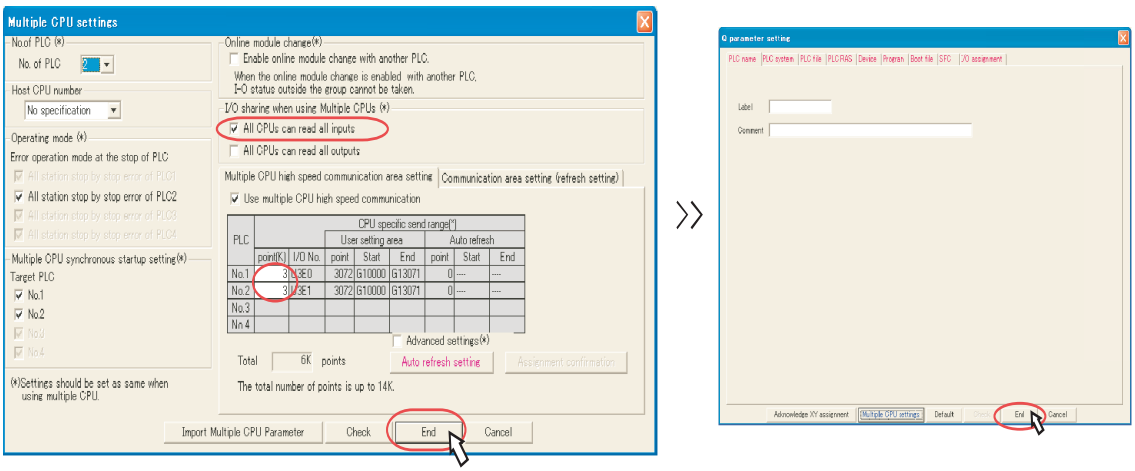
(1) Double-click [Parameter]--->[PLC parameter] in the project list. "Q parameter setting" dialog box appears. In the "Q parameter setting" dialog box, click "Multiple CPU settings".



(2) In "No. of PLC" in the "Multiple CPU settings" dialog box, set the total number of CPU modules mounted on the base. For example, if one PLC CPU and one CNC CPU are mounted, the number will be "2".



(3) In the "I/O sharing when using Multiple CPUs" field, check the check box of "All CPUs can read all inputs". On the "Multiple CPU high speed transmission area setting" tab, set "3" to each CPU's "Points (K)", and click "End". Also in the "Q parameter setting" dialog box, click "End".

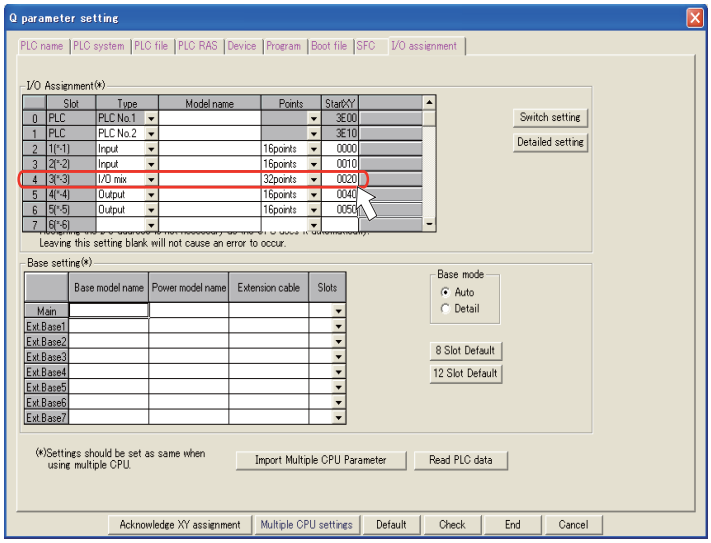


3.4 Parameter Settings for Safety Observation

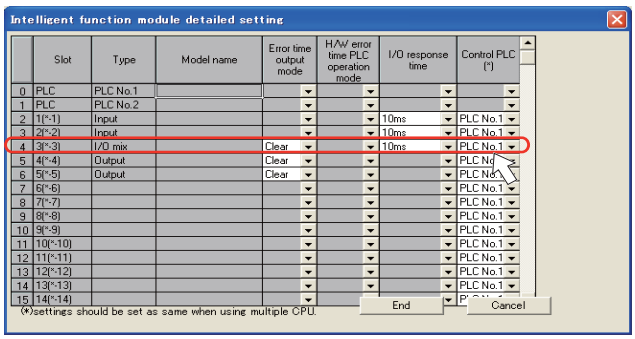
The following settings are required on the "Q parameter setting" dialog box to execute the safety signal comparison. For details, refer to "Safety Observation Specification Manual" (BNP-C3059-001N).

I/O assignments setting

Double click "I/O assignment", and set the headXY device on the dual signal module.
Set the same value to CNC parameters "#21143 SSU_Dev1" to "#21145 SSU_Dev3".
To prevent the device No. being changed by removing the module, be sure to set headXY device on the dual signal module. If the headXY device settings are different from the parameter settings from "#21143 SSU_Dev1" to "#21145 SSU_Dev3", the safety observation error will occur when the controller's power is turned ON or in 24 hours continuous operation.
To confirm the device assignment of the dual signal module, click "Acknowledge XY assignment" on the bottom of the screen. To confirm the actual mounting state, select [Diagnositics] - [System monitor] with connecting GX Developer to the controller.
Select "I/O mix" for "Type" of the dual signal module.
The dual signal module occupies 32 points in both input and output. Pay attention to the next slot's I/O assignment.



Click the "Detailed setting" in the "I/O assignment" on the screen, and set the dual signal module's "Control PLC" to "PLC No.1" in the "Intelligent function module detailed setting" dialog box.
Set "Error time output mode" to "Clear".
Unless the "Control CPU" is set to "PLC No.1", other CPU module may control the signal. Make sure that the "Control CPU" is set to "PLC No.1". Also if "Error time output mode" is not set to "Clear", the safety observation error will occur when the controller's power is turned ON or in 24 hours continuous operation.

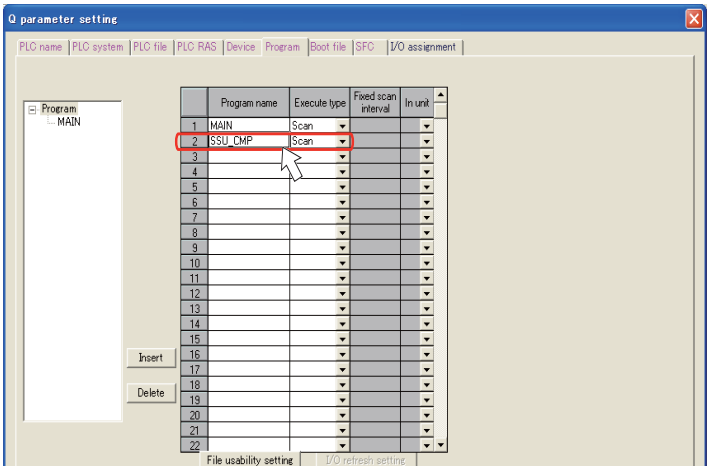


(Note) This parameter is enabled when the controller's power is turned ON again.

Dual-signal comparison sequence program setting

Click the "Program" tab, and add the program name for executing the dual-signal comparison sequence program (SSU_CMP).

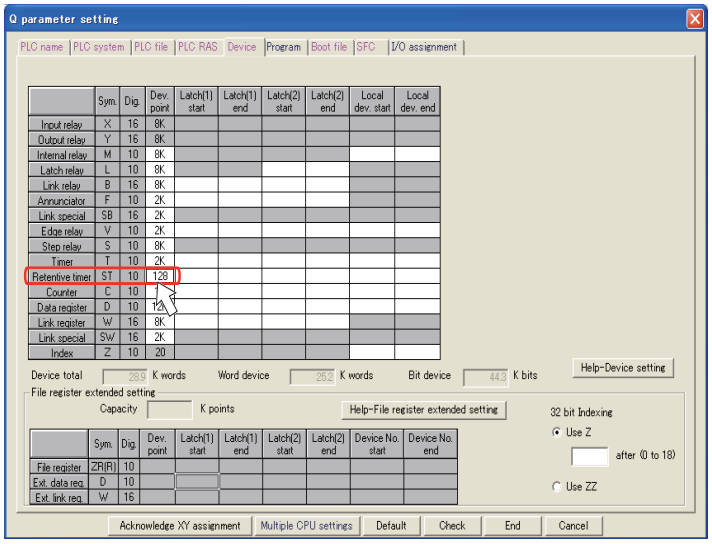
Unless the program name is set, multiple sequence programs in the PLC cannot be executed.



Device No.

Click the "Device" tab, and set "128" to "Retentive timer".

Do not change the values other than "Retentive timer".



(Note) This parameter is enabled when the PLC sequence program's STOP-->RUN is executed.

Do not set a value to "Latch" on the device used for the dual signal comparison sequence program.

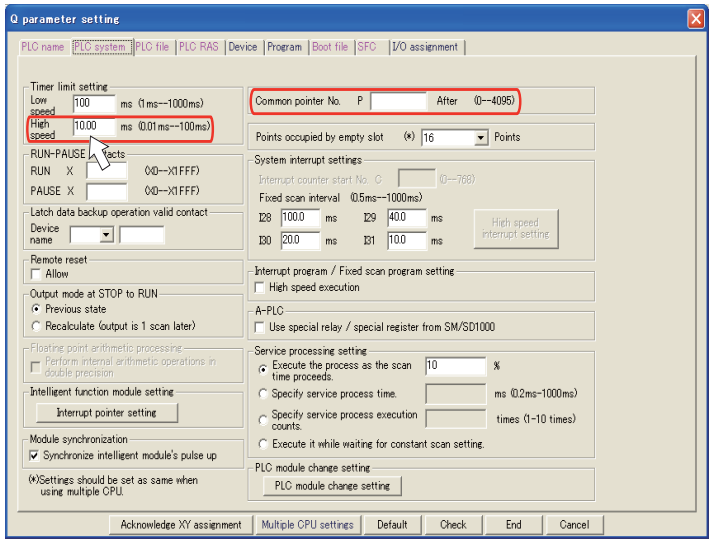
Also make sure that the following device is not used in the machine sequence program or other sequence program.

Device usage restriction on PLC side user safety sequence program

Device No.	Device range
D	D0 to D199
M	M0 to M999
T	T0 to T199
Z	Z15 to Z19

PLC system

Click the "PLC system" tab, and confirm "High speed" for "Time limit setting" is set to "10.00".
If this setting is changed from "10.00", the safety observation error will occur when the controller's power is turned ON or in 24 hours continuous operation.
Also, P0 to P19 are used as a local pointer for the safety signal comparison sequence program. When an earlier number than P20 is set to the "Common pointer No.", PLC CPU will have an error then STOP.

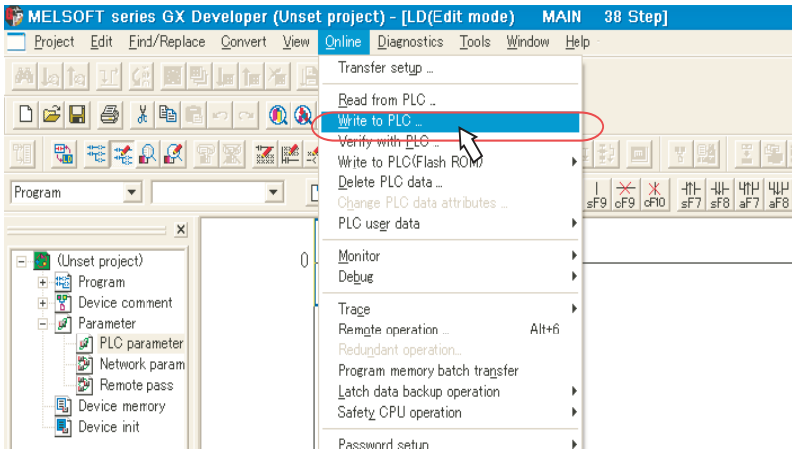


(Note) This parameter is enabled when the PLC sequence program's STOP-->RUN is executed.

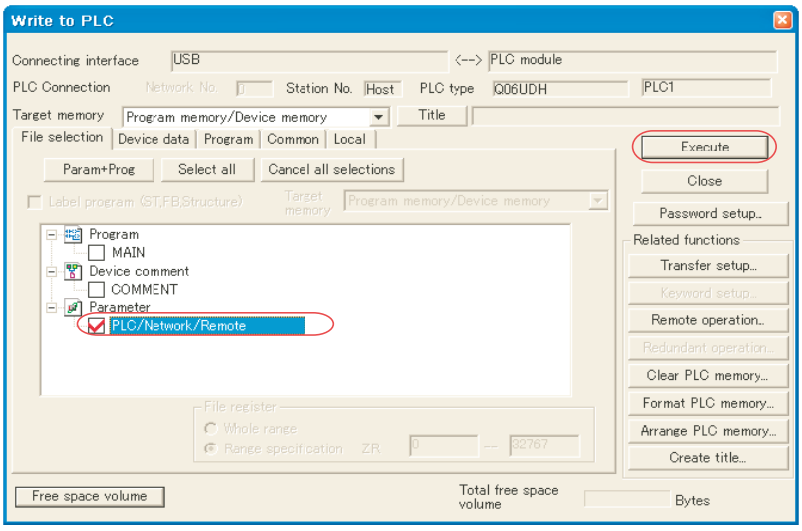
3.5 Writing Parameters

Write the parameters which are set in GX Developer to the PLC CPU.

(1) Select [Write to PLC...] from the [Online] menu.



(2) In the "Write to PLC" dialog box, check the check box of "Parameter", and click "Execute". When writing is finished, the completion message will appear.



(3) Turn the power OFF and ON.

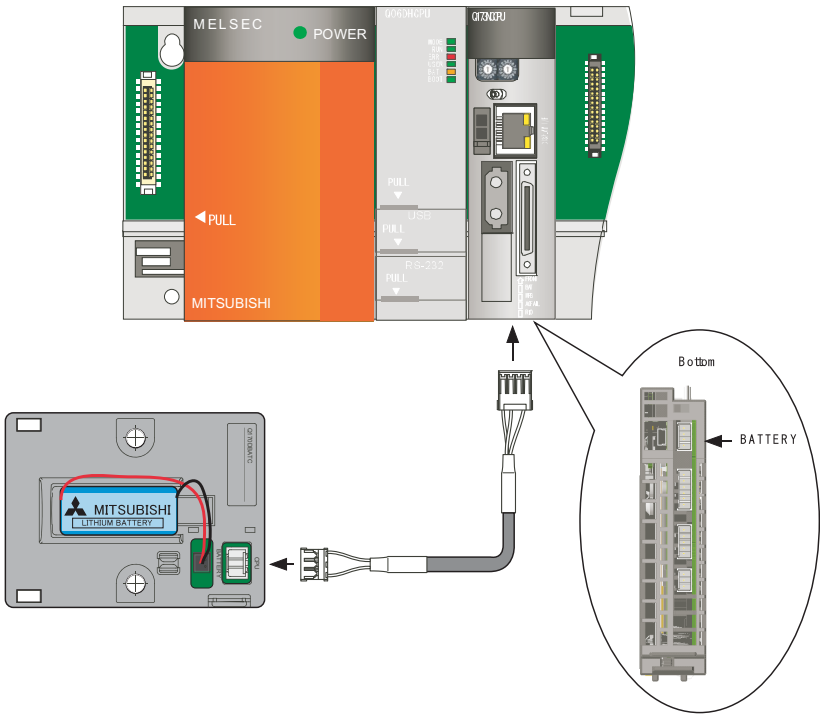
3 PLC CPU Initial Setup

4

CNC CPU Initial Setup

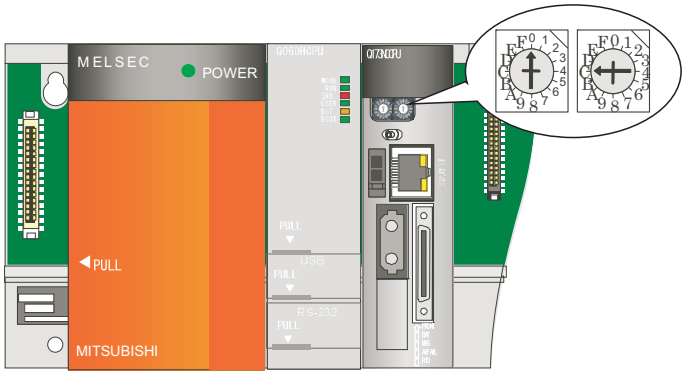
4.1 Connecting Battery to CNC CPU

Confirm that a battery for data backup is connected to the CNC CPU.



4.2 Initializing CNC CPU Internal Data (Clearing SRAM Data)

(1) With the power OFF, set the CNC CPU module's left rotary switch 1 to "0", right rotary switch 2 to "C". Then turn the power ON.



(2) The LED changes from "b00" --> ... --> "b80". When "c30" is displayed, clearing is complete. It takes approximately four seconds.

(3) Turn the power OFF, and set the right rotary switch 2 to "0" (normal setting).

(Note) By clearing the SRAM, the CNC CPU's Ethernet is set to the following initial values.

<Ethernet's initial setting values of CNC CPU>

- IP address：192.168.1.2
- Subnet mask：255.255.255. 0
- Gateway： 0. 0. 0. 0
- Port No.：64758
- Communication speed：Auto-detect

4.2.1 Types of Memory and Backup Data

An NC incorporates the four types of memory below.

SRAM (Static Random Access Memory)

This RAM stores data using a sequential circuit, such as Flip-Flop.
The SRAM contents are backed up by the battery.

FROM (Flash Read Only Memory)

This retains the contents even after turning the power OFF.

EEPROM (Electrically Erasable Programmable Read Only Memory)

This retains the contents even after turning the power OFF.

DRAM (Dynamic Random Access Memory)

This RAM stores data by accumulating charge on a capacitor. The contents are cleared when the power is turned OFF.
This is used as the temporary data area and an area to apply FROM data in the NC system.

The table below lists the data to be backed up in each memory and shows whether it is the object to format, SRAM clear or Backup/Restore.
Set "1" to "#1060 SETUP" and select "execute" to format.

Memory	Data contents	Data name	Format	SRAM clear	Backup/ Restore
SRAM	Machining program	ALL.PRG O_.PRG	○	○	○
	Fixed cycle program (Note 1)	O_.PRG	○	○	
	Tool offset	TOOL.OFS	○	○	○
	Common variable	COMMON.VAR	○	○	○
	Parameter	ALL.PRM		○	○
	Workpiece offsets	WORK.OFS		○	○
	CNC safety sequence	USERPLC.LAD		○	○
	Operation history data	TRACE.TRC		○	
	Tool life	—		○	
	Cycle monitor	—		○	
	Absolute position data (Note 2)	—		○	○
FROM	APLC data	APLC.O			
EEPROM	Option (Note 3)	—			○
DRAM	Sampling data	NCSAMP.CSV			

(Note 1) Fixed cycle program can be input/output only when #1166 fixpro=1.

(Note 2) For the restoration of the absolute position data, refer to the next page.

(Note 3) Options are updated by writing a parameter or SRAM data, only when it is not formatted.

4.2.1.1 Loss and Restoration of Absolute Position Data

(1) Loss of Absolute Position Data

Any of the followings may result in the loss of absolute position data.

- Changing a parameter related to absolute position.
- Writing a parameter which was acquired when the zero point was in a different position.
- NC: SRAM clear
- NC: low battery
- Failure in NC absolute position data
- Servo drive: low battery or uninstallation of the battery
- Servo drive: disconnection of detector cable

The absolute position data can be restored by Backup/Restore or SRAM data.

(2) Restoration by Backup/Restore

- Execute "Restore" with Backup/Restore.
- Turn the NC power OFF and ON.

Restoration with the GOT's Backup/Restore function restores the linear axis, but not the rotary axis. An initialization of the absolute position of the rotary axis must be performed.
The same restoration as the Backup/Restore function can be performed by writing the parameter (ALL.PRM).

Status at Restore	Absolute position established	Absolute position not established, SRAM clear
Linear axis	- Status will not change - Absolute position internal data will be updated	- Absolute position will be established - Absolute position internal data will be updated
Rotary axis	- Status will not change - Absolute position internal data will not be updated	

⚠ CAUTION

It is dangerous to restore the backup data of other machine when the absolute position is established because the zero point will be established with the absolute position of the linear axis rewritten, thus the zero point position is off the right position.
Initialize the zero point again.

(3) Restoration by SRAM data

- On the CNC monitor, go to [PLC-I/F] screen from [DIAGN IN/OUT], and set "SM69" to "Device", "1" to "Data" and "2" to "Mode".
- Select [Maintenance] of CNC data I/O, copy the backup SRAM.BIN to the NC.
  Turn the NC power OFF and ON.

⚠ CAUTION

Restoration by SRAM data is available only if the rotary axis motor has not rotated in a same direction 30,000 times or more since the acquisition of the data.
Otherwise, the zero point of the rotary axis will change by turning the power OFF and ON after writing the SRAM data, which will cause danger. Make sure the zero point is not off the right position.
The use of this method should be limited to when necessary, such as when replacing an NC unit, and requires enough safety confirmation before executing.

(Note) If "Z70 Abs posn error 0101" occurs, execute SRAM clear and data restoration or initialize the zero point.

(4) Correspondence between absolute position data and parameters

Correspondence between absolute position data and I/O parameter #10000s is shown below.

#	Name	Description	Timing of Updating
10001	absfint	Absolute position setting completed I/O tempo	When the power is turned OFF and ON after changing a parameter related to absolute position detection.
10002	SV077	E0 The absolute position error saved when the basic position was set.	When the status changes to "Completed" during the initialization procedure.
10003	SV078	R0 The multi-rotation counter value of the detector saved when the basic point was set.	
10004	SV079	P0 The position in one rotation of the detector saved when the basic point was set.	
10005	SV080	P0 The position in one rotation of the detector, saved when the basic point was set.	
10006	absg	Machine end (Master) (cunit unit)	
10007	abssum1	SV077 ― SV080 Checksum (:absn abs1x absg)	
10008	abseor1	SV077 ― SV080 EOR (:absn abs1x absg)	
10009	abssum2	Parameter checksum	
10010	abseor2	Parameter EOR	
10011	absbase	Zero point (micro) (cunit unit)	The value in the #2 [Zero point] of [Mainte] - [Absolute Position Setting] screen. Updated by screen input.

4.2.1.2 List of Standard Parameters

The list below shows the standard parameters and their setting values, which are set by setting "1" to "#1060 SETUP". Some of the servo parameters (#2201-2438) and spindle parameters (#13001-13240) needs resetting in accordance with motor types after they are automatically set by the above setting.

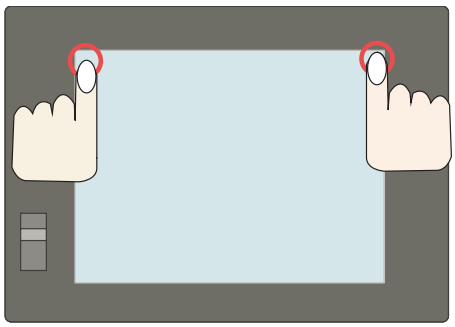
# No.	Name	Setting value		# No.	Name	Setting value
1084	RadErr	0.100		3001	slimit1	6000
1169	system name	1		3002	slimit2	6000
1170	M2name	B		3003	slimit3	6000
1174	skip_F	100		3004	slimit4	6000
1185	spd_F1	100		3005	smax1	6000
1186	spd_F2	200		3006	smax2	6000
1187	spd_F3	300		3007	smax3	6000
1188	spd_F4	400		3008	smax4	6000
1189	spd_F5	500		3009	ssift1	0
2001	rapid	10000		3010	ssift2	0
2002	clamp	4000		3011	ssift3	0
2003	smgst	0021		3012	ssift4	0
2004	G0tL	100		3013	stap1	6000
2005	G0t1	100		3014	stap2	6000
2006	G0t2	100		3015	stap3	6000
2007	G1tL	30		3016	stap4	6000
2008	G1t1	30		3017	stapt1	500
2009	G1t2	30		3018	stapt2	500
2011	G0back	0		3019	stapt3	500
2012	G1back	0		3020	stapt4	500
2013	OT-	1.000		3021	sori	0
2014	OT+	1.000		3022	sgear	0
2017	tap_g	15.000		3023	smini	0
2025	G28rap	8000		3024	sout	0
2026	G28crp	500		3025	enc_on	0
2027	G28sft	0		8204	OT-CHECK-N	1.000
2028	grmask	0		8205	OT-CHECK-P	1.000
2029	grspc	10				
2037	G53ofs	0				

4.3 Setting Multi-CPU Parameters

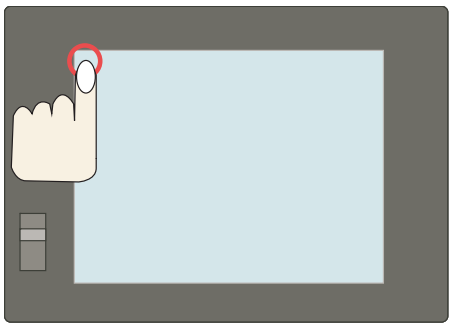
Set CNC CPU module's parameters from GOT's CNC monitor screen.

(1) Turn ON the CNC CPU module. Turn ON the GOT, and display the utility's main menu. The utility call key(s) is set as follows at factory shipment.

For GT15: Press the right and left top corners together.



For GT16: Press the left top corner.

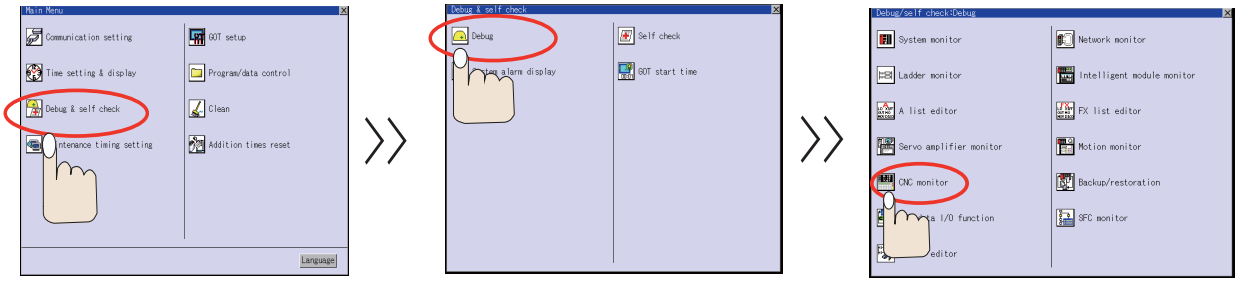


(Note 1) After turning the power ON, it takes approximately fifteen seconds for GOT to start.

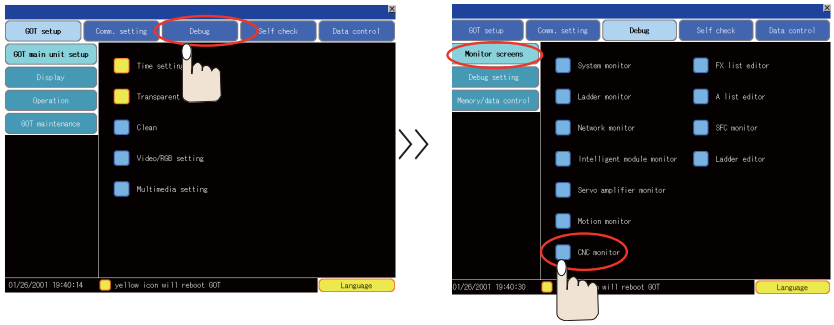
(Note 2) The utility call key(s) can be arranged on the GT Designer2's "GOT Setup" screen. For details, refer to the "GT Designer2 Version2 Screen Design Manual" (SH(NA)-080530), Section 3.

(2) Select the [CNC monitor] menu.

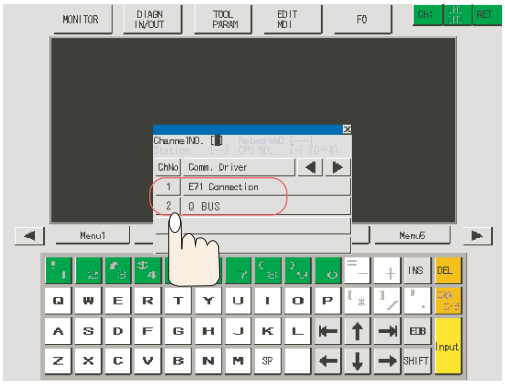
For GT15: [Debug & self check] - [Debug] - [CNC monitor]



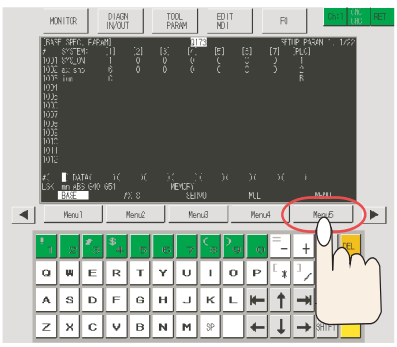
For GT16: [Debug] - [Monitor screens] - [CNC monitor]

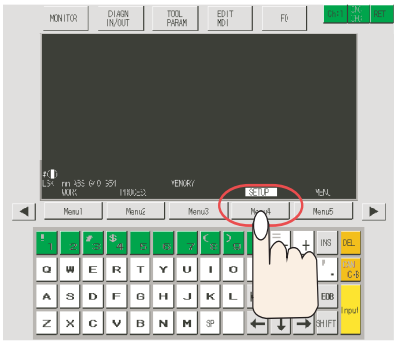


(3) The screen to select the communication driver to communicate with the GOT appears. Select "E71 Connection". Select "Q BUS" for bus connection. For E71 connection, refer to section 2.2.1 - 2.2.2. For the bus connection, refer to section 2.2.3.
(When the power is turned ON for the second time onwards, this communication selection screen won't be listed among the CNC monitor screen selections.)

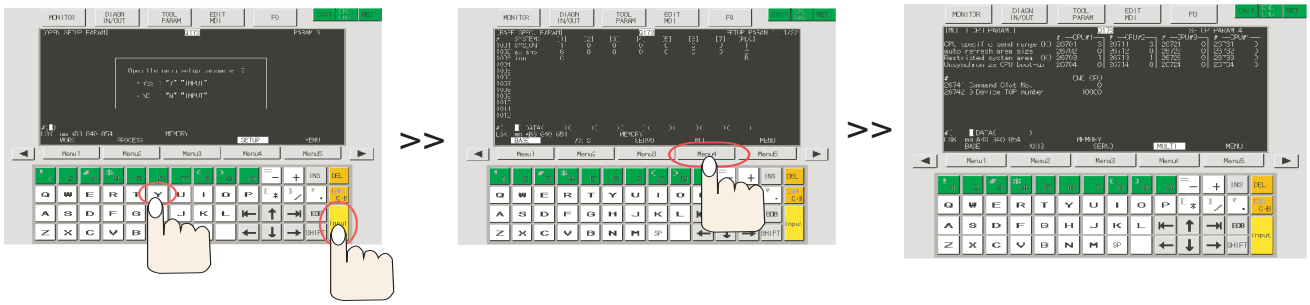


(4) Select [TOOL PARAM]--->[MENU (MENU 5)]--->[SETUP (MENU 4)] to display the setup screen selection.





(5) By following the screen's instruction, select "Y" ---> "INPUT" (input "Y"), and select "MULTI (MENU 4)".



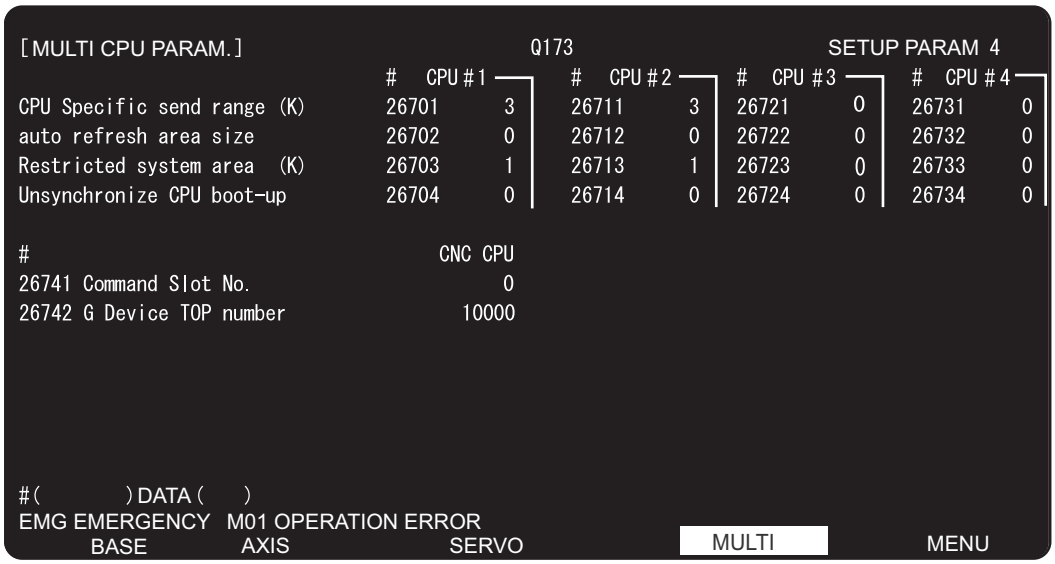
(Note 1) The display language will change to English after a SRAM clear. Select the display language by the parameter "#1043 Lang".

(Note 2) When the parameter "#1138 Pnosel" is set to "1", the function to select a screen by parameter will become valid.

(6) On the [MULTI CPU PARAM.] screen, set the following values.
(Note) Refer to Chapter 5 when connecting more than one CNC CPU.
Setting up CPU#1 (PLC CPU)
-CPU specific send range #26701 = 3
-auto refresh area size #26702 = 0
-Restricted system area #26703 = 1
-Unsynchronize CPU boot-up #26704 = 0

Setting up CPU#2 (CNC CPU)
-CPU specific send range #26711 = 3
-auto refresh area size #26712 = 0
-Restricted system area #26713 = 1
-Unsynchronize CPU boot-up #26714 = 0

-#26741 Command Slot No. = 0
-#26742 G Device TOP number = 10000

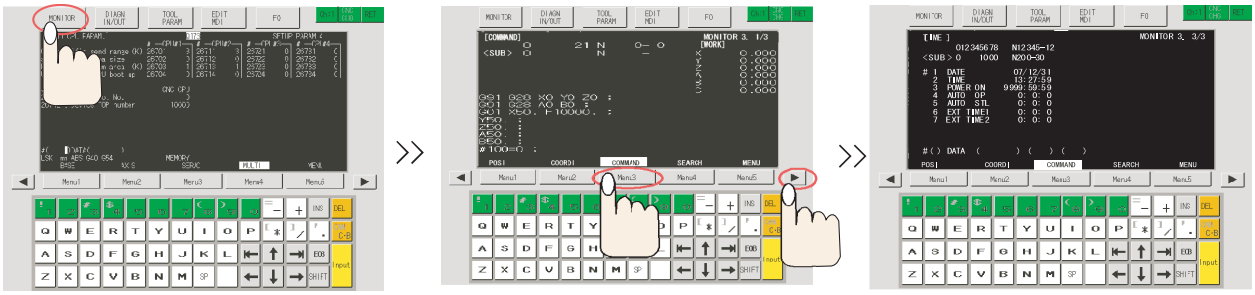


(7) Turn the power OFF and ON.
(Note) The parameter settings won't be enabled unless the power is turned ON again.

4.4 Setting the Date and Time

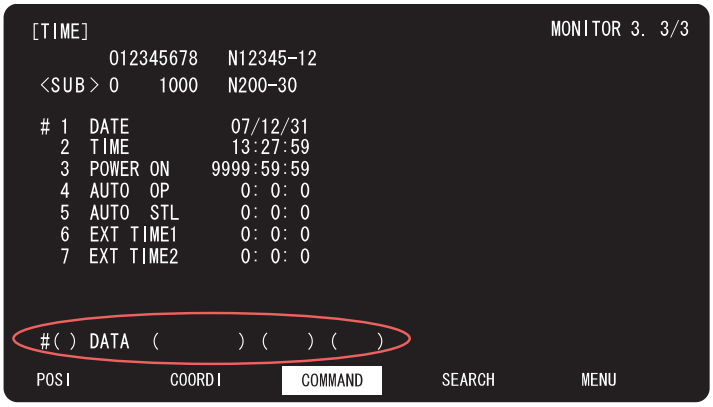
Date and time settings on CNC CPU module are automatically sent to the GOT and PLC CPU.

(1) Select [MONITOR]--->[COMMAND] to display the [COMMAND] screen. Scroll to the [TIME] page (3rd page).



(Note) As the CNC CPU memorizes the previously opened page, the order of screens displayed by function key and page scroll key is not always the same.

(2) In "#( )", input the item number you wish to change, and input values in "DATA ( ) ( ) ( )".



(Note) Date is shown as Year/Month/Day.

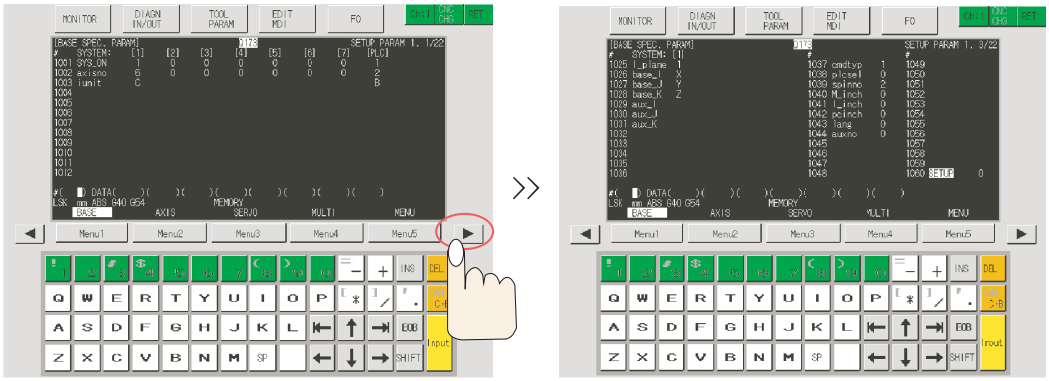
4.5 Formatting File System (Memory Area)

Memory in the CNC device (machining program, tool data area, etc.) must be formatted. Follow the following procedure.
The following contents will be erased by formatting.

- Machining program
- Tool data area (Tool length, tool wear data, etc.)
- Common variables (#100-#199, #500-#999)

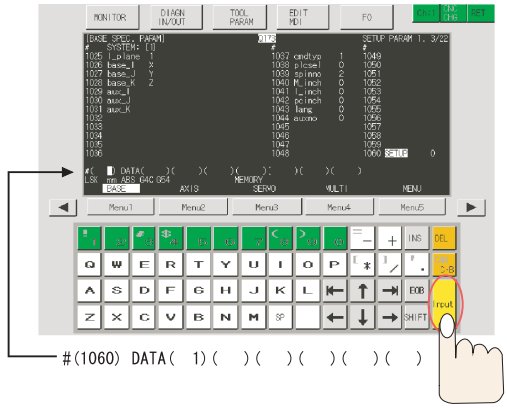
(1) Turn the power ON again to enable the parameter settings.

(2) Select [TOOL PARAM] on the "CNC monitor" screen to display the [BASE SPEC. PARAM] screen (SETUP PARAM 1. 3/22).



Press the button twice.

(3) Set the parameter "#1060" to "1", then touch the "INPUT" key to startup the CNC setup (internal memory formatting) function.



(4) When the message "BASE PARA. SET? (Y/N)" appears, touch the "N" and "INPUT" keys.
And when the message "FORMAT? (Y/N)" appears, touch the "Y" and "INPUT" keys.

(5) Turn the power OFF and ON.

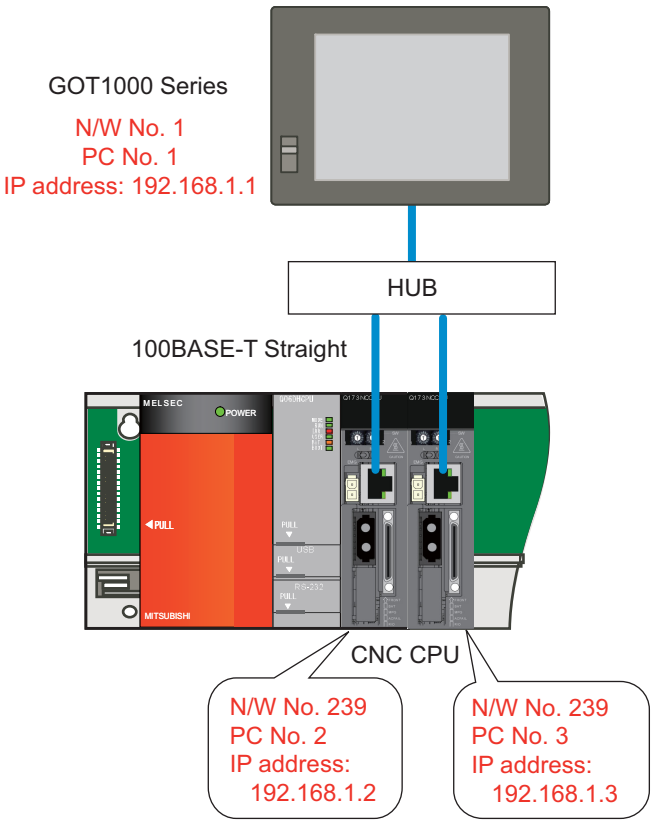
(Note) The page number differs depending on NC's version. The explanation on this page is based on the one with 22 pages.

5

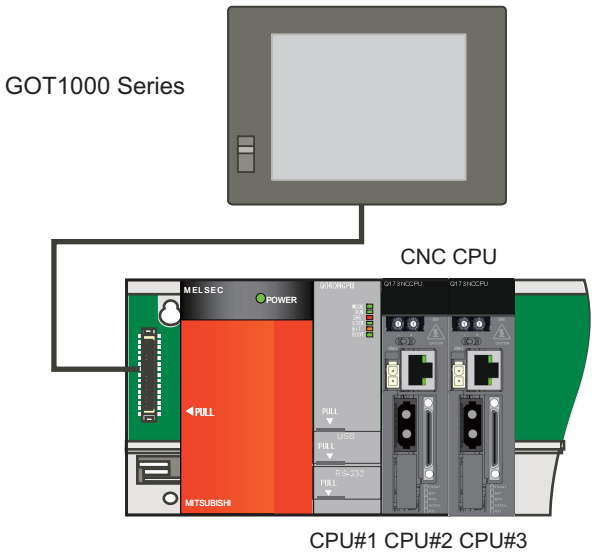
Connecting and Setting up Multiple CNC CPU Modules

Up to two CNC CPUs can be mounted on one base.
Connection procedure is explained based on the example shown below.

For Ethernet connection

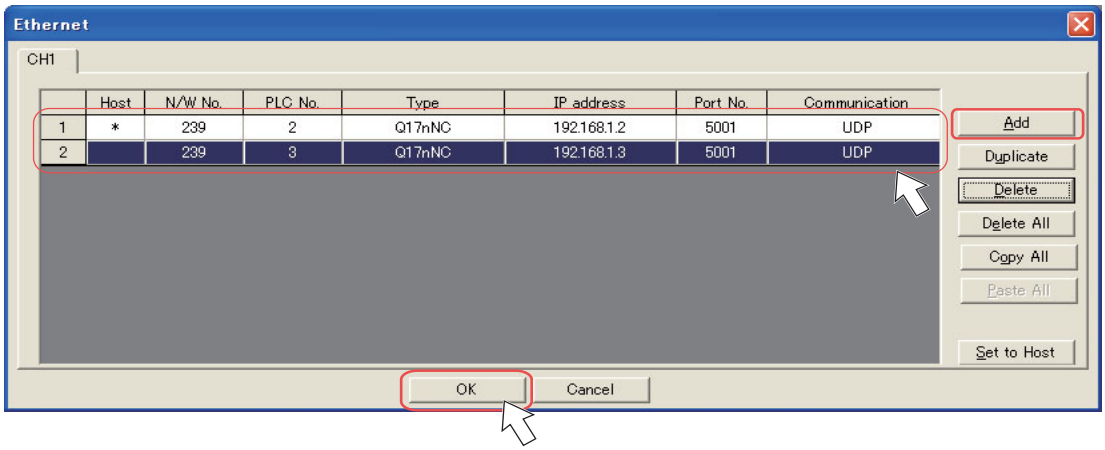


For bus connection



5.1 GOT Communication Setting

When connecting with Ethernet, select [Common Settings] - [Ethernet] on the GT Designer2 project, add the row as many as the number of CNC CPUs, and set the values. Set the different PLC No. and IP address from those for the 1st CNC CPU.
Other settings are the same as when setting one CNC CPU.



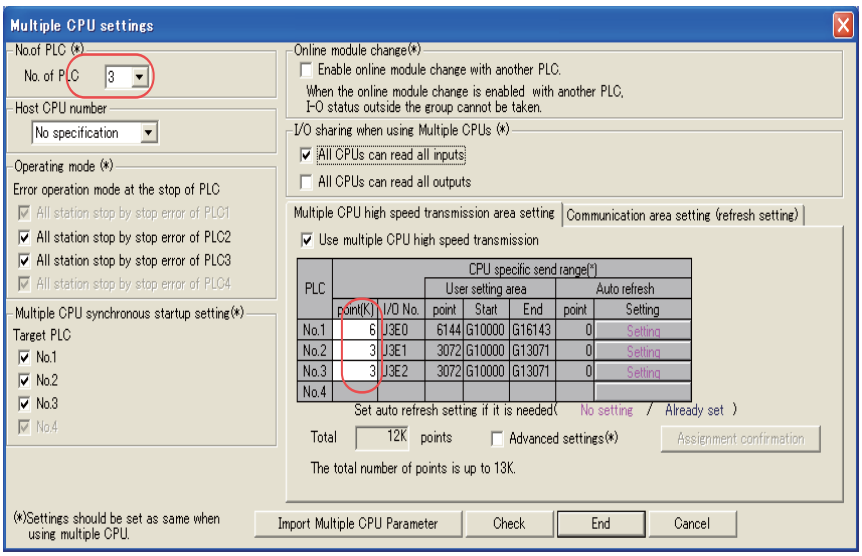
Bus connection settings are the same as when setting one CNC CPU.

5.2 Setting Multi-CPU Parameters to PLC CPU

When one PLC CPU and two CNC CPUs are mounted, set "3" for "No. of PLC" in the "Multiple CPU settings" dialog box. The point of PLC No.1 varies according to the value to be set for the parameter "#26742 G Device TOP number" of CPU#3 in "5.4 Setting Multi-CPU Parameters to CNC CPU".

(1) When setting the control signal of CPU#3 to G13072

Set "6" for the PLC No.1's "point".



(2) When setting the control signal of CPU#3 to G14000

This enables to start the CNC control signal from a round number.

Set "7" for the PLC No.1's "point".

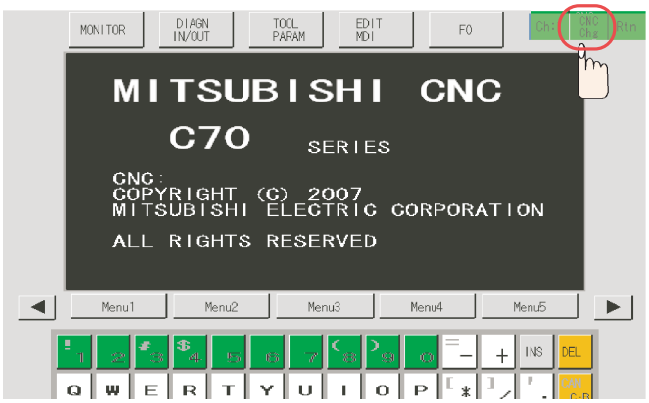
PLC	CPU specific send range(*)						
			User setting area			Auto refresh	
	point(K)	I/O No.	point	Start	End	point	Setting
No.1	7	U3E0	7168	G10000	G17167	0	Setting
No.2	3	U3E1	3072	G10000	G13071	0	Setting
No.3	3	U3E2	3072	G10000	G13071	0	Setting
No.4							

5.3 Switching the CNC Monitor Screen

Pressing "CNC Chg" switches the CNC CPU in the following order.

For Ethernet connection, the CNC CPU switches in the order that the data was set (from upper row on the Ethernet screen written before) in the GT Designer2 project data.

For bus connection, the CNC CPU switches in the order of CPU No. (CPU#).



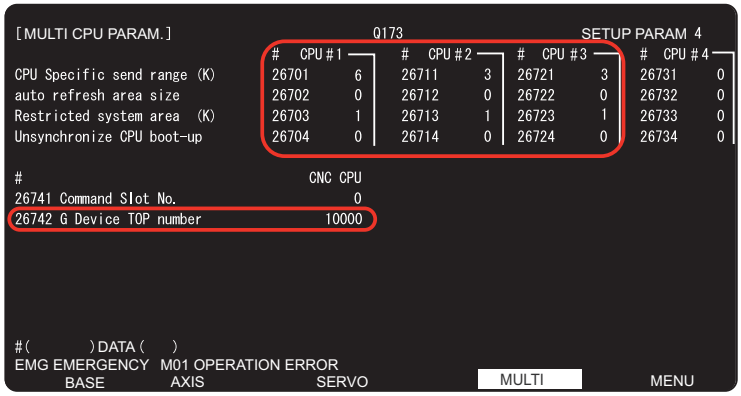
5.4 Setting Multi-CPU Parameters to CNC CPU

When connecting two CNC CPUs, there are two types of setting depending on the value to be set for the parameter "#26742 G Device TOP number" of CPU#3.

(1) When setting the control signal of CPU#3 to G13072.

Set "6" to the parameter "#26701 CPU specific send range(K)" for CPU #1. Set the parameter for CPU#3 in the same manner as CPU#2.

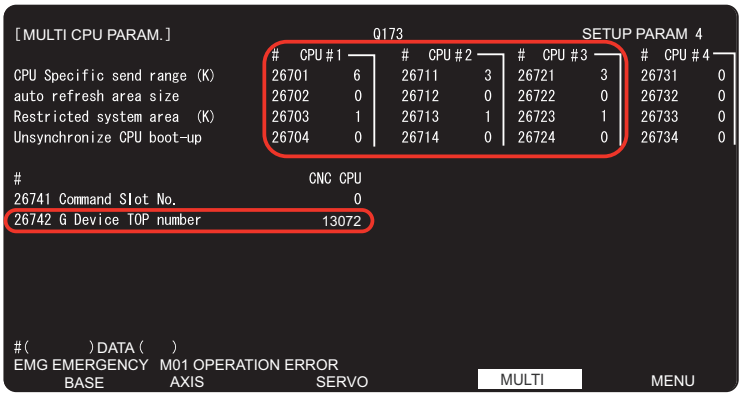
Setting up the 1st CNC CPU (CPU#2)



Apply the same settings to the 2nd CNC CPU.

However, set "13072" to the parameter "#26742 G Device TOP number".

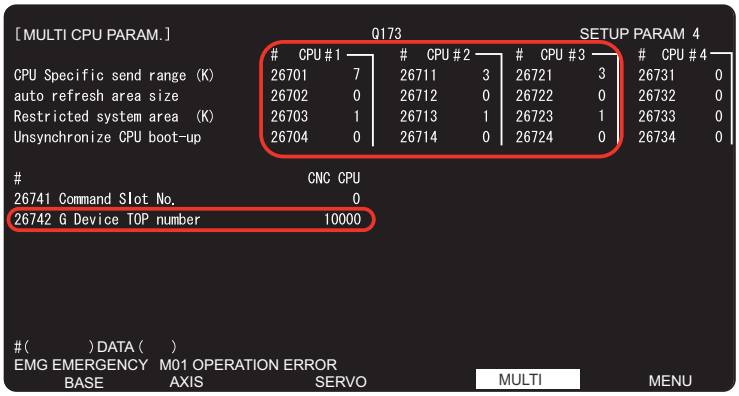
Setting up the 2nd CNC CPU (CPU#3)



(2) When setting the control signal of CPU#3 to G14000

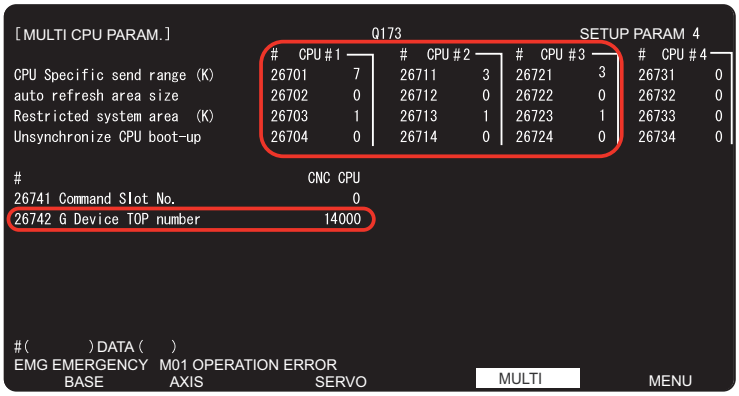
Set "7" to the parameter "#26701 CPU specific send range(K)" for CPU#1. Set the parameter for CPU#3 in the same manner as CPU#2.

Setting up the 1st CNC CPU (CPU#2)



Apply the same settings to the 2nd CNC CPU. However, set "14000" to the parameter "#26742 G Device TOP number".

Setting up the 2nd CNC CPU (CPU#3)



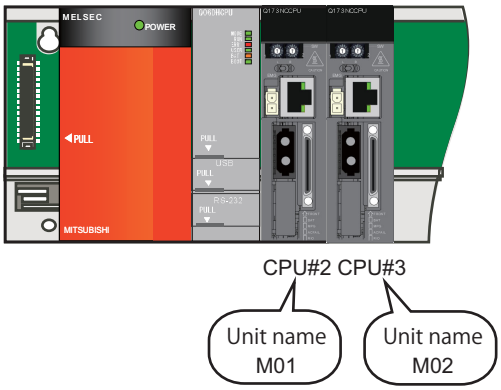
5.5 Setting the Module Name

To recognize which CNC CPU is set in the CNC monitor, each CNC CPU module needs to be named with the following parameter.

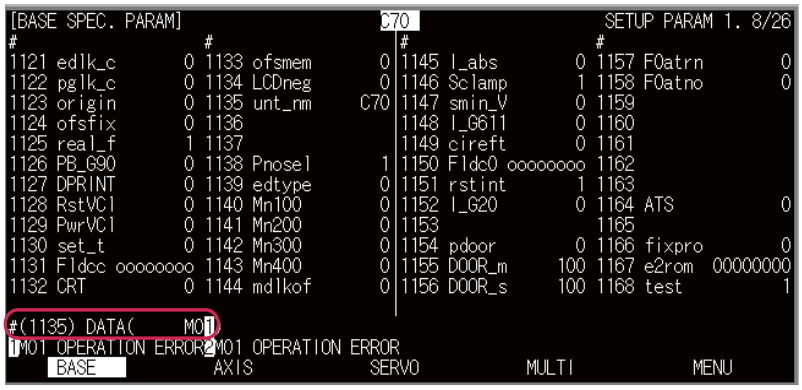
#1135 unt_nm: Set a module name.

Set up the module name with 4 or less characters consisting of both alphabets and numbers.
If “0” is set, the module name is not displayed.

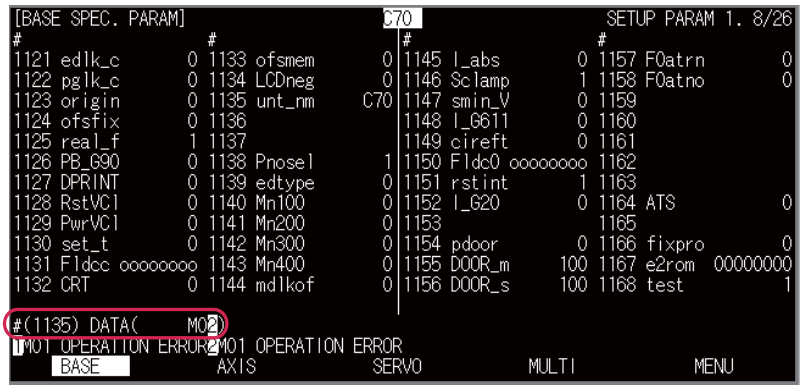
(Example)Setting the 1st CNC CPU as "M01" and the 2nd CNC CPU as "M02"



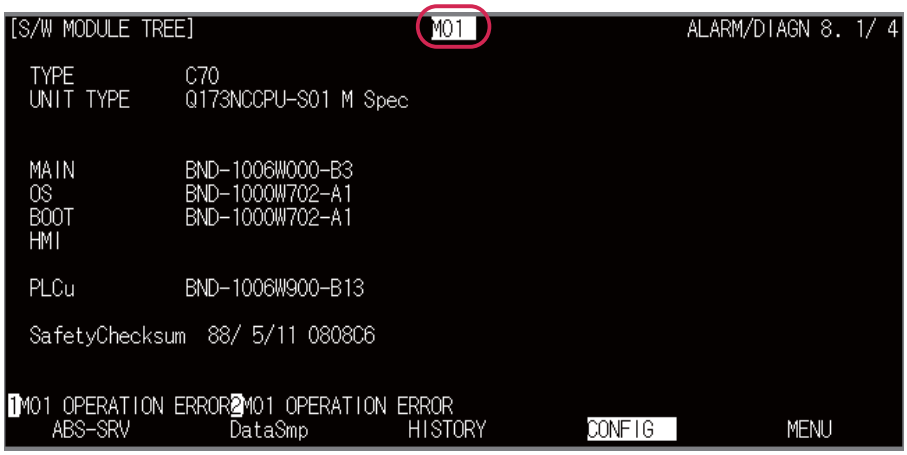
(1) In the CNC monitor screen for the 1st CNC CPU, set "M01" in the base specification parameter "#1135 unit_nm".



(2) Select "CNC Chg". In the CNC monitor screen for the 2nd CNC CPU, set "M02" in the base specification parameter "#1135 unit_nm".



The module name can be confirmed in the [S/W MODULE TREE] screen from [DIAGN IN/OUT] - [CONFIG].



6

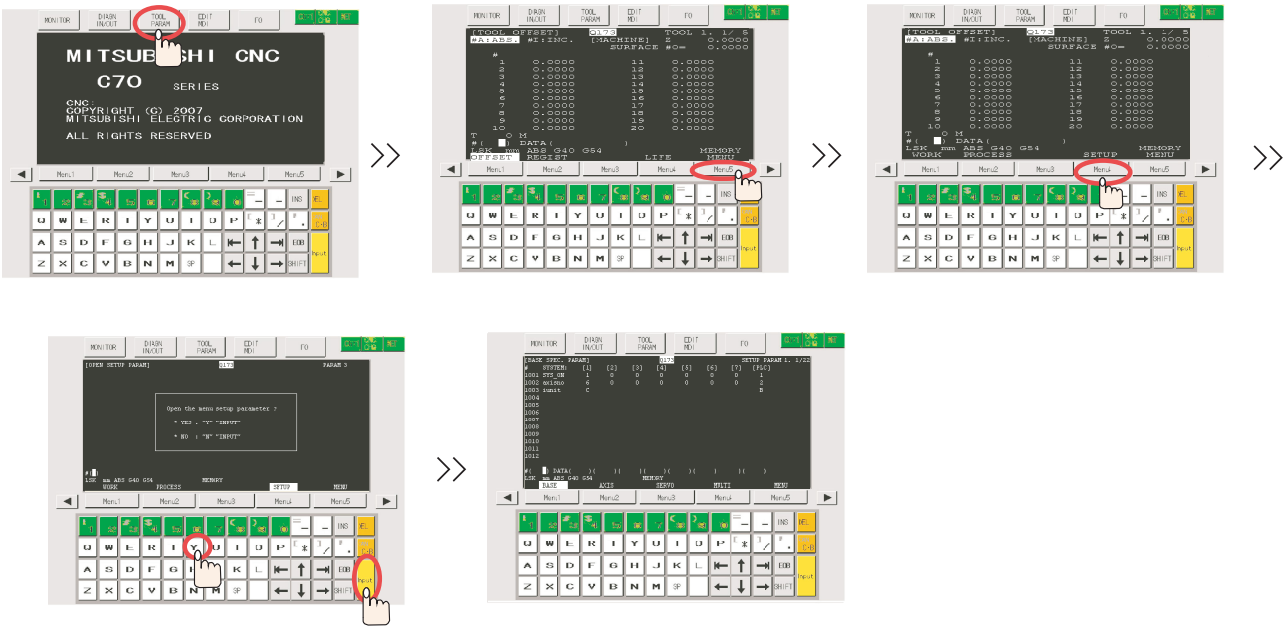
Setting Machine Parameters

6.1 Machine Parameters and Setting Screen Configuration

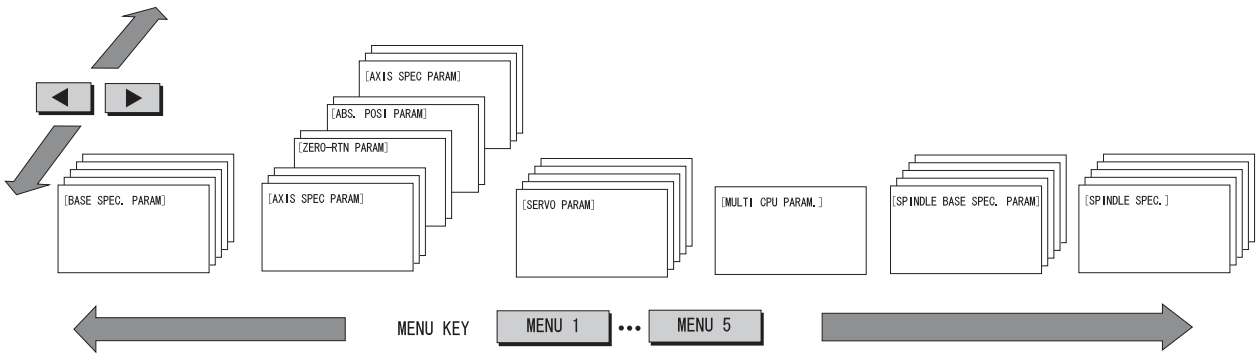
"Machine parameters" means parameters to make functions of CNC, CNC servo, and spindle adapt to the machine to control.
"Machine parameters" are classified into "Base specification parameters", "Axis specification parameters", "Servo parameters", "Multi-CPU parameters", "Spindle specification parameters", and "Spindle parameters" according to the usage and function.
The machine parameter setting screen is displayed when the display confirmation operation is done. When displayed, data changing is enabled.
When the alarm "Z20 Power ON again" appears, turn the power OFF and ON in order to validate the parameter.

6.1.1 Machine Parameter Setting Screen Display Confirmation

(1) Select [TOOL PARAM]-->[MENU (MENU 5)]-->[SETUP (MENU 4)]-->"Y"-->"INPUT".



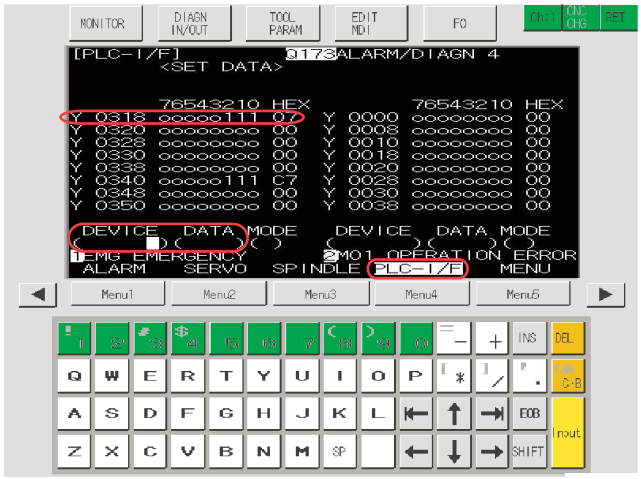
6.1.2 Configuration of Machine Parameter Setting Screen



(Note 1) For details of operation, refer to "C70 Instruction Manual (IB-1500267(ENG))".
(Note 2) For how to set [ZERO-RTN PARAM] and [ABS. POSI PARAM], refer to "Setting the Position Detection System".

6.1.3 Data Protection Key (Y319)

The data protection key must be turned ON before writing parameters in a CNC.
Turning the data protection key ON protects data, such as user parameters, common variables, CNC ladder, R register, C register, and T register. When the data protection key is turned OFF, setting operations for parameters and common variables are prohibited.
For details, refer to "C70 PLC Interface Manual".



For a setting from the CNC screen, go to "I/F diagnosis" screen on CNC monitor, enter "Y319" to "Device" and "1"to "Data", then touch "Input" key.
For a setting with a PLC program, turn ON the data protection key 2 (G+01/Y319).

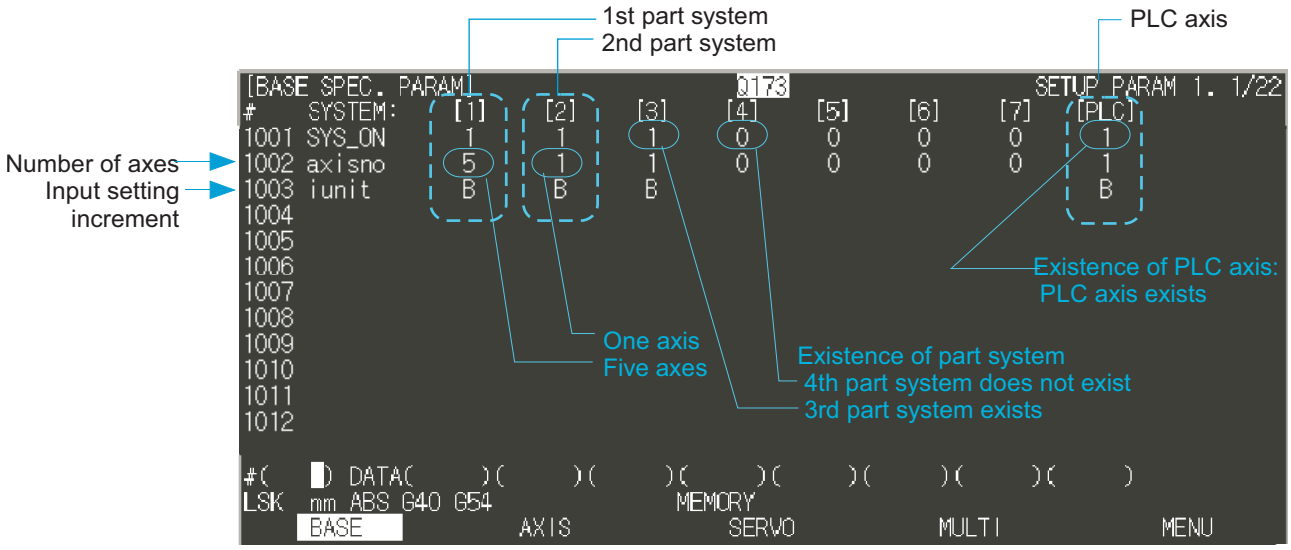
6.2 Setting the Axis Configurations (NC axes, PLC axes, Spindle)

6.2.1 Setting Part System, the Number of Axes, and PLC Axis

Set the servo system's configuration connected to the CNC CPU.

(1) Display [BASE SPEC. PARAM] (SETUP 1. 1/22), and set the control axes configuration.
#1001 SYS_ON: Select the existence of PLC axes and part systems. (0: Not exist, 1: Exist)
#1002 axisno: Set the number of control axes and PLC axes.
#1003 iunit: Select the input setting value for each part system and the PLC axis. (B: 1 μ m, C: 0.1 μ m)
#1169 system name: Set a name for each part system. The names should be within 4 alphabets and/or numbers.

Setting example:
For "3 part systems (1st part system: five axes, 2nd part system: one axis, 3rd part system: one axis), PLC axis: one axis, Spindle axis: one axis"



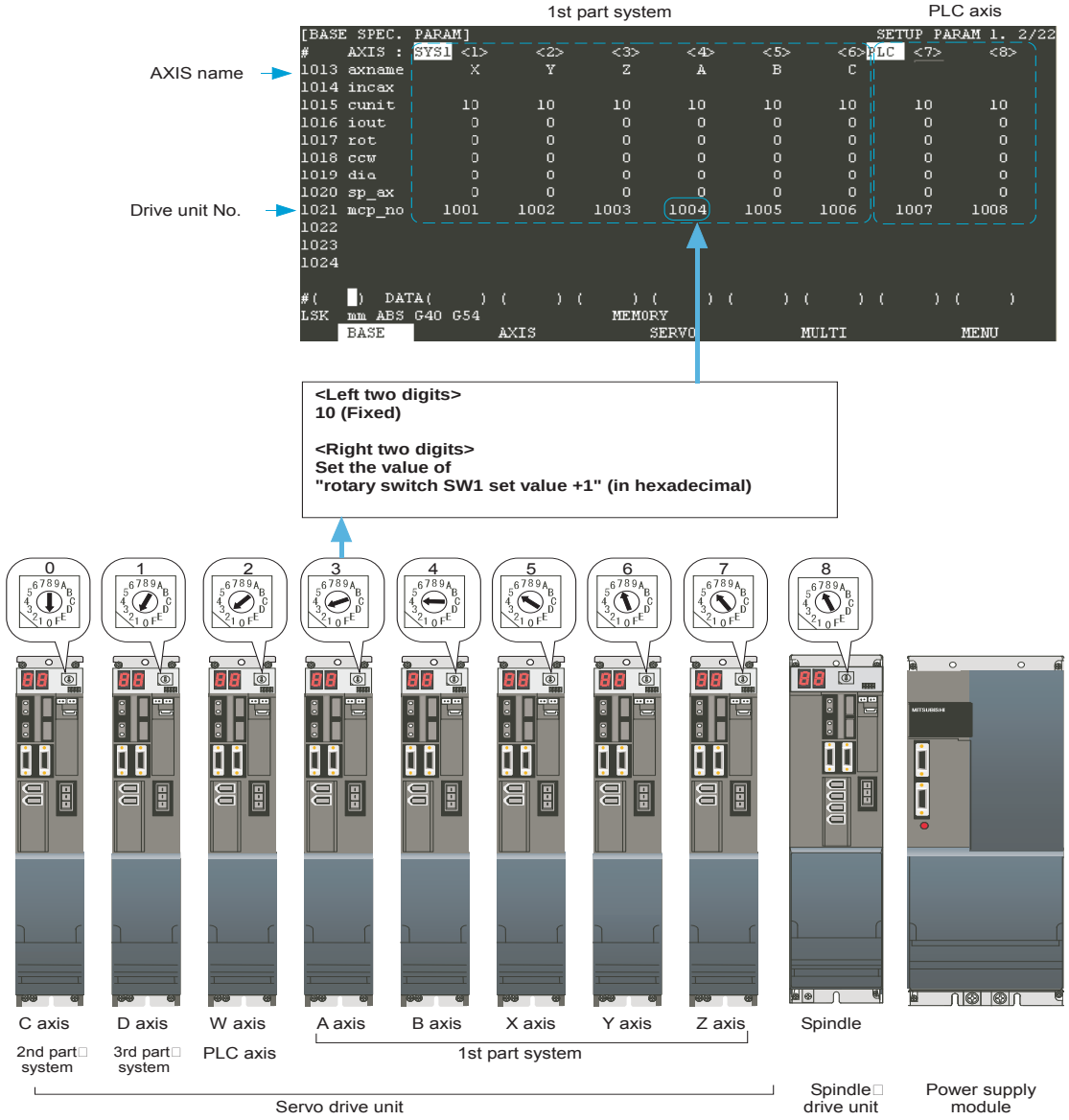
6.2.2 Setting Base Specifications for Each Axis

(1) Touch the page scroll key to display the "BASE SPEC. PARAM" screen (SETUP 1. 2/22), and set the following parameters according to the machine specifications.

(Note) The number of screens (pages) and their contents are different depending on the number of axes and part systems set in the previous section. (If the number of axes to use exceeds eight, pages will be automatically added.)
Turn the power OFF and ON in order to validate the axis setting.

#1013 axname: Set each axis' name. The alphabets available for axis names are X,Y,Z,U,V,W,A,B,and C.
#1014 incax: Set the axis name when commanding an incremental value for the axis travel amount.
(0: Follow "#1003 iunit", 1: 0.1 μ m, 10: 1 μ m, 100: 10 μ m, 1000: 100 μ m, 10000: 1.0mm)
This parameter is normally set for Lathe system.
#1015 cunit: Set the minimum increment of program travel command.
#1016 iout: Select the unit system used for setting mechanical value (ball screw pitch and position detection unit).
(0: Metric system, 1: Inch system)
#1017 rot: Select whether the axis is a rotary axis or linear axis. (0: Linear axis, 1: Rotary axis)
#1018 ccw: Select the direction of the motor rotation to the command direction. (0: Clockwise, 1: Counterclockwise)
#1019 dia: Select the command method of program travel amount. (0: Command with travel amount, 1: Command with diameter dimension-Actual travel amount is half of it)
This parameter is normally set for Lathe system' s X axis.
#1020 sp_ax: Select "1" when using the spindle for the counter control of NC axis (C-axis).
#1021 mcp_no: Set the number to specify the drive unit.
First two-digit: Set to "10" (fixed value).
Last two-digit: Set the value of the drive unit's rotary switch SW1 +1 (in hexadecimal).

Setting example



6.2.3 Setting Spindle Specifications

(Note) The number of spindles can be set by the parameter "#1039 spinno".

The following parameters need to be set to designate the configuration of spindle connected to the CNC CPU.

#3024 sout (Spindle connection interface)

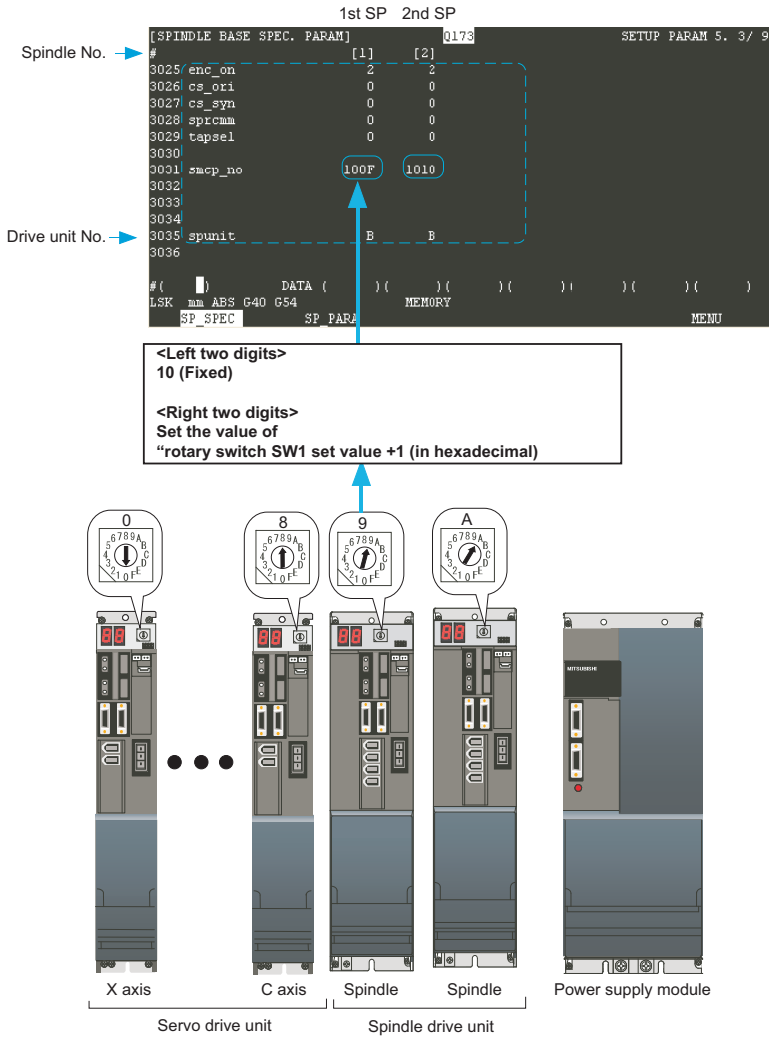
#3025 enc-on (Spindle encoder)

#3031 smcp_no (No. to specify the spindle drive unit)

(1) Select [MENU] -> [SP_SPEC] to display the [SPINDLE BASE SPEC. PARAM]screen (SETUP 5. 2/9), and set the parameter "#3024 sout (Spindle connection interface)" to "1" (Dedicated network).

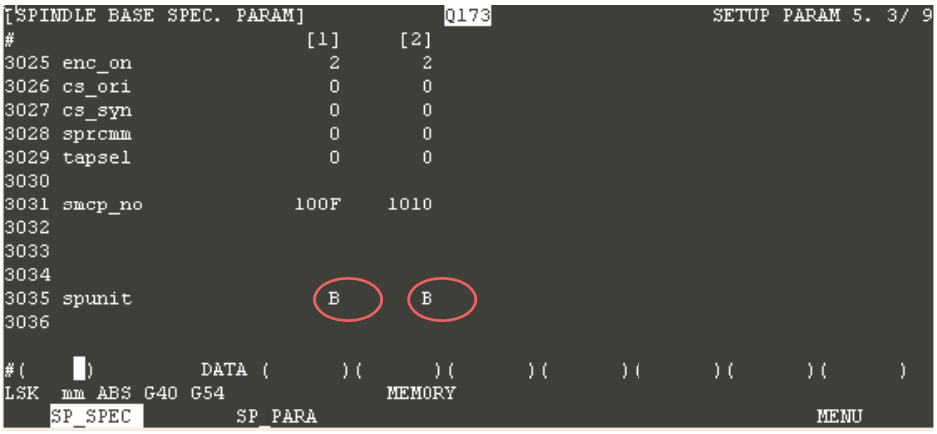
(2) Touch the page scroll key to display the [SPINDLE BASE SPEC. PARAM] screen (SETUP 5. 3/9) and set the connection condition of spindle detector to the parameter "3025 enc-on (Spindle encoder)". Also set the No. to designate the spindle drive unit to the parameter "#3031 sout (spindle connection interface)".
The first 2-digit of the set value is fixed to "10".
For the last 2-digit of the set value, add 1 to the spindle drive unit's rotary switch setting. (in hexadecimal)

Setting example



(Note) "#3031 smcp_no" (spindle drive rotary switch setting) needs to be the sequential number with the servo drive unit "#1021 mcp_no". If there is a missing number, "mcp alarm" will occur.

(3) Set "#3035 spunit (Command unit from CNC CPU to spindle drive unit)". The setting value is normally "B" (1 μ m) which is equivalent to the setting value of "#1003 iunit (Command unit from CNC CPU to servo drive unit)".

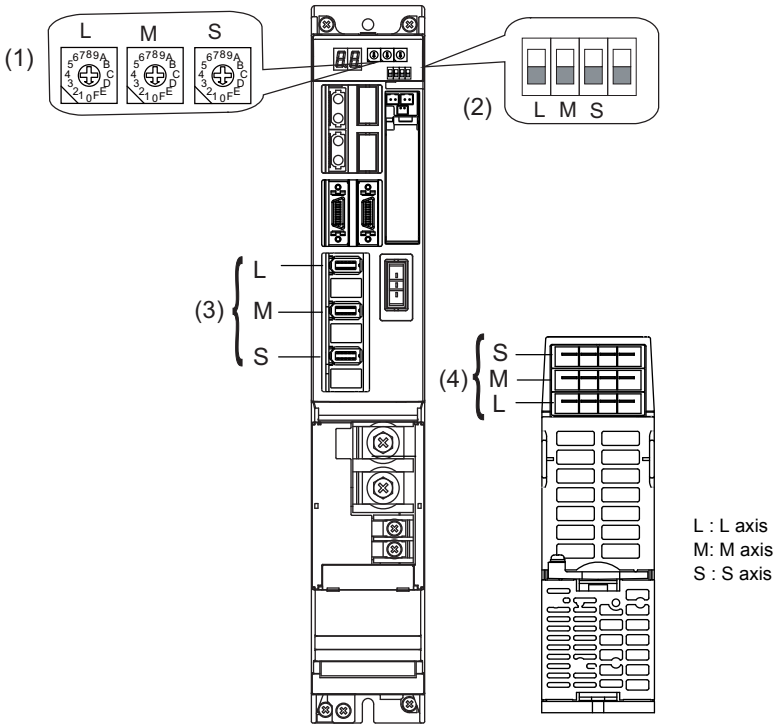


(4) Refer to "Appendix 1. Explanation of Parameters" to set spindle base specification parameters according to the machine's specifications.

6.3 Connection Settings

6.3.1 Setting Servo/Spindle Drive Unit's DIP Switches

Set the DIP switches ((2) in fig.) to the standard settings (turn all the switches OFF).
The switches are turned OFF when they are downward position as below.
Turning these switches ON sets the corresponding axis to the unused axis. (Do not turn ON the rightmost switch.)
Carry out the unused axis setting when you use the multi-axes drive unit that has any unused axis.
For those axes that are supposed to be used later, refer to "Setting up without Connecting to the Motor/ Drive unit" instead of doing this setting.



(1) Axis No. setting switch
(2) Unused axis setting switch
(3) Motor side detector connection connector
(4) Motor power supply output connector

<MDS-DM-SPV series>

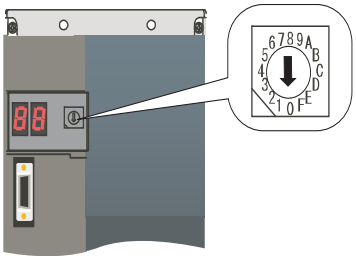
The setting of the axis number is fixed as follows in the MDS-DM-SPV Series.

Setting the MDS-DM-SPV Series	Details
1st axis	Spindle axis
2nd axis	L-axis
3rd axis	M-axis
4th axis	S-axis (MDS-DM-SPV3/SPV3F)

When using the MDS-DM-SPV Series, MDS-D and MDS-DM-V3 together, the axis numbers for the MDS-DM-SPV Series are fixed as above. Set the axis numbers from 4th axis or 5th axis.

6.3.2 Setting Power Supply Module's Rotary Switch

Set whether to use the external emergency stop input (CN23) or not with the rotary switch. This setting will be read and enabled immediately after the drive unit's power is tuned ON. Thus, make sure to turn OFF and ON the drive unit after setting.



Set SW1 to "0" when not using the external emergency stop.
Set SW1 to "4" when using the external emergency stop.

Setting other values is prohibited.

<MDS-D/DH Series>

When connecting a power supply unit and a drive unit with CN4 connector, set the power supply unit type and the external emergency stop enable/disable with the following parameter.

Servo drive unit : "#2236 SV036"

Spindle drive unit : "#13032 SP032"

For the setting value of each parameter, refer to "Appendix 1. Explanation of Parameters".

6.3.3 Setting up without Connecting to the Motor/ Drive unit

When connecting the motor or drive unit after setting up the system, set the axis data beforehand to enable the operation without the motor or drive unit. The following shows the procedures.

Setting up without Connecting to the Motor

The axis detach function can be used for servo axis. The detach function cannot be used for spindle.

(1) Set the drive unit rotary switch and "#1021 mcp-no" for the axis that is not connected to the motor.
(2) Set "1" to the parameter "#1070 axoff" for the axis that is not connected to the motor.
(3) Do (a) or (b).
  (a) Set "1" to parameter "#8201 AX. RELEASE" for the axis that is not connected to the motor.
  (b) Turn ON the control axis detach signal (G+16/Y400) for the axis that is not connected to the motor by a sequence program.

Setting up without Connecting to the Drive unit

Set the following parameters.

(1) Set "#1021 mcp-no" (for the servo axis) or "#3031 smcp_no" (for the spindle axis) to the axis that is not connected to the drive unit.
(2) Set the following parameters to the axis that is not connected to the drive unit.
  For the servo axis: Set "1" to "#2018 no_srv".
  For the spindle axis: Set "0" to "#3024 sout".

After connecting to the drive unit, make sure to set "#2018 no_srv" to "0" and "#3024 sout" to "1".

6.4 Setting NC Base Parameters

6.4.1 Setting Parameters to Specify the Machine's Basic Configuration

(1) On the [BASE SPEC. PARAM] screen, scroll to the following parameters to set each of them.

#1025 I_plane: 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)

#1026-1028 base_I, J, K: Set the names of the basic axes that compose the plane.

Set the axis name set in "#1013 axname". 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.

#1029 aux_I: Set the axis name when there is an axis parallel to "#1026 base_I".

#1030 aux_J: Set the axis name when there is an axis parallel to "#1027 base_J".

#1031 aux_K: Set the axis name when there is an axis parallel to "#1028 base_K".

#1037 cmdtyp: Set the G code list and compensation type for programs.

G code list	Compensation type
List 1 (for M)	Type A (one compensation amount for one compensation No.)
List 1 (for M)	Type B (shape and wear compensation amounts for one compensation No.)
List 2 (for L)	Type C (shape and wear compensation amounts for one compensation No.)

(Note) When "#1037 cmdtyp Command type" is changed, file system formatting is required. For how to execute formatting, refer to "4.5 Formatting File System (Memory Area)".

#1038 plcsel: Set to "0".

#1041 I_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)

#1042 pcinch: Select the unit system for the commands to the PLC axis. (0: Metric system, 1: Inch system)

#1043 lang: Select the display language. (0: English, 1: Japanese)

#1044 auxno: Set to "0".

6.4.2 Setting Parameters Related to the Hardware Connection

The following shows the minimum required parameters to set up the door interlock II , manual pulse generator , and dual signal module.

6.4.2.1 Setting the Door Interlock II

When using the door interlock II, set the following parameters.

#1155 DOOR_m: 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".

#1156 DOOR_s: Set the same value as #1155.

6.4.2.2 Setting the Manual Pulse Generator

Set one of the following parameters which is suitable for your manual pulse generator.

- 5V manual pulse generator (UFO-01-2Z9) : #1240 set12/bit0 = 1 (100 pulse/rev)
-12V manual pulse generator (HD60) : #1240 set12/bit0 = 0 (25 pulse/rev)

Use G10210/R10 to G10212/R12 to confirm the pulse input from the manual pulse generator.
1st to 3rd handle pulse counter values are output to R10 to R12.
When the pulse input is not confirmed, check the connection or sequence program.

6.4.2.3 Setting the Dual Signal Module

When using the dual signal module, set the following parameters.

#21125 SSU_num: Enter the number of dual signal modules to install.

#21143 to #21145 SSU_Dev1 to Dev3:

Set the head device Nos. to which the dual signal modules, station No. 0 to 2, are installed.
Make sure that the dual signal module I/O assignment in the PC parameters matches the parameter settings "#21143 SSU_Dev1" to "#21145 SSU_Dev3".

(Note) For details, refer to "Safety Observation Specification Manual"(BNP-C3059-001N).

6.5 Setting CNC Axis Parameters

Refer to "Appendix 1. Explanation of Parameters" to set parameters according to the machine's specifications.

6.6 Setting CNC Servo Parameters

Refer to "Appendix 1. Explanation of Parameters" and each servo drive unit's manual to set parameters according to the machine's specifications and servo drive system.

6.7 Setting CNC Spindle Parameters

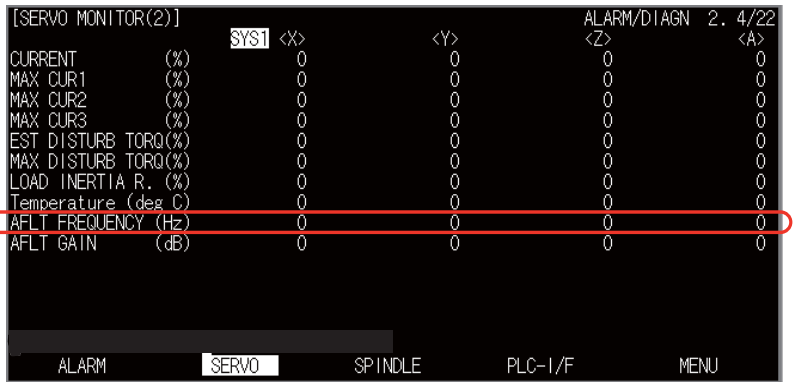
Refer to "Appendix 1. Explanation of Parameters" and each spindle drive unit's manual to set parameters according to the machine's specifications and spindle drive system.

6.8 Servo Simplified Adjustment

6.8.1 First Measure Against Vibration

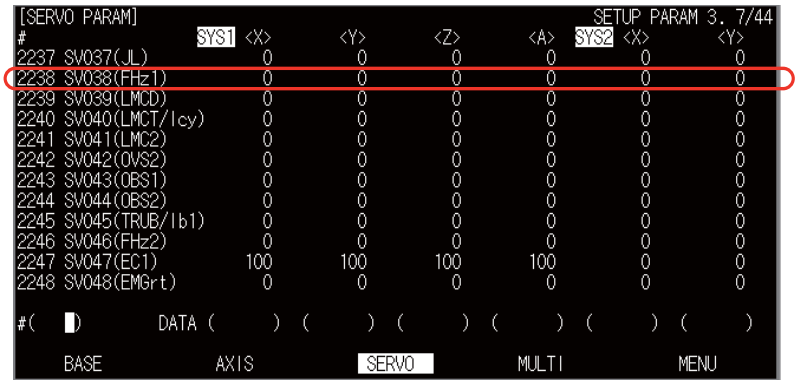
Vibration may occur when CNC is turned ON after setting parameters.
Setting the filter can reduce the vibration.

(1) Select [ALARM/DIAGN] --> [SERVO] on the CNC monitor screen.
(2) Touch the page scroll key and confirm the displayed value of the "AFLT FREQUENCY".



(Note) This screen display is for when NC parameters have default value.

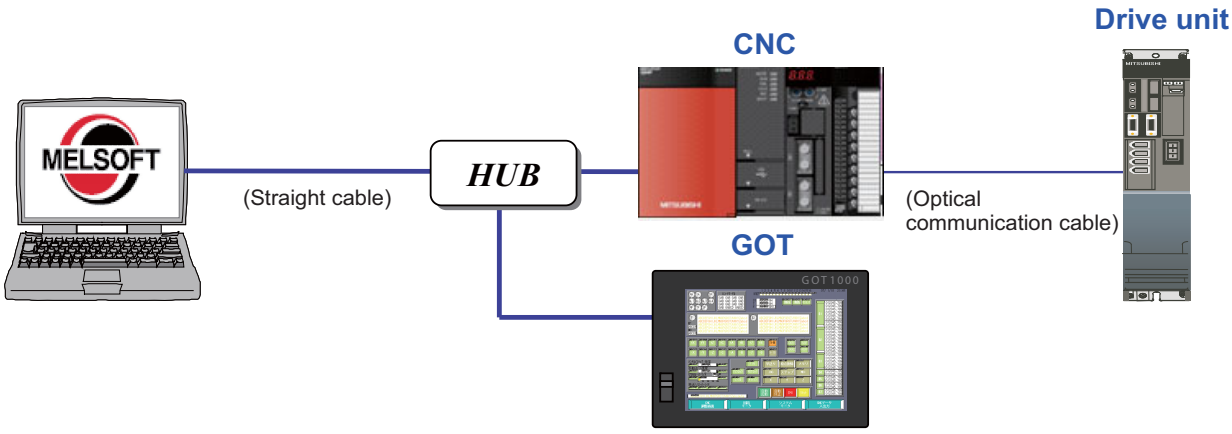
(3) Display [SERVO PARAM] screen from [TOOL PARAM] and input the "AFLT FREQUENCY" value, which is confirmed in the step (2), to "#2238 SV038 FHz1 (Notch filter frequency 1)".



(Note) This screen display is for when NC parameters have default value.

6.8.2 MS Configurator

MS Configurator measures and analyzes the machine's characteristics to automatically adjust the servo parameters while activating the motor with test machining programs or vibration signals. MS configurator also supports the data measurement functions.



Function

- Automatic adjustment function
  - Initial notch filter setting: Sets the notch filter automatically when the resonance is large in the initial state.
  - Speed loop gain adjustment: Adjusts the notch filter and speed loop gain automatically.
  - Time constant adjustment: Adjusts the acceleration/deceleration time constant automatically.
  - Position loop gain adjustment: Adjusts the position loop gain automatically.
  - Lost motion adjustment: Adjusts the quadrant protrusion amount of the designated axis automatically.
  - Lost motion 3 adjustment: Adjusts the lost motion type 3 against the quadrant protrusion amount of the designated axis automatically.
- Measurement functions
  - Frequency response measurement: Carries out the speed loop frequency response measurement between the speed command and the speed FB against designated axis.
  - Frequency response measurement of Machine: Carries out the machine system's frequency response measurement between the torque command and the speed FB against designated axis.
  - Measurement function (program create function valid): Carries out the "Time-series data measurement", the "Circular error measurement", the "Sync. tapping error measurement", and the "Arbitrary path measurement".
- Adjustment setting-up functions
  - Communication path setup: Sets the path to communicate with NC. Select the NC's model name to connect with.
  - Program creation: Creates an operation program for adjustment.
- Assistance Function
  - Parameter setup: Servo parameters can be set or saved.

Preparation

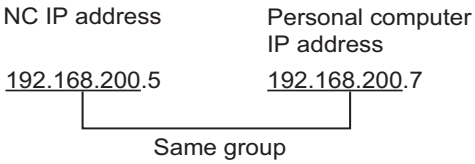
Before using the MS configurator, do the followings.

<Preparation of a personal computer>

(1) Connect the personal computer and NC with a LAN cable.

(2) Install the MS Configurator.

(3) Set the IP address of the personal computer, which should be the same group as the NC's IP address in "#1926 Global IP address".



<Setting parameters>

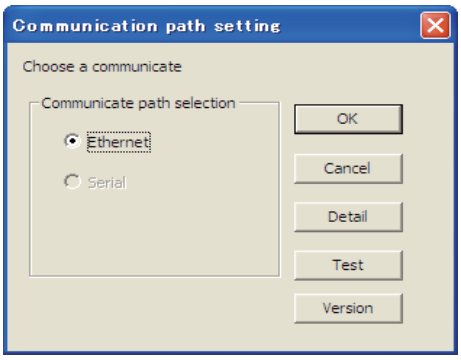
Set "1: Enable" to "#1164 ATS Automatic tuning function".

(Note 1) Although later CNC software versions allow constant connection of MS Configurator while this parameter is set to "0", the available functions are limited.

(Note 2) This parameter setting is enabled immediately after it is set.

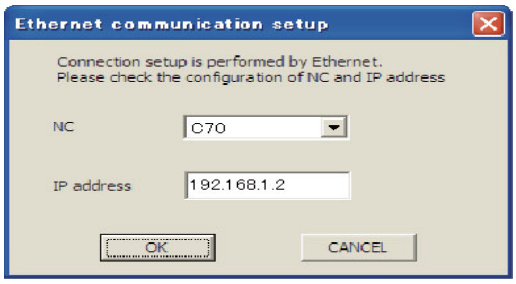
<Communication path setup>

(1) Select [Tool] - [1.Setup] - [Communication path setup]. The communication path setting screen will be displayed.



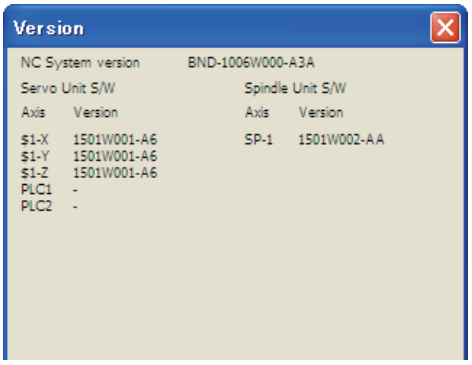
(2) 2) Press the [Detail] button. The Ethernet communication setting screen will be displayed.

(3) Select the NC model to use, and enter the NC's IP address which is set to parameter "#1926 Global IP address". Press "OK".



(4) Press the [Test] button. Communication test with NC will be carried out and the result will be displayed. After confirming the result, press "OK" button and close the communication test dialogue box.
When an error occurs, display the Ethernet communication screen and check the NC model which is confirmed at (3). Then start the MS configurator.exe again.

(5) Click [Version] button on the communication path setting screen, and make sure the version of the NC, servo unit etc. supports the MS Configurator.
If any servo axis' version shows "-" (a hyphen), it means the servo axis is an unconnected axis. Do not use the unconnected axis for adjustment or measurement.



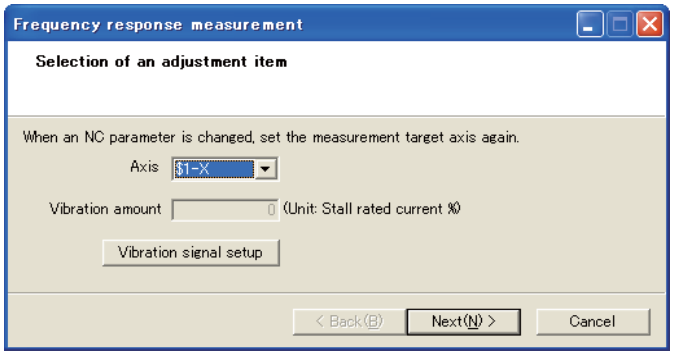
(6) Press "OK" to save the setting value, "Cancel" if not. The communication path setting is finished.

Operation Example

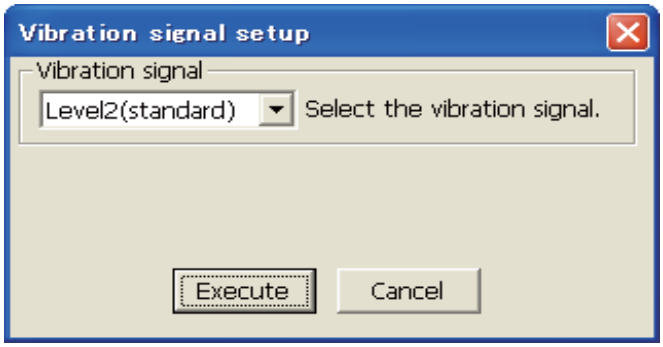
(1) Set the NC's operation mode to memory mode.

(2) Carry out the Frequency response measurement. Select [Tool] - [4. MeasurementFunction] - [Frequency response measurement] to display the Frequency response measurement screen.

(3) Select the axis to measure.

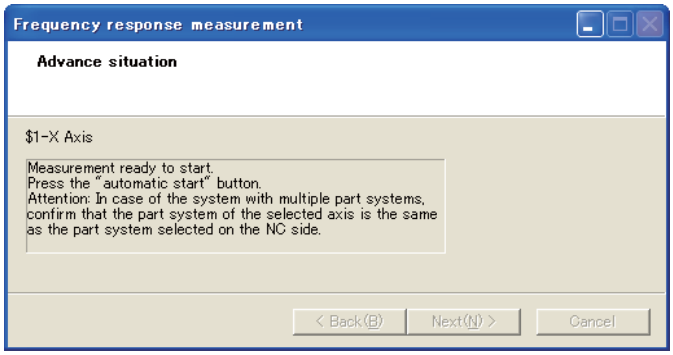


(4) Click the "Vibration signal setup" button, and select the level of the vibration signal. Click "Execute" to carry out the vibration signal setting.



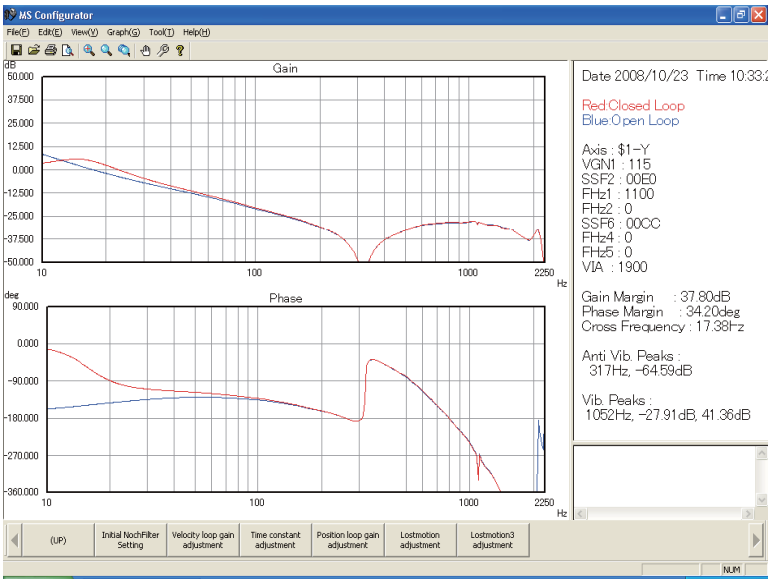
(5) Press [Next] button.

(6) The state display screen will be appeared. The state display screen partly automatically scrolls as the following order.
[Preparating screen] -> [Ready to start screen] -> [Measuring screen] -> [Measurement completed screen].
When the "Measurement ready to start. Press the "automatic start"button." message is displayed, press the NC auto start button and execute the measurement.



When "Measurement completed. Click the "Close" button." message is displayed, press "Close" button.

(7) The measurement result screen will be displayed. Adjust the speed loop gain etc. based on this result.



For details, refer to "MS Configurator instruction manual" (IB-1500154).

7

Setting the Position Detection System

There are two kinds of position detection system: one is "relative position detection", which determines the reference position (zero point) at every CNC power-ON; the other is "absolute position detection", which allows to start the operation without redetermining the reference position (zero point) after the CNC power-ON.
Reference position determination method for "Relative position detection" is "dog-type method (dog-type reference position return)" only, and for "Absolute position detection", "dogless-type" as well as "dog-type" is available. "Dogless-type" has three methods: "machine end stopper method", "marked point alignment method" and "marked point alignment method II".
Set the parameter "#2049 type (Absolute position detection method)" for the type and method of absolute position zero point initialization set.

(Note) Determining and storing the reference position (absolute position zero point) is also required to carry out "absolute position detection".

			Parameter "#2049 type"
■ Dog-less type	Machine end stopper method	Automatic initialization	1
		Manual initialization	1
	Marked point alignment method		2
	Marked point alignment method II		4
■ Dog type			3

7.1 Setting the Original Dog

When carrying out the dog-type reference point return, the origin dog signal device No. will be assigned by setting the following parameters.
Parameter "#2073" will be valid only when "#1226 aux10/bit" is set to "1".

#1226 aux10/bit5: Set "1" (.assigning the signal is valid).
#2073 zrn_dog: Set the input device for assinging the origin dog signal. (Setting range 0000 to 02FF (Hexadecimal))

(Note 1) When "Near-point dog ignored" (R2421) signal is set to ON, the origin dog signal associated with a specific control axis can be ignored.
(Note 2) When parameter "#1226 aux10/bit5" is set to "1", do not set the same device No. to "#2073" to "#2075". Setting the same device No. may cause the emergency stop. However, the device number will not be checked if the ignore signal (R2420, R2421) is set to the axis.

7.2 Adjustment of Reference Position Return in Relative Position Detection System

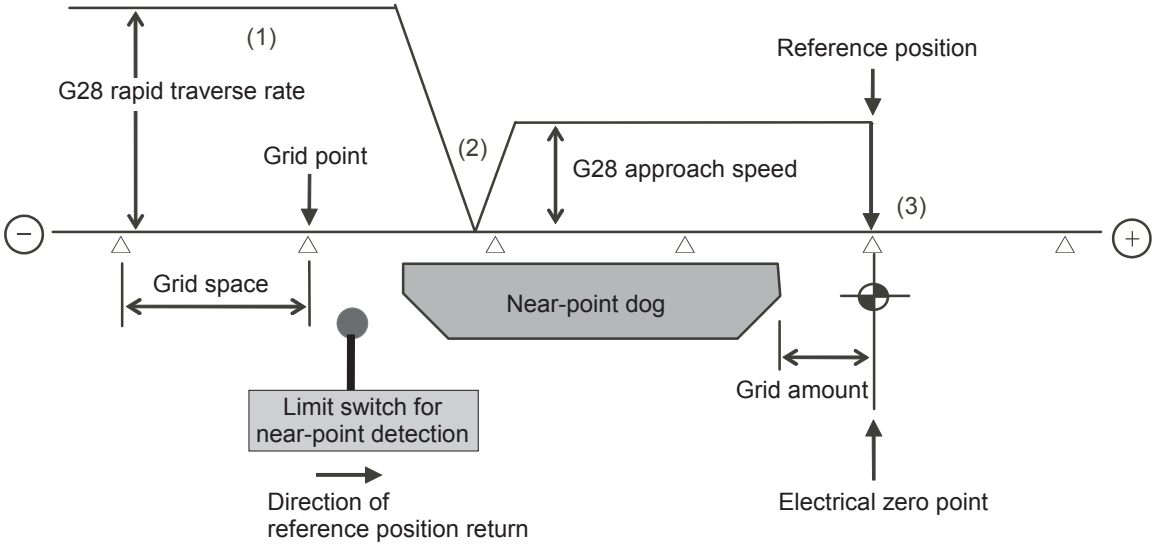
7.2.1 Dog-type Reference Position Return

7.2.1.1 Dog-type Reference Position Return Operation

In the dog-type reference position return, the axis moves as follows:

(1) Starts moving at G28 rapid traverse rate.
(2) Decelerates to stop when the near-point dog is detected during the movement. Then, resumes moving at G28 approach speed.
(3) Stops at the first grid point after leaving the near-point dog.

This grid point, where the axis stopped at (3), is called the electrical zero point. Normally, this electrical zero point is regarded as the reference position.



The first reference position return after turning the power ON is carried out with the dog-type reference position return. The second and following returns are carried out with either the dog-type reference position return or the high-speed reference position return, depending on the parameter.
High-speed reference position return is a function that directly positions to the reference position saved in the memory without decelerating at the near-point dog.

(Note) If reference position return has never been executed after turning the power ON and a movement command other than G28 is executed, the program error (P430) will occur.

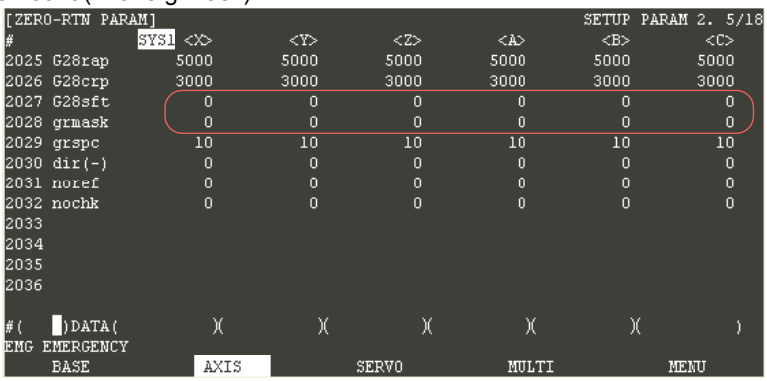
7.2.1.2 Dog-type Reference Position Return Adjustment Procedures

Adjust the dog-type reference position return with the following steps.

(Note) This adjustment is available when the sequence programs for machine control are installed in PLC CPU so that the CNC servo axis can be operated.

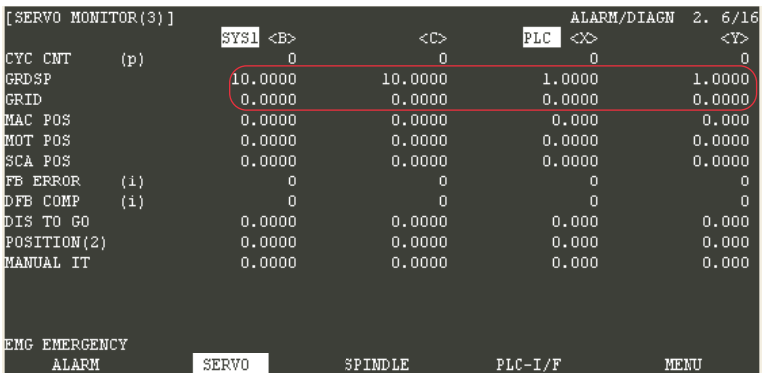
(1) Select [TOOL PARAM] ---> [MENU (MENU 5)] ---> [SETUP (MENU 4)] ---> "Y" ---> "INPUT" --->[AXIS]. Scroll the page to display the [ZERO-RTN PARAM] screen.

(2) Set "0" for the following parameters on the [ZERO-RTN PARAM] screen.
Reference position shift amount (#2027 G28sft)
Grid mask amount (#2028 grmask)



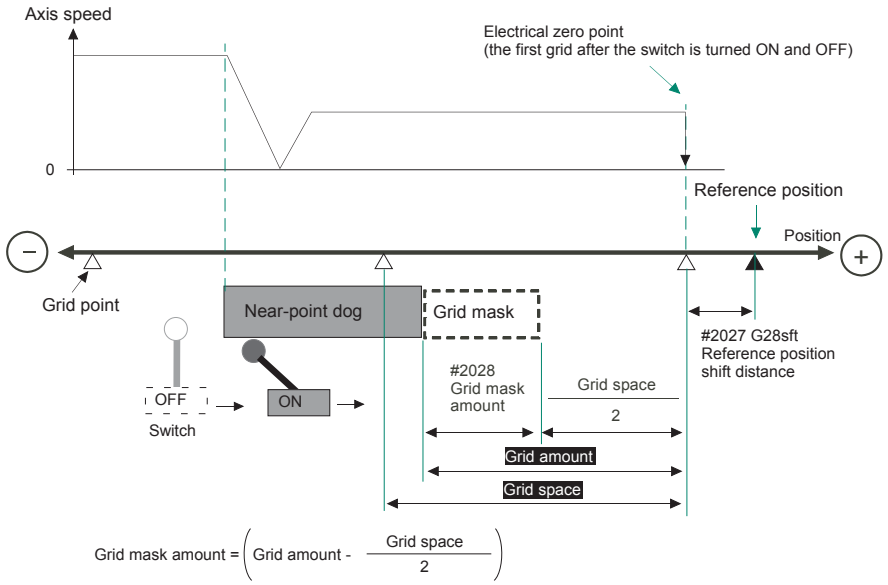
(3) Turn the power OFF and ON, and then execute reference position return.
(Note) Use the GOT project, controlled by sequence programs, or the switches on the machine operation panel to command "reference position return mode" and operate the axis movement. The GOT project and the panel switches are made by the machine tool builder.

(4) Select [ALARM/DIAGN] --> [SERVO (MENU 2)]. Scroll the page to display the [SERVO MONITOR(3)] screen.
Confirm "GRDSP"(Grid space) and "GRID"(Grid amount).

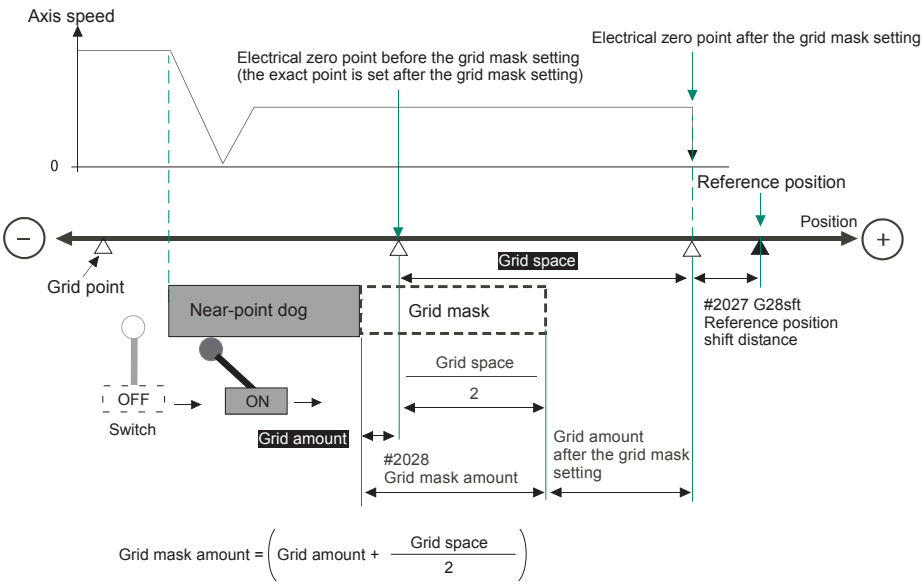


(5) Determine the grid mask amount according to the state as shown below.

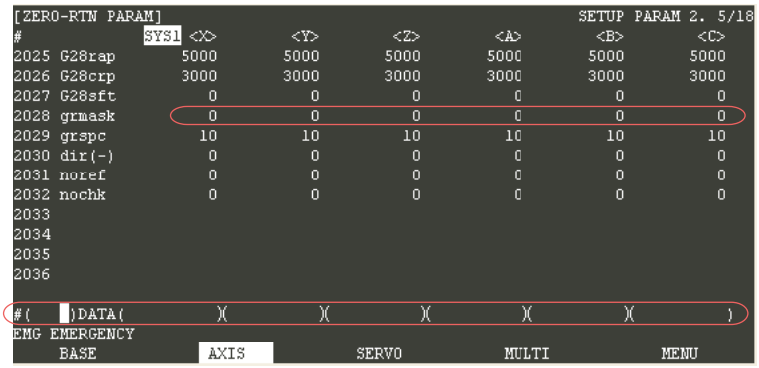
■ When $\frac{\text{Grid space}}{2}$ is smaller than the grid amount



■ When $\frac{\text{Grid space}}{2}$ is larger than the grid amount



(6) Select [TOOL PARAM] ---> [MENU (MENU 5)] ---> [SETUP (MENU 4)] ---> "Y" ---> "INPUT" --->[AXIS]. Scroll the page to display the [ZERO-RTN PARAM] screen. Set the determined grid mask amount for "#2028 grmask".



(7) Turn the power OFF and ON, and then execute reference position return.

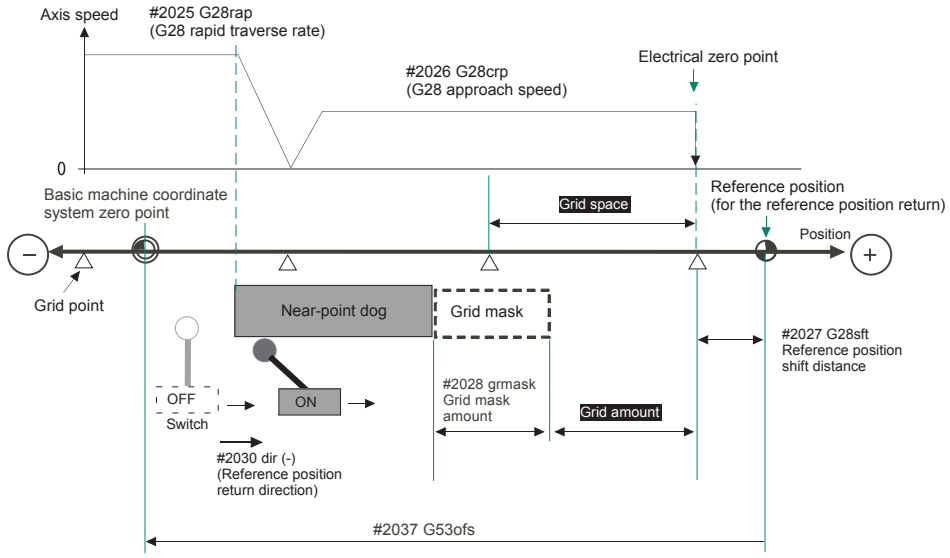
(8) Confirm the grid space and grid amount values on DRIVE MONITOR screen.
If the grid amount value is approximately half of the grid space, the grid mask amount has been set correctly. If the value is not approximately half, repeat the procedure from step (1).

(9) Set the reference position shift amount (#2027 G28sft).
To designate the electrical zero point as reference position, set "0" to "#2027 G28sft".

(10) Turn the power OFF and ON, and then execute the reference position return.
(Note) The axis moves at the speed of "#2025 G28rap G28 rapid traverse rate".
The parameter "#2025 G28rap G28 rapid traverse rate" is usually set the maximum speed, which makes the high-speed movement in the 2nd reference position return and later. Take extra care for the safe axis movement.

(11) Set the machine coordinate system offset amount (#2037 G53ofs).

[Terms and parameters related to the dog-type reference position return]



Electrical zero point
The first grid point after the dog OFF.
If the grid point is at the position where the near-point dog is kicked OFF, the position of electrical zero point may be at the grid point where the dog is kicked OFF or at the next grid point because of the delay of the limit switch operation. This causes a deviation of reference position by the amount of the grid space.
Setting the grid mask amount ("#2028 grmask") prevents this deviation.

Reference position
The base for position and coordinate.
The axis is positioned to this position by the manual reference position return command or G28 command in the machining program.
The position is determined by shifting from the electrical zero point by the amount of "#2027 G28sft Reference position shift amount".

Grid point
The position detector has a Z-phase that generates one pulse per rotation. The 0-point position of this Z-phase is the grid point.
Thus, there is a grid point per rotation of the position detector, and the machine has many grid points at a regular pitch.
The grid point can be set at intervals of grid space by setting the grid space (#2029 grspc). Thus, multiple grid points can be set per detector rotation.

Grid amount
The grid amount is the distance from where the near-point detection limit switch leaves the near-point dog to the grid point (electrical zero point) as the dog-type reference position return is executed.
The grid amount can be confirmed on the DRIVE MONITOR screen.
After setting the grid mask, the grid amount shows the distance from the grid mask OFF to the grid point.

G28 rapid traverse rate (#2025 G28rap)
Set the feedrate for dog-type reference position return in manual operation and the automatic operation.
The rapid traverse rate (#2001 rapid) is applied for the feedrate during the high-speed reference position return.

G28 approach speed (#2026 G28crp)
Set the approach speed to the reference position after decelerating to a stop by the near-dog detection. Since the approach speed is accelerated and decelerated in steps (no-acceleration/deceleration), the mechanical shock, etc. could occur if the speed is too large. The G28 approach speed should be set between 100 and 300 mm/min., or within 500 mm/min. at the fastest.

Reference position shift amount (#2027 G28sft)
When shifting the reference position from the electrical zero point, set the shift amount.
The shifting direction can be set only in the reference position return direction.
If the reference position shift amount is "0", the grid point (electrical zero point) will be the reference position.

Grid mask amount (#2028 grmask)
The first grid point after the dog OFF is regarded as the electrical zero point.
If the grid point is at the position where the near-point dog is kicked OFF, the position of electrical zero point may be at the grid point where the dog is kicked OFF or at the next grid point because of the delay of the limit switch operation. This causes a deviation of reference position by the amount of the grid space. Thus, the position that the dog is kicked OFF needs to be at the approximate center of the grid space.
Adjustments are made by setting the grid mask amount or changing the near-point dog.
Setting the grid mask has the same effect as lengthening the near-point dog. Refer to the previous procedures for setting the grid mask amount.

Grid space (#2029 grspc)
Set the distance between grids.
The normal grid space is the ball screw pitch value (#2218 PIT) or the movement amount per motor rotation set as a millimeter measurement unit. To make the grid space smaller, set a divisor of the grid space.

<Calculation method for movement amount per motor rotation>

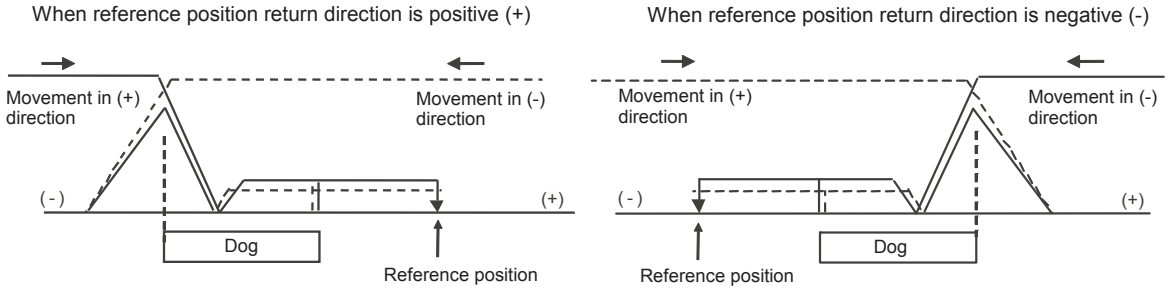
(1) When linear feed mechanism is a ball screw:
The movement amount per motor rotation = the motor side gear ration / the machine side gear ratio x the ball screw pitch
(2) When linear feed mechanism is a rack and pinion:
The movement amount per motor rotation = the motor side gear ration / the machine side gear ratio x number of pinion gear teeth x the rack pitch
(3) For the rotary axis:
The movement angle per motor rotation = the motor side gear ration / the machine side gear ratio x 360

Reference position return direction (#2030 dir (-))

The direction of the (axis) movement, after the dog-type reference position return is executed and the limit switch kicks the dog and decelerate to stop, is set to either positive "0" or negative "1".

Set "0" if the reference position is in the positive direction from the near-point dog.

Set "1" if the reference position is in the negative direction from the near-point dog.



Axis with no reference position (#2031 noref)

Set "0" for the axis to carry out dog-type reference position return and the axis for absolute position detection.

Set "1" for the axis without carrying out reference position return during the relative position detection.

Machine coordinate system offset (#2037 G53ofs)

Set the amount to shift the basic machine coordinate system zero point position from the reference position.

When "0" is set, the reference position will be the position of the basic machine coordinate system zero point.

In “G53ofs” parameter, set the position of the reference position looking from the basic machine coordinate system zero point with the coordinates of basic machine coordinate system. By the reference position return after the power is turned ON, the machine position will be set and the basic machine coordinate system will be established.

Selection of grid display type (#1229 set01/bit6)

Select the grid display type on DRIVE MONITOR screen during dog-type reference position return.

0:Distance from dog OFF to electric zero point (including the grid mask amount)

1:Distance from dog OFF to electric zero point (excluding the grid mask amount)

7.3 Adjustment in Absolute Position Detection System

(Note) This adjustment is available when the sequence programs for machine control are installed in PLC CPU so that the CNC servo axis can be operated.

7.3.1 Operation when No Absolute Position has been Established

If zero point has never been initialized or if the absolute position is lost, the alarms "Z70 ABS. ILLEGAL" and "Z71 DETECTOR ERROR" will occur. Then the "Initialization incomplete" signal in the PLC interface table will be turned ON. This state, where the coordinate system is not established, gives the following limitations to each mode. Carry out the absolute position initialization set to establish the coordinate system.

Operation in each mode

Operation mode	Type of absolute position initialization set	
	Dogless-type	Dog-type
Memory/MDI	Movement command invalid (Note 1) (Including G28)	Movement command invalid (Note 1) (Excluding G28)
JOG feed	Valid	Valid
Rapid traverse	Valid	Valid
Handle	Valid	Valid
Step	Valid	Valid
ZP-RTN	Starting not possible (Note 2)	Starting possible

(Note 1) The program error (P430) will occur.

(Note 2) "M01 OPERATION ERROR 0024" will occur when an axis is started before the absolute position is established. (This mode is valid for the axis for which the absolute position has been established.)

7.3.2 Selecting the Type of Absolute Position Initialization Set

The absolute position zero point initialization set is required before starting up the absolute position detection system. There are two types of the absolute position zero point initialization set, "dogless-type" and "dog-type". "Dogless-type" has two methods, "machine end stopper method", "marked point alignment method I" and "marked point alignment method II". I I I I I

Set the parameter "#2049 type" for the type and method of absolute position zero point initialization set.

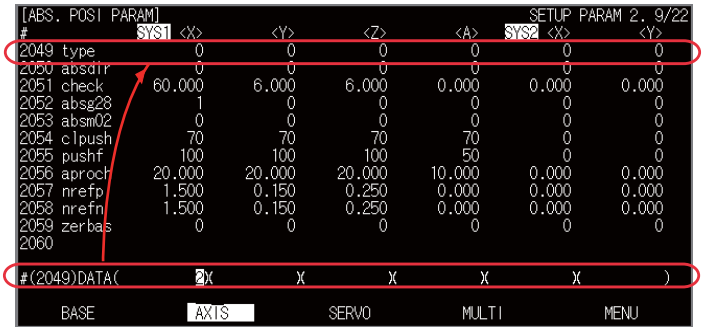
"#2049 type"

■ Dog-less type
- Machine end stopper method
  - Automatic initialization 1
  - Manual initialization 1
- Marked point alignment method I 2
- Marked point alignment method II 4

■ Dog type 3

(Note) The type of absolute position zero point initialization set is decided by the machine and axes specifications. Confirm which type is given in the machine specifications.

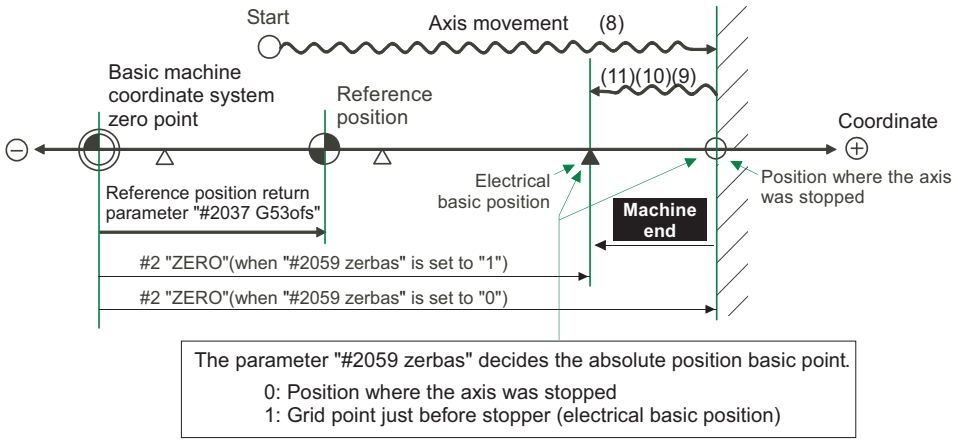
Select [TOOL PARAM] ---> [MENU (MENU 5)] ---> [SETUP (MENU 4)] ---> "Y" ---> "INPUT" --->[AXIS] , and scroll the page to display the [ZERO-RTN PARAM] screen to set "#2049 type". After setting "#2049 type", turn the CNC power ON again.



7.3.3 Dogless-type Absolute Position Zero Point Initialization Set

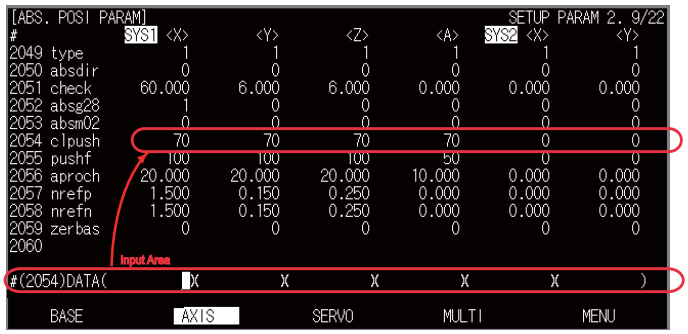
7.3.3.1 Machine End Stopper Method Manual Initialization

Use GOT project controlled by sequence programs, switches on the machine operation panel, a manual handle, and the [ABS. POSITION SET] screen in the CNC monitor on GOT for the absolute position zero point initialization set. The GOT project and panel switches are made by the machine tool builder.



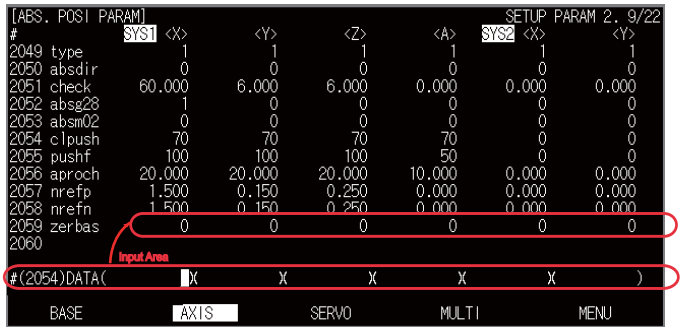
(1) Display [ABS SERVO MONITOR] screen from [TOOL PARAM].

(2) Set the current (torque) limit value for when the axis is pushed against the machine end stopper to "#2054 clpush Current limit(%)".
The value to set is the ratio of the rated current value of servomotor. Set the appropriate value in accordance with the machine specifications.



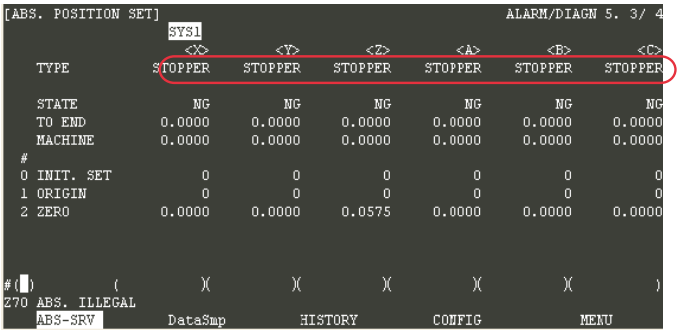
(Note) Setting the excessive value may cause damage to the machine, as well as overload warning and overcurrent alarm. Setting too small value may lead to the incorrect detection of stopper since the system will identify the machine's friction load.

(3) Select the absolute position basic point with the parameter "#2059 zerbas Select zero point parameter and basic point".
0: Position where the axis was stopped
1: Grid point just before stopper (electrical basic position)
(Note) When the first grid point is on the grid mask ("#2028 grmask"), the axis will stop at the next grid point.



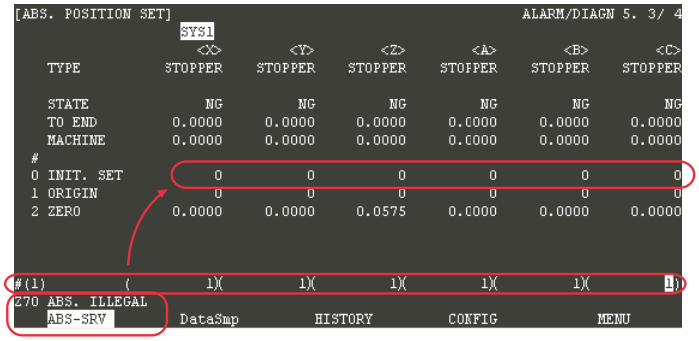
(4) Select the handle mode or the JOG mode.

(5) Select [ALARM/DIAGN] ---> [MENU (MENU 5)] ---> [ABS SERVO MONITOR] in the CNC monitor on GOT. Scroll the page to display the [ABS. POSITION SET] screen.
Check that the STOPPER is applied for the axis for which the absolute position zero point is to be initialized.



(Note) The type of absolute position zero point initialization set is decided by the machine and axes specifications, although "stopper method" can be selected by setting "1" for "#2049 type Absolute position detection method". Confirm whether the machine specifications allow "stopper method" before changing the type.

(6) Set "1" to "#0 INIT. SET" of the axis for which the zero point is to be initialized.



(7) Set the parameter "#2 ZERO".

(8) Move the axis with JOG or manual handle feed to be pushed against the machine end stopper.

(9) When the axis is pushed and the current to the servomotor exceeds the current limit value (the set value in "#2054 clpush Current limit(%)"), the STATE display will be changed from "STOPPER" to "RELEASE".
(Note) When the first grid point is on the grid mask ("#2028 grmask"), the axis will stop at the next grid point.

(10) Move the axis against the pushed direction. The axis is automatically stopped at the first grid from the stopper. Then the absolute position is established and basic machine coordinate system is automatically set.

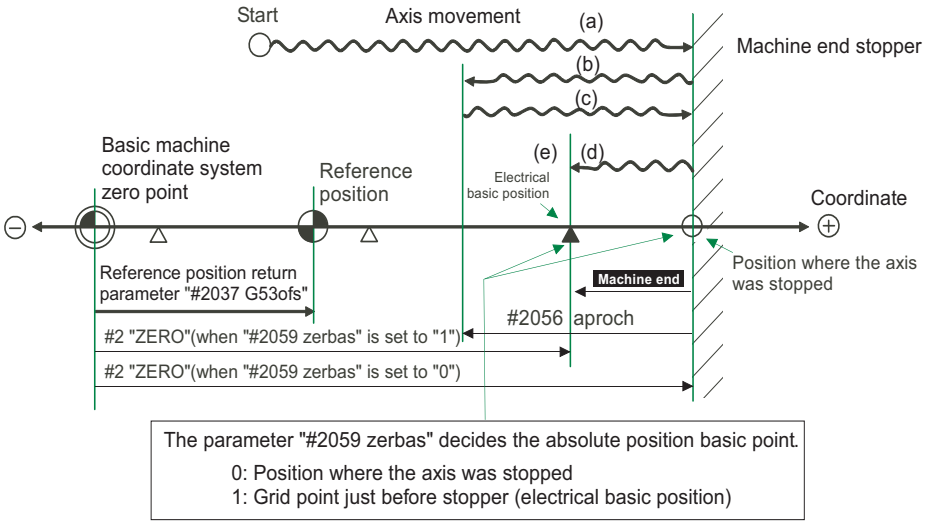
(11) Carry out the absolute position initialization set for all the axes, and then turn the power ON again.
When changing only the basic machine coordinate zero point, carry out steps (4) and (5) above and then turn the power OFF and ON.

7.3.3.2 Machine End Stopper Method Automatic Initialization

This method, with which the axis is pushed against the machine end stopper, is available when "INIT-SET" can be selected for the operation mode. (Sequence programs are required.))

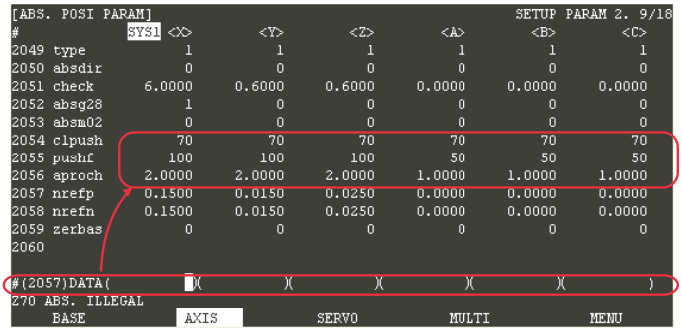
This method has the following features compared to the manual initialization method:

- The axis is pushed with the same conditions (feedrate, distance) each time, so inconsistencies in the zero point position can be more reduced.
- Part of the operations are automated to simplify the zero point initialization.



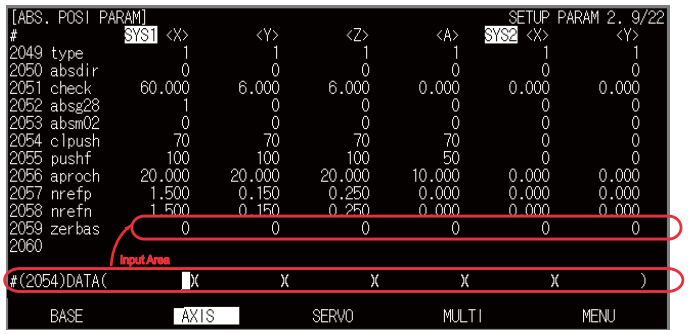
(1) Display [ABS SERVO MONITOR] screen from [TOOL PARAM].

(2) Set the current (torque) limit value when the axis is pushed against the machine end stopper to the parameter"#2054 clpush Current limit(%)". Also set the parameter "#2055 pushf Pushing speed" and "#2056 aproch Approach point".
The setting values differ according to the machine specifications. Set the appropriate value in accordance with the machine specifications.



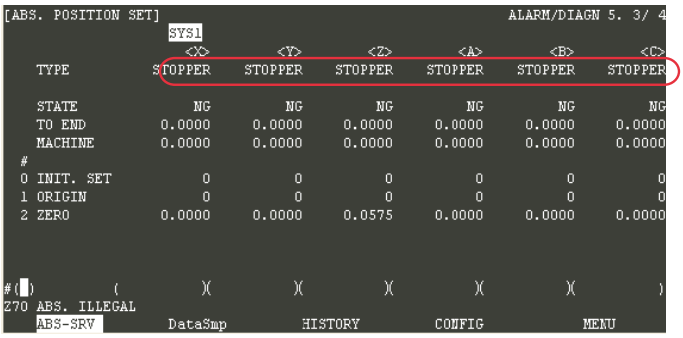
(Note) Setting the excessive value may cause damage to the machine, as well as the warning and alarm. Setting too small value may cause the unsuccessful detection of stopper, because the system will identify the machine's friction load.

(3) Select the absolute position basic point with the parameter "#2059 zerbas Select zero point parameter and basic point".
0: Position where the axis was stopped
1: Grid point just before stopper (electrical basic position)



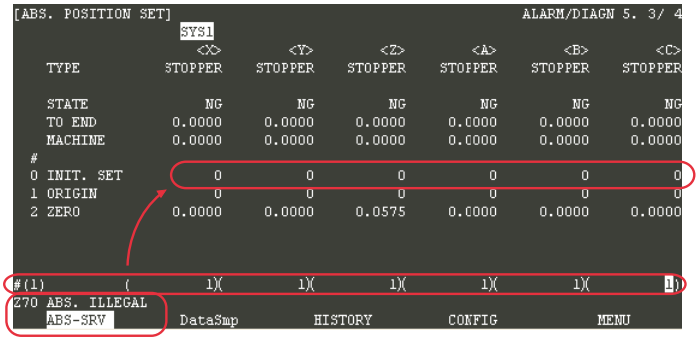
(4) Select the "INIT-SET" mode.

(5) Select [ALARM/DIAGN] ---> [MENU (MENU 5)] ---> [ABS SERVO MONITOR] in the CNC monitor on GOT. Scroll the page to display the [ABS. POSITION SET] screen.
Check that the STOPPER is applied for the axis for which the absolute position zero point is to be initialized.



(Note) The type of absolute position zero point initialization set is decided by the machine and axes specifications, although "stopper method" can be selected by setting "1" for "#2049 type Absolute position detection method". Confirm whether the machine specifications allow "stopper method" before changing the type.

(6) Set "1" to "#0 INIT. SET" of the axis for which the zero point is to be initialized.



(7) Set the parameter "#2 ZERO".

(8) Start the axis for which the zero point is to be initialized with JOG.
(Note) JOG can be started only in the "#2 Zero" sign direction (machine end stopper direction). (If the JOG start direction is illegal, the message "ILLEGAL DIRECTION" will appear.)

(9) --- Axis movement in the automatic initialization ---

Movement	STATE display
(a) The axis will move at the "pushing speed" in the machine end stopper direction.	STOPPER 1
(b) When the axis is pushed against the machine end stopper and the current reaches the current limit value, the axis will return toward the approach point at the "pushing speed".	ZP-RTN
(c) Having reached the approach point, the axis moves toward the machine end stopper at the "pushing speed".	STOPPER 2
(d) When the axis is pushed against the machine end stopper and the current reaches the current limit value, the axis will return toward the adjacent grid at the "pushing speed".	OK
(e) When the adjacent grid is reached, the movement will automatically stop.	ORIG-RTN

Then the absolute position is established and basic machine coordinate system is automatically set.

(10) Carry out the absolute position initialization set for all the axes, and then turn the power ON again.
When changing only the basic machine coordinate zero point, carry out steps (7) and (8) above and then turn the power OFF and ON.

(Note 1) Smoothing is turned OFF (step feed is applied) for the acceleration/deceleration during movement at the pushing speed.

(Note 2) If "0" is set for the absolute position parameter "#2056 aproch", the reference position will be the approach point.

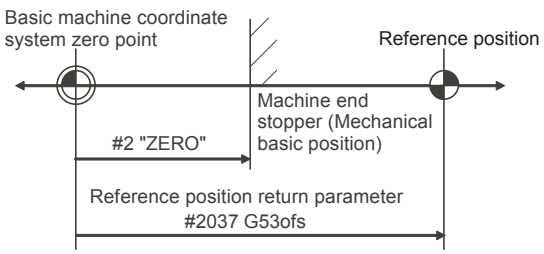
(Note 3) The automatic initialization will stop in the following cases after starting. "STATE" will change to JOG START when the initialization has stopped (or when the "INIT-SET" has been selected at the mode change). Start the operation from step (8).
- When a new absolute position detection alarm has occurred
- When READY has been turned OFF
- When the mode has been changed
- When reset is executed

If the "STATE" has shown OK before the automatic initialization, turn the power ON again without resuming the operation from (8). The "STATE" will return to OK.

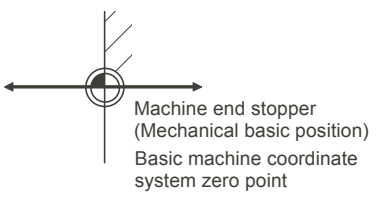
(Note 4) At the step (9) (e), if the first grid point is on the grid mask ("#2028 grmask"), the axis will stop at the next grid point. Note that the zero point shift ("#2027 G28sft") is invalid.

(Note 5) Automatic initialization cannot be started in the following cases. The message "T01 CAN'T CYCLE ST" will appear if starting is attempted.
- When "#0 INIT. SET" has not been set.
- When the "#2 ZERO" setting is inappropriate.
- When "#2055 pushf" has not been set on the [ABS. POSI PARAM] screen.
- When "Z71 Detector Error 0005" has occurred.

In the above cases, the inappropriate "#2 ZERO" setting means the inappropriate relation of "#2 ZERO" and "#2037 G53ofs". In other words, if the value of "#2 ZERO" is smaller than that of "#2037 G53ofs", the machine end stopper will be located between the basic machine coordinate system zero point and the reference position, so automatic initialization cannot be started. If "#2 ZERO" is set to "0", the machine end stopper direction will not be set, so automatic initialization cannot be started, either. (Refer to the following diagram)



Cannot execute the reference position return because the reference position will be set over the machine end stopper from basic machine coordinate zero point.



When "ZERO" is set to "0", the pushing direction cannot be set because the machine end stopper will be positioned at the basic machine coordinate system zero point.

PLC axis automatic initialization

To carry out the automatic initialization with PLC axis, select the "automatic initialization set" for the operation mode whose axis executes the initialization set. Then designate to "start up" of the control signal.

(1) Select the "automatic initialization set" for the operation mode to the PLC axis.
Set "7" to "G+1371/R4201".

G+1371 (R4201)
(1st axis)

Operation mode

(Numerical data)
0 : Rapid traverse (GO)
1 : Cutting feed (G1)
2 : Jog feed (+)
3 : Jog feed (-)
4 : Reference position return (+)
5 : Reference position return (-)
6 : JOG feed
7: Automatic initialization set

(2) Select "start up" of the control signal for the PLC axis.
Turn "G+1376/R4206" ON.

G+1376 (R4206)
(First axis)

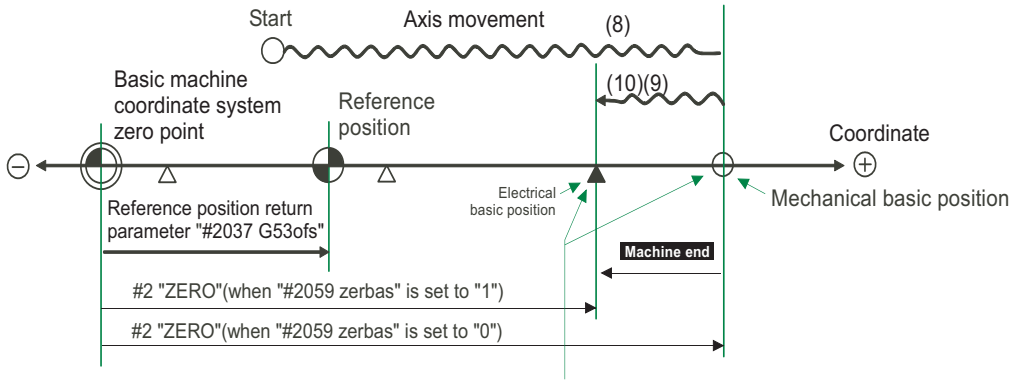
F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0

bit0: Start
1: Interlock
2: Reset
3: Servo OFF
4: Axis removal
5: Axis removal 2
6:
7:

bit8: Absolute value command
9:
A:
B:
C:
D:
E:
F:

7.3.3.3 Marked Point Alignment Method I

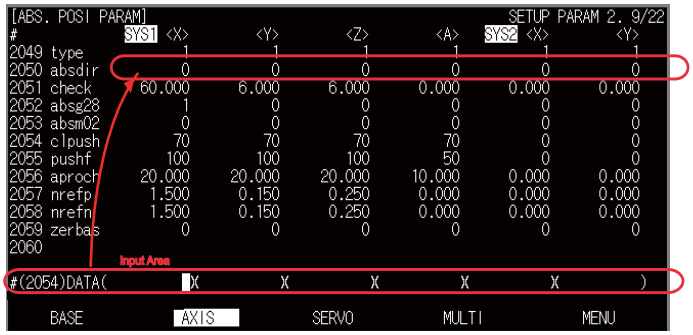
This is a method to align to the marked point (matchmark or marking line) on the machine. Use GOT project controlled by sequence programs, switches on the machine operation panel, manual handle, and the [ABS. POSITION SET] screen in the CNC monitor on GOT for the absolute position zero point initialization set. The GOT project and panel switches are made by the machine tool builder.



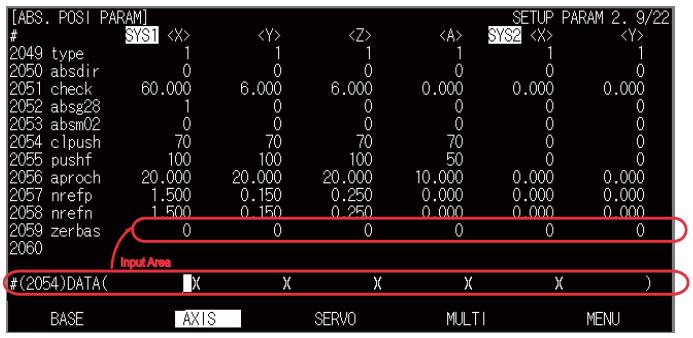
The parameter "#2059 zerbas" decides the absolute position basic point.
0: Position where the axis was stopped
1: Grid point just before stopper (electrical basic position)

(1) Display [ABS SERVO MONITOR] screen from [TOOL PARAM].

(2) Select the direction of the grid point just before the marked point of Marked Point Alignment Method I with "#2050 absdir Base point of Z direction". (0: Forward direction 1: Reverse direction)

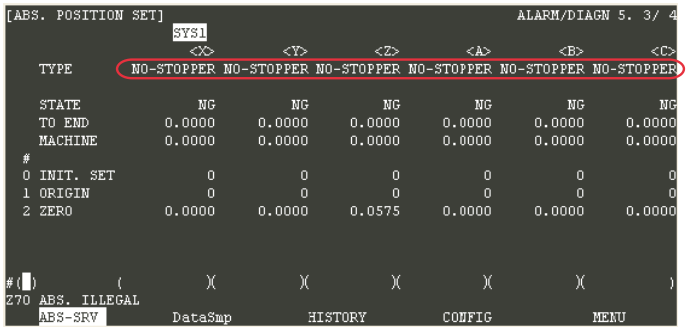


(3) Select the absolute position basic point with the parameter "#2059 zerbas Select zero point parameter and basic point".
0: The aligned position (mechanical basic position)
1: Grid point just before the aligned position (electrical basic position)



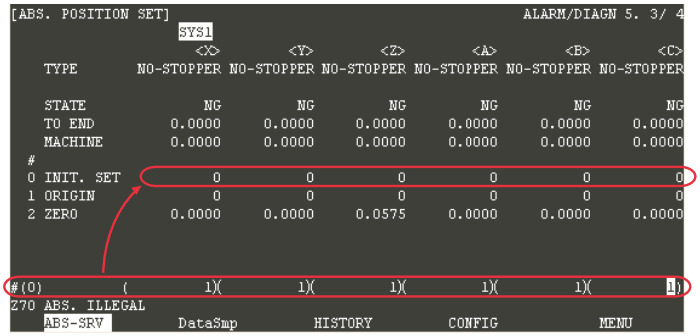
(4) Select the handle mode or the JOG mode.

(5) Select [ALARM/DIAGN] ---> [MENU (MENU 5)] ---> [ABS SERVO MONITOR] in the CNC monitor on GOT. Scroll the page to display the [ABS. POSITION SET] screen.
Check that the NO-STOPPER is applied for the axis for which the absolute position zero point is to be initialized.



(Note) The type of absolute position zero point initialization set is decided by the machine and axes specifications, although "marked alignment method I" can be selected by setting "2" for "#2049 type Absolute position detection method". Confirm whether the machine specifications allow the "marked alignment method" before changing the type.

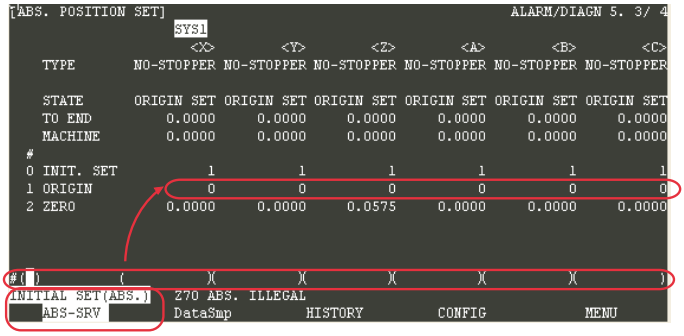
(6) Set "1" to "#0 INIT. SET" of the axis for which the zero point is to be initialized.



(7) Set the parameter "#2 ZERO".

(8) Move the axis to the marked point.

(9) Set "1" for "#1 ORIGIN" on the [ABS. POSITION SET] screen.



(10) Move the axis in the direction designated with the parameter "#2050 absdir".
The axis automatically stops when it has reached the first grid. Then the absolute position is established and the basic machine coordinate system is automatically set.

(11) Carry out the absolute position initialization set for all the axes, and then turn the power ON again.

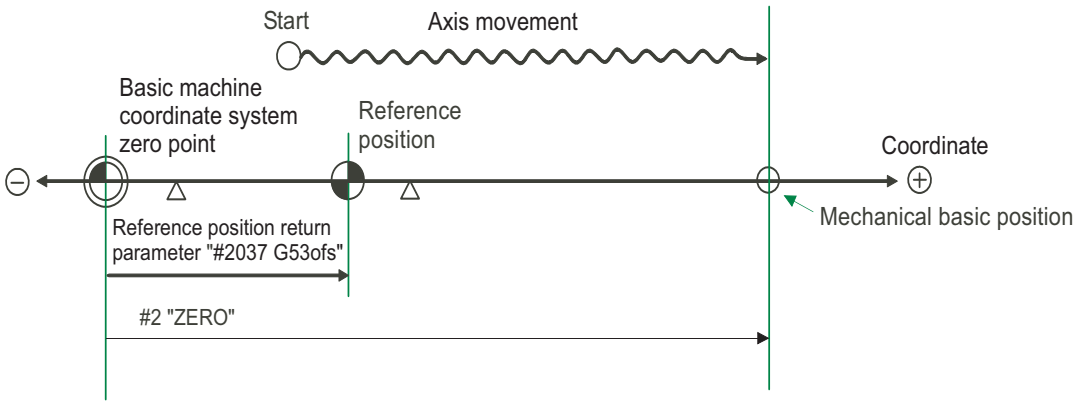
(Note 1) When changing only the basic machine coordinate zero point, carry out steps (6) and (7) above and then turn the power OFF and ON.

(Note 2) At the step (9), if the first grid point is on the grid mask ("#2028 grmask"), the axis will stop at the next grid point.
Note that the zero point shift ("#2027 G28sft") is invalid.

(Note 3) If no movement takes place in step (8), recheck the "#2050 absdir" direction.
When this parameter is set to "0", the axis will move only in the forward direction. When set to "1", only in the reverse direction.

7.3.3.4 Marked Point Alignment Method II

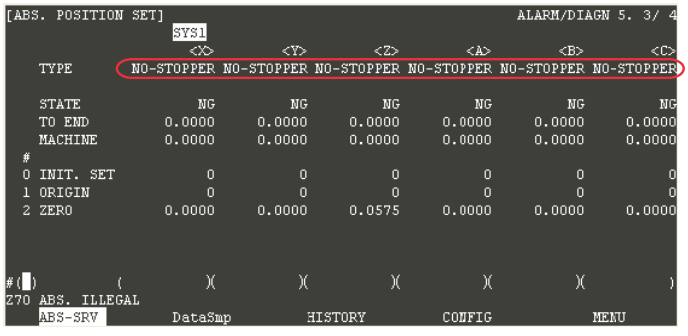
In a similar way to the "Marked Point Alignment Method I", this is a method to align to the marked point (matchmark or marking line) on the machine. However, the grid return will not be performed and the basic point is set as the absolute position zero point. Use GOT project controlled by sequence programs, switches on the machine operation panel, manual handle, and the [ABS. POSITION SET] screen in the CNC monitor on GOT for the absolute position zero point initialization set. The GOT project and panel switches are made by the machine tool builder.



(1) Display [ABS SERVO MONITOR] screen from [TOOL PARAM].

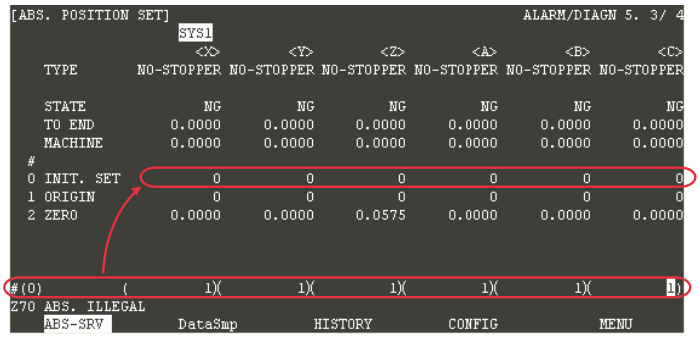
(2) Select the handle mode or the JOG mode.

(3) Select [ALARM/DIAGN] ---> [MENU (MENU 5)] ---> [ABS SERVO MONITOR] in the CNC monitor on GOT. Scroll the page to display the [ABS. POSITION SET] screen.
Check that the NO-STOPPER is applied for the axis for which the absolute position zero point is to be initialized.



(Note) The type of absolute position zero point initialization set is decided by the machine and axes specifications, although "marked alignment method II" can be selected by setting "4" for "#2049 type Absolute position detection method". Confirm whether the machine specifications allow the "marked alignment method II" before changing the type.

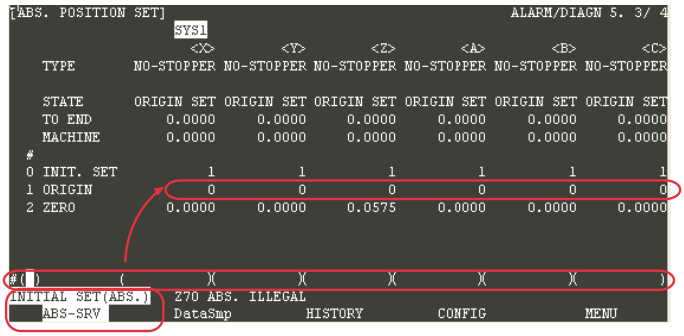
(4) Set "1" to "#0 INIT. SET" of the axis for which the zero point is to be initialized.



(5) Set the parameter "#2 ZERO".

(6) Move the axis to the marked point.

(7) Set "1" for "#1 ORIGIN" on the [ABS. POSITION SET] screen.



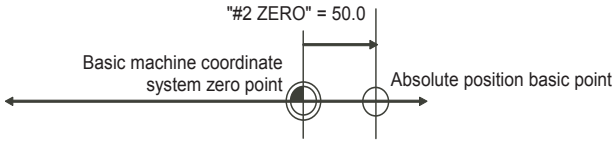
(8) Carry out the absolute position initialization set for all the axes, and then turn the power ON again.

7.3.3.5 Common Precautions for Dogless-type Absolute Position Detector

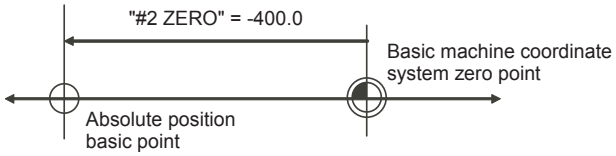
(a) Example of setting the "#2 ZERO" parameter

For the "#2 Zero" parameter, set the coordinate value of the absolute position basic point (mechanical basic position or electrical basic position) looking from the basic machine coordinate system zero point.

(Example 1)To set the zero point at 50.0mm before the absolute position basic point at machine end



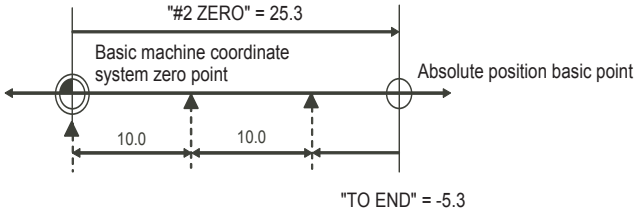
(Example 2)To set the zero point at 400.0mm after the absolute position basic point at machine end



(Example 3)To set the basic machine coordinate system zero point on a grid point, calculate the "#2 Zero" parameter setting value as shown below using the value displayed at "TO END". "TO END" shows the distance from the mechanical basic position to the previous grid point.

Note that when setting the electrical basic position coordinate value for "#2 Zero", the "TO END" value does not need to be considered.

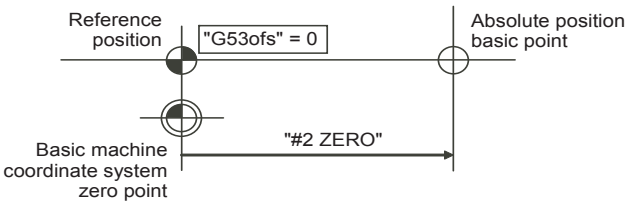
To set the third grid point as zero point when the "TO END" display is -5.3 at the mechanical basic position (with the grid space 10.0mm).)



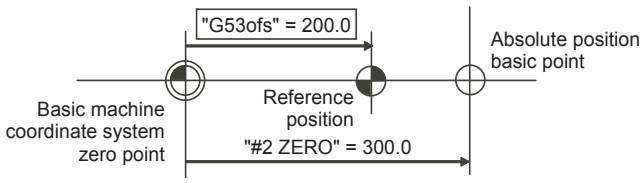
(b) Setting the reference position

The reference position can be set as shown below by setting "#2037 G53ofs".

(Example 1)To set the reference position to the same position as the basic machine coordinate system zero point.



(Example 2)To set the reference point at a position 200.0mm to the + side from the basic machine coordinate zero point. (To set the basic machine coordinate system zero point 300.0mm front of the absolute position origin point.)



(c) Common precautions for initialization operations

(1) The "#0 INIT. SET" parameter (axis for which zero point is to be initialized) can be set simultaneously for all axes or individually for each axis.

(2) The "#0 INIT. SET" parameter cannot be turned OFF with the keys. It is turned OFF when the power is turned ON again.
If this parameter is ON for even one axis, the message "INITIAL SET (ABS)" will appear in the operation status display area of all screens, and "In zero point initialization" signal will be output for the axis.The automatic, MDI and manual zero point return operations will be interlocked at this time.

(3) "#2 Zero" can be set at any time as long as "#0 INIT. SET" is set to "1".

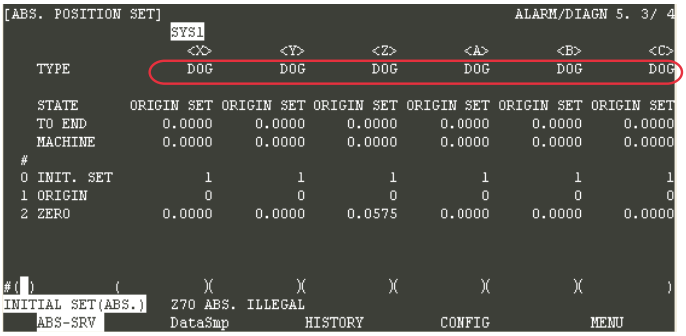
(4) The grid point must be passed at least once after the power-ON for the zero point initialization. If no grid point has been passed, "Not Pass" will appear at the "MACHINE" display.

(5) The necessary data will be saved in EEROM upon the establishment of the absolute position. The message notifies that the data is being written in EEROM.

7.3.4 Dog-type Absolute Position Zero Point Initialization Set

Execute the dog-type reference position return with the manual reference position return mode or automatic reference position return command (G28).
Use GOT project controlled by sequence programs, switches on the machine operation panel, manual handle, and the [ABS. POSITION SET] screen in the CNC monitor on GOT for the absolute position zero point initialization set. The GOT project and panel switches are made by the machine tool builder.

(1) Select [ALARM/DIAGN] ---> [MENU (MENU 5)] ---> [ABS SERVO MONITOR] in the CNC monitor on GOT. Scroll the page to display the [ABS. POSITION SET] screen.
Check that the "DOG" is applied for the axis for which the absolute position zero point is to be initialized.



(Note) The type of absolute position zero point initialization set is decided by the machine and axes specifications, although "DOG" can be selected by setting "3" for "#2049 type Absolute position detection method". Confirm whether the machine specifications allow the "DOG" before changing the type.

(2) Perform manual or automatic dog type reference point return.

(3) The absolute position will be established under the completion of the reference position return. The basic machine coordinate system will be automatically set.

(4) Carry out the absolute position initialization set for all the axes, and then turn the power ON again.

(Note 1) If the dog type reference position return is stopped by resetting, the previous state (OK or NG) will be displayed for "STATE".
(Note 2) The necessary data will be saved in EEROM upon the establishment of the absolute position. The message notifies that the data is being written in EEROM.
(Note 3) With dog-type, the reference position return can be executed again even if the "STATE" displays "OK".

8

Deceleration Check

With the deceleration check function, a deceleration stop is executed at the block seam before the next block is executed, preventing corner roundness by reducing the machine shock that occurs when the control axis feedrate is suddenly changed.

8.1 Conditions for Executing the Deceleration Check

(1) Deceleration check during rapid traverse
During the rapid traverse mode, deceleration check is carried out at the block seam before executing the next block.

(2) Deceleration check during cutting feed
The deceleration check is carried out at the block joints (before executing the next block) during cutting feed when any one of the following conditions is valid.
(a) When the error detect switch (external signal) is ON.
(b) When G09 (exact stop check) is commanded in the same block.
(Note) The G09 command is issued in the same block as the cutting command. It is an unmodal command.
(c) When G61 (exact stop check mode) has been selected.
(Note) The G61 command is a modal command. The modal is canceled by the following commands.
G61.1: High accuracy control
G62: Automatic corner override
G63: Tapping mode
G64: Cutting mode

8.2 Deceleration Check and Parameters

Select the deceleration check method with these parameters.

[Base specification parameter] #1193 inpos Deceleration check method selection

#1193 inpos	Command mode			
	Rapid traverse	G09 + G01	G01 -> G00	G01 -> G01
0	Command deceleration check	Command deceleration check	Deceleration is not applied	Deceleration is not applied
1	In-position	In-position	Deceleration is not applied	Deceleration is not applied
2	Command deceleration check	Command deceleration check	Command deceleration check	Deceleration is not applied
3	In-position	In-position	Command deceleration check	Deceleration is not applied

[Servo parameter] #2224 SV024 (INP) In-position width

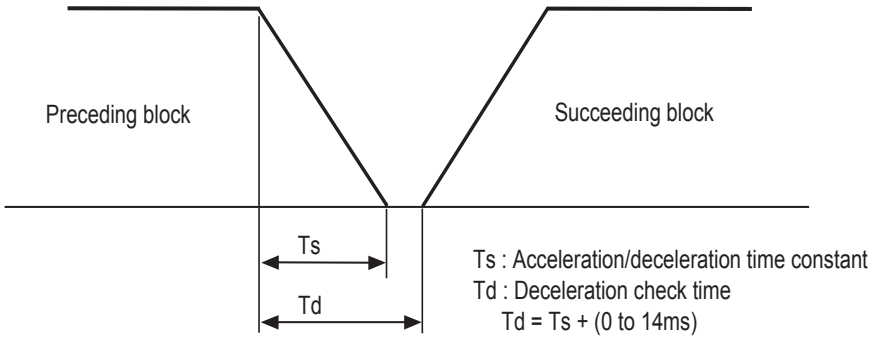
0 to 32767 (Output unit 1 μm) Valid during in-position check

8.3 Deceleration Check Method

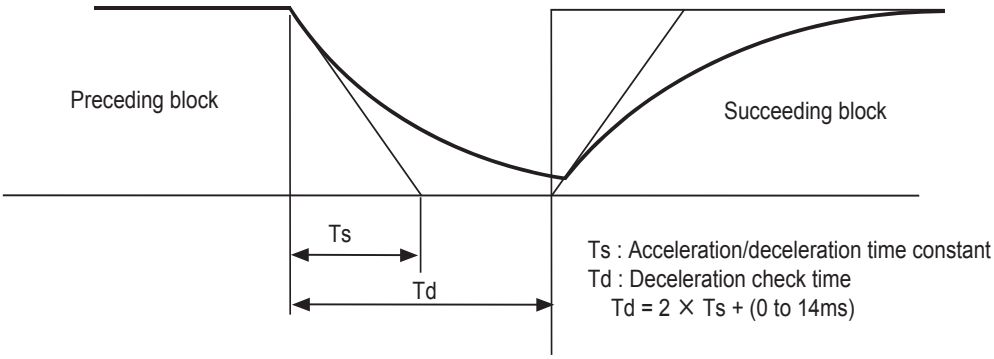
(1) Command deceleration check

After interpolation for one block has been completed, the completion of the command system deceleration is confirmed before execution of the next block. The time required for the deceleration check is determined according to the acceleration/deceleration mode and acceleration/deceleration time constant.

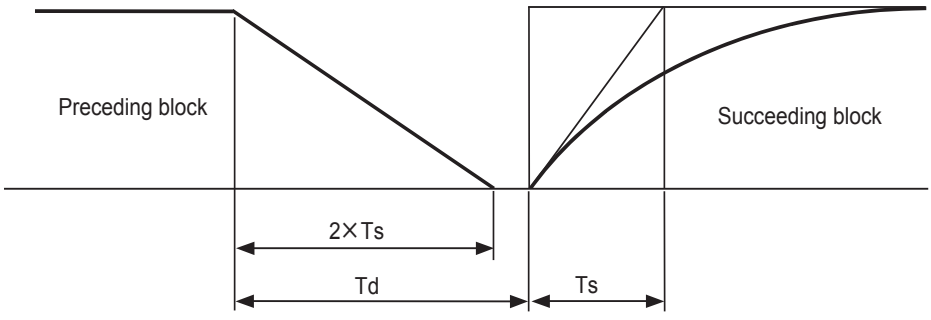
(a) For linear acceleration/deceleration



(b) For exponential acceleration/deceleration



(c) For exponential acceleration and linear deceleration



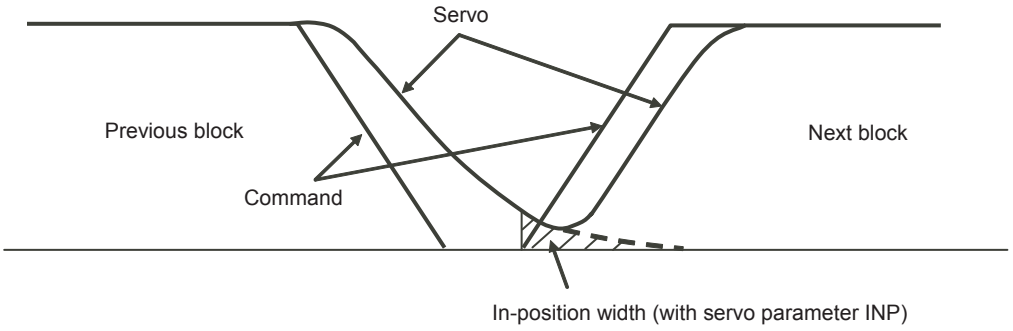
Ts : Acceleration/deceleration time constant
Td : Deceleration check time
Td = 2 × Ts + (0 to 14ms)

The deceleration check time required during rapid traverse is the longest rapid traverse deceleration check time of all axes. This check time is determined by the rapid traverse acceleration/deceleration mode and rapid traverse acceleration/deceleration time constant of simultaneously commanded axes.

The deceleration check time required during cutting feed is determined in the same manner. It is the longest cutting feed deceleration check time of all axes. This check time is determined by the cutting feed acceleration/deceleration mode and cutting feed acceleration/deceleration time constant of simultaneously commanded axes.

(2) In-position check

With the in-position check, after the commanded deceleration check is carried out it is confirmed that the servo system's position error amount is less than the value set in the parameters before executing the next block.



9

Setting the Tool Entry Prohibited Range

Stroke End (H/W OT) and Stored Stroke Limit (S/W OT) set the tool entry prohibited range and detect the overtravel (OT).

9.1 Stroke End (H/W OT)

The axis movement is controlled by the limit switch which detects the stroke end.
Signal device No. is allocated by the following parameters.
Parameter "#2074" and "#2075" will be valid only when "#1226 aux10/bit" is set to "1".

#1226 aux10/bit5: Set to "1" (assigning the signal is valid).
#2074 H/W OT+: Set the input device for assinging the OT (+) signal. (Setting range 0000 to 02FF (Hexadecimal))
#2075 H/W OT-: Set the input device for assinging the OT (-) signal. (Setting range 0000 to 02FF (Hexadecimal))

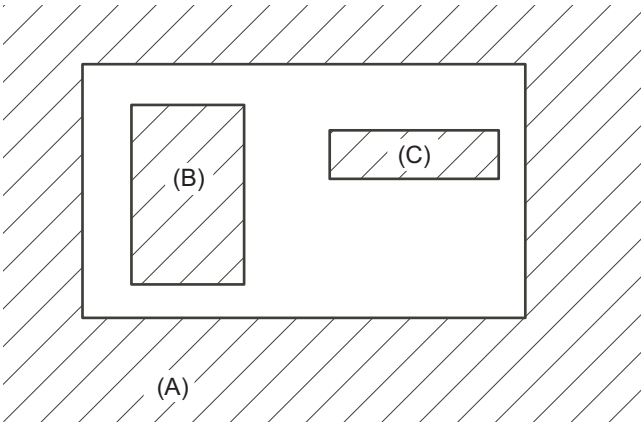
(Note 1) When "OT IGNORED" (R2420) signal is set to ON, the stroke end signal associated with a specific control axis can be ignored.
(Note 2) When parameter "#1226 aux10/bit5" is set to "1", do not set the same device No. to #2073 to #2075. Setting the same device No. may cause the emergency stop. However, the device number will not be checked for the axis which is set the signal to ignore (R2420, R2421).

9.2 Storeed Stroke Limit (S/W OT)

9.2.1 Outline

Three tool entry prohibited ranges can be set with stored stroke limit I, stored stroke limit II, IIB and stored stroke limit IB. Set the parameters to select the entry prohibited range for stored stroke limit II or IIB.

(Ⅱ : Prohibits entering outside the range IIB: Prohibits entering inside the range)



: Moveable range

: Prohibited range

(A): Prohibited range by stored stroke limit I
(B): Prohibited range by stored stroke limit IIB
(C): Prohibited range by stored stroke limit IB

If the axis is moving over the set range, an alarm will appear and the axis will decelerate to a stop.
If the prohibited range is entered and an alarm occurs, movement will be possible only in the direction opposite the entry direction.

Valid Conditions of Stored Stroke Limit

When using the relative position detection system, the stored stroke limit is invalid until the reference position return is completed after the power is turned ON.
The stored stroke limit can be validated by setting "#2049 type (Absolute position detection method)" to "9"even if the reference position return is not yet completed.

(Note) If the absolute position detection is valid when using the absolute position detection system, the stored stroke limit will be validated immediately after the power is turned ON.

Stored Stroke Limit Coordinates

The stored stroke limit check is carried out in the basic machine coordinate system established by the reference position return.
When making the stored stroke limit validated while the reference position return has not been completed, execute the stored stroke limit check with the basic machine coordinate system at the time of last power-OFF as temporary one.
When the 1st dog-type reference position return is completed after the power is turned ON, the proper coordinate system is established.

(Note) While the reference position return has not been completed, only the manual and handle feed mode allow the axis movement. Automatic operation is validated after the reference position return is completed.

⚠CAUTION **Always set the stored stroke limit. Failure to set this could result in collision with the machine end.**

9.2.2 Detailed Explanation

The stored stroke limit sets a prohibited range with the parameters or program command. The minimum and maximum values of the prohibited range are set as the coordinate value (radius value) on the machine coordinate system for each axis.

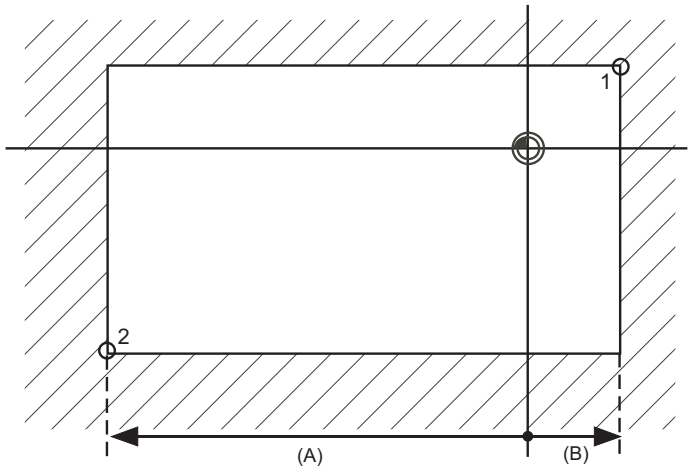
- The stroke check will not be executed when a same value is set to both maximum and minimum value.
- This function is valid after the reference position return if the absolute position detection system is not applied.
- Before the machine enters the prohibited range, an error "M01 Operation error 0007" (S/W stroke end) will occur, and the machine movement will stop. The alarm can be reset by moving the erroneous axis in the opposite direction.
- During automatic operation, if an alarm occurs with even with one axis, all axes will decelerate to a stop.
- During manual operation, only the axis that caused the alarm will decelerate to a stop.
- The axis will always stop at a position before the prohibited range.
- The distance between the prohibited range and stop position will depend on the feedrate, etc.

The stored stroke limits I, II, IIB and IB are handled as follows.

<table>
<tr><th>Type</th><th>Prohibited range</th><th colspan="2">Description</th><th>Range setting parameters</th><th>Validating conditions</th></tr>
<tr><td>I</td><td>Outside</td><td colspan="2">- Set by the machine tool builder.
- When used with II, the confined range designated by the two functions becomes the movement valid range.</td><td>"#2013 OT -
(Soft limit I -)"<br>"#2014 OT +
(Soft limit I +)"</td><td>- Reference position return is completed.
- #2013 and #2014 are not set to the same value.</td></tr>
<tr><td>II</td><td>Outside</td><td rowspan="2">- Set by the user.
- Select II or IIB with the parameters.</td><td>- "#8210 OT-INSIDE" = "0"
- Used with I.</td><td rowspan="2">"#8204 OT-CHECK-N"
"#8205 OT-CHECK-P"</td><td rowspan="2">- Reference position return is completed.
- #8204 and #8205 are not set to the same value.
- "#8202 OT-CHECK OFF" = "0"</td></tr>
<tr><td>IIB</td><td>Inside</td><td>- "#8210 OT-INSIDE" = "1"</td></tr>
<tr><td>IB</td><td>Inside</td><td colspan="2">- Set by the machine tool builder.</td><td>"#2061 OT_1B-
(Soft limit IB -)"<br>"#2062 OT_1B+
(Soft limit IB +)"</td><td>- Reference position return is completed.
- #2061 and #2062 are not set to the same value.</td></tr>
</table>

9.2.2.1 Stored Stroke Limit I

This is a stroke limit function used by the machine tool builder. The boundary is set with the parameters ("#2013 OT -(Soft limit I -)" and "#2014 OT + (Soft limit I +)"). The outside of the set boundary is the prohibited range.
When used with the stored stroke limit II function, the confined range designated by the two functions becomes the moveable range.



: Moveable range

: Prohibited range

(A): Set value for (-) side
(B): Set value for (+) side
Point 1: "#2014 OT+ (Soft limit I +)" and
Point 2: "#2013 OT+ (Soft limit I +)"
are set with the coordinate value of the basic machine coordinate system.

(Note 1) This function will be invalid if the same value excluding "0" is set for both "#2013 OT -" and "#2014 OT +".
(Note 2) When using the peripheral axis, inside of the specified range will be prohibited if the "#2013 OT -" value is larger than that of "#2014 OT +".

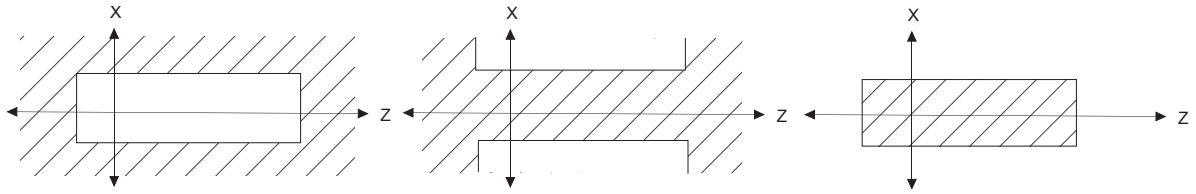
9.2.2.2 Stored Stroke Limit II

The boundary is set with the axis parameters "#8204 OT-CHECK-N" and "#8205 OT-CHECK-P" or with program commands. Either the inside or the outside of the set boundary is the prohibited range. Whether the inside or outside of the range is prohibited is determined by "#8210 OT-INSIDE". When the inside is selected, this function is called stored stroke limit IIB.

When using program commands, entry of the tool into the prohibited range is prohibited with G22, and entry into the prohibited range is enabled with G23. The stored stroke limit II can be invalidated for each axis with setting "#8202 OT-CHECK OFF" to "1".

Prohibited range

X: Outside Z:Outside: X: Inside Z: Outside X: InsideZ: Inside

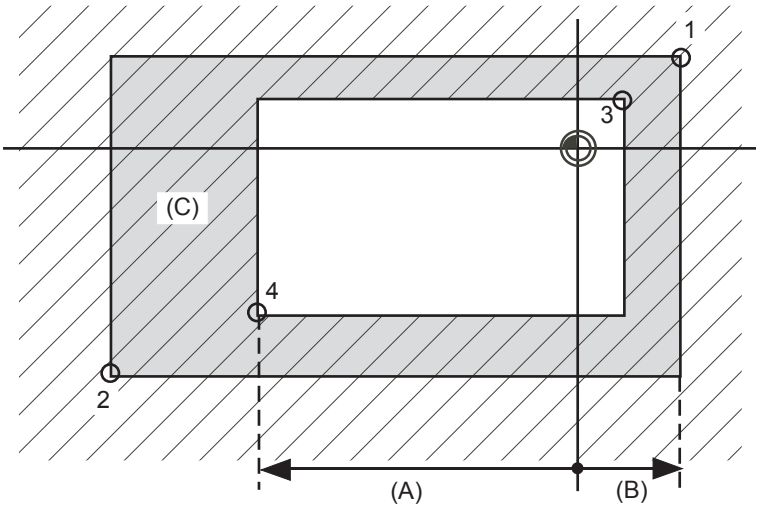


: Moveable range

: Prohibited range

(1) Stored stroke limit II (When prohibited range is on outside)

When used with the stored stroke limit I function, the narrow range designated by the two types becomes the movement valid range.



: Moveable range

: Prohibited range

(A): Set value for (-) side

(B): Set value for (+) side

(C): Prohibited range by stored stroke limit II

Point 3: "#8205 OT-CHECK-P" and

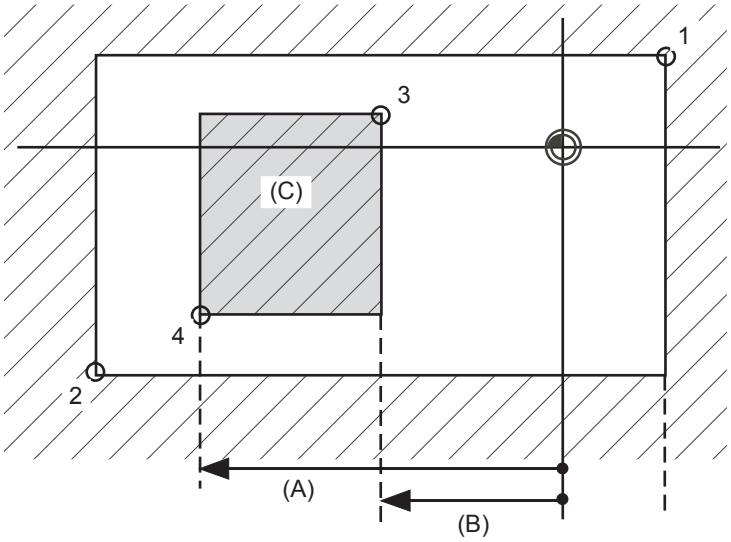
Point 4: "#8204 OT+ (Soft limit I +)"

are set with the coordinate value of the basic machine coordinate system.

Points 1 and 2 are the prohibited range set with stored stroke limit I.

(2) Stored stroke limit IIB (When prohibited range is on inside)

A range except for that of the stored stroke limit I becomes the movement prohibited range.



: Moveable range

: Prohibited range

(A): Set value for (-) side

(B): Set value for (+) side

(C): Prohibited range by stored stroke limit IIB

Point 3: "#8205 OT-CHECK-P" and

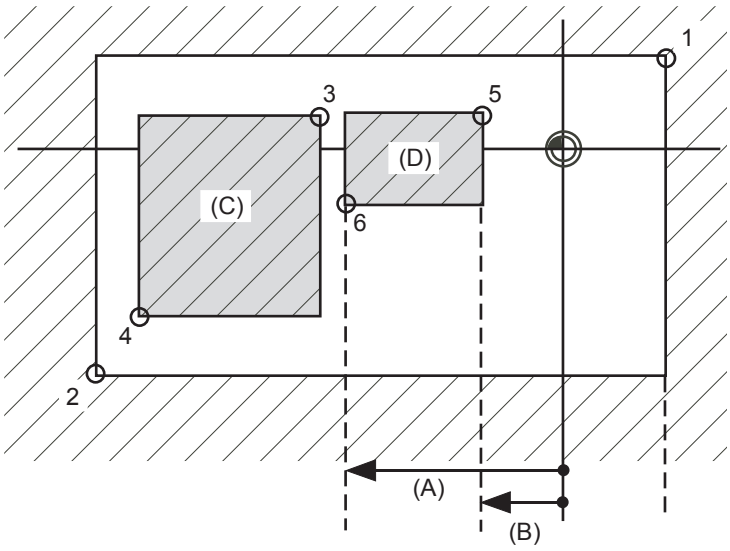
Point 4: "#8204 OT+ (Soft limit I +)"

are set with the coordinate value of the basic machine coordinate system.

Points 1 and 2 are the prohibited range set with stored stroke limit I.

9.2.2.3 Stored Stroke Limit IB

The boundary is set for each axis with the axis parameters "#2061 OT_1B-" and "#2062 OT_1B+". The inside of the set boundary is the prohibited range.



: Moveable range

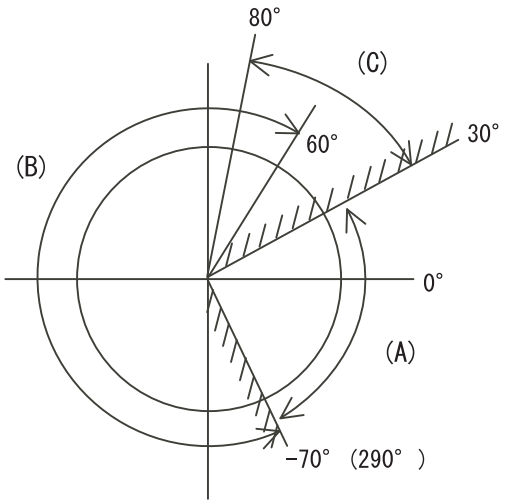
: Prohibited range

Point 5: "#2062 OT_1B+ (Soft limit IB+)" and
Point 6: "#2061 OT+ (Soft limit I +)"
are set with the coordinate value of the basic machine coordinate system.
(A): Set value for (-) side
(B): Set value for (+) side
(C): Prohibited range by stored stroke limit II
(D): Prohibited range by stored stroke limit IB
Points 1 and 2 are the prohibited range set with stored stroke limit I., and Points 3 and 4 are the prohibited range set with stored stroke limit IIB.

9.2.2.4 Stored Stroke Limit for Rotation Axis

Stored stroke limits I and II are used as the stored stroke limit for the rotation axis. The area between the maximum and minimum values of the prohibited range's parameters, which does not contain the 0 point of the basic machine coordinate system, is the entry prohibited range.
The prohibited range parameters for the rotation axis can be set to establish "maximum value < minimum value". This will be handled in the same manner as if "maximum value > minimum value".

(Example)Stored stroke limit I (maximum value and minimum value of prohibited range parameter)
#2013 OT -: -70.000°
#2014 OT +: 60.000°
Stored stroke limit II (maximum value and minimum value of prohibited range parameter)
#8204 OT-CHECK-N: 30.000°
#8205 OT-CHECK-P: 80.000°



(A): Moveable range
(B): Prohibited range by stored stroke limit I
(C): Prohibited range by stored stroke limit II

9.2.2.5 Notes

(1) If the maximum value and minimum value of the stored stroke limit's prohibited range are set to the same value, the following will occur.
  (a) When the maximum value and minimum value are set to "0", if the outside is the prohibited range, the entire range will be prohibited. If the inside is the prohibited range, the entire range will be the moveable range.
  (b) If data other than "0" is set for the maximum value and minimum value, the entire range will be the moveable range.
(2) When using the peripheral axis, inside of the specified range will be prohibited if the "#2013 OT -" value is larger than that of "#2014 OT +".

9 Setting the Tool Entry Prohibited Range

10

Data Backup and Restoration

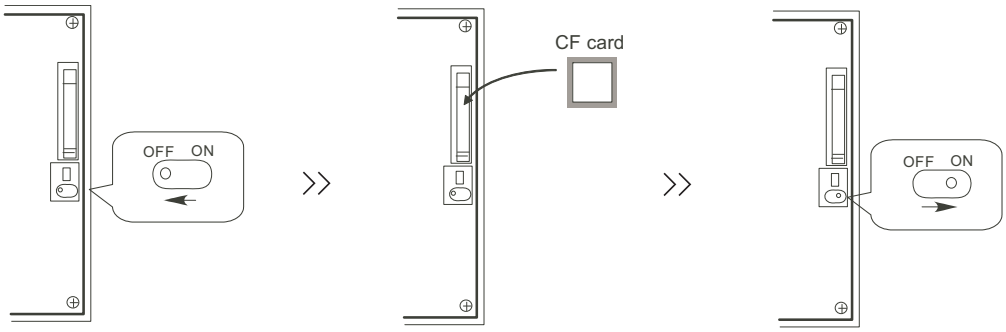
10.1 GOT Data Backup and Reinstallation

Standard functions (standard monitor OS), communication driver, BootOS and projects in GOT can be backed up in batch to the CF card inserted in GOT.
The data backed up in batch can be reinstalled to GOT in easy operation.

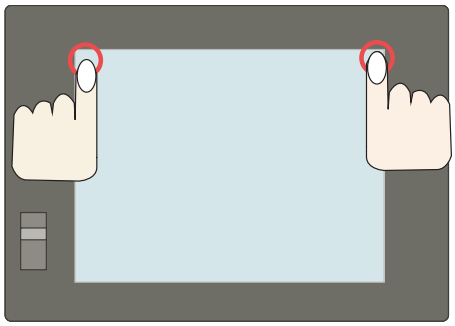
(Note 1) See below for the procedure when OS data and project data (drawing data) are stored in "C Drive". If OS data and project data (drawing data) are installed in "A Drive (CF card)", backup data from the CF card.
(Note 2) When using GOT1000 series GT16, USB memory is also available for backup and reinstallation.
.

10.1.1 Backup procedures

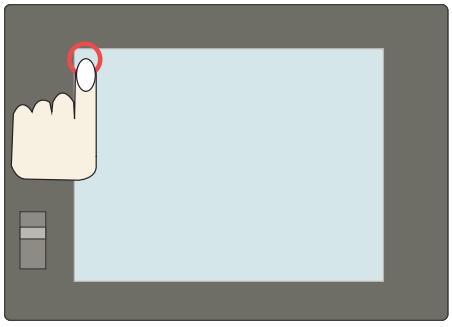
(1) Set "OFF" the CF Card access switch.
(2) Insert the CF Card into the card slot.
(3) Set "ON" the CF Card access switch.



(4) Open the GOT Utility screen.
For GT15: Press the right and left top corners together.

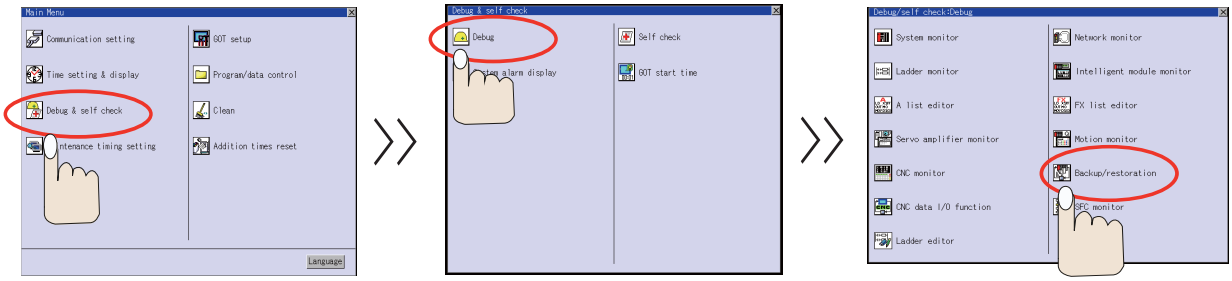


For GT16: Press the left top corner.

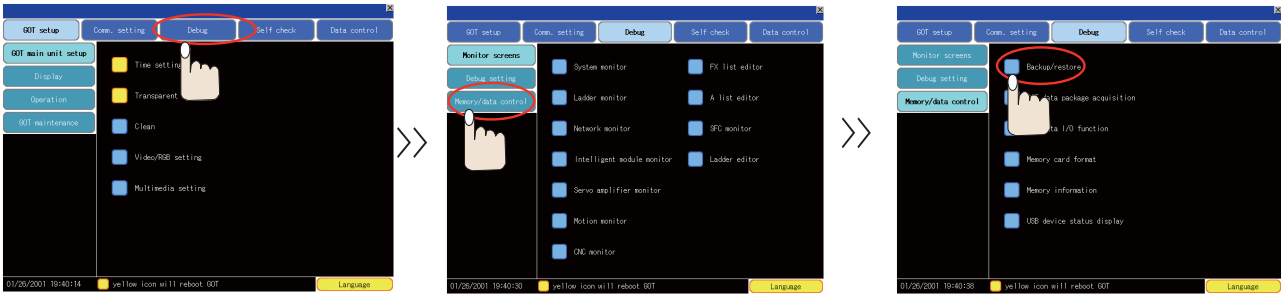


(5) Select the [Backup / Restoration] menu.

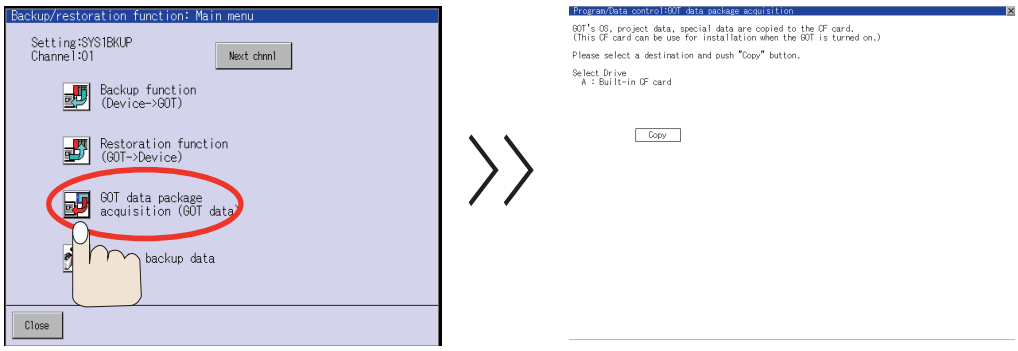
For GT15: [Debug & self check] - [Debug] - [Backup / Restoration]



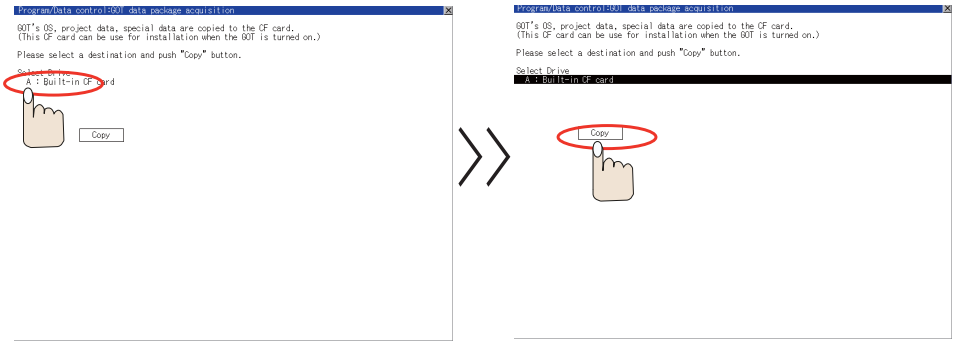
For GT16: [Debug] - [Memory / Data control] - [Backup / Restoration function]



(6) Select [Program/data control] -> [GOT data package acquisition] to display the [Program/Data control: GOT data package acquisition] screen.



(7) Select "A: Built-in CF card". Then select "Copy".



(Note) To backup the data to USB memory (GT16 only), select "E: USB Drive".

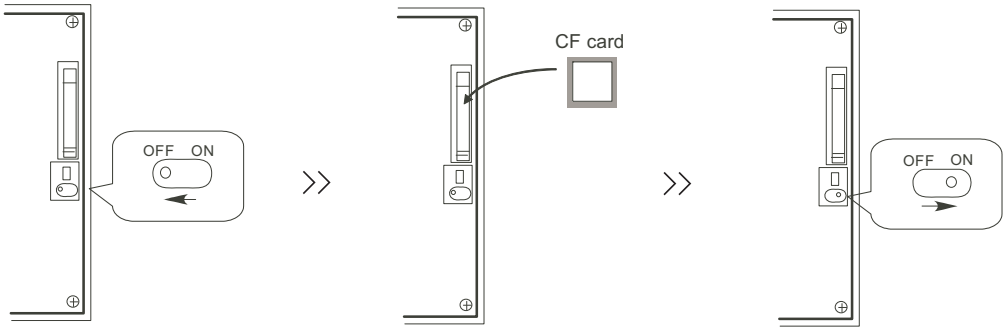
(8) The confirmation window will appear. Select "OK".

(9) When the data has been backed up, confirmation window will appear. Select "OK" to complete.

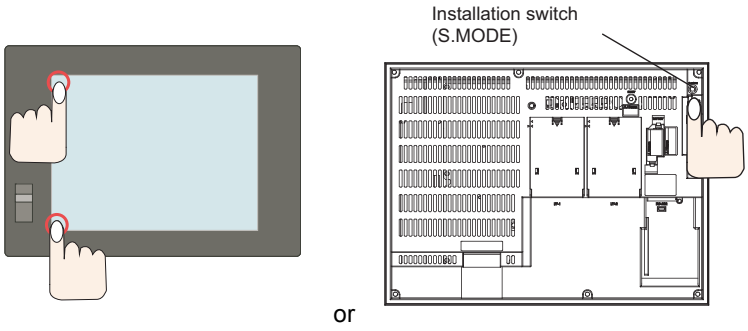
(Note) For details, refer to "GT15 User's Manual"(SH(NA)-080528ENG), Section 13 or "GT16 User's Manual"(SH(NA)-080778ENG), Section 12.

10.1.2 Reinstallation Procedures

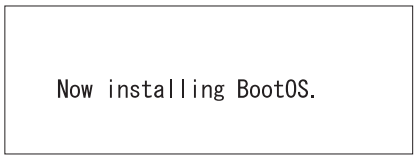
(1) Turn the GOT OFF and set "OFF" the CF card access switch on the back of GOT.
Insert the CF card, which contains the data such as standard functions (standard monitor OS), in the slot. Then set "ON" the CF card access switch.



(2) Turn the GOT power ON. Keep touching the GOT screen's left top and bottom during turning ON.
When using GT1595-X or GT16, keep pressing the installation switch (S.MODE switch) on the back of the GOT during turning the GOT ON.



Boot OS and the standard monitor OS are installed to built-in flash memory.



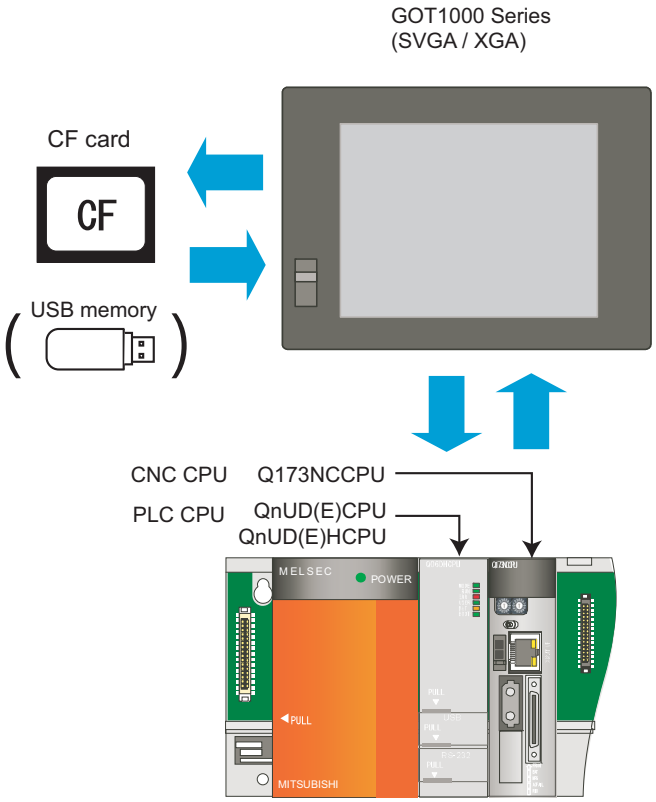
(3) GOT will automatically restart after the completion of installation. (If the standard monitor OS has already been installed, press the button to restart.)

(4) Confirm that the GOT is successfully restarted, and set the GOT's CF card access switch to "OFF".
Confirm that the CF card access LED is OFF, and remove the CF card from the GOT's CF card interface.

(Note) For details, refer to the "GT Designer2 Version2 Basic Operation/Data Transfer Manual" (SH(NA)-080529), Section 8.

10.2 PLC/CNC CPU Data Backup and Restoration

Backup / Restoration function is installed on GOT1000 series.
All of PLC/CNC CPU data that needs to backup is saved into the CF card on GOT1000 in an easy operation.
All backup data can be restored to each CPU module one by one.
USB memory(Max.2GB) can be used on GOT1000 series GT16.



(Note 1) Backup/restoration is not executed on latch device of PLC CPU. If the data requires to be restored when CPU is replaced, assign the data to file registers.

(Note 2) Editing CNC data
The backed up CNC data includes machining programs, parameters, and others. Those data are related one another.
Therefore, when any of the data is changed with a text editor and others, the GOT cannot restore the backed-up CNC data to the CNC.
When editing the setting data, use the CNC data I/O function.
(For the CNC data I/O function, refer to "C70 Instruction Manual" (IB-1500267).)

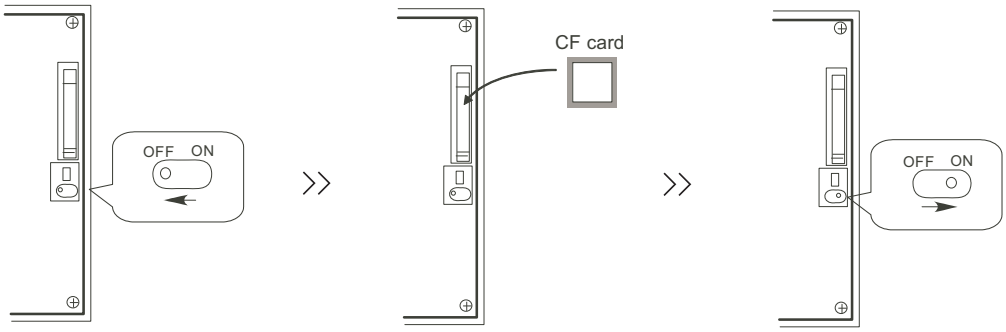
(Note 4) Refer to "Setting the saving destination drive for backup data" for destination drive for backup data.

10.2.1 Data Backup

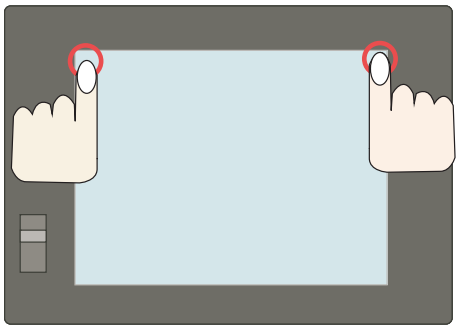
10.2.1.1 Backup procedures

The following shows the backup procedures.

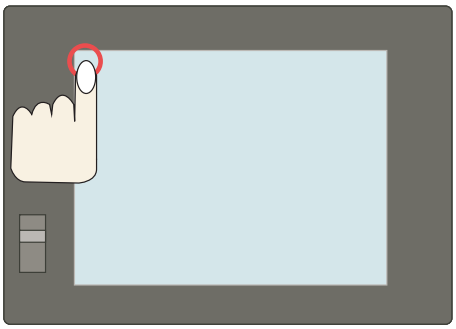
(1) Set "OFF" the CF Card access switch.
(2) Insert the CF Card into the card slot.
(3) Set "ON" the CF Card access switch.



(4) Open the GOT Utility screen. The utility call key(s) is set as follows at factory shipment.
For GT15: Press the right and left top corners together.



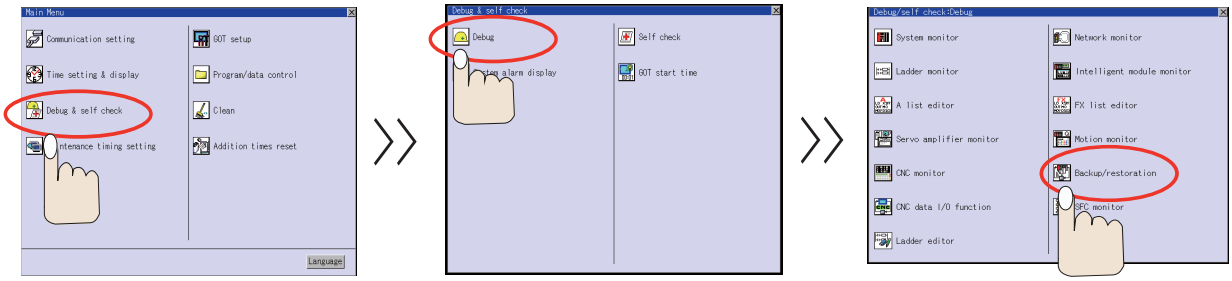
For GT16: Press the left top corner.



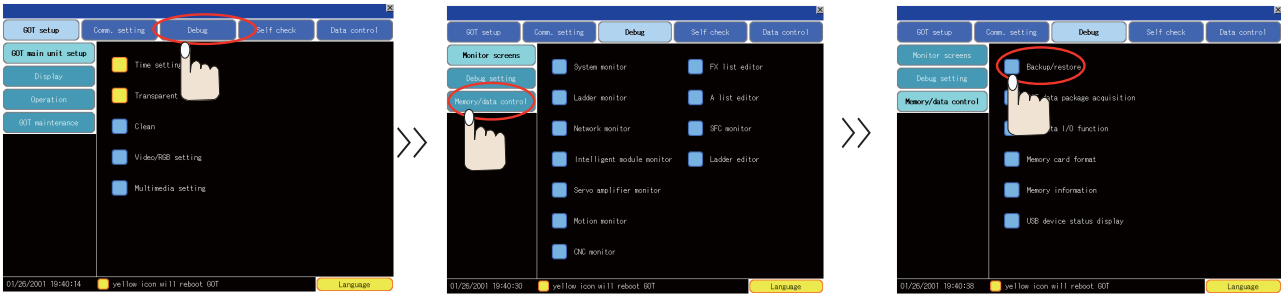
(Note) The utility call key(s) can be arranged on the GT Designer2's "GOT Setup" screen. For details, refer to the "GT Designer2 Version2 Screen Design Manual" (SH(NA)-080530), Section 3.

(5) Select the [Backup / Restoration] menu.

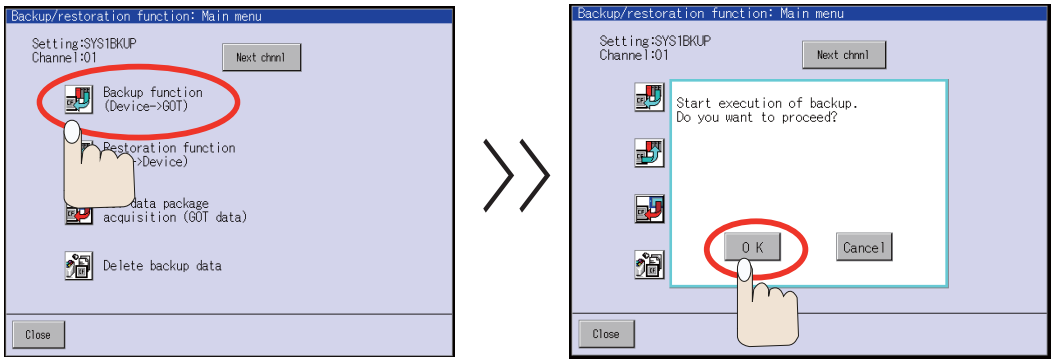
For GT15: [Debug & self check] - [Debug] - [Backup / Restoration]



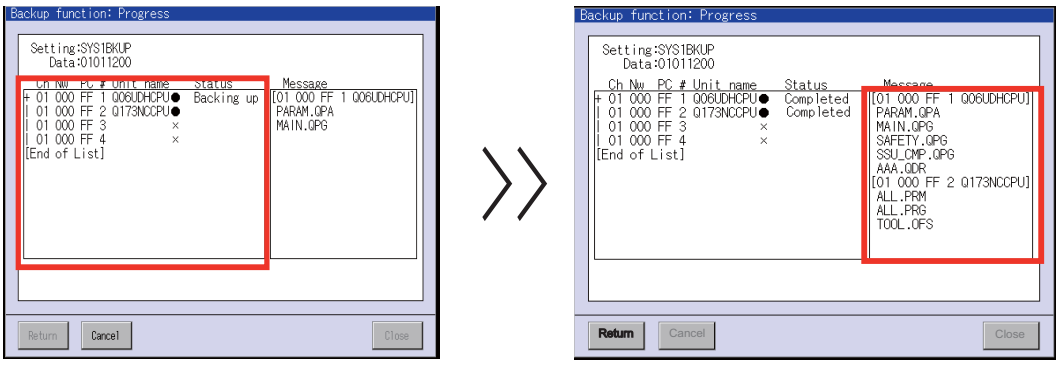
For GT16: [Debug] - [Memory / Data control] - [Backup / Restoration function]



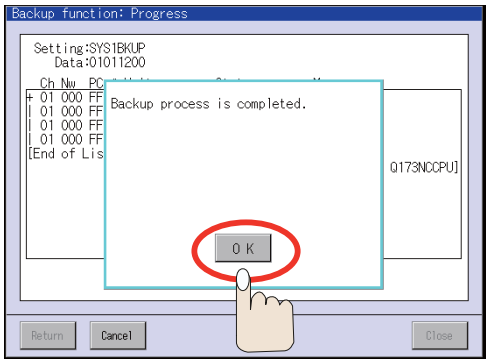
(6) Select [Backup function (Device->GOT)]. Then the confirmation window appears.
Click "OK" to start the backup.



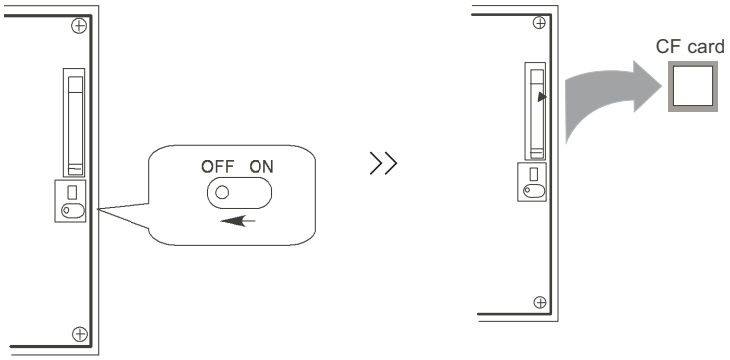
(7) CPU modules are selected and displayed automatically.
Backup files are made. The file names are displayed automatically.



(8) The completion window appears. Select "OK".

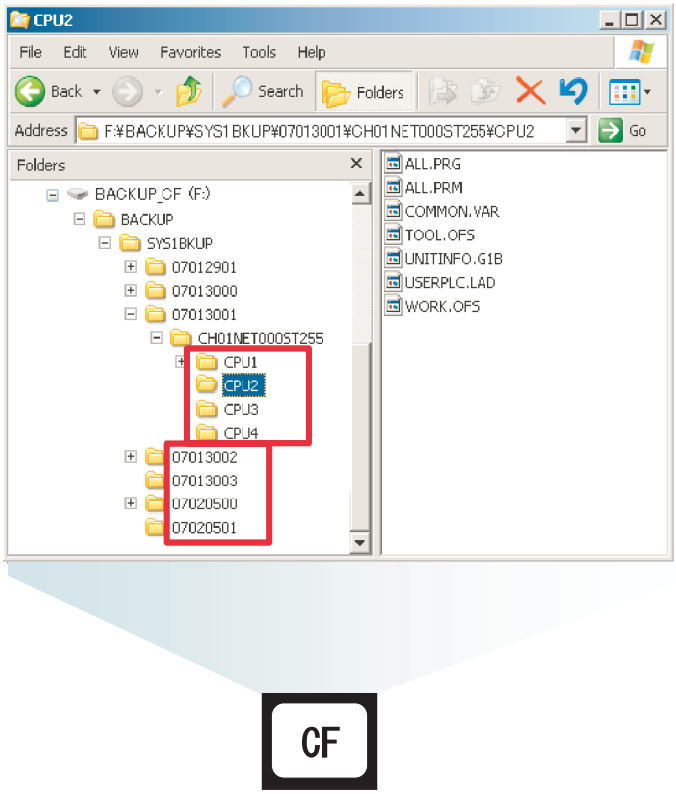


(9) Set "OFF" the Compact Flash card access switch, and then take out the card.



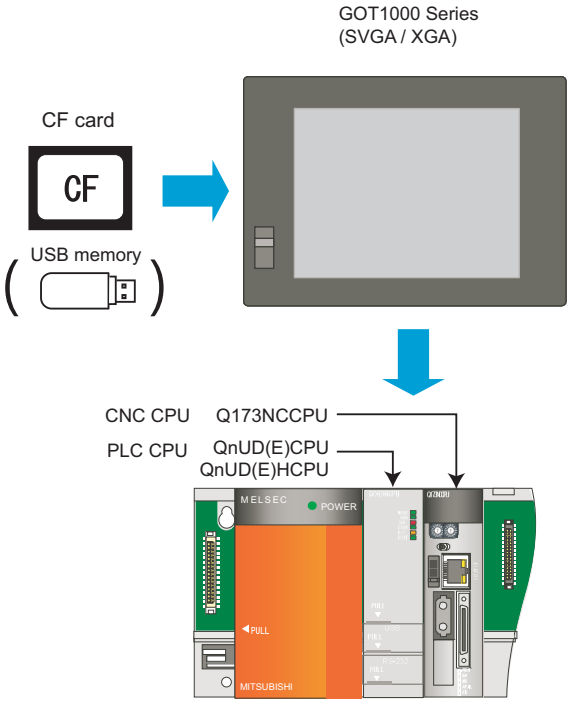
10.2.1.2 Backup Files Structure

Each backup makes a folder in a CF card, and data is saved.
Each folder name contains the backup date and order No.
And, sub folders are made for each CPU module.



10.2.2 Data Restoration

Backup / Restoration function is installed on GOT1000 series.
The backup data can be restored to each CPU module one by one in easy operation.
USB memory can be used on GOT1000 series GT16.



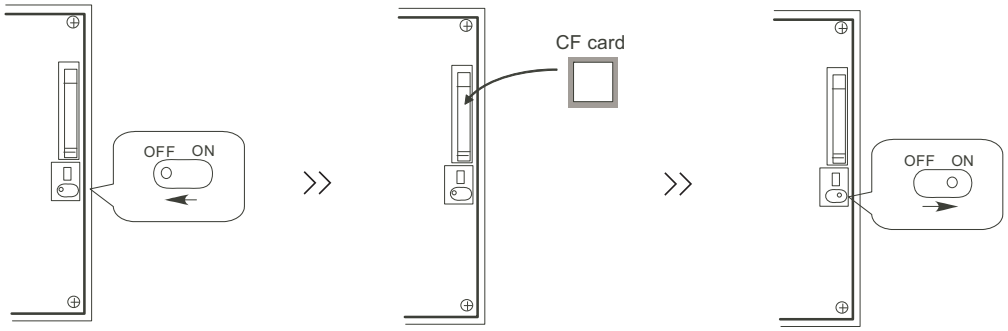
To exchange the CNC CPU unit, initialize the internal data. Refer to "4.2 Initializing CNC CPU Internal Data (Clearing SRAM Data)" for how to initialize.

(Note) The zero point of rotary axis will disappear after replacing the CNC CPU unit. Repeat the zero point initialization.

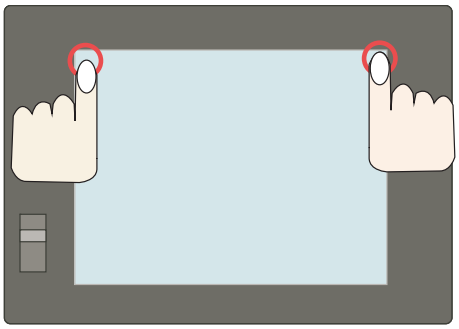
10.2.2.1 Restoration procedures

The following shows the restoration procedures.

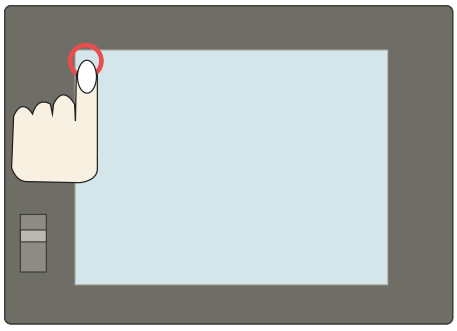
(1) Set "OFF" the CF Card access switch.
(2) Insert the CF Card that has backup data into the card slot.
(3) Set "ON" the CF Card access switch.



(4) Open the GOT Utility screen. The utility call key(s) is set as follows at factory shipment.
For GT15: Press the right and left top corners together.



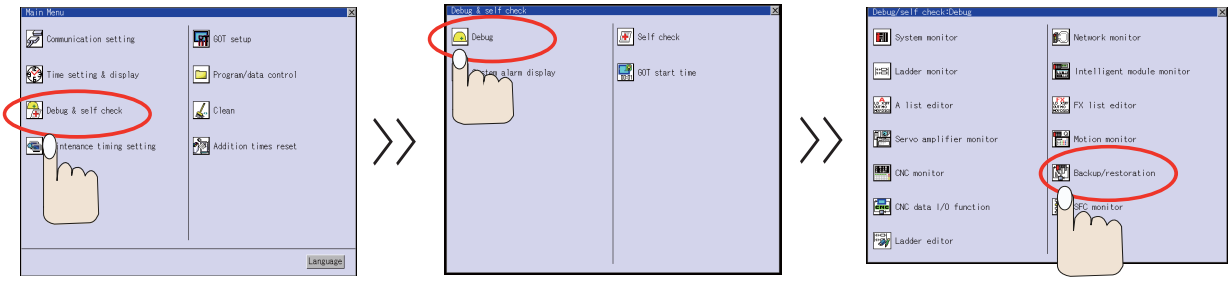
For GT16: Press the left top corner.



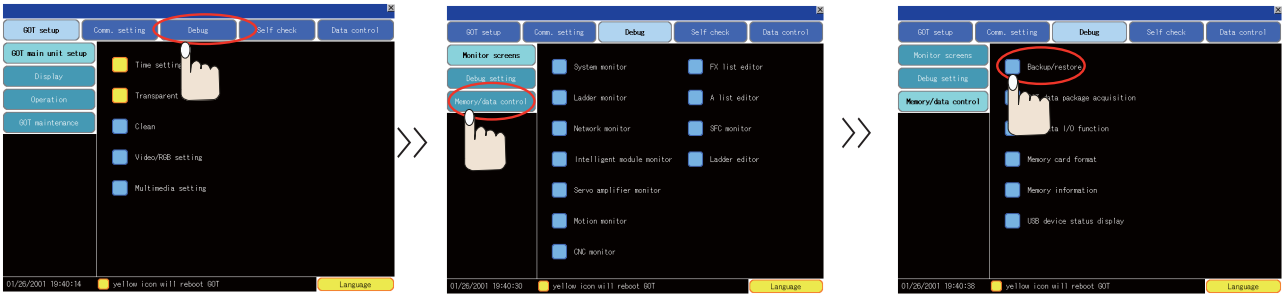
(Note) The utility call key(s) can be arranged on the GT Designer2's "GOT Setup" screen. For details, refer to the "GT Designer2 Version2 Screen Design Manual" (SH(NA)-080530), Section 3.

(5) Select the [Backup / Restoration] menu.

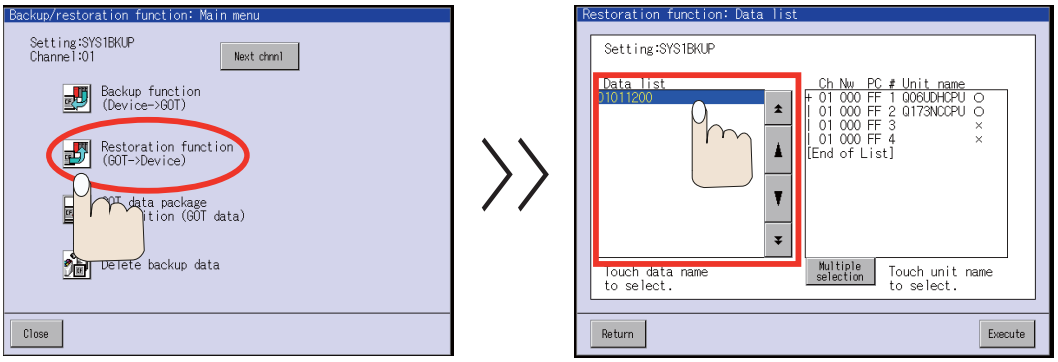
For GT15: [Debug & self check] - [Debug] - [Backup / Restoration]



For GT16: [Debug] - [Memory / Data control] - [Backup / Restoration function]

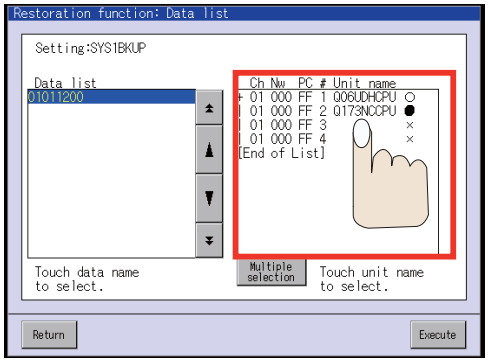


(6) When [Restoration function(Device->GOT)] is selected, backup files in the CF card are displayed in the “Data list” screen. Select the files for the restoration.

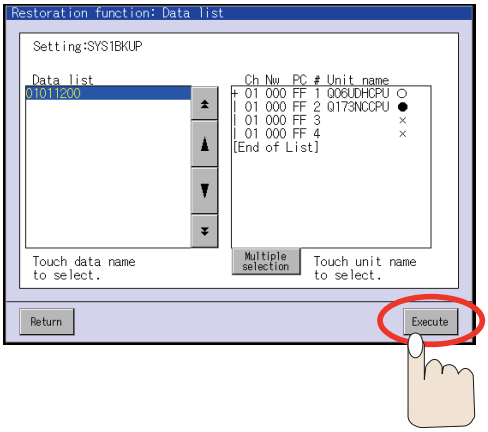


(Note) Data name displayed in the "Date list" screen contains backup date and the number of backup.
Example: Backup data on 2009/04/05 is displayed as follow.
09040500 (1st backup)
09040501 (2nd backup)
Refer to "Backup Files Structure".

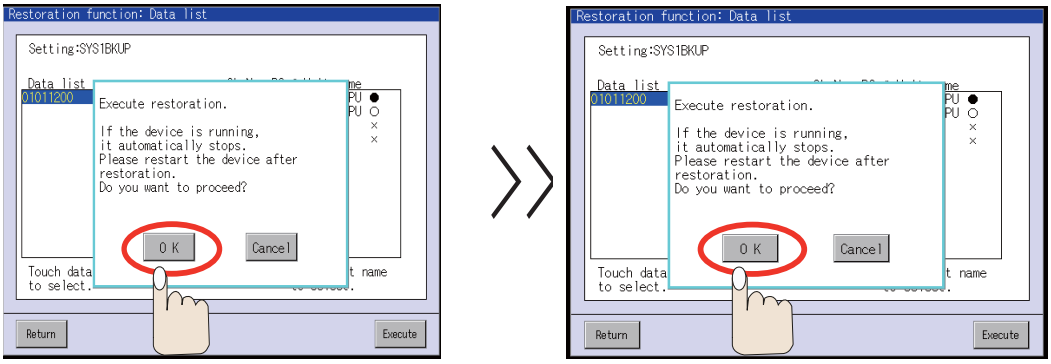
(7) CPU modules are also displayed. Select the CPU modules to be restored.
Selected modules are shown with "?".



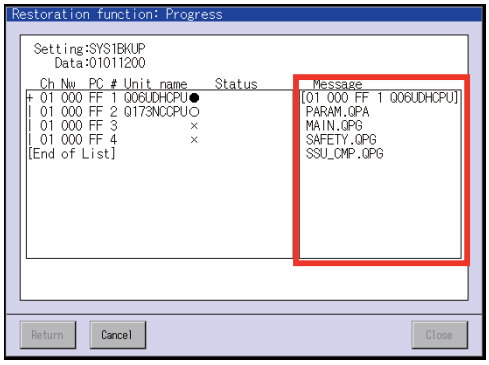
(8) Select "Execute".



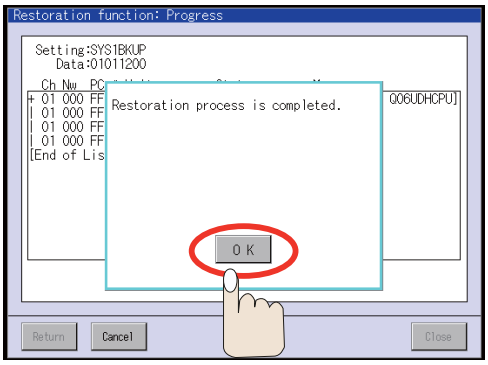
(9) The confirmation window appears. Click "OK" to start the restoration.



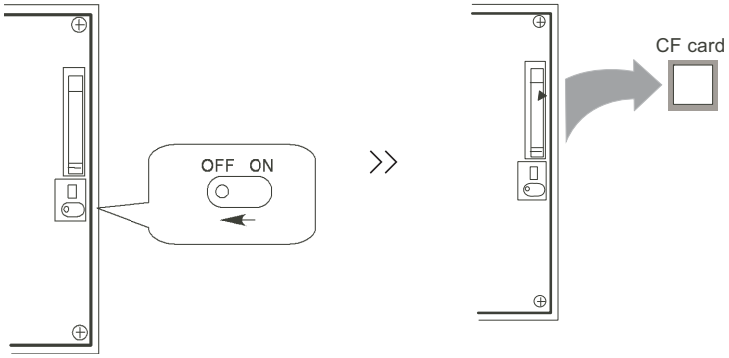
(10) The “Progress” screen appears and displays the restored files.



(11) The completion window appears after all the selected data have been restored. Select "OK".
When "OK" is selected, all the CPU modules are reset automatically.



(12) Set "OFF" the Compact Flash card access switch, and then take out the card.



Appendix 1

Explanation of Parameters

Appendix 1.1 Parameter Screens

The parameter input setting units are as follow.

Input unit "#1003 iunit":	Linear axis "#1017 rot"=0		Rotary axis "#1017 rot"=1
	Machine constant:mm "#1040 M_inch"=0	Machine constant:inch "#1040 M_inch"=1	
B:	0.001 mm	0.0001 inch	0.001°
C:	0.0001 mm	0.00001 inch	0.0001°

Appendix 1.1.1 User parameters

The following menus can be selected when the key [TOOL PARAM] is pressed.

Menu	Details	Reference Section
PROCESS	The PROCESS PARAM screen will open.	Process Parameters
SETUP	The screen to set the setup parameters will open.	Setup Parameters

Appendix 1.1.2 Setup Parameters

The following menus can be selected when SETUP is selected.

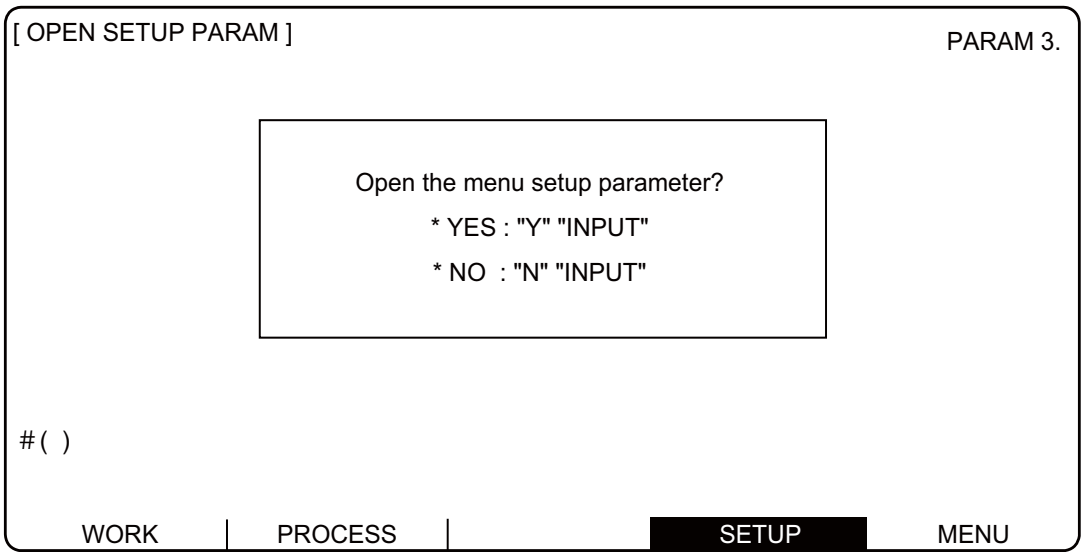
Menu	Details	Reference Section
BASE	The BASE SPEC. PARAM screen will open.	Base Specifications Parameters
AXIS SPEC	The AXIS SPEC PARAM screen will open.	Axis Specifications Parameters
SERVO	The SERVO PARAM screen will open.	Servo Parameters
SPINDLE	The SPINDLE BASE SPEC. PARAM screen will open.	Spindle Parameters
Multi-CPU	The MULTI-CPU PARAM screen will open.	Multi-CPU Parameter
NET Parameters	The FL-NET PARAM and DEVICE NET PARAM screen will open.	FL-net parameters Device Net parameters
MC-ERR	The MC-ERR. CMP. screen will open.	Machine Error Compensation
PLC	The PLC DATA screen will open.	PLC Parameters
MACRO	The MACRO FILE screen will open.	Macro List
PSW	The POSITION SWITCH screen will open.	Position Switch

Setup Parameters

Pressing the menu key SETUP displays the OPEN SETUP PARAM screen.

The system's basic parameters are normally hidden as setup parameters to prevent mistaken operations and to simplify the display.

The setup parameters can be displayed and set by making a declaration to open the setup parameters on this screen.



(1) Select the setup parameter.
Key-in Y in # ( ), and then press INPUT.
Pressing the MENU key displays the normally hidden setup parameter menu.
The required menu can be selected to display and set the setup parameters.

(2) Cancel the setup parameter selection.
Key-in N in # ( ), and then press INPUT.
The setup parameter menu will disappear.

(Note) The setup parameters are not displayed when the power is turned on.

Refer to "Base Specifications Parameters" and following for details on the setup parameters.
Be sure to turn off the power supply after selecting the setup parameter.

Appendix 1.2 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

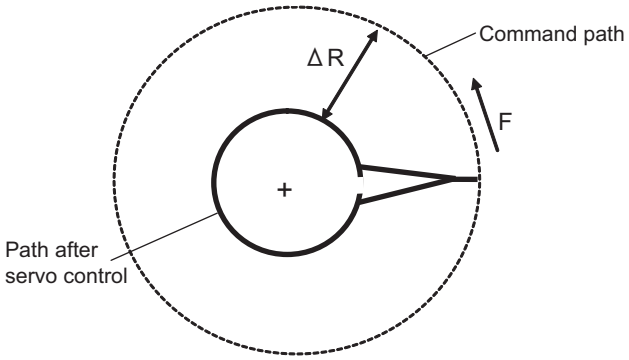
Set a compensation coefficient for reducing a control error in the reduction of a corner roundness and arc radius.
Indicates a maximum control error (mm) in parentheses.
The larger the set value is, the smaller the theoretical error will be. However, since the speed at the corner goes down, the cycle 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

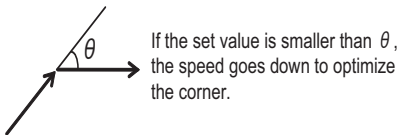
Displays the theoretical radius decrease error amount, ΔR(mm), from the automatic calculation by NC.



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")

【#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".

【#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.
(Note2) 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 0° 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)

Appendix 1.3 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 Abslnc” = “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

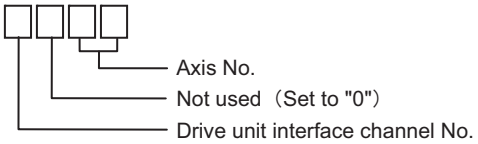
Select the command method of program travel amount.
When the travel amount is commanded with the diameter dimensions, the travel distance will be 5mm when the command is 10mm of travel distance.
The travel amount per pulse will also be halved during manual pulse feed.
If diameter is selected, tool length, 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
5 : List4(for special L) Ditto
6 : List5(for special L) Ditto
7 : List6(for special L) Ditto
8 : List7(for special 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

↓

"SETUP COMPLETE"

(Note) The machining program is cleared with the above operations. Back up necessary machining programs 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.
0: Metric system
1: Inch system

【#1043】 lang Select language displayed

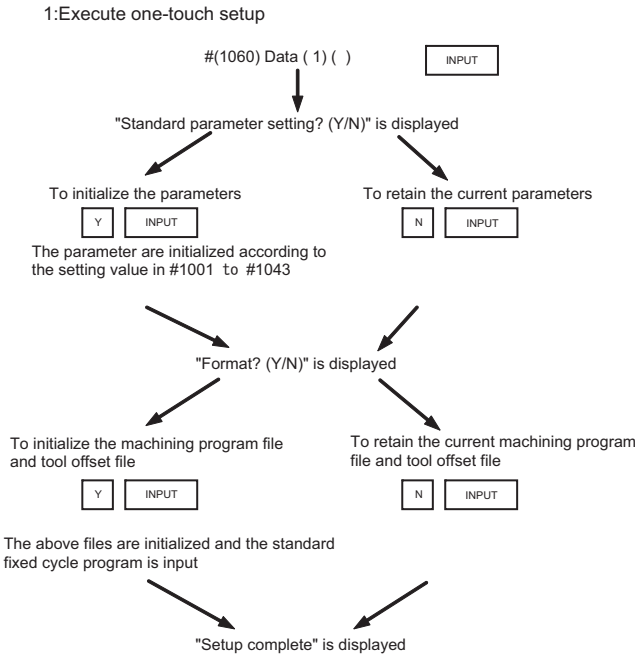
Select the display language.
0: English (Standard)
1: Japanese (Standard)
14: Spanish (Option)
21: Polish (Option)
22: Simplified Chinese (Option)

【#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

【#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】 Tl_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

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

【#1127】 DPRINT DPRINT alignment

Select the alignment for printing out with the DPRINT function.
0: No alignment, output s printed with left justification
1: Align the minimum digit and output

【#1128】 RstVCl Clear variables by resetting

Select how to handle the common variables when resetting.
0: Common variables won't change after resetting.
1: 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】 PwrVCl Clear variables by power-ON

Select how to handle the common variables when the power is turned ON.
0: The common variables are in the same state as before turning the power OFF.
1: 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

【#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】 l_abs Manual ABS parameter

Select how to handle the absolute position data during automatic handle interrupt.
0: Absolute position data will be renewed if manual ABS switch is ON. If it is OFF, data won't be renewed.
1: Follow the "intabs" state when "#1061 intabs" is enabled

【#1146】 Sclamp Spindle rotation speed clamp function

Select how to handle the spindle rotation speed clamp function with the 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】 l_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

【#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】 l_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 angle 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) "1" cannot be set for the 2nd part system and the following.

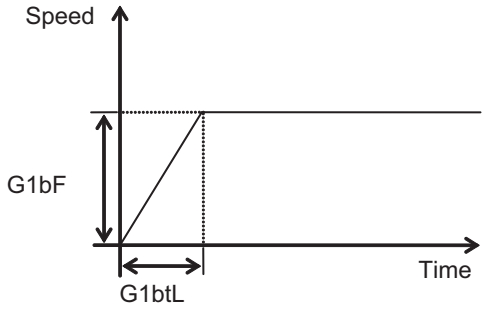
【#1206】 G1bF Maximum speed

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: (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: 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	*	*

F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
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)

【#1217】 aux01

Not used. Set to "0".

【#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

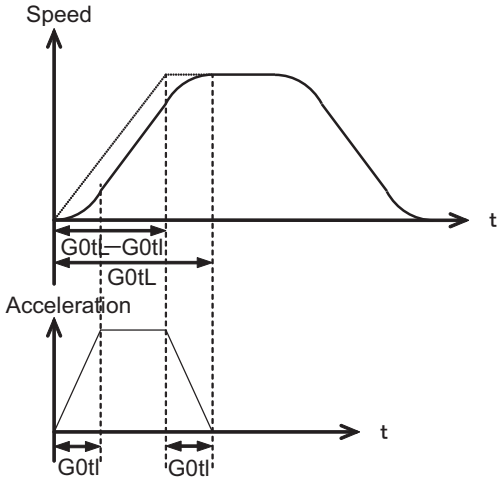
Reserved for system.

bit3

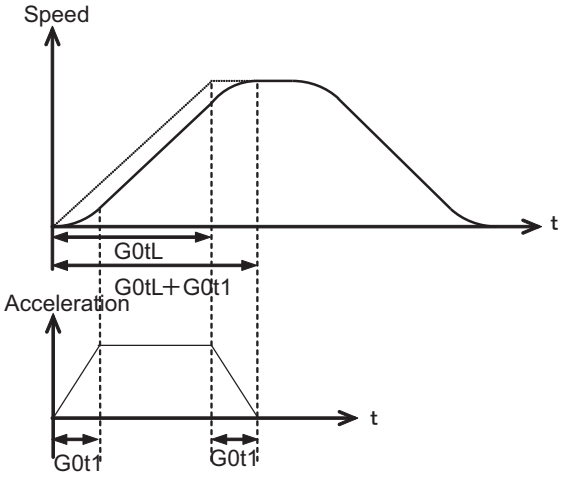
Reserved for system.

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

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

【#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)"

bit7: Shorten JOG stop time

Select whether to shorten the JOG stop time.
0: Not shorten the JOG stop time. (Same as conventional)
1: Shorten the JOG stop time.

【#1227】 aux11

bit0: Select PLC signal or spindle feedrate attained

Set up this option when disabling the cutting start interlock by spindle feedrate attained.
0: Cutting start interlock by PLC signal
1: Cutting start interlock by spindle feedrate attained

bit1: Select H or D code

Set up this option to validate the data that is set up on the tool life management screen when issuing the H99 or D99 command.
0: The H and D codes validate the data that is set up on the management setup screen.
1: Validates the data that is set up on the management setup screen when issuing the H99 or D99 command.

bit2: Measures against tool setter chattering

Select a condition where a relieving operation completes after measurement with tools.
0: Sensor signals have stopped for 500 ms or longer.
1: 100 μm or longer has passed after sensor signals stopped.

bit3: Absolute coordinate switching (nose R)

Select whether to display a nose position or coordinate value with the absolute coordinate counter.
0: Displays the nose position.
1: Displays the position specified by program command. Select a condition where a relieving operation completes after measurement with tools.

bit5: Spindle rotation speed clamp

Specify whether to clamp the rotation speed in constant surface speed mode when the spindle rotation clamp command is issued.
0: Clamps the rotation regardless of the constant surface speed mode.
1: Clamps the rotation only in constant surface speed mode.

bit7: Switch the range of tool life data to be input

Set up the range of tool life data to be input or compared.
0: Inputs or compares all of the data output.
1: Inputs or compares part of the data output

1) Tool life management I data to be input or compared tool number (D), lifetime (E), life count (F), and auxiliary data (B).
2) Tool life management II data to be input or compared Group number (G), method (M), life (E/F), tool number (D), and compensation number (H)

【#1228】 aux12

bit0: 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.

bit3: Nose R specification

Select the method to specify the nose R compensation.
0: Specify by shape number.
1: Specify by wear number.

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

【#1232】 set04

Not used. Set to "0".

【#1233】 set05

Not used. Set to "0".

【#1234】 set06

Not used. Set to "0".

【#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.

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

【#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)

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.

【#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.

【#1281(PR)】 ext17

bit5: High-speed synchronous tapping valid

Select whether to enable the high-speed synchronous tapping.
0: Disable
1: Enable

【#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".

【#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

【#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

【#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 remote I/O device to input the contactor's auxiliary b contact signal used for the contactor weld detection.
If "0" is set, weld detection will not be executed.

---Setting range---
0000 to 01FF (HEX)

【#1331(PR)】 MC_dp2 Contactor weld detection device 2

When safety observation is executed, set the remote I/O device to input the contactor's auxiliary b contact signal used for the contactor weld detection.
If "0" is set, weld detection will not be executed.

---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)

【#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】

Not used. Set to "0".

【#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 26 (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".

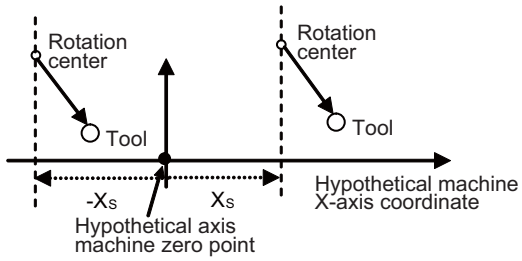
【#12015(PR)】 v_leng Hypothetical axis tool length

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

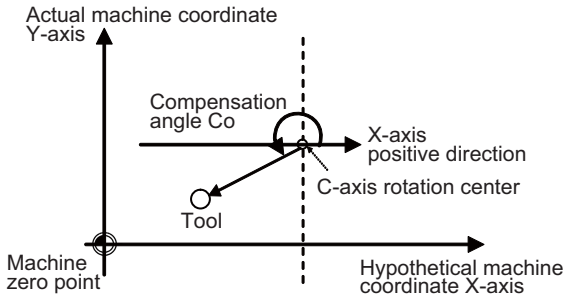
Set the distance Xs from the hypothetical axis machine zero point to the center of the rotary axis. If the rotation center is left side from the zero point as follows, set a negative value.



---Setting range---
-99999.999 to 99999.999 (mm)

【#12017(PR)】 ofsang Actual rotary axis compensation angle

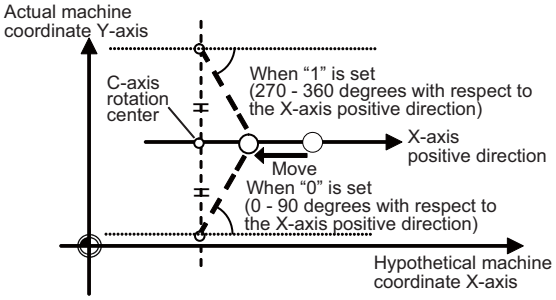
Set the angle Co of the vector from the rotation center to the tool when the C-axis (actual axis) is positioned at 0 degrees with respect to the positive direction of the hypothetical axis (X-axis) in the hypothetic plane.



---Setting range---
0 to 359.999(°)

【#12018】 ClAng1 Angle 1 in conversion

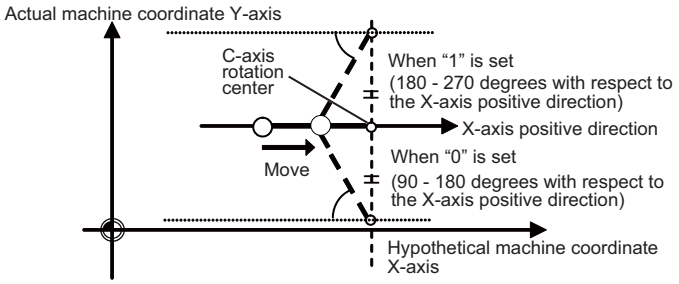
Set which solution is applied when the rotary axis angle is 0 degrees with respect to the X-axis positive direction and a command would give an equal travel distance in both directions along Y-axis.



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)

【#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

【#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: Sampling mode selection

Select the sampling mode.
0 : Cycle monitor mode
1 : NC alarm diagnosis mode

When NC power is turned ON, cycle monitor mode is selected.

【#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 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:
- #1329 Emgcnt Emergency stop contactor shut-off time
- #1330 MC_dp1 Contactor weld detection device 1
- #1331 MC_dp1 Contactor weld detection device 2
- #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
- #2118 SscDrSel Speed monitor Door selection
- #2140 Ssc Svof Filter 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
- #3071 SscDrSelSp Speed monitor Door selection
- #3072 Ssc Svof Filter Sp Speed monitor Error detection time during servo OFF
- #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
- #3140 S_DINSp Speed observation input door No.
- #3141 to #3144 sscfeedsp1 to sscfeedsp4 Safety observation speed 1 to 4
- #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

Appendix 1.4 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)

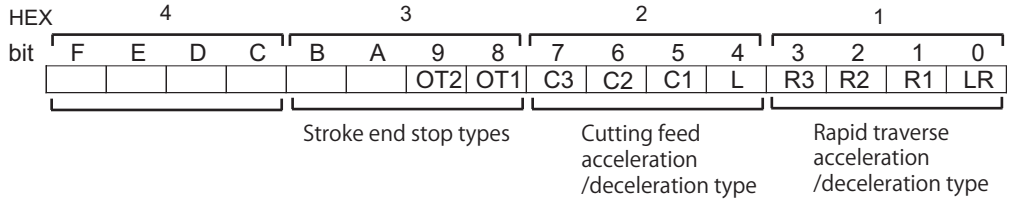
【#2002】 clamp Cutting feedrate for clamp function

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

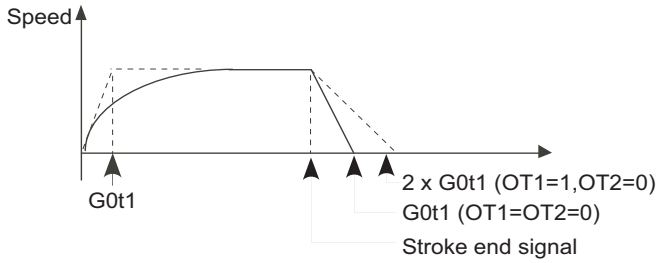
(Note) R1 > R3 when both R1 and R3 contain 1.

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



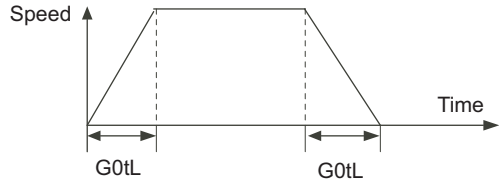
(Note) OT1(bit8) is valid under the following conditions (valid for dog type zero point return):
- Stop type: Linear deceleration
- Acceleration/Deceleration mode: Exponential acceleration and Linear deceleration

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".

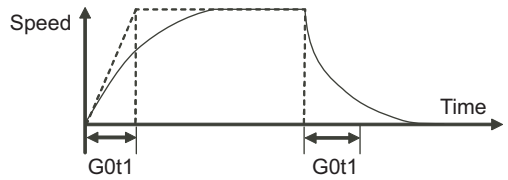


---Setting range---
1 to 4000 (ms)

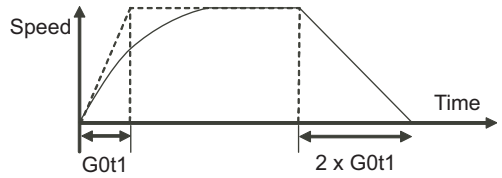
【#2005】 G0t1 G0 time constant(primary delay) / Second-step time constant for soft acceleration/deceleration

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.

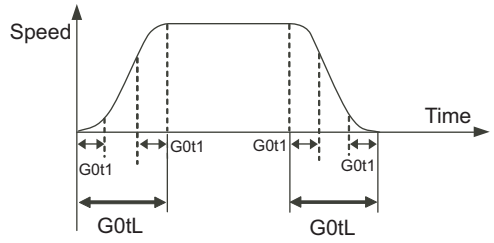
<Rapid traverse feed with primary delay>



<Rapid traverse feed with exponential acceleration and linear deceleration>



<Soft acceleration/deceleration>



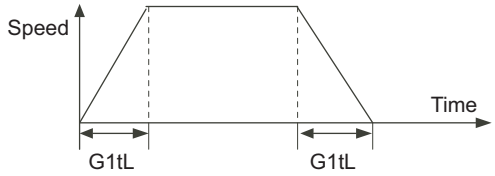
---Setting range---
1 to 5000 (ms)

【#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".

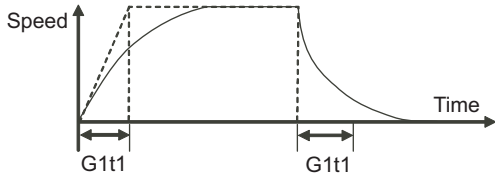


---Setting range---
1 to 4000 (ms)

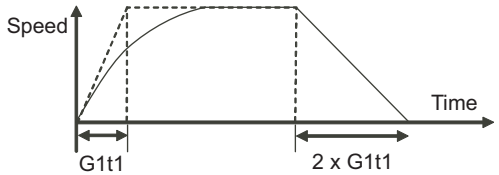
【#2008】 G1t1 G1 time constant (primary delay)/Second-step time constant for soft acceleration/deceleration

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.

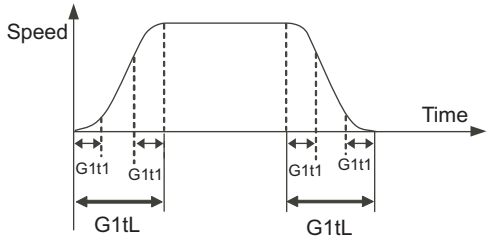
<Cutting feed with primary delay>



<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)

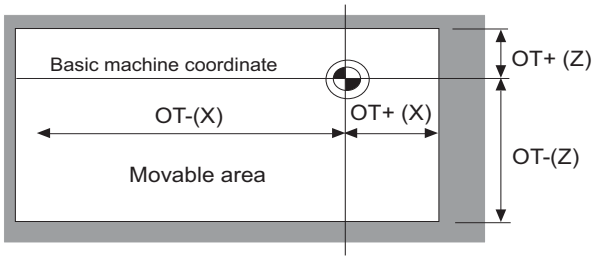
【#2012】 G1back G1 backlash

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 -

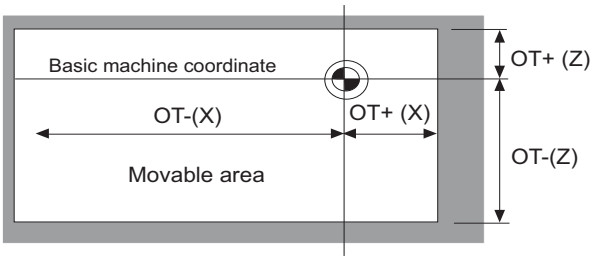
Set a soft limit area with reference to the zero point of the basic machine coordinate. Set the coordinate in the negative direction for the movable area of stored stroke limit 1. The coordinate in the positive direction is set in "#2014 OT+".
To narrow the available range in actual use, use the parameters "#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】 t1m1- 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】 t1m1+ 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)

【#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)

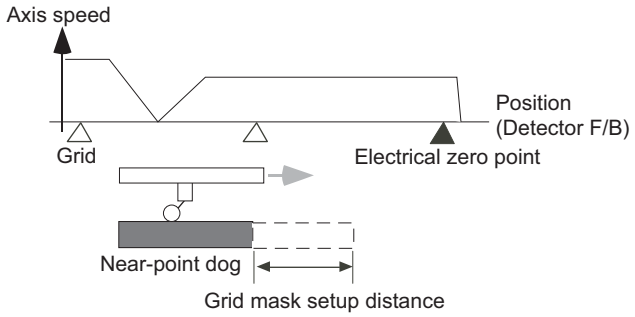
【#2027】 G28sft Reference position shift distance

Set the distance from the electrical zero-point detection position to the reference position.

---Setting range---
0 to 65535 (μm)

【#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.

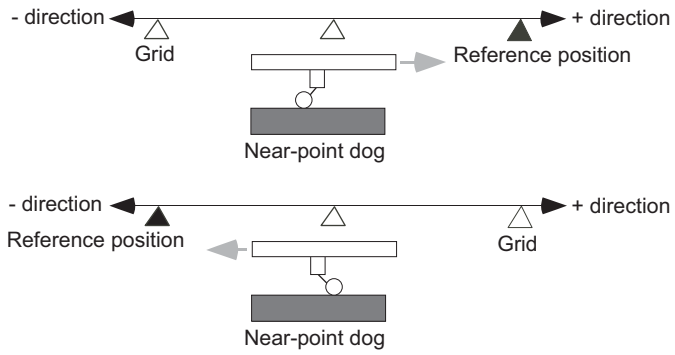
---Setting range---

-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

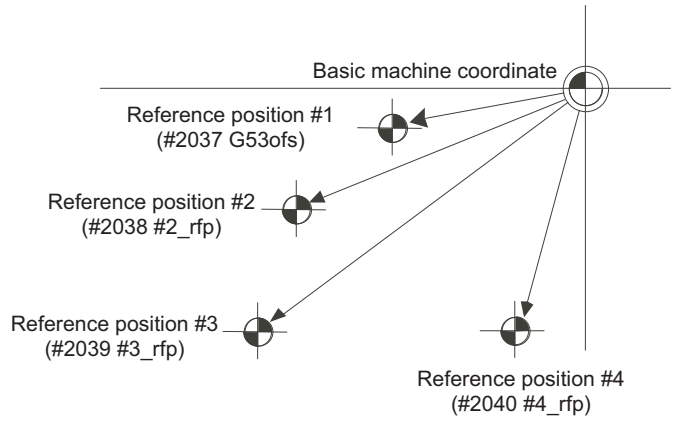
Select whether the reference position is provided for the axis.
0: Reference position is provided. (Normal controlled axis)
1: No reference position is provided.
When "1" is set, reference position return is not required before automatic operation starts.

【#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

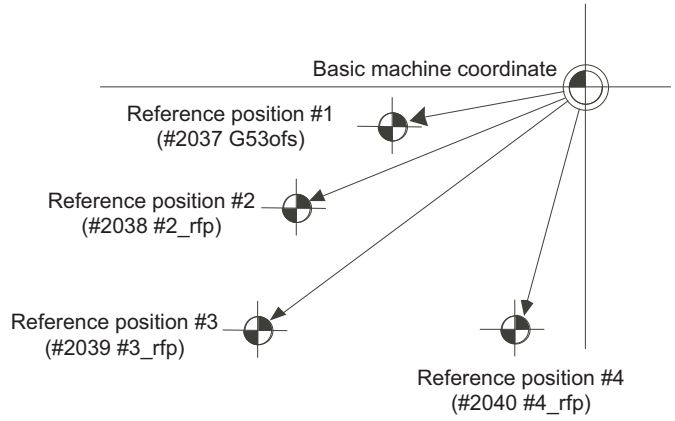
Set the position of the first reference position from the zero point of the basic machine coordinate.



---Setting range---
-99999.999 to 99999.999 (mm)

【#2038】 #2_rfp Reference position #2

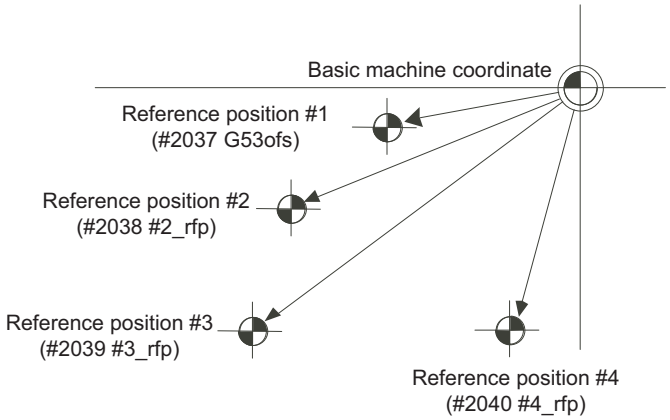
Set the position of the second reference position from the zero point of the basic machine coordinate.



---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.

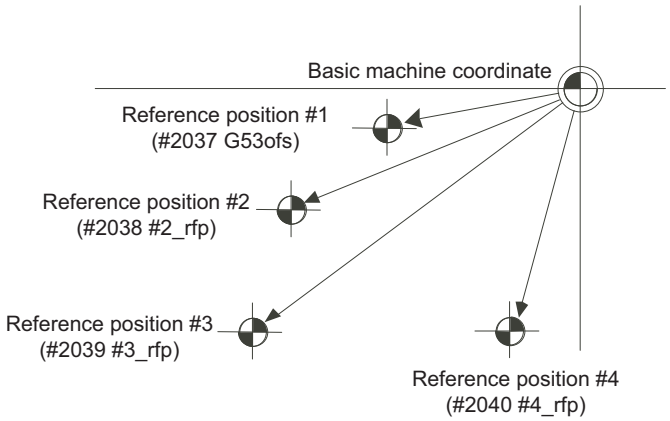


---Setting range---

-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.)
8: Automatic stopper method (automatically push against mechanical stopper)
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 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 Index table indexing axis

Select whether the axis is a normal axis or an index table indexing axis.
0: Normal axis
1: Index table indexing axis

(Note) This parameter is valid only for the NC axis. The parameter is invalid if set for the PLC axis.

【#2077】 G0inps G0 in-position width

Set the in-position width for G0.
Between SV024 and this parameter, the parameter with a larger value will be applied.
When "0" is set, this parameter will be invalid: only SV024 will be available.

---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)

【#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) 】 SscDrSel 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.

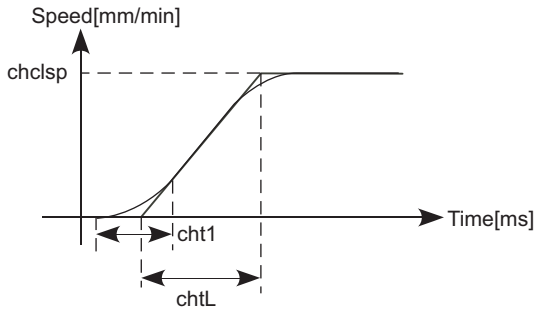
【#2140(PR)】 Ssc Svof Filter Speed monitor Error detection time during servo OFF

Set the error detection time of command speed monitoring and feedback speed monitoring during servo OFF.
An alarm will occur if the time, for which the speed has been exceeding the safe speed or safe rotation speed, exceeds the error detection time set in this parameter.
If "0" is set, it will be handled as 200 (ms).

---Setting range---
0 to 9999 (ms)

【#2141】 chtL Chopping first-step time constant for soft acceleration 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)

【#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

【#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

Appendix 1.5 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 servomotor'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 servomotor'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).

---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".

Related parameters: SV003, SV057

---Setting range---
0 to 999 (rad/s)

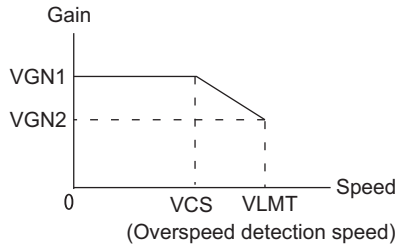
【#2205】 SV005 VGN1 Speed loop gain 1

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 9999

【#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 9999

【#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.
Forward run and reverse run (for linear motors): This is a limit value in forward and reverse directions.
When the standard setting value is "800", the maximum torque is determined by the specification of the motor.
Set this parameter as a proportion (%) to the stall current.

---Setting range---
0 - 999 (Stall current %)

【#2214】 SV014 ILMTsp Current limit value in special control

Set the current (torque) limit value in a special operation (absolute position initial setting, stopper control and etc.).
This is a limit value in forward and reverse directions.
Set to "800" when not using.
Set this parameter as a proportion (%) to the stall current.

---Setting range---
0 - 999 (Stall current %)
However, when SV084/bitB=1, the setting range is from 0 to 32767 (Stall current 0.01%).

【#2215】 SV015 FFC Acceleration rate feed forward gain

When a relative error in synchronous control is too large, set this parameter to the axis that is delaying.
The standard setting is "0". The standard setting in the SHG control is "100".
To adjust a relative error in acceleration/deceleration, increase the value by 50 - 100 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 (SSF1)/bit9, 8 (lmc) = 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, SV113/bit7

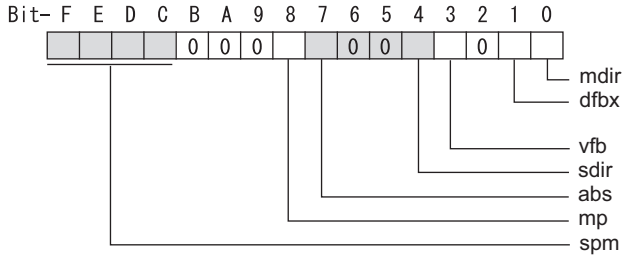
Type 3: When SV082(SSF5)/bit1= 1
Set the compensation torque equivalent of dynamic friction amount of the type 3 method compensation amount. The standard setting is double the dynamic friction torque.
Related parameters: SV041, SV082/bit2,1, SV085, SV086, SV113/bit7

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: 200V HF, HP motor (MDS-D/DH S/W version A6 and below)
1: 200V HF, HP motor 2
2: 400V HF-H, HP-H motor (MDS-D/DH S/W version A6 and below)
3: 400V HF-H, HP-H motor 2
6: 200V LM-F linear motor
7: 200V DD motor
8: 400V LM-F linear motor
9: 400V DD motor

bit B :

Not used. Set to "0".

bit A : drvup Combined drive unit:

- For MDS-DM Series
0: Normal setting (Combined drive unit: normal) 1:
1: Combined drive unit: one upgrade
In the following combination of the drive unit and servomotors, set to "bitA=1".
MDS-DM-V3-404040 --------- HF75, HF105, HF123, HF142
MDS-DM-SPV2/SPV3 --------- HF54, HF104, HF223, HF302

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 detector feedback

Set the machine side detector'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 end detector and machine end detector.
0: Stop 1: Start

Related parameters: SV051, SV052

bit 0 : mdir Machine side detector feedback (for Linear/DD motor)

Set the detector installation polarity in the linear servo and DD 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 DD 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 detector 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 DD motor
Set the same value as SV020.

For 1000 pulse unit resolution detector, 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 detector, 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
M700V, M70V, M70: 0 to 65536 (p)
C70: -32768 to 32767 (p)

【#2220(PR)】 SV020 RNG2 Main side detector resolution

Set the number of pulses per revolution of the motor side detector.
OSA18 (-A48) (260,000 p/rev) ---------- SV020 = 260
OSA105 (-A51) (1,000,000 p/rev) ------- SV020 = 1000
OSA166 (-A74) (16,000,000 p/rev) ----- SV020 = 16000

For linear motor
Set the number of pulses of the detector per magnetic pole pitch with SV118.

For DD motor
Set the number of pulses per revolution of the motor side detector.

For 1000 pulse unit resolution detector, 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 detector, 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: 0 to 65536 (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.
<Standard setting value>

OD1=OD2= (Rapid traverse rate [mm/min]) / (60×PGN1) / 2 [mm]

When set to "0", the excessive error alarm detection will be ignored.

Related parameters: SV026

---Setting range---
0 to 32767 (mm)
However, when SV084/bitC=1, the setting range is from 0 to 32767 (μ m).
(Only for MDS-D/DH and MDS-DM)

【#2224】 SV024 INP In-position detection width

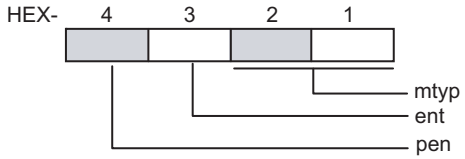
Set the in-position detection width.
Set the positioning accuracy required for the machine.
The lower the setting is, the higher the positioning accuracy will be. However the cycle time (settling time) becomes longer.
The standard setting value is "50".

---Setting range---

0 to 32767 (μ m)

【#2225(PR)】 SV025 MTYP Motor/Detector type

Set the position detector type, speed detector type and motor type.
The setting value is a four-digit hex (HEX).



bit F-C : pen(HEX-4) Position detector

Semi-closed loop control by general motor
pen=2

Full-closed loop control by general motor
- Ball screw end detector (OSAxxx-ET2)
  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 DD motor
pen=2

bit B-8 : ent(HEX-3) Speed detector

For general motor ent=2
For linear motor ent=A
For DD 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, HF123 : 24h
HF105 : 02h, HP104 : 12h, HF142 : 25h
HF54 : 03h, HP154 : 13h, HF223 : 26h
HF104 : 04h, HP204 : 14h, HF302 : 27h
HF154 : 05h, HP354 : 15h, HF303 : 28h
HF224 : 06h, HP454 : 16h, HF223 : 2Dh (when MDS-DM-V3 M/S axis is connected)
HF204 : 07h, HP704 : 17h, HF302 : 2Eh (when MDS-DM-V3 M/S axis is connected)
HF354 : 08h, HP903 : 18h, HF-KP13 : E9h (MDS-D-SVJ3 only)
HF453 : 09h, HP1103: 19h, HF-KP23 : EAh
HF703 : 0Ah, HF-KP43 : EBh
HF903 : 0Bh, HP224 : 1Bh, HF-KP73 : ECh
HF154 : 0Fh (when MDS-DM-V3 is connected)

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 DDM, follow the settings stated in respective materials.

【#2226】 SV026 OD2 Excessive error detection width during servo OFF

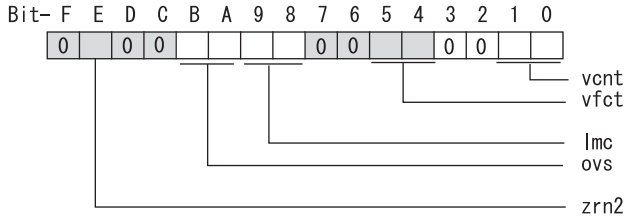
Set the excessive error detection width during servo OFF.
<Standard setting value>
OD1=OD2= (Rapid traverse rate [mm/min]) / (60×PGN1) / 2 [mm]
When set to "0", the excessive error alarm detection will be ignored.

Related parameters: SV023

---Setting range---
0 to 32767 (mm)
However, when SV084/bitC=1, the setting range is from 0 to 32767 (μ m).
(Only for MDS-D/DH and MDS-DM)

【#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 type selection

Set this if overshooting occurs during positioning.
00: Compensation stop 01: Setting prohibited 10: Setting prohibited 11: Type 3
(Set the compensation amount in SV031 and SV042.)

Related parameters: SV031, SV042, SV034/bitF-C

bit 9-8 : lmc Lost motion compensation type selection

Type 2 has an obsolete type compatible control.
00: Compensation stop 01: Setting prohibited 10: Type 2 11: Setting prohibited
(Set the compensation amount in SV016 and SV041.))
(Note) When "SV082/bit1=1", the lost motion compensation type 3 will be selected.

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.
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".
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/DD motor)

Set this parameter to adjust the motor magnetic pole position and detector's installation phase when using linear motors or DD 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(SSF1)/bitB,A(ovs) = 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).

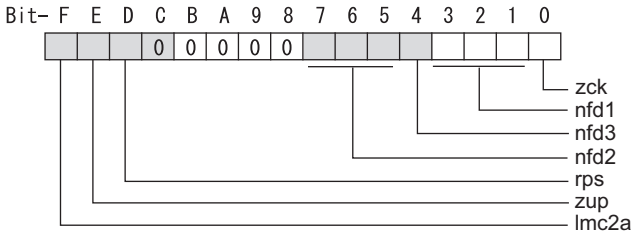
Related parameters: SV007, SV033/bitE, SV059

---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 Speed setting increment

Change the setting units of the specified speed signal output speed (SV073) and safety observation safety 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: - ∞ bit7,6,5=001: -18.1[dB]
bit7,6,5=010: -12.0[dB] bit7,6,5=011: -8.5[dB]
bit7,6,5=100: -6.0[dB] bit7,6,5=101: -4.1[dB]
bit7,6,5=110: -2.5[dB] bit7,6,5=111: -1.2[dB]

Set the adaptive frequency of Notch filter 2 in "#2246 SV046 FHz2".

bit 4 : nfd3 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: - ∞ bit3,2,1=001: -18.1[dB]
bit3,2,1=010: -12.0[dB] bit3,2,1=011: -8.5[dB]
bit3,2,1=100: -6.0[dB] bit3,2,1=101: -4.1[dB]
bit3,2,1=110: -2.5[dB] bit3,2,1=111: -1.2[dB]

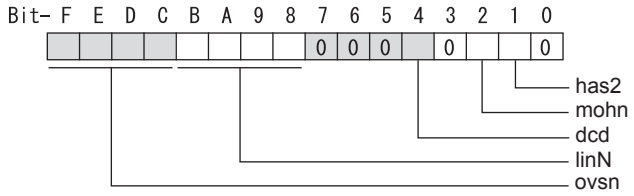
Set the adaptive frequency of Notch filter 1 in "#2238 SV038 FHz1".

bit 0 : zck Feedback error alarm 42 detection

This ignores the false detection of alarms when using multipoint Z phase scale including distance-coded reference scale.
0: Normal setting 1: Disable

【#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 μm.
In the feed forward control, set the non-sensitive band of the model position droop and ignore the overshooting of the model.
0 : 0 μm, 1: 2 μm, 2: 4 μm,---, E : 28 μm, F: 30 μm

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/DD 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/DD 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

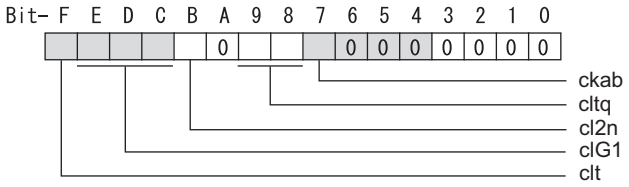
Related parameters: SV084/bitF

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.
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

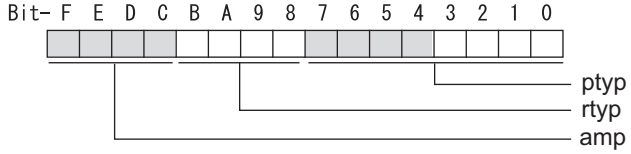
bit 6-0 :

Not used. Set to "0".

【#2236(PR)】 SV036 PTYP Power supply type/ Regenerative resistor type

MDS-D/DH Series: Power supply type

When connecting a power supply unit, set a code for each power supply unit.



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

When the emergency stop input signal of the power supply unit is "disabled"
Power supply unit is not connected : 0000h
MDS-D-CV-37 / MDS-DH-CV-37 : 0004h
MDS-D-CV-75 / MDS-DH-CV-75 : 0008h
MDS-D-CV-110 / MDS-DH-CV-110 : 0011h
MDS-D-CV-185 / MDS-DH-CV-185 : 0019h
MDS-D-CV-300 / MDS-DH-CV-300 : 0030h
MDS-D-CV-370 / MDS-DH-CV-370 : 0037h
MDS-D-CV-450 / MDS-DH-CV-450 : 0045h
MDS-D-CV-550 : 0055h
MDS-DH-CV-750 : 0075h

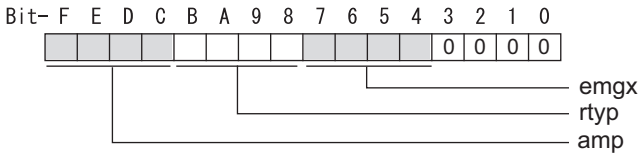
When the emergency stop input signal of the power supply unit is "enabled"
(Note) Set the power supply rotary switch to "4".
Power supply unit is not connected : 0000h
MDS-D-CV-37 / MDS-DH-CV-37 : 0044h
MDS-D-CV-75 / MDS-DH-CV-75 : 0048h
MDS-D-CV-110 / MDS-DH-CV-110 : 0051h
MDS-D-CV-185 / MDS-DH-CV-185 : 0059h
MDS-D-CV-300 / MDS-DH-CV-300 : 0070h
MDS-D-CV-370 / MDS-DH-CV-370 : 0077h
MDS-D-CV-450 / MDS-DH-CV-450 : 0085h
MDS-D-CV-550 : 0095h
MDS-DH-CV-750 : 00B5h

MDS-DM-SPV Series

Not used. Power supply type is set by spindle side.

MDS-D-SVJ3 Series: Regenerative resistor type

Set the regenerative resistor type.



bit F-8 : amp(bit F-C) / rtyp(bit B-8)

For "amp = 1"
"rtyp" setting value
0: Resistor built-in drive unit
1: Setting prohibited
2: MR-RB032
3: MR-RB12 or GZG200W39OHMK
4: MR-RB32 or GZG200W120OHMK 3 units connected in parallel
5: MR-RB30 or GZG200W39OHMK 3 units connected in parallel
6: MR-RB50 or GZG300W39OHMK 3 units connected in parallel
7: MR-RB31 or GZG200W20OHMK 3 units connected in parallel
8: MR-RB51 or GZG300W20OHMK 3 units connected in parallel
9 - F: Setting prohibited

For "amp = 2"
"rtyp" setting value
0 - 3: Setting prohibited
4: FCUA-RB22
5: FCUA-RB37
6: FCUA-RB55
7: FCUA-RB75/2 1 unit
8: R-UNIT1
9: R-UNIT2
A: R-UNIT3
B: R-UNIT4
C: R-UNIT5
D: FCUA-RB75/2 2 units connected in parallel
E: FCUA-RB55 2 units connected in parallel
F: Setting prohibited

bit 7-4 : emgx External emergency stop function

Set the external emergency stop function. (Do not set a value other than specified.)
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".

Related parameters: SV016

---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".

Related parameters: SV031

---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/DDM 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/DDM 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).
(Only for MDS-D/DH and MDS-DM)

【#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 detector and the linear scale (machine side detector) exceeds the value set by this parameter, it will be judged as overrun and "Alarm 43" will be detected.
When "-1" is set, the alarm detection will not be performed.
When "0" is set, overrun will be detected with a 2mm width.

For linear servo/DDM 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).
(Only for MDS-D/DH and MDS-DM)

【#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). Normally, set the same value as the rapid traverse acceleration/deceleration time constant.
When the axis is used in the synchronous control, set the same value with minus sign to both axes. If one of the axes switches to dynamic brake by an alarm during deceleration control, another axis will also switch.

Related parameters: SV048, SV055

---Setting range---
-20000 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".

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 DD motor.
Set the initial excitation level in DC excitation control.
Set 5% 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 DD motor.
Set the final excitation level in DC excitation control.
Set 5% 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 DD motor.
Set the initial excitation time in DC excitation control.
Set 500ms 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 (μ m) = 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.

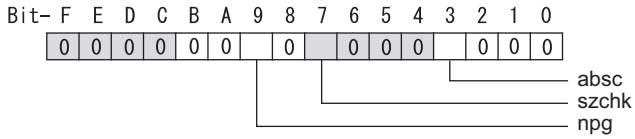
---Setting range---
-32768 to 32767 (r/min)
However, when SV033/bitD=1, the setting range is from -32768 to 32767 (100mm/min).

【#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)

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

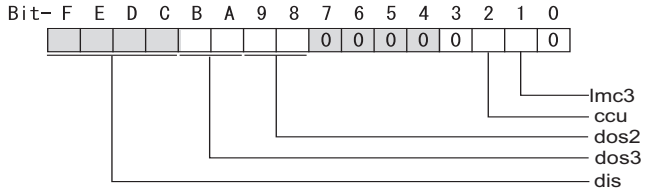
0: Disable 1: Enable

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: Safety observation function door state signal
2: Battery box voltage drop warning

When "2" is set, make sure to set it for all the axes of the servo drive unit which is connected to the battery box (MDS-BTBOX-36).

bit B-A : dos3 Digital signal output 3 selection

00: Disable 01: Contactor control signal output (For MDS-D-SVJ3)

bit 9-8 : dos2 Digital signal output 2 selection

00: Disable 01: Specified speed output

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

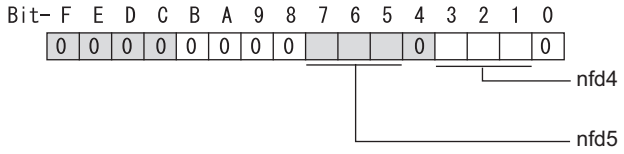
Related parameters: SV016, SV041, SV085, SV086

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.
bit7,6,5=000: - ∞ bit7,6,5=001: -18.1[dB]
bit7,6,5=010: -12.0[dB] bit7,6,5=011: -8.5[dB]
bit7,6,5=100: -6.0[dB] bit7,6,5=101: -4.1[dB]
bit7,6,5=110: -2.5[dB] bit7,6,5=111: -1.2[dB]

Set the adaptive frequency of Notch filter 5 in "#2288 SV088 FHz5".

bit 4 :

Not used. Set to "0".

bit 3-1 : nfd4 Depth of Notch filter 4

Set the depth of Notch filter 4.
bit3,2,1=000: - ∞ bit3,2,1=001: -18.1[dB]
bit3,2,1=010: -12.0[dB] bit3,2,1=011: -8.5[dB]
bit3,2,1=100: -6.0[dB] bit3,2,1=101: -4.1[dB]
bit3,2,1=110: -2.5[dB] bit3,2,1=111: -1.2[dB]

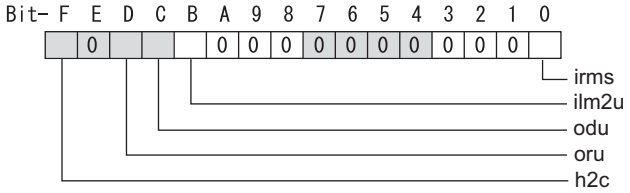
Set the adaptive frequency of Notch filter 4 in "#2287 SV087 FHz4".

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 (for MDS-D/DH and MDS-DM)

0: mm (normal setting) 1: μm

bit C : odu Excessive error detection width unit (for MDS-D/DH and MDS-DM)

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 using 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 using 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)

【#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.

MDS-DM-V3, MDS-DM-SPV series
Not used. Set to "0".

---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 (10r/min)
Hundreds digit, Tens digit, Ones digit ---------- Motor speed error detection level (10r/min)

【#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

Not used. Set to "0".

【#2302】 SV102

Not used. Set to "0".

【#2303】 SV103

Not used. Set to "0".

【#2304】 SV104

Not used. Set to "0".

【#2305】 SV105

Not used. Set to "0".

【#2306】 SV106

Not used. Set to "0".

【#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

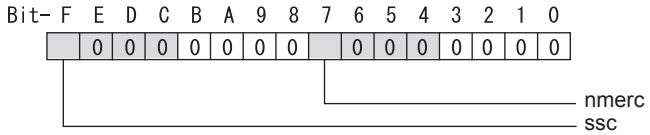
Not used. Set to "0".

【#2312】 SV112

Not used. Set to "0".

【#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 Safety observation function

0: Stop 1: Start

bit E-8 :

Not used. Set to "0".

bit 7 : nmerc Machine error compensation amount

When disabled, the machine error compensation amount including backlash and pitch error to be compensated by an NC will be ignored by the servo control.
Use this to adjust the lost motion compensation by the electric end roundness measurement.

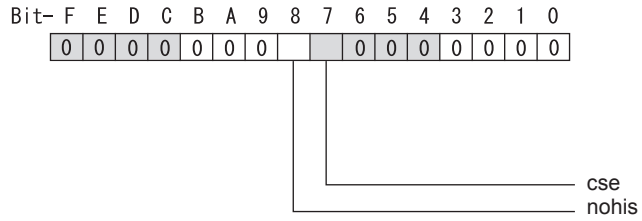
0: Normal setting 1: Disable

bit 6-0 :

Not used. Set to "0".

【#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

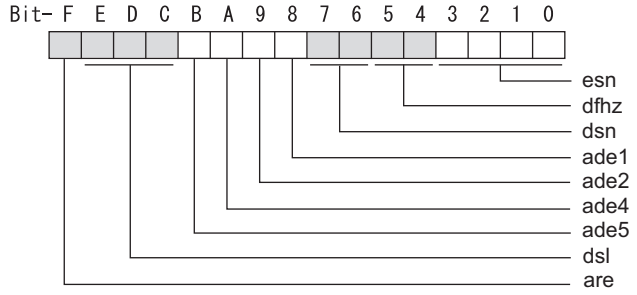
0: Normal setting 1: Enable

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.

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.

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".

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 detector resolution

For high-accuracy binary resolution detector, 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 detector resolution

When using high-accuracy binary resolution detector, 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.

For MDS-DM Series / linear servo system
Not used. Set to "0".

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.

For MDS-DM Series / linear servo system
Not used. Set to "0".

Related parameters: SV081/bit7,3, SV130, SV134 to SV137

---Setting range---
0 to 32767 (μm)

【#2332】 SV132

Not used. Set to "0".

【#2333】 SV133

Not used. Set to "0".

【#2334】 SV134 RRn0 Distance-coded reference check / revolution counter

Set this parameter to operate distance-coded reference check when using distance-coded reference scale.
During the distance-coded reference check initial setup (SV137 : RAER=-1), set the following items on the NC drive monitor screen after the distance-coded reference check initial setup warning A3 turns OFF.

SV134=Rn, SV135=Pn, SV136=MPOS

When reference point is set, the warning A3 turns OFF.
To enable the distance-coded reference check function, SV081/bit3=1setting and a battery option are needed.

Related parameters: SV081/bit3,7, SV130, SV131, SV134 to SV137

---Setting range---
-32768 to 32767

【#2335】 SV135 RPn0H Distance-coded reference check /position within one rotation High

Set this parameter to operate distance-coded reference check when using distance-coded reference scale.
During the distance-coded reference check initial setup (SV137 : RAER=-1), set the following items on the NC drive monitor screen after the distance-coded reference check initial setup warning A3 turns OFF.

SV134=Rn, SV135=Pn, SV136=MPOS

When reference point is set, the warning A3 turns OFF.
To enable the distance-coded reference check function, SV081/bit3=1setting and a battery option are needed.

Related parameters: SV081/bit3,7, SV130, SV131, SV134 to SV137

---Setting range---
-32768 to 32767

【#2336】 SV136 RPn0L Distance-coded reference check / position within one rotation Low

Set this parameter to operate distance-coded reference check when using distance-coded reference scale.
During the distance-coded reference check initial setup (SV137 : RAER=-1), set the following items on the NC drive monitor screen after the distance-coded reference check initial setup warning A3 turns OFF.

SV134=Rn, SV135=Pn, SV136=MPOS

When reference point is set, the warning A3 turns OFF.
To enable the distance-coded reference check function, SV081/bit3=1setting and a battery option are needed.

Related parameters: SV081/bit3,7, SV130, SV131, SV134 to SV137

---Setting range---
-32768 to 32767

【#2337】 SV137 RAER Distance-coded reference check allowable width

For the distance-coded reference check function when using distance-coded reference scale, set the allowable gap from the reference point position data calculated by the main side detector. 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=32768, 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 detector feedback exceeds this setting in the rectangular wave signal output linear scale.
When "0" is set, the detection will be performed with a 15 μ m width.
For MDS-D-SVJ3, this parameter setting is invalid and the detection width is fixed to 15 μ m.

---Setting range---
0 to 32767 (μ m)

【#2399-2437】 SV199 - SV237

Not used. Set to "0".

【#2438】 SV238 SSCFEED Safety observation Safety speed

Set the machine's safety speed for the safety observation 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 Safety observation Safety motor speed

Set the motor's safety speed for the safety observation function.
Set a value to hold the following relationship.

SV239=(SV238/SV018) x (SV002/SV001)
Only when the product is 0, set to "1".

When not using, set to "0".

Related parameters: SV033/bitD, SV113/bitF, SV239

---Setting range---
0 to 32767 (r/min)

【#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.
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".

Appendix 1.6 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 speed for maximum motor speed with gear 00.
(Set the spindle speed for the S analog output 10V.)

---Setting range---
0 to 99999 (r/min)

【#3002】 slimt 2 Limit rotation speed (Gear: 01)

Set the spindle speed for maximum motor speed with gear 01.
(Set the spindle speed for the S analog output 10V.)

---Setting range---
0 to 99999 (r/min)

【#3003】 slimt 3 Limit rotation speed (Gear: 10)

Set the spindle speed for maximum motor speed with gear 10.
(Set the spindle speed for the S analog output 10V.)

---Setting range---
0 to 99999 (r/min)

【#3004】 slimt 4 Limit rotation speed (Gear: 11)

Set the spindle speed for maximum motor speed with gear 11.
(Set the spindle speed for the S analog output 10V.)

---Setting range---
0 to 99999 (r/min)

【#3005】 smax 1 Maximum rotation speed (Gear: 00)

Set the maximum spindle speed with gear 00.
Set this as slimt >= smax.
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 speed with gear 01.
Set this as slimt >= smax.
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 speed with gear 10.
Set this as slimt >= smax.
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 speed with gear 11.
Set this as slimt >= smax.
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 Tap rotation speed (Gear: 00)

Set the maximum spindle speed during tapping cycle with gear 00.

---Setting range---
0 to 99999 (r/min)

【#3014】 stap 2 Tap rotation speed (Gear: 01)

Set the maximum spindle speed during tapping cycle with gear 01.

---Setting range---
0 to 99999 (r/min)

【#3015】 stap 3 Tap rotation speed (Gear: 10)

Set the maximum spindle speed during tapping cycle with gear 10.

---Setting range---
0 to 99999 (r/min)

【#3016】 stap 4 Tap rotation speed (Gear: 11)

Set the maximum spindle speed during tapping cycle with gear 11.

---Setting range---
0 to 99999 (r/min)

【#3017】 stapt 1 Tap time constant (Gear: 00)

Set the time constant for constant inclination synchronous tapping cycle with gear 00 (linear acceleration/deceleration pattern).

---Setting range---
1 to 5000 (ms)

【#3018】 stapt 2 Tap time constant (Gear: 01)

Set the time constant for constant inclination synchronous tapping cycle with gear 01 (linear acceleration/deceleration pattern).

---Setting range---
1 to 5000 (ms)

【#3019】 stapt 3 Tap time constant (Gear: 10)

Set the time constant for constant inclination synchronous tapping cycle with gear 10 (linear acceleration/deceleration pattern).

---Setting range---
1 to 5000 (ms)

【#3020】 stapt 4 Tap time constant (Gear: 11)

Set the time constant for constant inclination synchronous tapping cycle with gear 11 (linear acceleration/deceleration pattern).

---Setting range---
1 to 5000 (ms)

【#3021】 sori Orientation rotation speed

Set the spindle orientation speed.
Set the speed for when the spindle rotates at the constant speed.

---Setting range---
0 to 32767 (r/min)

【#3022(PR)】 sgear Encoder gear ratio

Set the gear ratio of the spindle to the detector.
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

---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 interface with a spindle drive unit.
0: No connection with a spindle
1: Dedicated network, dedicated optical communication
2 - 5: S-analog

(Note) Spindles connected through the dedicated network/ dedicated optical communication network must be set first.
The dedicated network/ dedicated optical communication network cannot be set for the spindles after the ones with analog connection.

<Example> [S1] [S2] [S3] [S4]
- Case 1 : 1 2 2 2 ... Connection OK
- Case 2 : 1 1 1 2 ... Connection OK
- Case 3 : 2 2 1 2 ... Connection NG

---Setting range---
0 to 5

【#3025(PR)】 enc-on Spindle encoder

Set the connection condition of a spindle's detector.
Setting 0 ---> Not connected
Setting 1 ---> Connected (Spindle detector connection check function is enabled.)
Setting 2 ---> Serially connected

---Setting range---
0 to 2

【#3026】 cs_ori Selection of winding in orientation mode

0: Perform orientation using the coil selected when the orientation command is issued.
1: Use the coil L whenever the orientation command is issued.

【#3027】 cs_syn Selection of winding in spindle synchronous mode

0: Select the coil H or L based on the actual spindle motor speed (calculated from commanded speed) when spindle synchronization starts. (Coil switch is not performed during spindle synchronous tapping control. This control is carried out using the coil selected at start.)
If the actual spindle motor speed is less than the setting of SP020, the coil L is selected. But if the actual speed exceeds the setting of SP020, the coil H is selected.
1: Use the coil H whenever the spindle synchronization command is issued.

【#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 Asynchronous tap gear selection

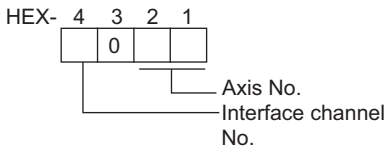
Select whether to use the tapping speed or maximum speed for the gear that is selected when an asynchronous tapping command is issued.
0: Tapping speed
1: Maximum speed
This parameter is enabled only when the M-function synchronous tapping cycle enable parameter "#1272 ext08/bit1" is ON.

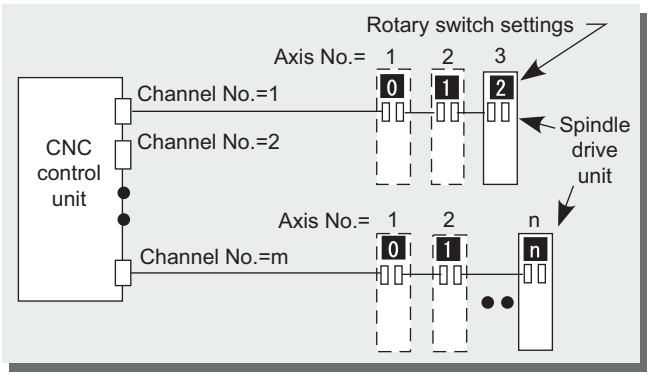
【#3030】

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-DM-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).

【#3032】

Not used. Set to "0".

【#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 tap switching spindle speed 2 (Gear: 00)

Set the spindle speed at which the 2nd step acceleration/deceleration time constant is to be switched with gear 00.

---Setting range---
0 to 99999 (r/min)

【#3038】 taps22 Synchronous tap switching spindle speed 2 (Gear: 01)

Set the spindle speed at which the 2nd step acceleration/deceleration time constant is to be switched with gear 01.

---Setting range---
0 to 99999 (r/min)

【#3039】 taps23 Synchronous tap switching spindle speed 2 (Gear: 10)

Set the spindle speed at which the 2nd step acceleration/deceleration time constant is to be switched with gear 10.

---Setting range---
0 to 99999 (r/min)

【#3040】 taps24 Synchronous tap switching spindle speed 2 (Gear: 11)

Set the spindle speed at which the 2nd step acceleration/deceleration time constant is to be switched with gear 11.

---Setting range---
0 to 99999 (r/min)

【#3041】 tapt21 Synchronous tap switching time constant 2 (Gear: 00)

Set the time constant to reach synchronous tapping switching spindle speed 2 (taps21- 24) with gear 00.

---Setting range---
1 to 5000 (ms)

【#3042】 tapt22 Synchronous tap switching time constant 2 (Gear: 01)

Set the time constant to reach synchronous tapping switching spindle rotation speed 2 (taps21 - 24) with gear 01.

---Setting range---
1 to 5000 (ms)

【#3043】 tapt23 Synchronous tap switching time constant 2 (Gear: 10)

Set the time constant to reach synchronous tapping switching spindle rotation speed 2 (taps21 - 24) with gear 10.

---Setting range---
1 to 5000 (ms)

【#3044】 tapt24 Synchronous tap switching time constant 2 (Gear: 11)

Set the time constant to reach synchronous tapping switching spindle rotation speed 2 (taps21 - 24) with gear 11.

---Setting range---
1 to 5000 (ms)

【#3045】 tapt31 Synchronous tap switching time constant 3 (Gear: 00)

Set the time constant to reach the maximum speed (smax1 - 4) with gear 00.

---Setting range---
1 to 5000 (ms)

【#3046】 tapt32 Synchronous tap switching time constant 3 (Gear: 01)

Set the time constant to reach the maximum speed (smax1 - 4) with gear 01.

---Setting range---
1 to 5000 (ms)

【#3047】 tapt33 Synchronous tap switching time constant 3 (Gear: 10)

Set the time constant to reach the maximum speed (smax1 - 4) with gear 10.

---Setting range---
1 to 5000 (ms)

【#3048】 tapt34 Synchronous tap switching time constant 3 (Gear: 11)

Set the time constant to reach the maximum speed (smax1 - 4) with gear 11.

---Setting range---
1 to 5000 (ms)

【#3049】 spt Spindle synchronization acceleration/deceleration time constant

Set the acceleration/deceleration time constant for when the commanded spindle synchronization speed changes under spindle synchronization control.

---Setting range---
0 to 9999 (ms)

【#3050】 sprlv Spindle synchronization rotation speed attainment level

Set the level of difference between the commanded synchronization spindle speeds and actual speeds of both the basic and synchronous spindles during spindle synchronization, below which the spindle speed synchronization complete signal will go 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, below which the spindle phase synchronization complete signal will go ON.

---Setting range---
0 to 4095 (pulse) (1 pulse = 0.088°)

【#3052】 spplr Spindle motor spindle relative polarity

Set the polarity of the rotation direction of the spindle motor and the spindle detector.
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 detector'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 spindle speed for changing the 1st step's acceleration/deceleration time constant.

---Setting range---
0 to 99999 (r/min)

【#3055】 sptc2 Spindle synchronization multi-step acceleration/deceleration changeover speed 2

Set the spindle speed for changing the 2nd step's acceleration/deceleration time constant.

---Setting range---
0 to 99999 (r/min)

【#3056】 sptc3 Spindle synchronization multi-step acceleration/deceleration changeover speed 3

Set the spindle speed for changing the 3rd step's acceleration/deceleration time constant.

---Setting range---
0 to 99999 (r/min)

【#3057】 sptc4 Spindle synchronization multi-step acceleration/deceleration changeover speed 4

Set the spindle speed for changing the 4th step's acceleration/deceleration time constant.

---Setting range---
0 to 99999 (r/min)

【#3058】 sptc5 Spindle synchronization multi-step acceleration/deceleration changeover speed 5

Set the spindle speed for changing the 5th step's acceleration/deceleration time constant.

---Setting range---
0 to 99999 (r/min)

【#3059】 sptc6 Spindle synchronization multi-step acceleration/deceleration changeover speed 6

Set the spindle speed for changing the 6th step's acceleration/deceleration time constant.

---Setting range---
0 to 99999 (r/min)

【#3060】 sptc7 Spindle synchronization multi-step acceleration/deceleration changeover speed 7

Set the spindle speed for changing the 7th step's acceleration/deceleration time constant.

---Setting range---
0 to 99999 (r/min)

【#3061】 spdiv1 Magnification for time constant changeover speed 1

Set the acceleration/deceleration time constant from the spindle synchronization multi-step acceleration/deceleration changeover speed 1 (sptc1) to the spindle synchronization multi-step acceleration/deceleration changeover speed 2 (sptc2). Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---
0 to 127

【#3062】 spdiv2 Magnification for time constant changeover speed 2

Set the acceleration/deceleration time constant from the spindle synchronization multi-step acceleration/deceleration changeover speed 2 (sptc2) to the spindle synchronization multi-step acceleration/deceleration changeover speed 3 (sptc3). Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---
0 to 127

【#3063】 spdiv3 Magnification for time constant changeover speed 3

Set the acceleration/deceleration time constant from the spindle synchronization multi-step acceleration/deceleration changeover speed 3 (sptc3) to the spindle synchronization multi-step acceleration/deceleration changeover speed 4 (sptc4). Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---
0 to 127

【#3064】 spdiv4 Magnification for time constant changeover speed 4

Set the acceleration/deceleration time constant from the spindle synchronization multi-step acceleration/deceleration changeover speed 4 (sptc4) to the spindle synchronization multi-step acceleration/deceleration changeover speed 5 (sptc5). Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---
0 to 127

【#3065】 spdiv5 Magnification for time constant changeover speed 5

Set the acceleration/deceleration time constant from the spindle synchronization multi-step acceleration/deceleration changeover speed 5 (sptc5) to the spindle synchronization multi-step acceleration/deceleration changeover speed 6 (sptc6). Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---
0 to 127

【#3066】 spdiv6 Magnification for time constant changeover speed 6

Set the acceleration/deceleration time constant from the spindle synchronization multi-step acceleration/deceleration changeover speed 6 (sptc6) to the spindle synchronization multi-step acceleration/deceleration changeover speed 7 (sptc7). Set this as a magnification in relation to the spindle synchronization acceleration/deceleration time constant (spt).

---Setting range---
0 to 127

【#3067】 spdiv7 Magnification for time constant changeover speed 7

Set the acceleration/deceleration time constant for the spindle synchronization multi-step acceleration/deceleration changeover speed 7 (sptc7) and higher. 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 2 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)

【#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)

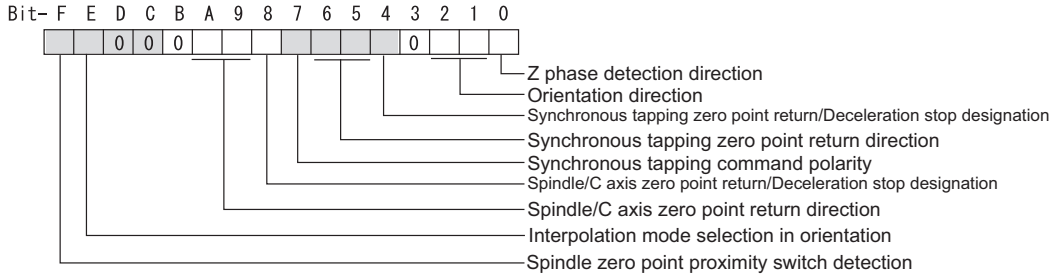
【#3105】 sut Speed reach range

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.

---Setting range---
1 to 99999 (r/min)

【#3108】 ori_sft In-position shift amount for orientation

Set the orientation stop position.
The clockwise direction when viewed from the load side is considered as minus (-).

---Setting range---
-35999 to 35999 (0.01°)

【#3109】 zdetspd Z phase detection speed

When "#3106/bitF = 0" (Normal), set the spindle speed at initial Z phase detection.
Guideline for the initial setting value is from 50 to 300.

When "#3106/bitF = 1" (Spindle zero point proximity switch detection enabled), set the spindle speed at initial spindle zero point proximity switch detection.

(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. Guideline for the initial setting value is from 50 to 300.

---Setting range---
1 to 99999 (r/min)

【#3110】 tap_spd Synchronous tapping zero point return speed

Set the synchronous tapping zero point return speed.

---Setting range---
1 to 99999 (r/min)

【#3111】 tap_sft Synchronous tapping zero point return shift amount

Set the synchronous tapping zero point return shift amount.

---Setting range---
0.00 to 35999 (0.01°)

【#3112】 cax_spd Spindle C axis zero point return speed

Set the spindle C axis zero point return speed.

---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

---Setting range---
0.00 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)

【#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

1: Phase alignment method Type 1 (Step alignment method)
0: Phase alignment method Type 2 (Acceleration/ deceleration 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_DSlSp" 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. The standard setting is "33".
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.
The position loop gain will be selected corresponding to the control mode selection command set with control input 4/bit 2, 1, 0.

bit2,1,0 = 000: Non-interpolation
bit2,1,0 = 001: Spindle synchronization
bit2,1,0 = 010: Interpolation
bit2,1,0 = 100: Interpolation

(Note) The control mode is commanded by NC.
When carrying out the SHG control, set SP035(SFNC3)/bitC(shgn) or SP036(SFNC4)/bit4(shgs) to "1".

---Setting range---

1 to 200 (1/s)

【#13002】 SP002 PGN Position loop gain interpolation mode

Set the position loop gain for "interpolation" control mode. The standard setting is "33".
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.
The position loop gain will be selected corresponding to the control mode selection command set with control input 4/bit 2, 1, 0.

bit2,1,0 = 000: Non-interpolation
bit2,1,0 = 001: Spindle synchronization
bit2,1,0 = 010: Interpolation
bit2,1,0 = 100: Interpolation

(Note) The control mode is commanded by NC.
When carrying out the SHG control, set SP035(SFNC3)/bitC(shgn) or SP036(SFNC4)/bit4(shgs) 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. The standard setting is "33". 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.
The position loop gain will be selected corresponding to the control mode selection command set with control input 4/bit 2, 1, 0.

bit2,1,0 = 000: Non-interpolation
bit2,1,0 = 001: Spindle synchronization
bit2,1,0 = 010: Interpolation
bit2,1,0 = 100: Interpolation

(Note) The control mode is commanded by NC.
When carrying out the SHG control, set SP035(SFNC3)/bitC(shgn) or SP036(SFNC4)/bit4(shgs) 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.
For MDS-D/DH-SP, the control method can be selected by SP033(SFNC1)/bit1,0(vcnt).
Normally, use "Changeover type 2".
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), SP006(VIA1), SP007(VIL1) are used.
By setting "SP035(SFNC3)/bit1(vgin), SP035(SFNC3)/bit9(vgn) or SP036(SFNC4)/bit1(vgs)=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), SP006(VIA1), SP007(VIL1) for procedures.

---Setting range---
1 to 9999

【#13009】 SP009 VIA2 Speed loop lead compensation 2

Normally SP005(VGN1), SP006(VIA1), SP007(VIL1) are used.
By setting "SP035(SFNC3)/bit1(vgin), SP035(SFNC3)/bit9(vgn) or SP036(SFNC4)/bit1(vgs)=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), SP006(VIA1), SP007(VIL1) for procedures.

---Setting range---
1 to 9999

【#13010】 SP010 VIL2 Speed loop delay compensation 2

Normally SP005(VGN1), SP006(VIA1), SP007(VIL1) are used.
By setting "SP035(SFNC3)/bit1(vgin), SP035(SFNC3)/bit9(vgn) or SP036(SFNC4)/bit1(vgs)=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), SP006(VIA1), SP007(VIL1) for 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(SFNC3)/bit2(pyin), SP035(SFNC3)/bitA(pyn) or SP036(SFNC4)/bit2(pys)=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 procedures.
Set to "0" when using an IPM spindle motor.

---Setting range---
0 to 100 (%)

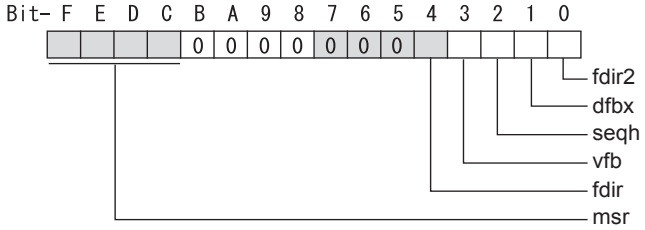
【#13016】 SP016 DDT Phase alignment deceleration rate

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 ⊿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

0000(0xxxh): 200V specification IM spindle motor
0001(1xxxh): 200V specification IPM spindle motor
0010(2xxxh): 400V specification IM spindle motor
0011(3xxxh): 400V specification IPM spindle motor
0100(4xxxh): 200V specification HF servo motor
Only "0" or "4" setting is available for MDS-D-SPJ3 Series.

- For MDS-DM Series
For MDS-DM-SPV2/SPV3, set to "0000".

bit B-5 :

Not used. Set to "0".

bit 4 : fdir Position feedback

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
Set "0" for MDS-D-SPJ3 Series.

bit 1 : dfbx Dual feedback control

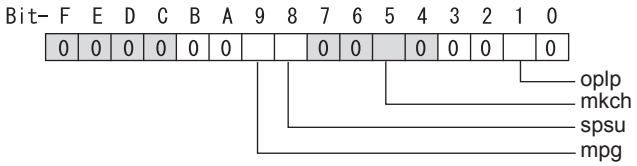
0: Stop 1: Start

bit 0 : fdir2 Speed feedback polarity

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: Normal (Earth fault detection by CV) 1: Enable
Set "0" and it is constantly "Enable" for MDS-D-SPJ3 Series.

bit 8 : spsu Speed setting unit

0: rev/min 1: x4 r/min

bit 7-6 :

Not used. Set to "0".

bit 5 : mkch Coil switch function

0: Disable 1: Enable
It is not available for MDS-D-SPJ3 Series.

bit 4-2 :

Not used. Set to "0".

bit 1 : oplp Open loop

0: Disable 1: Enable

bit 0 :

Not used. Set to "0".

【#13019(PR)】 SP019 RNG1 Sub side detector 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 speed detector.
When using ABZ pulse encoder, used this with SP097(RNG1ex).

E.g.: The setting for ABZ pulse encoder "OSE-1024-3-15-68"
SP019 = 4096
SP097 = -1

---Setting range---
-32768 to 32767 (kp/rev)
When using SP097: (p/rev)

【#13020(PR)】 SP020 RNG2 Main side detector resolution

Set the number of pulses per revolution of the main side detector.
When using the serial changer MDS-B-HR, use this with SP098(RNG2ex).

Detector
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

OSA18(-A48): SP020 = 260

---Setting range---
-32768 to 32767 (kp/rev)
When using SP098: (p/rev)

【#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 not be performed.

---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 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 detection 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 zero speed detection 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(SFNC9)/bitC(sdt2) to "1".
It is not available for MDS-D-SPJ3 Series.

---Setting range---
-32768 to 32767 (r/min)

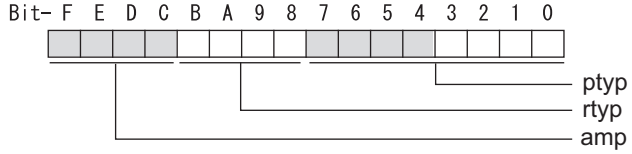
【#13031(PR)】 SP031 MTYP Motor type

Set the position detector type, speed detector type and motor type.
"2200" semi-close
"4200" ABZ pulse detector + full-close
"6200" serial detector + full-close

【#13032(PR)】 SP032 PTYP Power supply type/ Regenerative resistor type

MDS-D/DH Series: Power supply type

When connecting a power supply unit, set a code for each power supply unit.



bit F-C : amp

Not used. Set to "0".

bit B-8 : rtyp

Not used. Set to "0".

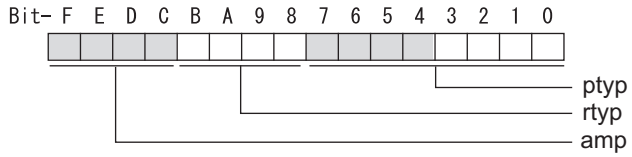
bit 7-0 : ptyp External emergency stop setting

When the emergency stop input signal of the power supply unit is "disabled"
Power supply unit is not connected : 0000h
MDS-D-CV-37 / MDS-DH-CV-37 : 0004h
MDS-D-CV-75 / MDS-DH-CV-75 : 0008h
MDS-D-CV-110 / MDS-DH-CV-110 : 0011h
MDS-D-CV-185 / MDS-DH-CV-185 : 0019h
MDS-D-CV-300 / MDS-DH-CV-300 : 0030h
MDS-D-CV-370 / MDS-DH-CV-370 : 0037h
MDS-D-CV-450 / MDS-DH-CV-450 : 0045h
MDS-D-CV-550 : 0055h
MDS-DH-CV-750 : 0075h

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 : 0000h
MDS-D-CV-37 / MDS-DH-CV-37 : 0044h
MDS-D-CV-75 / MDS-DH-CV-75 : 0048h
MDS-D-CV-110 / MDS-DH-CV-110 : 0051h
MDS-D-CV-185 / MDS-DH-CV-185 : 0059h
MDS-D-CV-300 / MDS-DH-CV-300 : 0070h
MDS-D-CV-370 / MDS-DH-CV-370 : 0077h
MDS-D-CV-450 / MDS-DH-CV-450 : 0085h
MDS-D-CV-550 : 0095h
MDS-DH-CV-750 : 00B5h

MDS-DM-SPV Series: Power supply type

Set as follows for the spindle drive section of the MDS-DM-SPV.



bit F-C : amp

Not used. Set to "0".

bit B-8 : rtyp

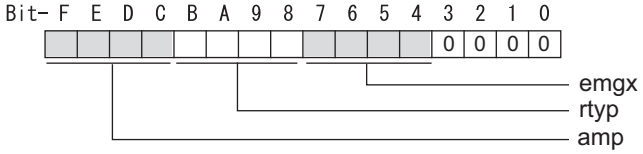
Not used. Set to "0".

bit 7-0 : ptyp External emergency stop setting

Normal : 0019h
External emergency stop function 0059h

MDS-D-SPJ3 Series: Regenerative resistor type

Set the regenerative resistor type.



bit F-8 : amp(bit F-C) / rtyp(bit B-8)

For "amp = 1"
"rtyp" setting value
0: Setting prohibited
1: Setting prohibited
2: MR-RB032
3: MR-RB12 or GZG200W39OHMK
4: MR-RB32 or GZG200W120OHMK 3 units connected in parallel
5: MR-RB30 or GZG200W39OHMK 3 units connected in parallel
6: MR-RB50 or GZG300W39OHMK 3 units connected in parallel
7: MR-RB31 or GZG200W20OHMK 3 units connected in parallel
8: MR-RB51 or GZG300W20OHMK 3 units connected in parallel
9 - F: Setting prohibited

For "amp = 2"
"rtyp" setting value
0 - 3: Setting prohibited
4: FCUA-RB22
5: FCUA-RB37
6: FCUA-RB55
7: Setting prohibited
8: R-UNIT1
9: R-UNIT2
A: R-UNIT3
B: R-UNIT4
C: R-UNIT5
D: FCUA-RB75/2 2 units
E, F: Setting prohibited

bit 7-4 : emgx External emergency stop function

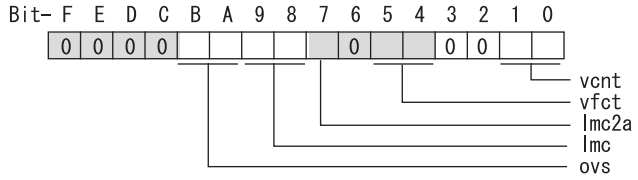
Set the external emergency stop function. (Do not set a value other than specified.)
0: Disable 4: Enable

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

00: Compensation stop 01: Setting prohibited 10: Setting prohibited 11: Compensation type 3

(Note) Set the compensation amount in SP043(OVS1) and SP042(OVS2).

bit 9-8 : lmc Lost motion compensation

00: Compensation stop 01: Setting prohibited 10: Compensation type 2 11: Setting prohibited

(Note) Set the compensation amount in SP048(LMC1) and SP041(LMC2).
When "SP227/lmc3" is set to "1", the lost motion compensation type 3 is selected regardless of this setting.

bit 7 : lmc2a Lost motion compensation 2 timing

0: Normal timing 1: Timing changed

bit 6 :

Not used. Set to "0".

bit 5-4 : vfct Jitter compensation

00: Disable 01: 1 pulses 10: 2 pulses 11: 3 pulses

bit 3-2 :

Not used. Set to "0".

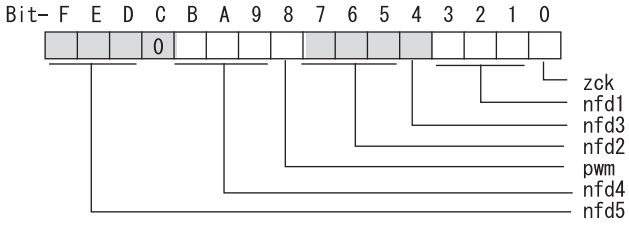
bit 1-0 : vcnt Delay compensation changeover

00: Disable 01: Changeover type 1 10: Changeover type 2 11: Changeover type 2

- For MDS-DM Series
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.
bit F,E,D=000: - ∞ bit F,E,D=001: -18.1[dB]
bit F,E,D=010: -12.0[dB] bit F,E,D=011: -8.5[dB]
bit F,E,D=100: -6.0[dB] bit F,E,D=101: -4.1[dB]
bit F,E,D=110: -2.5[dB] bit F,E,D=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.
bit B,A,9=000: - ∞ bit B,A,9=001: -18.1[dB]
bit B,A,9=010: -12.0[dB] bit B,A,9=011: -8.5[dB]
bit B,A,9=100: -6.0[dB] bit B,A,9=101: -4.1[dB]
bit B,A,9=110: -2.5[dB] bit B,A,9=111: -1.2[dB]

bit 8 : pwm Current control

0: Standard current control 1: High frequency current control

- For MDS-DM Series
Not used. Set to "0".

bit 7-5 : nfd2 Depth of Notch filter 2

Set the depth of Notch filter 2.
bit 7,6,5=000: - ∞ bit 7,6,5=001: -18.1[dB]
bit 7,6,5=010: -12.0[dB] bit 7,6,5=011: -8.5[dB]
bit 7,6,5=100: -6.0[dB] bit 7,6,5=101: -4.1[dB]
bit 7,6,5=110: -2.5[dB] bit 7,6,5=111: -1.2[dB]

bit 4 : nfd3 Notch filter 3(1125Hz)

0: Stop 1: Start

bit 3-1 : nfd1 Depth of Notch filter 1

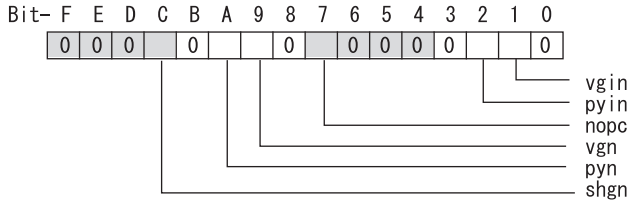
Set the depth of Notch filter 1.
bit 3,2,1=000: - ∞ bit 3,2,1=001: -18.1[dB]
bit 3,2,1=010: -12.0[dB] bit 3,2,1=011: -8.5[dB]
bit 3,2,1=100: -6.0[dB] bit 3,2,1=101: -4.1[dB]
bit 3,2,1=110: -2.5[dB] bit 3,2,1=111: -1.2[dB]

bit 0 : zck Z phase check (ALM42)

0: Enable 1: Disable

【#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

0: Stop 1: Start

bit B :

Not used. Set to "0".

bit A : pyn Excitation rate selection

0: Select Excitation rate 1 1: Select Excitation rate 2

bit 9 : vgn Speed loop gain set selection

0: Select Set 1 1: Select Set 2

bit 8 :

Not used. Set to "0".

bit 7 : nopc Phase alignment

0: Start 1: Stop

bit 6-3 :

Not used. Set to "0".

bit 2 : pyin Excitation rate selection

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

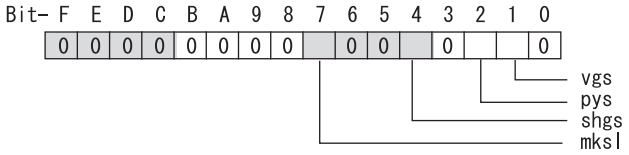
The speed loop gain set after the in-position can be selected.
0: Select Set 1 1: Select Set 2

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 Spindle coil selection

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

0: Stop 1: Start

bit 3 :

Not used. Set to "0".

bit 2 : pys Excitation rate selection

0: Select Excitation rate 1 1: Select Excitation rate 2

bit 1 : vgs Speed loop gain set selection

0: Select Gain Set 1 1: Select Gain set 2

bit 0 :

Not used. Set to "0".

【#13037】 SP037 JL Load inertia scale

Set "the motor inertia + motor axis conversion load inertia" 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".

---Setting range---
0 to 2250 (Hz)

【#13039】 SP039 LMCD Lost motion compensation timing

Set this parameter when the lost motion compensation 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(SFNC1)/ bitB,A(ovs)=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(SFNC6)/ bitE(obs).
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(SFNC6)/ bitE(obs).
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".

---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 compensates the torque at quadrant change.
This is valid only when the overshooting compensation SP033 (SFNC1/lmc) is selected.

[Type 2 "When SP033(SFNC1)/bit9,8(lmc)=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.

[Other than type 2 "When SP033(SFNC1)/bit9,8(lmc) ≠ 10"]
Lost motion compensation (Type 2) is not executed.

[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 "100".
Adjust relative errors in acceleration/deceleration by increasing the value by 50 to 100.

---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.

---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".

---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 main side detector and the sub side detector exceeds the set value, it is judged as an overrun and "Alarm 43" is detected.
When "-1" is set, the alarm detection will not be performed.
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---
-32768 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.

---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".

---Setting range---
-29900 to 29900 (ms)

【#13057(PR)】 SP057 GRA1 Spindle side gear ratio 1

Set the number of 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 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 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 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 teeth on the spindle 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 teeth on the spindle 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 teeth on the spindle 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 teeth on the spindle 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

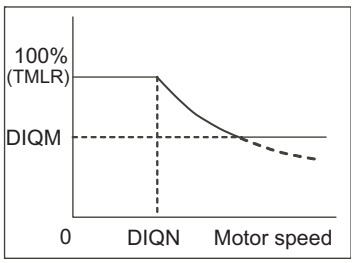
Set the scale for SP016 (DDT) to change the deceleration rate only during rotation command (command F ⊿T ≠ 0).
When the setting value increases, the single-rotation position alignment will be completed faster, but the impact to the machine will also increase. When not using, set to "0".

---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 current limit value in deceleration (TMRL) set in the motor constants is applied.

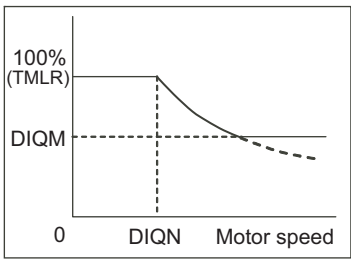


---Setting range---

0 to 999 (%)

【#13072】 SP072 DIQN Variable current limit during deceleration, break point speed

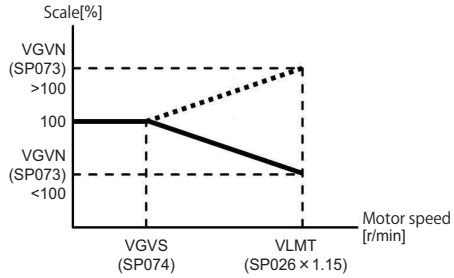
Set this parameter to adjust the deceleration time by changing the current limit value during deceleration depending on the motor speed.
As shown below, set the lower limit rate of the current limit in SP071 (DIQM), and use with SP072 (DIQN).
When DIQM is set to 100%, the current limit value in deceleration (TMRL) set in the motor constants is applied.



---Setting range---
1 to 32767 (r/min)

【#13073】 SP073 VGVN Variable speed gain target value

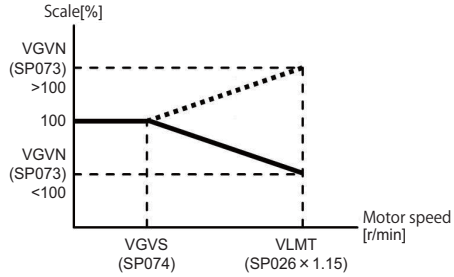
If noise is bothersome during high speed rotation, it may be reduced by lowering the speed loop gain at high speed.
As shown below, set the speed loop gain rate for the overspeed detection speed in SP073 (VGVN), and use with SP074 (VGVS).
When not using, set to "0".
The overspeed detection speed (VLMT) is 115% of the maximum motor speed (TSP).
This function can be used when either VGN1 or VGN2 is selected.



---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.
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 VGN1 or VGN2 is selected.



---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 LMCk Lost motion compensation 3 spring constant

Set the compensation amount for the spring constant when using lost motion compensation type 3.
When not using, set to "0".

- For MDS-DM Series
Not used. Set to "0".

---Setting range---
0 to 32767 (0.01%/0.001°)

【#13086】 SP086 LMCc Lost motion compensation 3 viscous coefficient

Set the compensation amount for the viscous coefficient when using lost motion compensation type 3.
When not using, set to "0".

- For MDS-DM Series
Not used. Set to "0".

---Setting range---
0 to 32767 (0.01% - s/ 1°)

【#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".

---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".

---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

When not using, set to "0".
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(SFNC6)/ bitD (vup) 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 Sub side extension detector resolution

Normally set to "0".
When setting the sub side detector resolution in pulse (p) unit, set the number of pulses to four bite data of SP097 (upper 16 bits) and SP019 (lower 16 bits).

SP097 = number of pulses / 65536 (When = 0, set SP097 = -1)
SP019 = the remainder of "number of pulses / 65536" (values can be set by the pulse)
For detectors not using the upper 16 bits, set to "-1".

When "SP019 > 32767", set "the remainder of above - 65536 (negative number)" to "SP019".

---Setting range---
-1,0 to 32767

【#13098】 SP098 RNG2ex Main side extension detector resolution

Normally set to "0".
When setting the main side detector resolution in pulse (p) unit, set the number of pulses to four bite data of SP098 (upper 16 bits) and SP020 (lower 16 bits).

SP098 = number of pulses / 65536 (When = 0, set SP098 = -1)
SP020 = the remainder of "number of pulses / 65536" (values can be set by the pulse)
For detectors not using the upper 16 bits, set to "-1".

When "SP020 > 32767", set "the remainder of above - 65536 (negative number)" to "SP020".

---Setting range---
-1,0 to 32767

【#13099】 SP099

Not used. Set to "0".

【#13100】 SP100

Not used. Set to "0".

【#13101】 SP101

Not used. Set to "0".

【#13102】 SP102

Not used. Set to "0".

【#13103】 SP103

Not used. Set to "0".

【#13104】 SP104

Not used. Set to "0".

【#13105】 SP105

Not used. Set to "0".

【#13106】 SP106

Not used. Set to "0".

【#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

Not used. Set to "0".

【#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 (SPEC2)/bit1 (oplp)" 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(SFNC5)/bit4(dcd)=1.
When not using, set to "0".

---Setting range---
-18000 to 18000 (electrical angle 0.01°)

【#13119】 SP119 FSP4 Notch filter specifications 4

When not using, set to "0".
Set the target attenuation and damping coefficient of the notch filter.
To determine the value, multiply the damping coefficient by 10000, and add it to the absolute value of the target attenuation -dB.
The setting range of each coefficient is as follows.
Damping coefficient: 0.01 - 1.00 (Increment: 0.01)
When "0" is set, the actual value to be set is 1.00.
Target attenuation: -80db - -1db (Increment: 1dB)
When "0" is set, the actual value to be set is -80.
E.g.: When the target attenuation is -40dB, and damping coefficient is 1.00
1.00×10000 + ABS(-40) = 10040

---Setting range---
0 to 32767

【#13120】 SP120 FSP5 Notch filter specifications 5

When not using, set to "0".
Set the target attenuation and damping coefficient of the notch filter.
To determine the value, multiply the damping coefficient by 10000, and add it to the absolute value of the target attenuation -dB.
The setting range of each coefficient is as follows.
Damping coefficient: 0.01 - 1.00 (Increment: 0.01)
When "0" is set, the actual value to be set is 1.00.
Target attenuation: -80db - -1db (Increment: 1dB)
When "0" is set, the actual value to be set is -80.
E.g.: When the target attenuation is -40dB, and damping coefficient is 1.00
1.00×10000 + ABS(-40) = 10040

---Setting range---
0 to 32767

【#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 driving an IPM motor (MDS-D/DH Series)]
Use in the DC excitation function.
DC excitation: Set the initial excitation level when SP225(SFNC5)/bit4(dcd)=1.
When "0" is set, the state will be the same as when "20" is set.

---Setting range---
0 to 100 (Short-time rated %)

【#13126】 SP126 DA2NO D/A output ch2 data No. / Final DC excitation level

Input the desired data number to D/A output channel.

[When driving an IPM motor (MDS-D/DH Series)]
Use in the DC excitation function.
DC excitation: Set the final excitation level when SP225(SFNC5)/bit4(dcd)=1.
When "0" is set, the state will be the same as when "50" is set.

---Setting range---
0 to 100 (Short-time rated %)

【#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 driving an IPM motor (MDS-D/DH Series)]
Use in the DC excitation function.
DC excitation: Set the initial excitation time when SP225(SFNC5)/bit4(dcd)=1.
When "0" is set, the state will be the same as when "10000" is set.

---Setting range---
0 to 32767 (ms)

【#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.

【#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-D-SPJ3 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-D-SPJ3 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-D-SPJ3 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-D-SPJ3 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

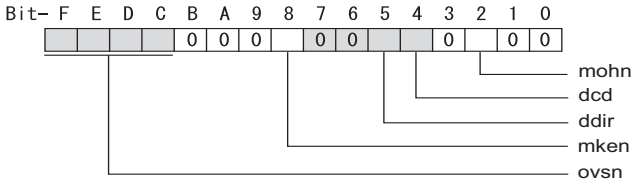
Not used. Set to "0".

【#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
It is not available for MDS-D-SPJ3 Series.

bit 7-6 :

Not used. Set to "0".

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 :

Not used. Set to "0".

bit 2 : mohn Thermistor temperature detection

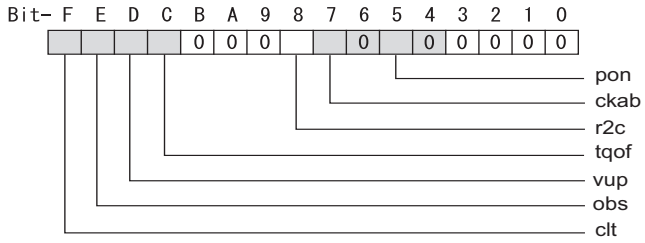
0: Normal 1: Disable (Except for TS5690/5691)

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
It is not available for MDS-D-SPJ3 Series.

bit 7 : ckab No signal detection 2

0: Disable 1: Enable

- For MDS-DM Series
Not used. Set to "0".

bit 6 :

Not used. Set to "0".

bit 5 : pon IPM spindle pulse application magnetic pole estimation

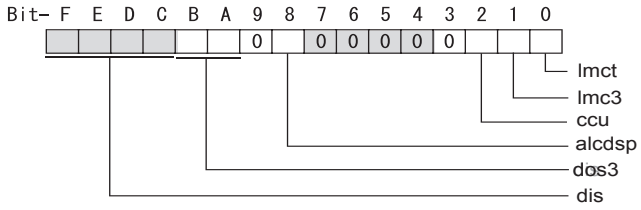
0: Normal 1: Enable
It is not available for MDS-D-SPJ3 Series.

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: Safety observation function door state signal 4: Proximity switch signal detection

bit B-A : dos3 Digital signal output 3 selection

00: Disable 01: Contactor control signal output (For MDS-D-SPJ3)

bit 9 :

Not used. Set to "0".

bit 8 : alcdsp

0: Display alarm history 1: Display alarm counter

- For MDS-DM Series
Not used. Set to "0".

bit 7-3 :

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 : lmc3 Lost motion compensation 3

0: Disable 1: Enable

- For MDS-DM Series
Not used. Set to "0".

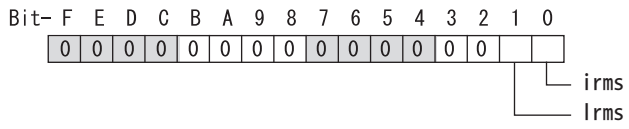
bit 0 : lmct Lost motion compensation 3 adjustment time measurement

0: Disable 1: Enable

- For MDS-DM Series
Not used. Set to "0".

【#13228】 SP228 SFNC8 Spindle function 8

Select the spindle functions.
Functions are allocated to each bit.
Set this in hexadecimal format.



bit F-2 :

Not used. Set to "0".

bit 1 : lrms Meter display

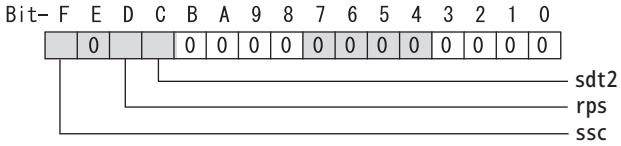
0: Display normal load meter 1: Motor output effective value
Set "0" for MDS-D-SPJ3 Series.

bit 0 : irms Meter display

0: Display normal load meter 1: Display effective motor current

【#13229】 SP229 SFNC9 Spindle function 9

Select the spindle functions.
Functions are allocated to each bit.
Set this in hexadecimal format.



bit F : ssc Safety observation function

0: Disable 1: Enable

bit E :

Not used. Set to "0".

bit D : rps Safety observation speed setting unit

0: Normal 1: 100°/min

bit C : sdt2 Specified speed output digital signal 2 output

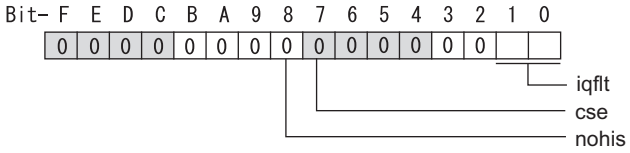
0: Normal 1: Enable
It is not available for MDS-D-SPJ3 Series.

bit B-0 :

Not used. Set to "0".

【#13230】 SP230 SFNC10 Spindle function 10

Select the spindle functions.
Functions are allocated to each bit.
Set this in hexadecimal format.



bit F-9 :

Not used. Set to "0".

bit 8 : nohis Communication error alarm(34,36,38,39) between NC and DRV Specific alarm history disabled

0: Enable 1: Disable
For C70, set "1".

bit 7 : cse Spindle C axis command speed monitoring function

0: Normal setting (function disabled) 1: Function enabled
It is not available for MDS-D-SPJ3 Series.

bit 6-2 :

Not used. Set to "0".

bit 1-0 : iqflt Current command filter

Current command filter disabled : 00
Current command filter small : 01
Current command filter large : 10
Current command filter disabled : 11

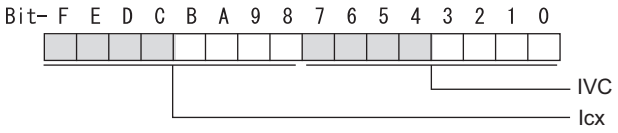
【#13231】 SP231

Not used. Set to "0".

【#13232】 SP232

Not used. Set to "0".

【#13233】 SP233 IVC/ICx Voltage non-sensitive band compensation/Current bias cx



bit F-8 : Icx Current bias

Normally, set to "0". (For machine tool builder adjustment)
When using this parameter, use this with SP234(Icy),SP234(Ib1).

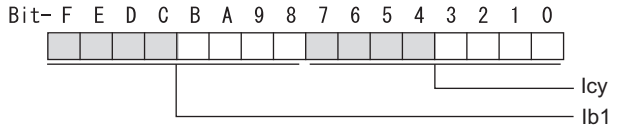
---Setting range---
0 to 255

bit 7-0 : 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 Icy/Ib1 Current bias cy/Current bias b1



bit F-8 : Ib1 Current bias 1

Normally, set to "0". (For machine tool builder adjustment)
When using this parameter, use this with SP233(Icx), SP234(Icy).

---Setting range---
0 to 255

bit 7-0 : Icy Current bias

Normally, set to "0". (For machine tool builder adjustment)
When using this parameter, use this with SP233(Icx), SP234(Ib1).

---Setting range---
0 to 255

【#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".
It is not available for MDS-D-SPJ3 Series.

---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".
It is not available for MDS-D-SPJ3 Series.

---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 detector TS5690 or TS5691.

---Setting range---
0 to 4500 (Hz)

【#13238】 SP238 SSCFEED Safety observation Safety speed

Set the safety speed at the spindle end for the safety observation 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 Safety observation Safety motor speed

Set the motor's safety speed for the safety observation function.
When not using, set to "0".

---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.

Appendix 1.7 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 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 TOPnumber 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.

Appendix 1.8 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 mode 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)

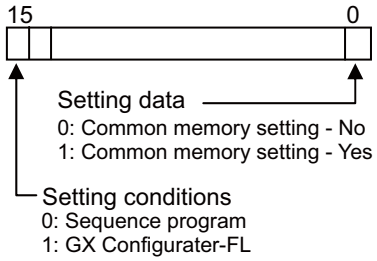
---Setting range---

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.

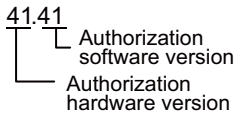
<17th word: Local node information area>
Indicates switches setting status.
0: Normal
1 and later: Error code

<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

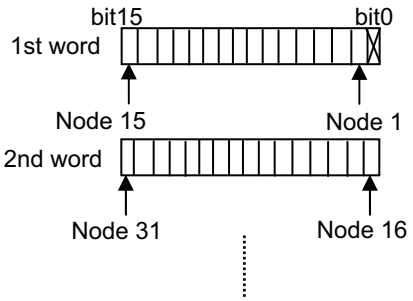
<32nd word: Local node information area>
Indicates log information clear results.
0: Normal
1 and later: Error code

---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.

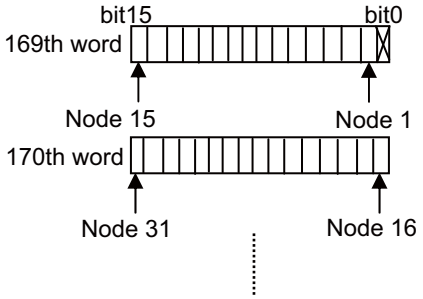
<149th, 150th word: Log information area>
Participation count:
Indicates the accumulated count of local node participation.

<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.

Appendix 1.9 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".

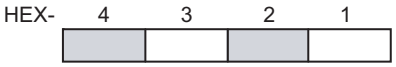
---Setting range---
0 to 128

【#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

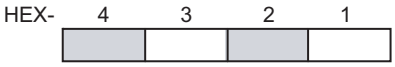
01(HEX): Node that supports UCMM and uses message group 3, 2, or 1
03(HEX): Node that supports UCMM and uses message group 1
04(HEX): Node that does not support UCMM (Group 2 dedicated server)
80(HEX): Reserved node

【#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

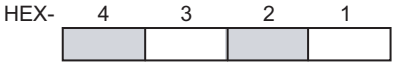
Set the number of input byte modules.

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

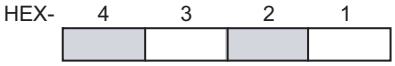
Set the number of input word modules.

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 Transfer Cont 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 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 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 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 Slave function communication status

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. 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".

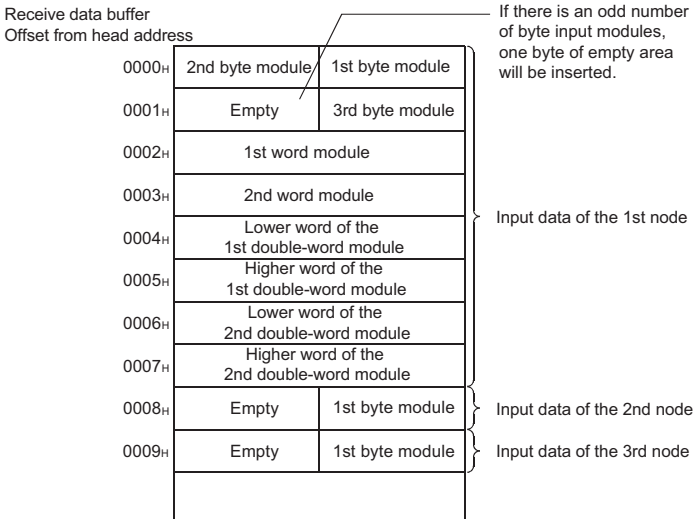
---Setting range---
1 to 256

【#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

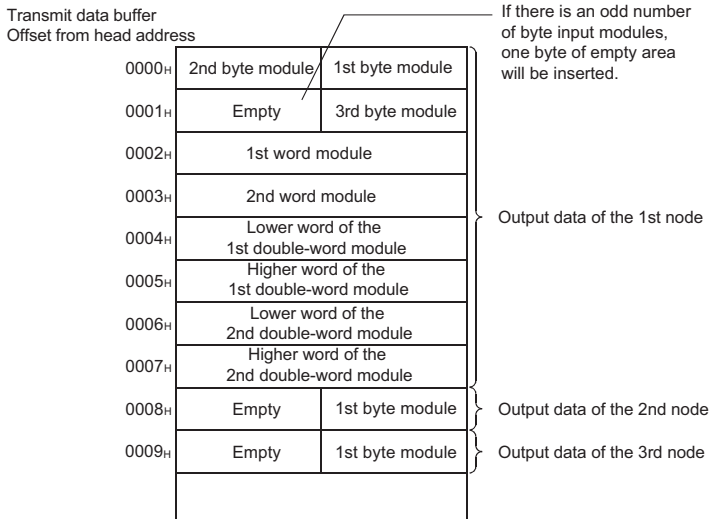
【#29083(PR)】 Master Func. Transmit Data PLC side Device
Master function transmit data write device

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

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.

Appendix 1.10 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.

Appendix 1.11 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】

bit6: Communication terminal overheat detected

Designate whether to detect the communication terminal overheat alarm or not.
0 : Detect
1 : Not detect

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.

Appendix 1.12 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---
1 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---
1 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---
1 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---
1 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---
1 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---
1 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---
1 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---
1 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---
1 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---
1 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 255

【#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 255

【#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 255

【#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 255

【#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 255

【#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 255

【#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 255

【#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 255

【#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 255

【#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 255

【#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

Appendix 1.13 Position Switches

【#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.

Appendix 1.14 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】 ST.offset Station offset

Set the distance (offset) from the reference position to station 1.

---Setting range---
-99999.999 to 99999.999 (° or mm)

【#12810+10(n-1)】 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】 PSW1dog1 PSW1 area setting 1

Set "PSW1 area setting" 1 and 2 to specify the area where the position switch 1 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12872】 PSW1dog2 PSW1 area setting 2

Set "PSW1 area setting" 1 and 2 to specify the area where the position switch 1 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12873】 PSW2dog1 PSW2 area setting 1

Set "PSW2 area setting" 1 and 2 to specify the area where the position switch 2 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12874】 PSW2dog2 PSW2 area setting 2

Set "PSW2 area setting" 1 and 2 to specify the area where the position switch 2 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12875】 PSW3dog1 PSW3 area setting 1

Set "PSW3 area setting" 1 and 2 to specify the area where the position switch 3 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12876】 PSW3dog2 PSW3 area setting 2

Set "PSW3 area setting" 1 and 2 to specify the area where the position switch 3 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12877】 PSW4dog1 PSW4 area setting 1

Set "PSW4 area setting" 1 and 2 to specify the area where the position switch 4 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12878】 PSW4dog2 PSW4 area setting 2

Set "PSW4 area setting" 1 and 2 to specify the area where the position switch 4 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12879】 PSW5dog1 PSW5 area setting 1

Set "PSW5 area setting" 1 and 2 to specify the area where the position switch 5 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12880】 PSW5dog2 PSW5 area setting 2

Set "PSW5 area setting" 1 and 2 to specify the area where the position switch 5 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12881】 PSW6dog1 PSW6 area setting 1

Set "PSW6 area setting" 1 and 2 to specify the area where the position switch 6 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12882】 PSW6dog2 PSW6 area setting 2

Set "PSW6 area setting" 1 and 2 to specify the area where the position switch 6 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12883】 PSW7dog1 PSW7 area setting 1

Set "PSW7 area setting" 1 and 2 to specify the area where the position switch 7 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12884】 PSW7dog2 PSW7 area setting 2

Set "PSW7 area setting" 1 and 2 to specify the area where the position switch 7 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12885】 PSW8dog1 PSW8 area setting 1

Set "PSW8 area setting" 1 and 2 to specify the area where the position switch 8 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12886】 PSW8dog2 PSW8 area setting 2

Set "PSW8 area setting" 1 and 2 to specify the area where the position switch 8 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12887】 PSW9dog1 PSW9 area setting 1

Set "PSW9 area setting" 1 and 2 to specify the area where the position switch 9 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12888】 PSW9dog2 PSW9 area setting 2

Set "PSW9 area setting" 1 and 2 to specify the area where the position switch 9 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12889】 PSW10dog1 PSW10 area setting 1

Set "PSW10 area setting" 1 and 2 to specify the area where the position switch 10 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12891】 PSW11dog1 PSW11 area setting 1

Set "PSW11 area setting" 1 and 2 to specify the area where the position switch 11 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12892】 PSW11dog2 PSW11 area setting 2

Set "PSW11 area setting" 1 and 2 to specify the area where the position switch 11 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12893】 PSW12dog1 PSW12 area setting 1

Set "PSW12 area setting" 1 and 2 to specify the area where the position switch 12 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12894】 PSW12dog2 PSW12 area setting 2

Set "PSW12 area setting" 1 and 2 to specify the area where the position switch 12 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12895】 PSW13dog1 PSW13 area setting 1

Set "PSW13 area setting" 1 and 2 to specify the area where the position switch 13 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12896】 PSW13dog2 PSW13 area setting 2

Set "PSW13 area setting" 1 and 2 to specify the area where the position switch 13 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12897】 PSW14dog1 PSW14 area setting 1

Set "PSW14 area setting" 1 and 2 to specify the area where the position switch 14 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12898】 PSW14dog2 PSW14 area setting 2

Set "PSW14 area setting" 1 and 2 to specify the area where the position switch 14 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12899】 PSW15dog1 PSW15 area setting 1

Set "PSW15 area setting" 1 and 2 to specify the area where the position switch 15 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

【#12900】 PSW15dog2 PSW15 area setting 2

Set "PSW15 area setting" 1 and 2 to specify the area where the position switch 15 will turn ON when the machine is positioned.
Whether the value of setting 1 is larger than setting 2 (or vice versa) does not affect the position switch operation.
For rotary axes, the output turns ON in the area excluding 0.000 degree.

---Setting range---
-99999.999 to 99999.999(° or mm)

Appendix 1.15 Machine Error Compensation Function Outline

Appendix 1.15.1 Outline

(1) Memorized pitch error compensation

According to the specified parameters, this method compensates an axis feed error caused by a ball screw pitch error, etc.

With the reference point defined as the base, as shown in Fig 1.1, set the compensation amount in the division points obtained by equally dividing the machine coordinates.

The compensation amount can be set by either the absolute or incremental system. Select the desired method with the "#4000 Pinc".

Machine position is compensated between division points n and n+1 as much as compensation amount between them by linear approximation.

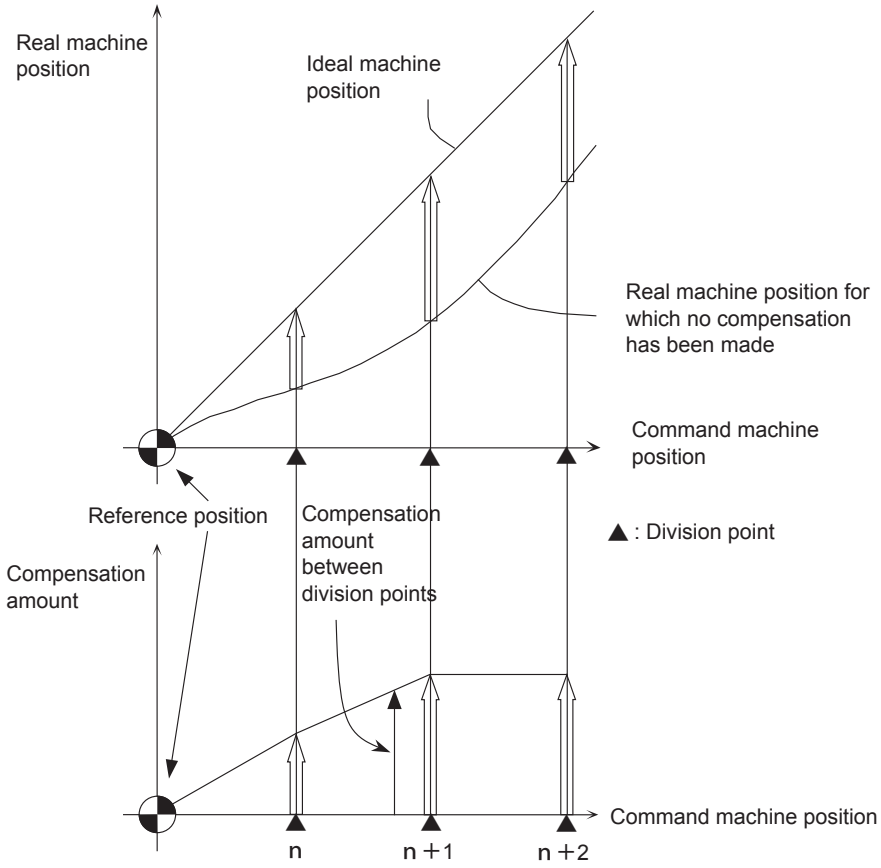


Fig. 1.1 Relationship between the compensation amount and machine position

(2) Memorized relative position compensation

This method, according to the parameters specified in advance, compensates the relative position error between two orthogonal axes caused by deflection of the moving stand.

For this, as shown in the following figure, specify the compensation amount in the compensation axis direction in the division points obtained by equally dividing the machine coordinates of the base axis. The section between division points n and n+1 is compensated smoothly by linear approximation.

The base axis is one of the two orthogonal axes to which relative position compensation applies. This axis is used as the criterion for relative-error measurement. The compensation axis is the coordinate axis that is orthogonal to the base axis. The compensation is actually made for this coordinate axis.

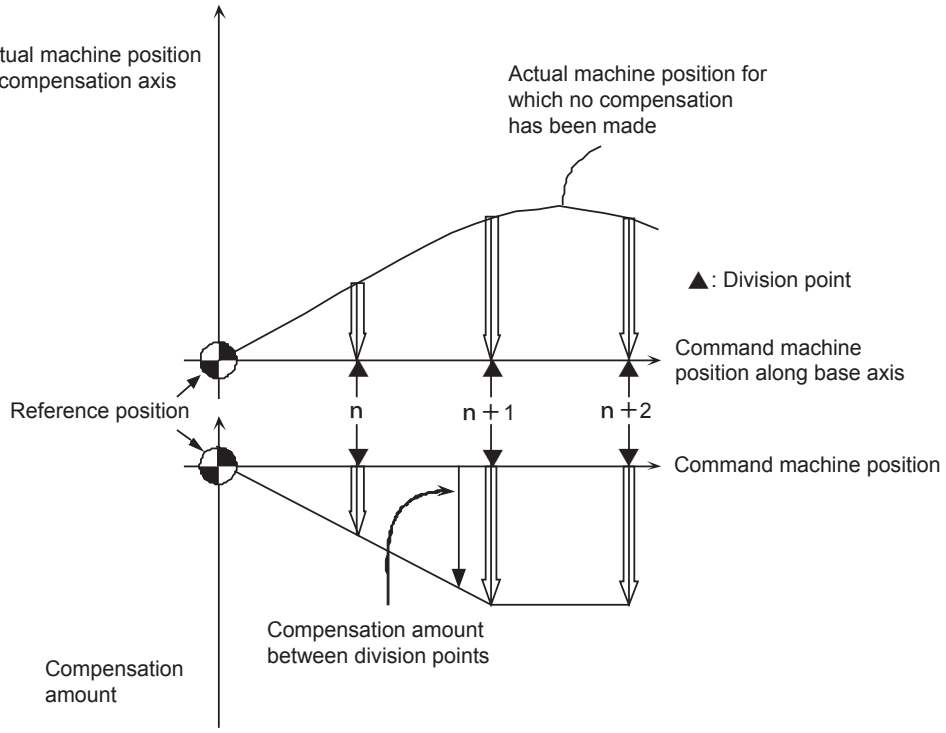


Fig. 1.2 Relationship between the compensation amount and machine position

Appendix 1.15.2 Setting Compensation Data

Compensation data can be set according to either absolute or incremental system.
"#4000:Pinc" 0: Absolute system
1: Incremental system

(1) Absolute system

Feed from the reference point to each division point is executed as shown in the following Figure 2.1.
(Specified position – Real machine position) × 2 (Unit of output)
Set it as the compensation amount.
For example, assume that the feed from the reference point to the +100mm position is executed. Also, assume that the real machine position is 99.990mm.
(100000 – 99990) × 2 = 20 pulses
In this case, the above value is defined as the compensation amount used at the +100mm position:
Assume that the real machine position resulting when feed to the –100mm position is executed, is –99.990mm.
(-100000 – -99990) × 2 = -20 pulses
In this case, the above value is defined as the compensation amount used at the -100mm position.

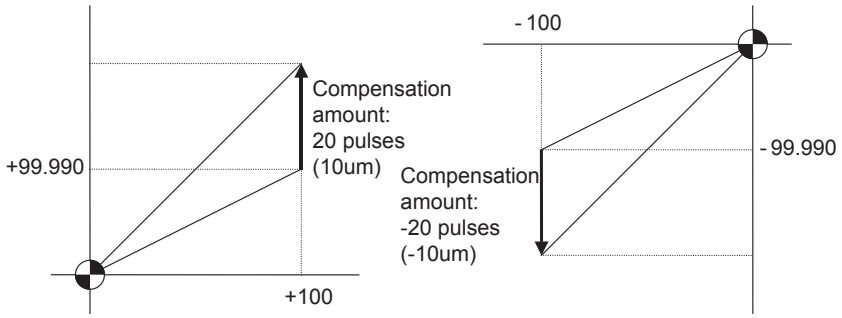


Fig. 2.1

(2) Incremental system

The Fig. 2.2 contains a machine position that is placed in the positive direction with respect to the reference point. Assume that feed from division n–1 to n (division interval) is executed.
(Division interval – Actual movement distance) × 2 (Unit of output)
In this case, the above value is defined as the compensation amount.
The following figure (right) contains a machine position that is placed in the negative direction with respect to the reference point. Assume that feed from division point n+1 to n by the division interval is executed. In this case, the following value is defined as the compensation amount: (Division interval + Actual movement distance) × 2 (Unit of output)

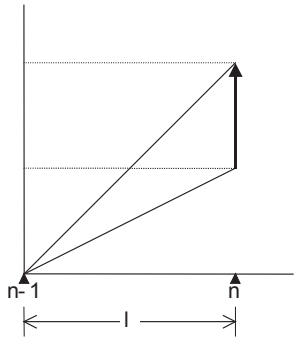


Fig. 2.2

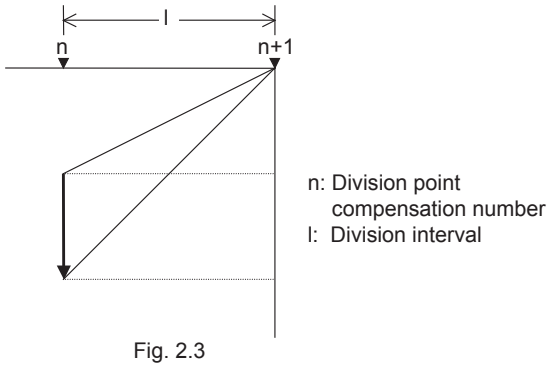


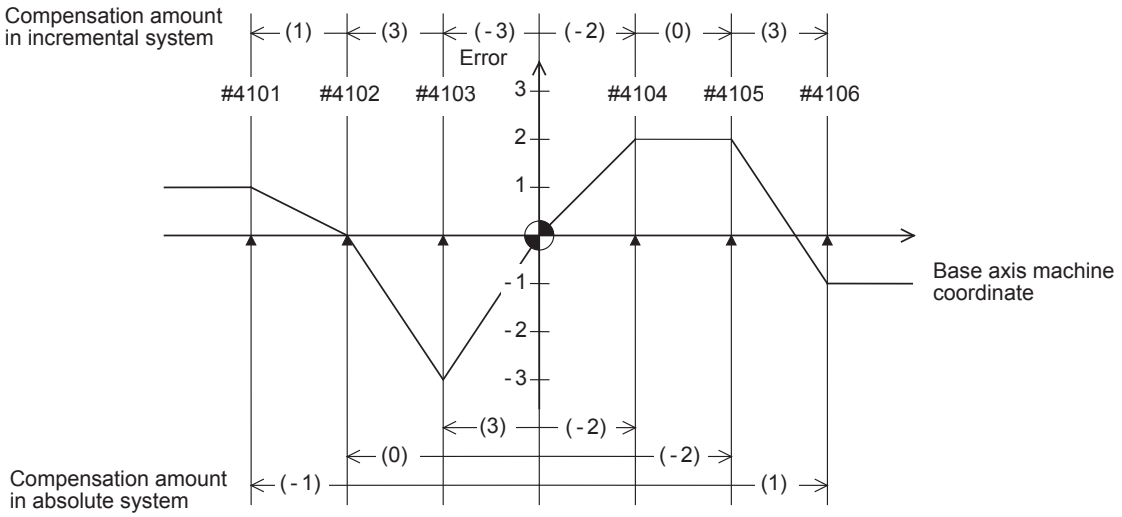
Fig. 2.3

Unit : Unit of output
Range : -128 to 127

(Note) The unit of output is used as the unit of setting.
The actual unit of compensation pulses depends on the compensation

Appendix 1.15.3 Example in Using a Linear Axis as the Base Axis

(1) When "mdvno" or "pdvno" exists at both ends of "rdvno"

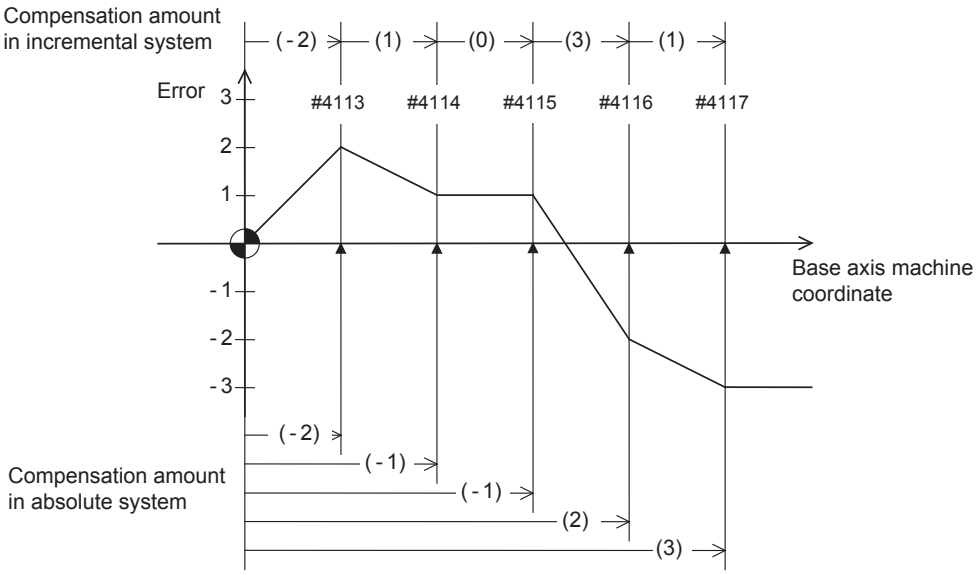


Division point number		#4101	#4102	#4103	#4104	#4105	#4106
Specified machine position		-300.000	-200.000	-100.000	100.000	200.000	300.000
Actual machine position		-299.999	-200.000	-100.003	100.002	200.002	299.999
Compensation amount	Incremental	2	6	-6	-4	0	6
	Absolute	-2	0	6	-4	-4	2

rdvno	4103
mdvno	4101
pdvno	4106

If the setting range (mdvno to "pdvno") is exceeded, the compensation will be based on compensation amount at mdvno or "pdvno".

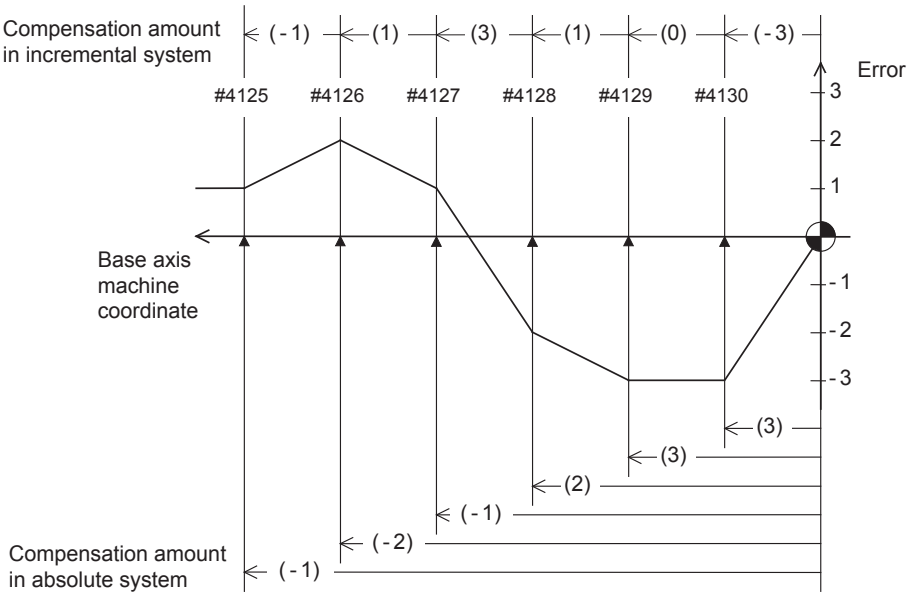
(2) When the range compensated is only the positive range:



Division point number		#4113	#4114	#4115	#4116	#4117		rdvno	4112
Compensation amount	Incremental	-4	2	0	6	2		mdvno	4113
	Absolute	-4	-2	-2	4	6		pdvno	4117

If the machine position exceeds "pdvno", the compensation will be based on the compensation amount at "pdvno". If the machine position is negative in this case, no compensation will be executed.

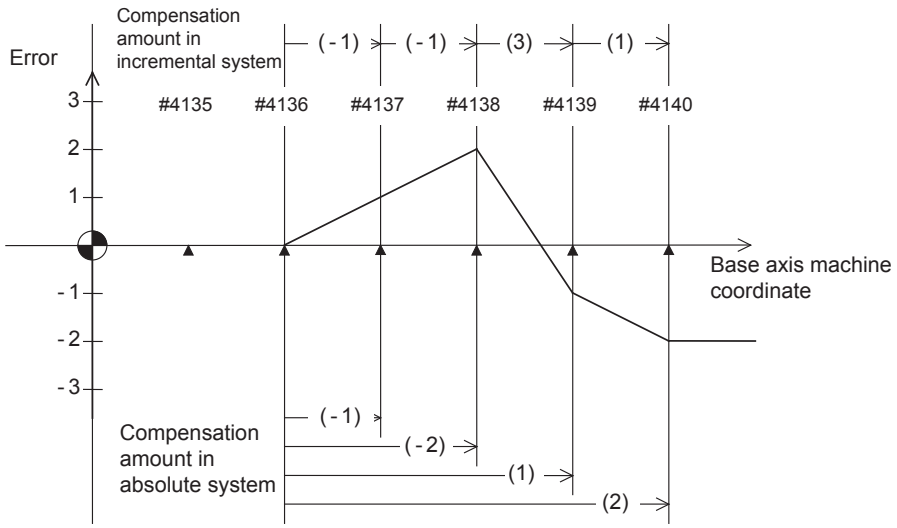
(3) When the range compensated is only the negative range:



Division point number		#4125	#4126	#4127	#4128	#4129	#4130		rdvno	4130
Compensation amount	Incremental	-2	2	6	2	0	-6		mdvno	4125
	Absolute	-2	-4	-2	4	6	6		pdvno	4130

If the machine position exceeds "mdvno", the compensation will be based on compensation amount at "mdvno".

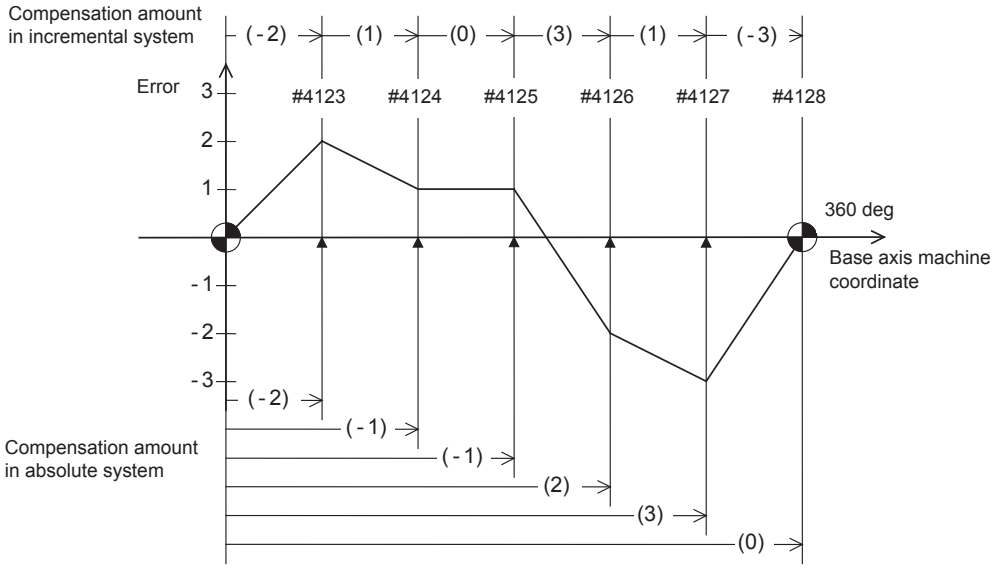
(4) When compensation is executed in a range that contains no reference point:



Division point number		#4135	#4136	#4137	#4138	#4139	#4140		rdvno	4134
Compensation amount	Incremental			-2	-2	6	2		mdvno	4136
	Absolute			-2	-4	2	4		pdvno	4140

In this case, the compensation is executed in the range from "mdvno" to "pdvno".
This setting rule applies also when the compensation is executed in a range which contains negative machine positions and no reference point.

Appendix 1.15.4 Example in Using a Rotation Axis as the Base Axis



Division point number		#4123	#4124	#4125	#4126	#4127	#4128		rdvno	4122
Compensation amount	Incremental	-4	2	0	6	2	-6		mdvno	4123
	Absolute	**-4**	**-2**	**-2**	**4**	**6**	**0**		pdvno	4128

In this case, the sum of the compensation amounts set according to the incremental system is always 0.
For the absolute system, the compensation amount at the terminal point (360 degrees) is always 0.

Appendix 1.16 Position Switch Function Outline

Appendix 1.16.1 Outline

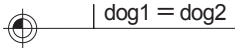
The position switch (PSW) is used as an imaginary dog switch by assigning an axis name and coordinate values that indicate the imaginary dog position to be used instead of the dog switch on the machine axis. When the machine reaches the imaginary dog position, a signal is output to the PLC interface. This imaginary dog switch is called the position switch (PSW).

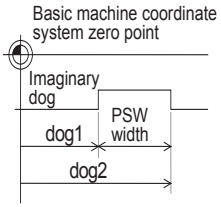
Position switch numbers of PSW1 to PSW16 and signal devices

	<axis>	<dog1>	<dog2>	<check>	1st part system	2nd part system	3rd part system	4th part system	5th part system	6th part system	7th part system
PSW1	7501	7502	7503	7504	X660	X6E0	X760	X7E0	X860	X8E0	X960
PSW2	7511	7512	7513	7514	X661	X6E1	X761	X7E1	X861	X8E1	X961
PSW3	7521	7522	7523	7524	X662	X6E2	X762	X7E2	X862	X8E2	X962
PSW4	7531	7532	7533	7534	X663	X6E3	X763	X7E3	X863	X8E3	X963
PSW5	7541	7542	7543	7544	X664	X6E4	X764	X7E4	X864	X8E4	X964
PSW6	7551	7552	7553	7554	X665	X6E5	X765	X7E5	X865	X8E5	X965
PSW7	7561	7562	7563	7564	X666	X6E6	X766	X7E6	X866	X8E6	X966
PSW8	7571	7572	7573	7574	X667	X6E7	X767	X7E7	X867	X8E7	X967
PSW9	7581	7582	7583	7584	X670	X6F0	X770	X7F0	X870	X8F0	X970
PSW10	7591	7592	7593	7594	X671	X6F1	X771	X7F1	X871	X8F1	X971
PSW11	7601	7602	7603	7604	X672	X6F2	X772	X7F2	X872	X8F2	X972
PSW12	7611	7612	7613	7614	X673	X6F3	X773	X7F3	X873	X8F3	X973
PSW13	7621	7622	7623	7624	X674	X6F4	X774	X7F4	X874	X8F4	X974
PSW14	7631	7632	7633	7634	X675	X6F5	X775	X7F5	X875	X8F5	X975
PSW15	7641	7642	7643	7644	X676	X6F6	X776	X7F6	X876	X8F6	X976
PSW16	7651	7652	7653	7654	X677	X6F7	X777	X7F7	X877	X8F7	X977

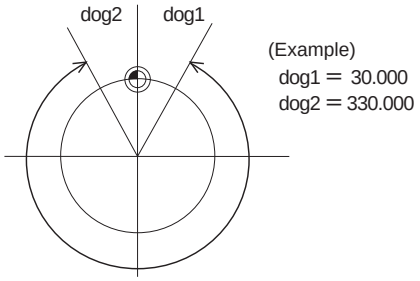
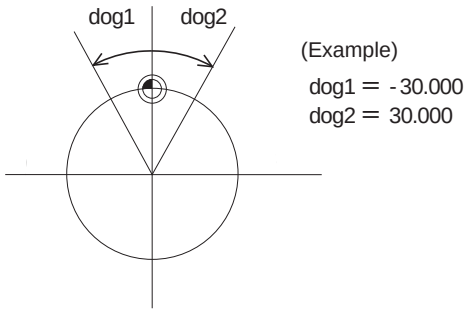
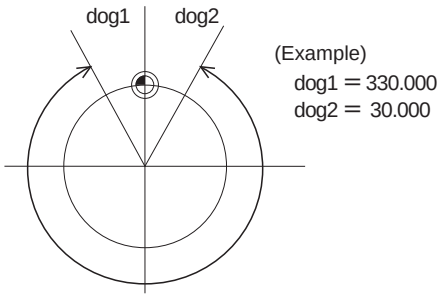
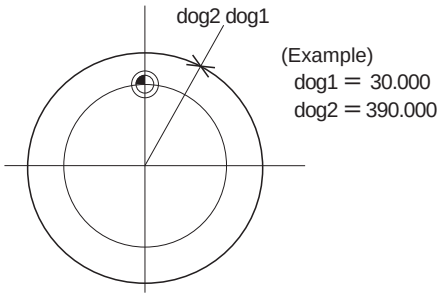
Instead of the dog switch provided on the machine axis, the coordinate values indicating imaginary dog positions (dog1 and dog2) on the coordinate axis of the axis name preset with axis are set with the position switches (PSW1 – PSW16). When the machine reaches the position, the signal is output to the device corresponding to the PLC interface.

Appendix 1.16.2 Example of settings of dog1 and dog2 and operation

Setting of dog1 and dog2	Positions of dog1 and dog2	Description
dog1 < dog2		A signal is output between dog1 and dog2.
dog1 > dog2		A signal is output between dog1 and dog2.
dog1 = dog2		If dog1 equals dog2, the dog1 position triggers a signal.



For the rotary axis:

Setting of dog1 and dog2	Positions of dog1 and dog2	Description
dog1 < dog2		A signal is output between dog1 and dog2.
		A signal is also output when dog1 is negative.
dog1 > dog2		A signal is output between dog1 and dog2.
| dog1 − dog2 | ≧ 360		A signal is kept output when the difference between dog1 and dog2 exceeds 360 degrees.

Appendix 1.16.3 Canceling the Position Switch

To cancel the position switch, enter the number (#75*1) of the position switch to be canceled in # ( ) of the setting area, enter a slash "/" in DATA ( ), then press the INPUT key. This deletes the axis name for the specified position switch, thus invalidating the position switch. The data specified for <dog1> and <dog2> are still stored in memory. To validate the position switch again, therefore, it is enough to specify the axis name only.

Appendix 1.17 Bit Selection Parameters #6449 to #6496"

	Symbol name	7	6	5	4	3	2	1	0
0	#6449 R4624 L	NC card Controller thermal alarm disable	Setting display unit thermal alarm disable	–	Automatic interlock invalid while battery alarm disable	Counter C retention	Integrating timer T retention	PLC counter program enabled	PLC timer program enabled
1	#6450 R4624 H		–	Alarm / operator change	Full screen display of message	–	Operator message enabled	1: R system / 0: F system	Alarm message enabled
2	#6451 R4625 L	–	–	–	–		–	–	F0 screen
3	#6452 R4625 H	–		–		Counter (fixed) retention	Integrating timer (fixed) retention		–
4	#6453 R4626 L	–	–	–	–	–		Message language change code	
5	#6454 R4626 H								Macro I/F for respective part system
6	#6455 R4627 L	–	–	–	–	–	–	–	–
7	#6456 R4627 H	–	–	–	–	–	–	–	–
8	#6457 R4628 L	High-speed input specification 1 (Note4)							
9	#6458 R4628 H	High-speed input specification 2							
A	#6459 R4629 L	High-speed input specification 3 (Spare)							
B	#6460 R4629 H	High-speed input specification 4 (Spare)							
C	#6461 R4630 L	High-speed output specification 1 (Note4)							
D	#6462 R4630 H	High-speed output specification 2							
E	#6463 R4631 L	High-speed output specification 3 (Spare)							
F	#6464 R4631 H	High-speed output specification 4 (Spare)							

(Note 1) Be sure to set the bits indicated "-" or blank to "0".

(Note 2) Parameters #6481 to #6496 are reserved for debugging by Mitsubishi.

(Note 3) High-speed input specification is valid for only the devices allocated to remote I/O.
Note that the high-speed input specification is invalid for the devices which are allocated to the input signals from network such as HR863 Q-bus bridge or H865 CC-Link.

	Symbol name	7	6	5	4	3	2	1	0
0	#6465 R4632 L	–	–	–	–	–	–	–	–
1	#6466 R4632 H	–	–	–	–	–	–	–	–
2	#6467 R4633 L	–	–	–	–	–	–	–	–
3	#6468 R4633 H								
4	#6469 R4634 L			Reserved for the system.				–	NC alarm output disable
5	#6470 R4634 H								
6	#6471 R4635 L	–	–	–	–	–	–	–	–
7	#6472 R4635 H	–	–	–	–	–	–	–	–
8	#6473 R4636 L	–							–
9	#6474 R4636 H								
A	#6475 R4637 L								
B	#6476 R4637 H								
C	#6477 R4638 L								
D	#6478 R4638 H								
E	#6479 R4639 L								
F	#6480 R4639 H								

(Note 1) Be sure to set the bits indicated "-" and blank to "0".

(Note 2) Parameters #6481 to #6496 are reserved for debugging by Mitsubishi.

Appendix 1 Explanation of Parameters

Appendix 2

Explanation of Alarms

Appendix 2.1 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.

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.

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 Sensor signal illegal ON 0019

Details

The sensor signal was already ON when the "tool length measurement 1" signal was validated.
The sensor signal turned ON when there was no axis movement after the "tool length measurement 1" signal was validated.
The sensor signal turned ON at a position within 100 μm from the final entry start position.

Remedy

- Disable the "tool length measurement 1" signal and move the axis in a safe direction.
- Disabling the sensor signal also clears the operation alarm.

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

M01 Ref point retract invalid 0020

Details

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

Remedy

- Execute reference position return.

M01 Tool ofs invld after R-pnt 0021

Details

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

Remedy

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

M01 R-pnt ret invld at abs pos alm 0024

Details

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

Remedy

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

M01 R-pnt ret invld at zero pt ini 0025

Details

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

Remedy

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

M01 High-accuracy skip disabled 0028

Details

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

Remedy

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

M01 Hi-ac skip coord retrieval err 0029

Details

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

Remedy

- Check the wiring.
- Check the parameters.

M01 Now skip on 0030

Details

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

Remedy

- Increase the skip retract amount.

M01 No skip 0031

Details

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

Remedy

- Check whether the measurement target has moved.

M01 Movement prohibited during tool retract 0035

Details

An axis movement was attempted from the tool retract position.
The movement was attempted by a manual command in the tool return.

Remedy

It is not allowed to move an axis arbitrarily from the tool retract position. Take the following steps to move the axis.

- Cancel the program execution by reset.
- Use the tool escape and retract function and let the axis escape from the tool retract position.

The interruption by a manual command is not allowed in a tool return. Take the following step to move the axis.

- Cancel the program execution by reset.

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 No spindle select signal 0053

Details

Synchronous tapping command was issued when the "spindle selection" signals for all spindles were OFF in the multiple-spindle control II.

Remedy

- Turn ON the "spindle selection" signal for the tapping spindle before performing the synchronous tapping command.

M01 No spindle serial connection 0054

Details

Synchronous tapping command was issued in the multiple-spindle control II, while the spindle with the "spindle selection" signal ON was not serially connected.

Remedy

- Make sure the "spindle selection" signal for the spindle is ON.
- Consider the machine construction when issuing the command.

M01 Spindle fwd/rvs run para err 0055

Details

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

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

Remedy

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

M01 Tap pitch/thread number error 0056

Details

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

Remedy

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

M01 Wait for tap retract 0057

Details

The axis travel command is interlocked 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 R-pos offset value illegal 0065

Details

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

Remedy

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

M01 R-pos scan distance exceeded 0066

Details

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

Remedy

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

M01 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_leng (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 Reverse run impossible 0119

Details

Either of the following conditions occurred:

- there is no block to run backward.
- eight blocks has been continued without any travel command.

Remedy

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

M01 In synchronous correction mode 0120

Details

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

Remedy

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

M01 No synchronous control option 0121

Details

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

Remedy

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

M01 Computer link B not possible 0123

Details

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

Remedy

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

M01 X/Z axes simultaneous prohibit 0124

Details

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

Remedy

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

M01 Rapid override zero 0125

Details

The RAPID TRAVERSE OVERRIDE switch on the machine operation panel is set to "0".

Remedy

- Set the RAPID TRAVERSE OVERRIDE switch to a value other than "0" to clear the error.
- If 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.

M01 Program restart machine lock 0126

Details

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

Remedy

- Cancel the machine lock and resume the operation.

M01 Rot axis parameter error 0127

Details

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

Remedy

- Correct the rotary axis configuration parameters.

M01 Restart pos return incomplete 0128

Details

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

Remedy

- Perform restart position return manually.
- Enable "#1302 AutoRP (Automatic return by program restart)" before executing the automatic start.

M01 PLC interruption impossible 0129

Details

After the automatic startup, the "PLC interrupt" signal was turned ON during buffer correction, program restart, arbitrary reverse run, tool escape and return, high-speed high-accuracy control II, or NURBS interpolation.

Remedy

- Turning OFF or resetting the "PLC interrupt" signal will clear the alarm.

M01 Restart posn return disabled 0130

Details

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

Remedy

- Correct the program restart position.

M01 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 Aux axis changeover error 0166

Details

One of the following attempts was made on an axis that can be switched to NC/auxiliary axis.

- A command was issued to an auxiliary axis from machining program.
- When there were more than one NC axis having a same name, a command was issued to those axes from machining program.
- "NC axis control selection" signal was turned OFF while the NC axis was in motion.
- "NC axis control selection" signal was turned ON while the auxiliary axis was in motion.

Remedy

- Turn ON the "NC axis control selection" signal to set the auxiliary axis to NC axis when issuing a command to the axis from machining program.
- When more than one axis have a same name, let only one of the axes work as an NC axis.
- Do not change the "NC axis control selection" signal while the axis is in motion.

M01 Illegal operation during tool tip control 0170

Details

Illegal operation was attempted during tool tip center control.

Remedy

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

M01 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 Spindle in-use by synchro tap 1007

Details

The spindle is being used in synchronized tapping.

Remedy

- Cancel the synchronized tapping.

M01 SP-C ax ctrl runs independntly 1026

Details

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

Remedy

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

M01 Synchronization mismatch 1030

Details

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

Remedy

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

M01 Multiple C axes select invalid 1031

Details

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

Remedy

- Correct the parameter settings and program.

M01 Tap retract Sp select illegal 1032

Details

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

Remedy

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

M01 Sp-Sp polygon cut interlock 1033

Details

Cutting feed is in wait state until synchronization is completed.

Remedy

- Wait for the synchronization to end.

M01 Mixed sync ctrl prmtr illegal 1034

Details

Mixed synchronization control with exceeding number of control axes was attempted.
Mixed synchronization control with duplicate axis address was attempted.

Remedy

- Correct the parameter settings for mixed synchronization control.

M01 Mixed sync ctrl disable modal 1035

Details

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

- During nose R compensation mode
- During pole coordinate interpolation mode
- During cylindrical interpolation mode
- During balance cut mode
- During fixed cycle machining mode
- During facing turret mirror image

Remedy

- Correct the program.

M01 Synchro ctrl setting disable 1036

Details

"Synchronous control operation method" was set (with R2589) when the mode was not the C axis mode.
"Synchronous control operation method" was set (with R2589) in the zero point not set state.
Mirror image is disabled.
External mirror image or parameter mirror image was commanded during facing turret mirror image.

Remedy

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

M01 Synchro start/cancel disable 1037

Details

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

Remedy

- Correct the program and parameters.

M01 Move cmnd invld to synchro ax 1038

Details

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

Remedy

- Correct the program.

M01 No spindle speed clamp 1043

Details

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.

M80 POSITION ERROR

Details

An axis position is illegal.
An alarm is displayed (AL4 is output) and a block stop is applied on the machining program.
When the block stop is not allowed in the thread cutting cycle and the like, the stop is applied at the next position where allowed.

Remedy

Carry out reset. Then confirm that the system starts the operation. If the alarm is displayed again, turn ON the emergency stop switch and turn the NC power OFF and ON.

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.

M91 INVALID MEASUR. 0002

Details

Data is over the range
The measurement result exceeds the tool data setting range.

Remedy

Correct the settings of "#2015 tlml- (Negative direction sensor of tool setter)" and "#2016 tlml+ (Positive direction sensor of tool setter or TLM standard length)".

M91 INVALID MEASUR. 0003

Details

No corresponding No.
No measurement tool No. has been set.
The registered No. is out of the specifications.

Remedy

Correct the measurement tool No.

M91 INVALID MEASUR. 0045

Details

Measurement axis illegal
Sensor has been turned ON while two or more axes are moving.

Remedy

Move a single axis when the sensor is contacted.

M91 INVALID MEASUR. 0046

Details

Measurement axis has not returned to reference position
Reference position return has not been executed on a measurement axis in an incremental system.

Remedy

Carry out the reference position return on the measurement axis before measuring the tool.

M91 INVALID MEASUR. 0089

Details

Sensor signal illegal ON
Sensor has already been ON when TLM mode is turned ON. The travel amount was so small that the tool contacted the sensor.

Remedy

All axes are interlocked when this alarm has occurred.
Turn the TLM mode OFF or use the interlock cancel signal to move the tool off the sensor.
Ensure at least 0.1mm for the movement to the sensor.

M91 INVALID MEASUR. 9000

Details

Speed at contact is below minimum
The tool has contacted the sensor at the lower speed than set in "#1508 TLM_Fmin (Minimum speed toward tool setter)".

Remedy

Correct the feed rate to move the tool to the sensor.

M91 INVALID MEASUR. 9001

Details

Speed at contact is over maximum
The tool has contacted the sensor at the higher speed than set in "#1509 TLM_Fmax (Maximum speed toward tool setter)".

Remedy

Correct the feed rate to move the tool to the sensor.

M91 INVALID MEASUR. 9002

Details

Change of compensation No. or sub-side selection during measurement
A compensation No. or sub-side valid signal state has been changed while a sensor signal is ON or a compensation amount is being written.

Remedy

Carry out the measurement again.

M91 INVALID MEASUR. 9003

Details

Error on response timing of sensor signal
A compensation No. has been changed at the same time as a sensor's response.

Remedy

Carry out the measurement again.

M92 IGNORE INT.LOCK

Details

Manual tool length measurement Interlock temporally canceled
"M01 Operation error 0005" and "M01 Operation error 0019", which occur at manual tool length measurement, are temporally canceled. When a tool has contacted a sensor and "M01 Operation error 0019" has occurred, tool escape is enabled by temporarily turning ON the interlock cancel request. This alarm notifies that the interlock is disabled in the meantime.

Remedy

After carrying out the tool escape from the sensor, turn OFF the interlock temporary cancel signal for manual tool length measurement.

Appendix 2.2 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.

(Note1) "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.

(Note2) "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.

(Note3) "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 0001). "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, tape, MDI).

T01 Operation mode duplicated 0108

Details

Two or more automatic operation modes have been selected.

Remedy

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

T01 Operation mode changed 0109

Details

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

Remedy

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

T01 Tape search execution 0110

Details

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

Remedy

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

T01 Cycle start prohibit 0111

Details

Automatic start is disabled because restart search is in execution.

Remedy

- Execute automatic start after the restart search is completed.

T01 CNC overheat 0113

Details

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

Remedy

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

T01 Cycle st. prohibit(Host comm.) 0115

Details

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

Remedy

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

T01 Cycle st prohibit(Battery alm) 0116

Details

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

Remedy

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

T01 R-pnt offset value not set 0117

Details

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

Remedy

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

T01 Cycle start prohibit 0118

Details

Tool retract position signal OFF
The axis was moved from the tool retract position. Tool retract position reached signal is OFF.

Remedy

Once the axis has been moved off the tool retract position, resuming the program is not possible.
Cancel the program by reset and then execute it from the start.

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 Cycle start prohibit 0142

Details

In manual coordinate system setting
Automatic start is not allowed during the manual coordinate system setting.

Remedy

The system restarts after either of the manual coordinate system setting completion signal or the error end signal has been turned ON.

T01 In manual measurement 0143

Details

Automatic start is disabled because manual measurement is in execution.

Remedy

- Execute automatic start after the manual measurement is completed.

T01 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.

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

Details

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

Remedy

- Enter the decryption code and turn the power ON again.

T02 H/W stroke end axis exists 0201

Details

An axis is at the stroke end.

Remedy

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

T02 S/W stroke end axis exists 0202

Details

An axis is at the stored stroke limit.

Remedy

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

T02 Reset signal ON 0203

Details

The reset has been entered.

Remedy

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

T02 Auto operation pause signal ON 0204

Details

The "feed hold" switch is ON.

Remedy

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

T02 Operation mode changed 0205

Details

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

Remedy

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

T02 Acc/dec time cnst too large 0206

Details

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

Remedy

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

T02 Abs posn detect alarm occurred 0215

Details

An absolute position detection alarm occurred.

Remedy

- Clear the absolute position detection alarm.

T02 Aux axis changeover error 0220

Details

A travel command was issued to an auxiliary axis.

Remedy

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

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.

T03 Aux axis changeover error 0330

Details

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

Remedy

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

T04 Collation stop 0401

Details

Collation stop occurred.

Remedy

- Execute the automatic start to resume the automatic operation.

T10 Fin wait 0200

Details

Waiting for completion of G11
G11 was issued while an axis was moving.

Remedy

Resume the operation after G11 has been completed.

T10 Fin wait 0ooo

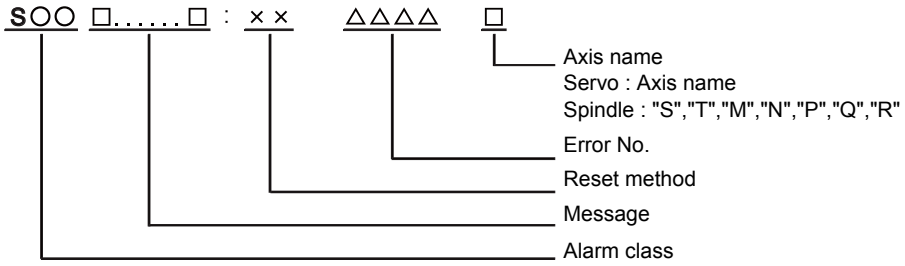
Details

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).
Display format of completion wait factor
0__ __ __
(a)(b)(c)
Each of the hexadecimal numbers (a), (b) and (c) indicates the following details.
(a)
bit0: In dwell execution
bit3: Unclamp signal wait (Note 1)
(b)
bit0: Waiting for spindle position to be looped
bit3: Door open (Note 2)
(c)
bit0: Waiting for MSTB completion
bit1: Waiting for rapid traverse deceleration
bit2: Waiting for cutting speed deceleration
bit3: Waiting for spindle orientation to com
(Note 1) This shows the wait state for the unclamp signal's ON/OFF for the index table indexing.
(Note 2) This shows the door open state caused by the door interlock function.

Appendix 2.3 Servo/Spindle Alarms (S)

Appendix 2.3.1 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) For the details of servo alarms, refer to your drive unit's instruction manual.

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

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, OSA105-ET2, OSA166, OSA166-ET2(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(SONY) 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.

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, OSA105-ET2, OSA166, OSA166-ET2(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(SONY) 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.

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, OSA105-ET2, OSA166, OSA166-ET2(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(SONY) Encoder mismatch 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.

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, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) ROM/ RAM error
- MPRZ Series(MHI) Scale breaking

[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, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) CPU error
- MPRZ Series(MHI) Absolute value detection fault

[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, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Overspeed
- SR75, SR85, SR77, SR87, RU77(SONY) 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.

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, RCN223M, RCN227M, RCN727M, RCN827M, EIB Series(HEIDENHAIN) Absolute position data error
- MPRZ Series(MHI) Gain fault
- SR75, SR85, SR77, SR87, RU77(SONY) 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)]
- 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(SONY) 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.

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, OSA105-ET2, OSA166, OSA166-ET2(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(SONY) 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, OSA105-ET2, OSA166, OSA166-ET2(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(SONY) 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, OSA105-ET2, OSA166, OSA166-ET2(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(SONY) Encoder mismatch 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

[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 safety observation 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

[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(SONY) 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(SONY) 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(SONY) 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

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 Sfty obsrvation: Cmd spd err

Details

A commanded speed exceeding the safe speed was detected in the safety observation mode.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

005D Sfty obsrvation: 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 safety observation mode. Otherwise, door open state was detected in normal mode.
- Servo stop method: Deceleration stop enabled
- Spindle stop method: Deceleration stop enabled

005E Sfty obsrvation: FB speed err

Details

A motor speed exceeding the safe speed was detected in the safety observation 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.
- LED display: 1

0062 Pw sply: Frequency error

Details

The input power supply frequency increased above the specification range.
- LED display: 2

0066 Process error

Details

An error occurred in the process cycle.
- LED display: 6

0067 Pw sply: Phase interruption

Details

An open-phase condition was detected in input power supply circuit.
- LED display: 7

0068 Pw sply: Watchdog

Details

The system does not operate correctly.
- LED display: 8

0069 Pw sply: Grounding

Details

The motor power cable is in contact with FG (Frame Ground).
- LED display: 9

006A Pw sply: Ext contactor weld

Details

A contact of the external contactor is welding.
- LED display: A

006B Pw sply: Rush relay welding

Details

An error was detected in the rush circuit.
- LED display: b

006C Pw sply: Main circuit error

Details

An error was detected in charging operation of the main circuit capacitor.
- LED display: C

006D Pw sply: Parameter error

Details

An error was detected in the parameter sent from the drive unit.
- LED display: d

006E Pw sply: Memory 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.
- LED display: E

006F Power supply error

Details

No power supply is connected to the drive unit, or a communication error was detected.
- LED display: F

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.
- LED display: G

0071 Pw sply: Instant pwr interrupt

Details

The power was momentarily interrupted.
- LED display: H

0072 Pw sply: Fan stop

Details

A cooling fan built in the power supply unit stopped, and overheat occurred in the power module.
- LED display: I

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.
- LED display: J

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.
- LED display: L

0076 Pw sply: Ext EMG stop set err

Details

The rotary switch setting of external emergency stop is not correct, or a wrong external emergency stop signal is input.
- LED display: M

0077 Pw sply: Power module overheat

Details

Thermal protection function in the power module has started its operation.
- LED display: n

Appendix 2.3.2 Initial Parameter Errors (S02)

S02 Initial parameter error : PR 2201-2264 (Axis name)

Details

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

Remedy

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

S02 Initial parameter error : PR 2301 (Axis name)

Details

The number of constants to be used in the following functions is too large:

- Electronic gears
- Position loop gain
- Speed feedback conversion

Remedy

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

S02 Initial parameter error : PR 2302 (Axis name)

Details

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

Remedy

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

S02 Initial parameter error : PR 2303 (Axis name)

Details

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

Remedy

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

S02 Initial parameter error : PR 2304 (Axis name)

Details

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

Remedy

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

S02 Initial parameter error : PR 2305 (Axis name)

Details

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

Remedy

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

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

Details

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

Remedy

Check the descriptions for the appropriate spindle parameters and correct them.
Refer to Alarm No.37 in Spindle Drive Maintenance Manual.

Appendix 2.3.3 Parameter Errors (S51)

S51 Parameter error 2201-2264 (Axis name)

Details

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

Remedy

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

S51 Parameter error 13001-13256 (Axis name)

Details

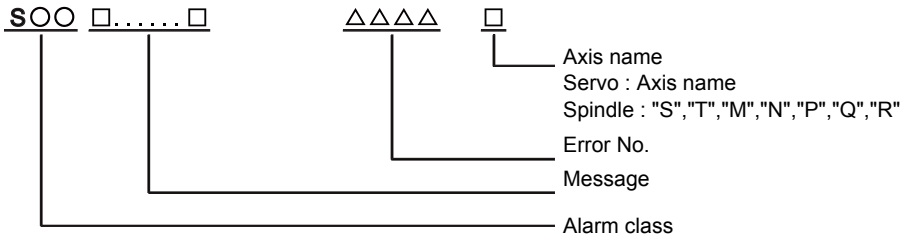
Spindle parameter setting data is illegal.
The alarm No. is the No. of the spindle parameter where the warning occurred.

Remedy

Check the descriptions for the appropriate spindle parameters and correct them.
Refer to Spindle Drive Maintenance Manual.

Appendix 2.3.4 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.
- Reset method: Automatically reset once the cause of the warning is removed.

00A3 DisCode ref chk: init s-up war

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.
- 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.
- LED display: P

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.
- LED display: q

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.
- LED display: r

00EE Power supply: 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.
- LED display: u

Appendix 2.4 MCP Alarms (Y)

(Note1) "Y02" alarms are displayed as "Y02 System alarm"with the error number. Error number is the four digit number displayed displayed after error name(start from 0050). "Y02"alarms are listed in ascending order in this manual.

(Note2) "Y20" alarms are displayed as "Y20 Safety observation alarm"with the error number. Error number is the four digit number displayed displayed after error name(start from 0001). "Y20"alarms are listed in ascending order in this manual.

(Note3) "Y21" warnings are displayed as "Y21 Safety observation warning"with the error number. Error number is the four digit number displayed displayed after error name(start from 0001). "Y21"warnings are listed in ascending order in this manual.

(Note4) "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

Details

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

Remedy

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

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".

Y07 Too many axes connected 0000 - Exceeded number of axes

Details

The number of axes connected to CNC has exceeded the maximum number of connectable axes.
The exceeded number of axes per channel is displayed as alarm No.

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.
- 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".

Y08 Too many drive units connected 0000 - 00FF

Details

The number of drive units connected to each channel exceeds 8.
The exceeded number of drive units per channel is displayed as alarm No.

Remedy

Remove drive units from the channel whose alarm No. is other than "0" for the number displayed as the alarm No. Keep the number of connected drive units to 8 or less.

(Note 1) The drive unit is not counted when all the axes connected to it are invalid.

(Note 2) If this alarm occurs, the alarm "Y03 Message: Drive unit unequipped" will not occur.

(Note 3) The alarm "Y07 Too many axes connected" and "Y09 Too many axisno connected" are displayed taking precedence over this alarm.

Y09 Too many axisno connected Exceeded number of axes

Details

The No. of the axis (drive unit's rotary switch No.) connected to CNC is bigger than the maximum number of connectable axes.

Remedy

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.

Y12 No commu. with axis drv unit

Details

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

Remedy

Replace the drive unit with that supports the option.

Y13 No commu. with sp drv unit

Details

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

Remedy

Replace the drive unit with that supports the option.

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.

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 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 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 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 newer than Ver. C4, 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.

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.

Y51 Parameter G0tL illegal 0001

Details

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

Remedy

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

Y51 Parameter G1tL illegal 0002

Details

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

Remedy

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

Y51 Parameter G0t1 illegal 0003

Details

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

Remedy

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

Y51 Parameter G1t1 illegal 0004

Details

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

Remedy

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

Y51 Parameter grid space illegal 0009

Details

The grid space is illegal.

Remedy

Correct "#2029 grspc(Grid interval)".

Y51 Parameter stapt1-4 illegal 0012

Details

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

Remedy

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

Y51 Slave axis No. illegal 0014

Details

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

Remedy

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

Y51 Parameter skip_tL illegal 0015

Details

The time constant has 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 No hi-accu acc/dec t-const ext 0020

Details

There is no expansion option for the high-accuracy acceleration/deceleration time constant.

Remedy

Set "#1207 G1btL (Time constant)" to a value within the setting range with no expansion specification for the extended high-accuracy time constant.

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_leng (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").

Y90 No spindle signal 0001-0007

Details

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

Remedy

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

Appendix 2.5 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 EZSocket.
- 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.

Z40 Format mismatch

Details

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

Remedy

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

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.
0002: The temperature around the communication terminal (setting and display unit) is high.
0003: The temperature in the control unit and around the communication terminal (setting and display 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.

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 __ __ __ __ __ __ __ __
(a) (b) (c) (d)(e) (f) (g) (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.)

Z58 ROM write not completed

Details

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

Remedy

- Write the machine tool builder macro program to FROM.

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

Z59 Acc/dec time cnst too large

Details

Acceleration and deceleration time constants are too large.
(This alarm 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.

Z60 Fieldbus communication error n1 n2 n3 n4

Details

A communication error has occurred on the Fieldbus communication with HN571/HN573/HN575.
[n1 :Shows state of the master channel (shown in hexadecimal number)]
00 :Offline In initializing
40 :Stop Cutting I/O communication
80 :Clear Resetting output data of each slave by sending 0 data.
C0 :In operation I/O In I/O communication
[n2 :Shows error state (shown in hexadecimal number)]
bit0 :Control error Parameter error
bit1 :Auto clear error Communication with all the slave channels was cut because a communication with one slave channel had an error.
bit2 :Non exchange error Slave channel with communication error is found.
bit3 :Fatal error The communication cannot be continued because sever network failure exists.
bit4 :Event error Short-circuit was found on the network.
bit5 :Not ready CNC communication is not ready.
bit6 :Time out error Time out was detected in communication with each channel.
bit7 :Not used
[n3 :Shows error No. (shown in hexadecimal number)]

- Error in master channel (when remote address with an error is FF (hexadecimal number))
  0 :No error Operating normally
  32 :No USR_INT Damage in HN571. Replace HN571.
  33 :No global data field
  34 :No FDL-task
  35 :No PLC-task
  37 :Master parameter incorrect
  39 :Slave parameter incorrect
  3C :Data offset exceeding allowable set value received. Check the configuration setting.
  3D :Slave data send range overlap
  3E :Slave data receive range overlap
  3F :Not set data hand shake Damage in HN571. Replace HN571.
  40 :RAM range exceeded
  41 :Slave parameter data set illegal
  CA :No segment
  D4 :Data base read illegal Download the configuration data again.
  D5 :Operating system illegal Damage in HN571. Replace HN571.
  DC :Watch dog error
  DD :Hand shake mode No data communication by 0
  DE :Master auto clear mode When setting auto clear mode, the auto clear mode was performed because one slave was not able to connect in run time.
- Error in slave channel (when remote address with an error is other than FF (hexadecimal number))
  Check the configuration of slave channel in which error has occurred. Check if there is any short-circuit in wire to bus.
  2 :Station overflow reported
  3 :Station stopped responding to master command
  9 :No slave required responding data
  11 :No station respond
  12 :No master to logical token ring
  15 :Illegal parameter requested

[n4 : Shows slave No. where communication error has occurred. (shown in hexadecimal number)]
'FF' means an error in master channel.

Z64 Valid term soon to be expired xx

Details

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

Remedy

- Obtain a decryption code by making a payment. Enter the decryption code.

Z65 Valid term has been expired

Details

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

Remedy

- Obtain a decryption code by making a payment. Enter the decryption code.

Z67 CC-Link communication error

Details

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

Remedy

- Refer to "List of Messages" in CC-Link (Master/Slave) Specification manual (BNP-C3039-214).

Z68 CC-Link unconnected

Details

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

Remedy

- Connect the cable.
- Check for any broken cables.

Z69 External link error 2

Details

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

Remedy

Install the MELSEC-Q interface expansion module.

Z69 External link error 3

Details

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

Remedy

Correct the I/O No.

Z69 External link error 4

Details

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

Remedy

Correct the transfer size.

Z69 External link error 5

Details

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

Remedy

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

Z69 External link error 6

Details

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

Remedy

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

Z69 External link error 7

Details

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

Remedy

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

Z69 External link error 8

Details

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

Remedy

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

Z69 External link error 9

Details

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

Remedy

Correct the head address of the buffer memory.

Z69 External link error 10

Details

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

Remedy

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

Z69 External link error 11

Details

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

Remedy

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

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.

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.

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.

Appendix 2.6 Absolute Position Detection System Alarms (Z7*)

(Note1) "Z70"alarms are displayed as "Z70 Abs data error"with the error number. Error number is the four digit number displayed displayed after error name(start from 0001). "Z70"alarms are listed in ascending order in this manual.

(Note2) "Z71"alarms are displayed as "Z71 Abs encoder failure"with the error number. Error number is the four digit number displayed 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 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.

Appendix 2.7 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, 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 WAIT

Details

The preparation sequence is not sent from the master station. Otherwise, the contents of the received preparation sequence are inconsistent with those of the parameters, so that the usual sequence cannot be started.

(Note) When "LINK" is also entered for the PLC serial link, refer to "Note" in the section, "LINK".

Remedy

- Check that the CC-Link card switch setting and wiring as well as the external sequencer transmission are normal.
- Check the diagnostic screen for link communication errors.

EMG Emergency stop XTEN

Details

The CC-Link card is operating incorrectly.
Switch/parameter settings for the CC-Link card are incorrect.

Remedy

- Replace the CC-Link card.
- Correct the switch/parameter settings for the CC-Link card.

EMG Emergency stop LAD

Details

The sequence program has an illegal code.

Remedy

- Correct any illegal device Nos. or constants in the sequence program.

EMG Emergency stop CVIN

Details

The "emergency stop" signal for power supply is significant (open) because the external emergency stop function for power supply is enabled.

Remedy

- Cancel the "emergency stop" signal.
- Check for any broken wires.

EMG Emergency stop MCT

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.

Appendix 2.8 Auxiliary Axis Operation Errors (M)

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 operation parameter's feedrate setting is zero.
The operation parameter feedrate setting is zero.
Or, the override is valid, and the override value is zero.

Remedy

- 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.

Appendix 2.9 Built-in PLC Alarms (U)

U10 Illegal PLC 0400 (Sub status)

Details

The instruction being used is not supported by built-in PLC. 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 built-in PLC.

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 built-in PLC.

Remedy

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

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.

Appendix 2.10 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).
- 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 stored data in the file register designated by the instruction exceeds the usable range. If not so, no file register is set. The ranges of stored data overlap among the devices designated by the instruction.
- The stored data in the file register designated by the instruction exceeds the usable range. If not so, no file register is set. The number of points of devices designated by the instruction exceeds the usable 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 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.)

Appendix 2.11 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.

Appendix 2.12 Program Errors (P)

(Note) Program error messages are displayed in abbreviation on the screen.

P10 No. of simultaneous axes over

Details

The number of axis addresses commanded in a block is exceeds the specifications.

Remedy

- Divide the alarm block command into two.
- Check the specifications.

P11 Illegal axis address

Details

The axis address commanded by the program does not match any of the ones set by the parameter.

Remedy

- Correct the axis names in the program.

P20 Division error

Details

The issued axis command cannot be divided by the command unit.

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 error

Details

The number of holes per character on the paper tape is even for EIA code and odd for ISO code.

Remedy

- Check the paper tape.
- Check the tape puncher and tape reader.

P31 Parity V error

Details

The number of characters per block on the paper tape is odd.

Remedy

- Make the number of characters per block on the paper tape even.
- Set the parameter parity V selection OFF.

P32 Illegal address

Details

An address not listed in the specifications has been used.

Remedy

- Correct the program address.
- Correct the parameter settings.
- Check the specifications.

P33 Format error

Details

The command format in the program is not correct.

Remedy

- Correct the program.

P34 Illegal G code

Details

The commanded G code is not in the specifications.
An illegal G code was commanded during the coordinate rotation command (G68).

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 Setting value range 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 error

Details

"EOR" has been read during tape and memory mode.

Remedy

- Enter the M02 and M30 command at the end of the program.
- Enter the M99 command at the end of the subprogram.

P37 O, N number zero

Details

"0" has been specified for program or sequence No.

Remedy

- Designate program Nos. within a range from 1 to 99999999.
- Designate sequence Nos. within a range from 1 to 99999.
- Add M02 or M03 to the end of the program running in FTP operation.

P38 No spec: Add. Op block skip

Details

"/n" has been issued while the optional block skip addition is not in the specifications.

Remedy

- Check the specifications.

P39 No specifications

Details

- A non-specified G code was commanded.
- The selected operation mode is out of specifications.

Remedy

- Check the specifications.

P40 Pre-read block error

Details

The interference check is disabled due to an error in the pre-read block in tool radius compensation.

Remedy

- Correct the program.

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.

P49 Invalid restart search

Details

- Restart search was attempted for the 3-dimensional circular interpolation.
- Restart search was attempted during the cylindrical interpolation, polar coordinate interpolation, or tool tip center control.
- Restart search was attempted from a block (G68.2) during the inclined surface machining mode or from the inclined surface machining mode cancel command block (G69).

Remedy

- Correct the program.
- Correct the restart search position.

P50 No spec: Inch/Metric change

Details

Inch/Metric changeover (G20/G21) command was issued while the function is out of specifications.

Remedy

- Check the specifications.

P60 Compensation length over

Details

The commanded movement distance is excessive (over 2^{31}).

Remedy

- Correct the command range for the axis address.

P61 No spec: Unidirectional posit.

Details

Unidirectional positioning (G60) was commanded while the function is out of specifications.

Remedy

- Check the specifications.

P62 No F command

Details

- No feed rate command has been issued.
- There is no F command in the cylindrical interpolation or polar coordinate interpolation immediately after the G95 mode is commanded.

Remedy

- The default movement modal command at power ON is G01. This causes the machine to move without a G01 command if a movement command is issued in the program, and an alarm results. Use an F command to specify the feed rate.
- Specify F with a thread lead command.

P63 No spec: High-speed machining

Details

High-speed machining cancel (G5P0) was commanded while the high-speed machining is out of specifications.

Remedy

- Check the specifications.

P65 No spec: High speed mode 3

Details

Remedy

- Check whether the specifications are provided for the high-speed mode III.

P70 Arc end point deviation large

Details

- There is an error in the arc start and end points as well as in the arc center.
- The difference of the involute curve through the start point and the end point is large.
- When arc was commanded, one of the two axes configuring the arc plane was a scaling valid axis.

Remedy

- Correct the numerical values of the addresses that specify the start and end points, arc center as well as the radius in the program.
- Correct the "+" and "-" directions of the address numerical values.
- Check for the scaling valid axis.

P71 Arc center error

Details

- An arc center cannot be obtained in R-specified circular interpolation.
- A curvature center of the involute curve cannot be obtained.

Remedy

- Correct the numerical values of the addresses in the program.
- Correct the start and end points if they are inside of the base circle for involute interpolation. When carrying out tool radius compensation, make sure that the start and end points after compensation will not be inside of the base circle for involute interpolation.
- Correct the start and end points if they are at an even distance from the center of the base circle for involute interpolation.

P72 No spec: Herical cutting

Details

A helical command has been issued though it is out of specifications.

Remedy

- Check whether the specifications are provided for the helical cutting.
- An Axis 3 command has been issued by the circular interpolation command. If there is no helical specification, move the linear axis to the next block.

P73 No spec: Spiral cutting

Details

A spiral command was issued though it is out of specifications.

Remedy

- Issue the G02.1 and G03.1 commands for circular interpolation.
- Check whether the specifications are provided for the spiral cutting.

P74 Can't calculate 3DIM arc

Details

The 3-dimension circular cannot be obtained because the end block was not specified during 3-dimension circular interpolation supplementary modal.
The 3-dimension circular cannot be obtained due to an interruption during 3-dimension circular interpolation supplementary modal.

Remedy

- Correct the program.

P75 3DIM arc illegal

Details

An illegal G code was issued during 3-dimension circular interpolation modal.
Otherwise, 3-dimension circular interpolation command was issued during a modal for which a 3-dimension circular interpolation command cannot be issued.

Remedy

- Correct the program.

P76 No spec: 3DIM arc interpolat

Details

G02.4/G03.4 was commanded though there is no 3-dimension circular interpolation specification.

Remedy

- Check the specifications.

P80 No spec: Hypoth ax interpolat

Details

Hypothetical axis interpolation (G07) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P90 No spec: Thread cutting

Details

A thread cutting command was issued though it is out of specifications.

Remedy

- Check the specifications.

P91 No spec: Var lead threading

Details

Variable lead thread cutting (G34) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P93 Illegal pitch vaule

Details

An illegal thread lead (thread pitch) was specified at the thread cutting command.

Remedy

- Correct the thread lead for the thread cutting command.

P100 No spec: Cylindric interpolat

Details

A cylindrical interpolation command was issued though it is out of specifications.

Remedy

- Check the specifications.

P110 Plane select during figure rot

Details

Plane selection (G17/G18/G19) was commanded during figure rotation.

Remedy

- Correct the machining program.

P111 Plane selected while coord rot

Details

Plane selection commands (G17, G18, G19) were issued during a coordinate rotation (G68) was being commanded.

Remedy

- Always command G69 (coordinate rotation cancel) after the G68 command, and then issue a plane selection command.

P112 Plane selected while R compen

Details

- Plane selection commands (G17, G18, G19) were issued while tool radius compensation (G41, G42) and nose R compensation (G41, G42, G46) commands were being issued.
- Plane selection commands were issued after completing nose R compensation commands when there were no further axis movement commands after G40, and compensation has not been cancelled.

Remedy

- Issue plane selection commands after completing (axis movement commands issued after G40 cancel command) tool radius compensation and nose R compensation commands.

P113 Illegal plane select

Details

The circular command axis does not correspond to the selected plane.

Remedy

- Select a correct plane before issuing a circular command.

P120 No spec: Feed per rotation

Details

Feed per rotation (G95) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P121 F0 command during arc modal

Details

F0 (F 1-digit feed) was commanded during the arc modal (G02/G03).

Remedy

- Correct the machining program.

P122 No spec: Auto corner override

Details

An auto corner override command (G62) was issued though it is out of specifications.

Remedy

- Check the specifications.
- Delete the G62 command from the program.

P123 No spec: High-accuracy control

Details

High-accuracy control command was issued though it is out of specifications.

Remedy

- Check the specifications.

P124 No spec: Inverse time feed

Details

- The inverse time option is not provided.

Remedy

- Check the specifications.

P125 G93 mode error

Details

- The issued G code command is illegal during G93 mode.
- G93 command was issued during a modal for which inverse time feed cannot be performed.

Remedy

- Correct the program.

P126 Invalid cmnd in high-accuracy

Details

An illegal command was issued during the high-accuracy control mode.

- A G code group 13 command was issued during the high-accuracy control mode.
- Milling, cylindrical interpolation or pole coordinate interpolation was commanded during the high-accuracy control mode.

Remedy

- Correct the program.

P127 No spec: SSS Control

Details

The SSS control valid parameter has been set although there is no SSS control specification.

Remedy

- Check the specifications. Set "#8090 SSS ON" to "0" when there is no SSS control specification.

P130 2nd M function code illegal

Details

The 2nd miscellaneous function address, commanded in the program, differs from the address set in the parameters.

Remedy

- Correct the 2nd miscellaneous function address in the program.

P131 No spec: Cnst surface ctrl G96

Details

A constant surface speed control command (G96) was issued though it is out of specifications.

Remedy

- Check the specifications.
- Issue a rotation speed command (G97) instead of the constant surface speed control command (G96).

P132 Spindle rotation speed S=0

Details

No spindle rotation speed command has been issued.

Remedy

- Correct the program.

P133 Illegal P-No. G96

Details

The illegal No. was specified for the constant surface speed control axis.

Remedy

- Correct the parameter settings and program that specify the constant surface speed control axis.

P134 G96 Clamp Err.

Details

The constant surface speed control command (G96) was issued without commanding the spindle speed clamp (G92/G50).

Remedy

Press the reset key and carry out the remedy below.

- Check the program.
- Issue the G92/G50 command before the G96 command.
- Command the constant surface speed cancel (G97) to switch to the rotation speed command.

P140 No spec: Pos compen cmd

Details

The position compensation command (G45 to G48) is out of specifications.

Remedy

- Check the specifications.

P141 Pos compen during rotation

Details

Position compensation was commanded during the figure rotation or coordinate rotation command.

Remedy

- Correct the program.

P142 Pos compen invalid arc

Details

Position compensation cannot be executed with the issued arc command.

Remedy

- Correct the program.

P150 No spec: Nose R compensation

Details

- Tool radius compensation commands (G41 and G42) were issued though they are out of specifications.
- Nose R compensation commands (G41, G42, and G46) were issued though they are out of specifications.

Remedy

- Check the specifications.

P151 Radius compen during arc mode

Details

A compensation command (G40, G41, G42, G43, G44, or G46) has been issued in the arc modal (G02 or G03).

Remedy

- Issue the linear command (G01) or rapid traverse command (G00) in the compensation command block or cancel block.
  (Set the modal to linear interpolation.)

P152 No intersection

Details

In interference block processing during execution of a tool radius compensation (G41 or G42) or nose R compensation (G41, G42, or G46) command, the intersection point after one block is skipped cannot be determined.

Remedy

- Correct the program.

P153 Compensation interference

Details

An interference error has occurred while the tool radius compensation command (G41 or G42) or nose R compensation command (G41, G42 or G46) was being executed.

Remedy

- Correct the program.

P154 No spec: 3D compensation

Details

A three-dimensional compensation command was issued though it is out of specifications.

Remedy

- Check the specifications.

P155 Fixed cyc exec during compen

Details

A fixed cycle command has been issued in the radius compensation mode.

Remedy

- Issue a radius compensation cancel command (G40) to cancel the radius compensation mode that has been applied since the fixed cycle command was issued.

P156 R compen direction not defined

Details

A shift vector with undefined compensation direction was found at the start of G46 nose R compensation.

Remedy

- Change the vector to that which has the defined compensation direction.
- Change the tool to that which has a different tip point No.

P157 R compen direction changed

Details

During G46 nose R compensation, the compensation direction is reversed.

Remedy

- Change the G command to that which allows the reversed compensation direction (G00, G28, G30, G33, or G53).
- Change the tool to that which has a different tip point No.
- Enable "#8106 G46 NO REV-ERR".

P158 Illegal tip point

Details

An illegal tip point No. (other than 1 to 8) was found during G46 nose R compensation.

Remedy

- Correct the tip point No.

P159 C-CMP REMAINS

Details

One of the followings was commanded while the compensation has not been canceled (the compensation amount remained).

(1) Automatic tool nose R compensation (G143)

(2) Radius compensation (G145)

(3) Plane selection (G17 to G19)

(4) Skip (G31 or G31.1/G31.2/G31.3)

(5) Fixed cycle for drilling (G81 to G89)

(6) Compound type fixed cycle II (G74 to G76)

Remedy

- Cancel the compensation (with compensation amount "0") before commanding.
- Command the G00 move block before the block with a command among (1) to (6).

P160 G53 CMP. ERR

Details

- G53 was commanded during nose R compensation (by G41/G42/G46).
- G53 was commanded to the block where the nose R compensation mode is changed (with G40/ G41/G42/G46).
- G53 was commanded while nose R compensation amount has not been cleared.

Remedy

- Correct the program.
- When issuing G53 after G40 command, move the compensation plane axis by G00/G01/G02/G03 command before issuing G53.

P170 No offset number

Details

No compensation No. (DOO, TOO or HOO) command was given when the radius compensation (G41, G42, G43 or G46) command was issued. Otherwise, the compensation No. is larger than the number of sets in the specifications.

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 spec:Comp input by prog G10

Details

Compensation data input by program (G10) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P172 G10 L number error

Details

An address of G10 command is not correct.

Remedy

- Correct the address L No. of the G10 command.

P173 G10 P number error

Details

The compensation No. at the G10 command is not within the permitted number of sets in the specifications.

Remedy

- Check the number of sets for the tool compensation Nos. and correct the address P designation to be within the number of sets.

P174 No spec:Comp input by prog G11

Details

Compensation data input by program cancel (G11) was commanded though there is no specification of compensation data input by program.

Remedy

- Check the specifications.

P177 Tool life count active

Details

Registration of tool life management data with G10 was attempted when the "usage data count valid" signal was ON.

Remedy

- The tool life management data cannot be registered during the usage data count. Turn the "usage data count valid" signal OFF.

P178 Tool life data entry over

Details

The number of registration groups, total number of registered tools or the number of registrations per group exceeded the range in the specifications.

Remedy

- Correct the number of registrations.

P179 Illegal group No.

Details

- A duplicate group No. was found at the registration of the tool life management data with G10.
- A group No. that was not registered was designated during the T****99 command.
- An M code command, which must be issued as a single command, coexists in the same block as that of another M code command.
- The M code commands set in the same group exist in the same block.

Remedy

- Register the tool life data once for one group: commanding with a duplicate group No. is not allowed.
- Correct to the group No.

P180 No spec: Drilling cycle

Details

A fixed cycle command (G72 - G89) was issued though it is out of specifications.

Remedy

- Check the specifications.
- Correct the program.

P181 No spindle command (Tap cycle)

Details

Spindle rotation speed (S) has not been commanded in synchronous tapping.

Remedy

- Command the spindle rotation speed (S) in synchronous tapping.
- When "#8125 Check Scode in G84" is set to "1", enter the S command in the same block where the synchronous tapping command is issued.

P182 Synchronous tap error

Details

- Connection to the main spindle unit was not established.
- The synchronous tapping was attempted with the spindle not serially connected under the multiple-spindle control I.

Remedy

- Check connection to the main spindle.
- Check that the main spindle encoder exists.
- Set 1 to the parameter #3024 (sout).

P183 No pitch/thread number

Details

The pitch or number of threads has not been commanded in the tap cycle of a fixed cycle for drilling command.

Remedy

- Specify the pitch data and the number of threads by F or E command.

P184 Pitch/thread number error

Details

- The pitch or the number of threads per inch is illegal in the tap cycle of the fixed cycle for drilling command.
- The pitch is too small for the spindle rotation speed.
- The thread number is too large for the spindle rotation speed.

Remedy

- Correct the pitch or the number of threads per inch.

P185 No spec: Sync tapping cycle

Details

Synchronous tapping cycle (G84/G74) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P186 Illegal S cmnd in synchro tap

Details

S command was issued during synchronous tapping modal.

Remedy

- Cancel the synchronous tapping before issuing the S command.

P190 No spec: Turning cycle

Details

A lathe cutting cycle command was issued though it is out of specifications.

Remedy

- Check the specification.
- Delete the lathe cutting cycle command.

P191 Taper length error

Details

In the lathe cutting cycle, the specified length of taper section is illegal.

Remedy

- Set the smaller radius value than the axis travel amount in the lathe cycle command.

P192 Chamfering error

Details

Chamfering in the thread cutting cycle is illegal.

Remedy

- Set a chamfering amount not exceeding the cycle.

P200 No spec: MRC cycle

Details

The compound type fixed cycle for turning machining I (G70 to G73) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P201 Program error (MRC)

Details

- The subprogram, called with a compound type fixed cycle for turning machining I command, has at least one of the following commands: reference position return command (G27, G28, G29, G30); thread cutting (G33, G34); fixed cycle skip-function (G31, G31.n).
- An arc command was found in the first movement block of the finished shape program in compound type fixed cycle for turning machining I.

Remedy

- Delete G27, G28, G29, G30, G31, G33, G34, and fixed cycle G codes from the subprogram called with the compound type fixed cycle for turning machining I commands (G70 to G73).
- Delete G02 and G03 from the first movement block of the finished shape program in compound type fixed cycle for turning machining I.

P202 Block over (MRC)

Details

The number of blocks in the shape program of the compound type fixed cycle for turning machining I is over 50 or 200 (the maximum number differs according to the model).

Remedy

- Set a 50/200 or less value for the number of blocks in the shape program called by the compound type fixed cycle for turning machining I commands (G70 to G73). (The maximum number differs according to the model).

P203 D cmnd figure error (MRC)

Details

A proper shape will not obtained by executing the shape program for the compound type fixed cycle for turning machining I (G70 to G73).

Remedy

- Correct the shape program for the compound type fixed cycle for turning machining I (G70 to G73).

P204 E cmnd fixed cycle error

Details

A command value of the compound type fixed cycle for turning machining (G70 to G76) is illegal.

Remedy

- Correct the command value of the compound type fixed cycle for turning machining (G70 to G76).

P210 No spec: Pattern cycle

Details

A compound type fixed cycle for turning machining II (G74 to G76) command was commanded though it is out of specifications.

Remedy

- Check the specifications.

P220 No spec: Special fixed cycle

Details

There are no special fixed cycle specifications.

Remedy

- Check the specifications.

P221 No. of special fixed holes = 0

Details

"0" has been specified for the number of holes in special fixed cycle mode.

Remedy

- Correct the program.

P222 G36 angle error

Details

A G36 command specifies "0" for angle intervals.

Remedy

- Correct the program.

P223 G12/G13 radius error

Details

The radius value specified with a G12 or G13 command is below the compensation amount.

Remedy

- Correct the program.

P224 No spec: Circular (G12/G13)

Details

There are no circular cutting specifications.

Remedy

- Check the specifications.

P230 Subprogram nesting over

Details

Over 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 sequence No.

Details

The sequence No., commanded at the return from the subprogram or by GOTO in the subprogram call, was not set.

Remedy

- Specify the sequence Nos. in the call block of the subprogram.

P232 No program No.

Details

- The machining program has not been found when the machining program is called.
- 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.

P235 Program editing

Details

Operation was attempted for the file under program editing.

Remedy

- Execute the program again after completion of program editing.

P240 No spec: Variable commands

Details

A variable command (with #) was issued though it is out of specifications.

Remedy

- Check the specifications.

P241 No variable No.

Details

The variable No. commanded is out of the range specified in the specifications.

Remedy

- Check the specifications.
- Correct the program variable No.

P242 = not defined at vrble set

Details

The "=" sign has not been commanded when a variable is defined.

Remedy

- Designate the "=" sign in the variable definition of the program.

P243 Can't use variables

Details

An invalid variable has been specified in the left or right side of an operation expression.

Remedy

- Correct the program.

P244 Invalid set date or time

Details

Date or time was set earlier than current date or time in the system variables (#3011, #3012) when the credit system was valid.

Remedy

- Date or time cannot be changed.
- Correct the program.

P250 No spec: Figure rotation

Details

Figure rotation (M98 I_J_P_H_L_) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P251 Figure rotation overlapped

Details

Figure rotation command was issued during figure rotation.

Remedy

- Correct the program.

P252 Coord rotate in fig. rotation

Details

A coordinate rotation related command (G68, G69) was issued during figure rotation.

Remedy

- Correct the program.

P260 No spec: Coordinates rotation

Details

A coordinate rotation command was issued though it is out of specifications.

Remedy

- Check the specifications.

P270 No spec: User macro

Details

A macro specification was commanded though it is out of specifications.

Remedy

- Check the specifications.

P271 No spec: Macro interrupt

Details

A macro interruption command has been issued though it is out of specifications.

Remedy

- Check the specifications.

P272 NC and macro texts in a block

Details

An executable statement and a macro statement exist together in the same block.

Remedy

- Place the executable statement and macro statement in separate blocks in the program.

P273 Macro call nesting over

Details

The number of macro call nests exceeded the limit imposed by the specifications.

Remedy

- Correct the program so that the macro calls do not exceed the limit imposed by the specifications.

P275 Macro argument over

Details

The number of argument sets in the macro call argument type II has exceeded the limit.

Remedy

- Correct the program.

P276 Illegal G67 command

Details

A G67 command was issued though it was not during the G66 command modal.

Remedy

- Correct the program.
- Issue G66 command before G67 command, which is a call cancel command.

P277 Macro alarm message

Details

An alarm command has been issued in #3000.

Remedy

- Refer to the operator messages on the diagnosis screen.
- Refer to the instruction manual issued by the machine tool builder.

P280 Brackets [ ] nesting over

Details

Over five times have the parentheses "[" or "]" been used in a single block.

Remedy

- Correct the program so that the number of "[" or "]" is five or less.

P281 Brackets [ ] not paired

Details

A single block does not have the same number of commanded parentheses "[" as that of "]".

Remedy

- Correct the program so that "[" and "]" parentheses are paired up properly.

P282 Calculation impossible

Details

The arithmetic formula is incorrect.

Remedy

- Correct the formula in the program.

P283 Divided by zero

Details

The denominator of the division is zero.

Remedy

- Correct the program so that the denominator for division in the formula is not zero.

P288 IF EXCESS

Details

Over ten times of IF statement nesting have been done.

Remedy

Correct the program so that the number of IF statement nesting does not exceed ten.

P289 IF-ENDIF MMC.

Details

An IF statement is not ended with ENDIF.
THEN/ELSE has been commanded while there is no IF command.

Remedy

- Correct the program so that IF statements are ended with ENDIFs.
- Put IF[condition] before THEN/ELSE command.

P290 IF sentence error

Details

There is an error in the "IF[<conditional>]GOTO(" statement.

Remedy

- Correct the program.

P291 WHILE sentence error

Details

There is an error in the "WHILE[<conditional>]DO(-END(" statement.

Remedy

- Correct the program.

P292 SETVN sentence error

Details

There is an error in the "SETVN(" statement when the variable name setting was made.

Remedy

- Correct the program.
- The number of characters in the variable name of the SETVN statement must be 7 or less.

P293 DO-END nesting over

Details

The number of DO-END nesting levels in the "WHILE[<conditional>]DO(-END(" statement has exceeded 27.

Remedy

- Correct the program so that the nesting levels of the DO-END statement does not exceed 27.

P294 DO and END not paired

Details

The DOs and ENDs are not paired off properly.

Remedy

- Correct the program so that the DOs and ENDs are paired off properly.

P295 WHILE/GOTO in tape

Details

There is a WHILE or GOTO statement on the tape during tape operation.

Remedy

- Apply memory mode operation instead of tape mode that does not allow the execution of the program with a WHILE or GOTO statement.

P296 No address (macro)

Details

A required address has not been specified in the user macro.

Remedy

- Correct the program.

P297 Address-A error

Details

The user macro does not use address A as a variable.

Remedy

- Correct the program.

P298 G200-G202 cmnd in tape

Details

User macro G200, G201, or G202 was specified during tape or MDI mode.

Remedy

- Correct the program.

P300 Variable name illegal

Details

The variable names have not been commanded properly.

Remedy

- Correct the variable names in the program.

P301 Variable name duplicated

Details

A duplicate variable name was found.

Remedy

- Correct the program so that no duplicate name exists.

P310 Not use GMSTB macro code

Details

G, M, S, T, or B macro code was called during fixed cycle.

Remedy

- Correct the program.
- Correct the parameter settings.

P350 No spec: Scaling command

Details

The scaling command (G50, G51) was issued though it is out of specifications.

Remedy

- Check the specifications.

P360 No spec: Program mirror

Details

A mirror image (G50.1 or G51.1) command has been issued though the programmable mirror image specifications are not provided.

Remedy

- Check the specifications.

P370 No spec: Facing t-post MR

Details

The facing turret mirror image specifications are not provided.

Remedy

- Check the specifications.

P371 Facing t-post MR illegal

Details

- Mirror image for facing tool posts was commanded to an axis in external mirror image or parameter mirror image.
- The commanded mirror image for facing tool posts enables the mirror image for a rotary axis.

Remedy

- Correct the program.
- Correct the parameter settings.

P380 No spec: Corner R/C

Details

The corner R/C was issued though it is out of specifications.

Remedy

- Check the specifications.
- Delete the corner chamfering/corner rounding command in the program.

P381 No spec: Arc R/C

Details

Corner chamfering II or corner rounding II was commanded in the arc interpolation block though it is out of specifications.

Remedy

- Check the specifications.

P382 No corner movement

Details

The block next to corner chamfering/ corner rounding is not a travel command.

Remedy

- Replace the block succeeding the corner chamfering/ corner rounding command by G01 command.

P383 Corner movement short

Details

The travel distance in the corner chamfering/corner rounding command was shorter than the value in the corner chamfering/corner rounding command.

Remedy

- Set the smaller value for the corner chamfering/corner rounding than the travel distance.

P384 Corner next movement short

Details

The travel distance in the following block in the corner chamfering/corner rounding command was shorter than the value in the corner chamfering/corner rounding command.

Remedy

- Set the smaller value for the corner chamfering/corner rounding than the travel distance in the following block.

P385 Corner during G00/G33

Details

A block with corner chamfering/corner rounding was given during G00 or G33 modal.

Remedy

- Correct the program.

P390 No spec: Geometric

Details

A geometric command was issued though it is out of specifications.

Remedy

- Check the specifications.

P391 No spec: Geometric arc

Details

There are no geometric IB specifications.

Remedy

- Check the specifications.

P392 Angle < 1 degree (GEOMT)

Details

The angular difference between the geometric line and line is 1° or less.

Remedy

- Correct the geometric angle.

P393 Inc value in 2nd block (GEOMT)

Details

The second geometric block has a command with an incremental value.

Remedy

- Issue a command with an absolute value in the second geometric block.

P394 No linear move command (GEOMT)

Details

The second geometric block contains no linear command.

Remedy

- Issue the G01 command.

P395 Illegal address (GEOMT)

Details

The geometric format is invalid.

Remedy

- Correct the program.

P396 Plane selected in GEOMT ctrl

Details

A plane switching command was issued during geometric command processing.

Remedy

- Complete the plane switching command before geometric command processing.

P397 Arc error (GEOMT)

Details

In geometric IB, the circular arc end point does not contact or cross the next block start point.

Remedy

- Correct the geometric circular arc command and the preceding and following commands.

P398 No spec: Geometric1B

Details

A geometric command was issued though the geometric IB specifications are not provided.

Remedy

- Check the specifications.

P411 Illegal modal G111

Details

- G111 was issued during milling mode.
- G111 was issued during nose R compensation mode.
- G111 was issued during constant surface speed.
- G111 was issued during mixed synchronization control.
- G111 was issued during fixed cycle.
- G111 was issued during polar coordinate interpolation.
- G111 was issued during cylindrical interpolation mode.

Remedy

- Before commanding G111, cancel the following commands.
- Milling mode
- Nose R compensation
- Constant surface speed
- Mixed synchronization control
- Fixed cycle
- Polar coordinate interpolation
- Cylindrical interpolation

P412 No spec: Axis name switch

Details

Axis name switch (G111) was issued though it is out of specifications.

Remedy

- Check the specifications.

P420 No spec: Para input by program

Details

Parameter input by program (G10) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P421 Parameter input error

Details

- The specified parameter No. or set data is illegal.
- An illegal G command address was input in parameter input mode.
- A parameter input command was issued during fixed cycle modal or nose R compensation.
- G10L50, G10L70, G11 were not commanded in independent blocks.

Remedy

- Correct the program.

P430 R-pnt return incomplete

Details

- A command was issued to move an axis, which has not returned to the reference position, away from that reference position.
- A command was issued to an axis removal axis.

Remedy

- Execute reference position return manually.
- Disable the axis removal on the axis for which the command was issued.

P431 No spec: 2,3,4th R-point ret

Details

A command for second, third or fourth reference position return was issued though there are no such command specifications.

Remedy

- Check the specifications.

P432 No spec: Start position return

Details

Start position return (G29) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P433 No spec: R-position check

Details

Reference position check (G27) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P434 Compare error

Details

One of the axes did not return to the reference position when the reference position check command (G27) was executed.

Remedy

- Correct the program.

P435 G27 and M commands in a block

Details

An M command was issued simultaneously in the G27 command block.

Remedy

- Place the M code command, which cannot be issued in a G27 command block, in separate block from G27 command block.

P436 G29 and M commands in a block

Details

An M command was issued simultaneously in the G29 command block.

Remedy

- Place the M code command, which cannot be issued in a G29 command block, in separate block from G29 command block.

P438 G52 invalid during G54.1

Details

A local coordinate system command was issued during execution of the G54.1 command.

Remedy

- Correct the program.

P450 No spec: Chuck barrier

Details

The chuck barrier on command (G22) was specified although the chuck barrier is out of specifications.

Remedy

- Check the specifications.

P451 No spec: Stroke chk bef travel

Details

Stroke check before travel (G22/G23) was commanded though it is out of specifications.

Remedy

- Check the specifications.

P452 Limit before travel exists

Details

An illegal command, which places the axis travel start/end point in the prohibited area or moves the axis through the prohibited area, was detected when Stroke check before travel (G22) was commanded.

Remedy

- Correct the coordinate values of the axis address commanded in the program.

P460 Tape I/O error

Details

An error has occurred in the tape reader. Otherwise an error has occurred in the printer during macro printing.

Remedy

- Check the power and cable of the connected devices.
- Correct the I/O device parameters.

P461 File I/O error

Details

- A file of the machining program cannot be read.
- IC card has not been inserted.

Remedy

- In memory mode, the programs stored in memory may have been destroyed. Output all of the programs and tool data and then format the system.
- Ensure that the external device (including an IC card, etc) that contains the file is mounted.
- Correct the parameter settings for HD operation or IC card operation.

P462 Computer link commu error

Details

A communication error occurred during the BTR operation.

Remedy

- "L01 Computer link error" is displayed simultaneously. Take the remedy corresponding to the error No.

P480 No spec: Milling

Details

- Milling was commanded though it is out of specifications.
- Polar coordinate interpolation was commanded though it is out of specifications.

Remedy

- Check the specifications.

P481 Illegal G code (mill)

Details

- An illegal G code was used during the milling mode.
- An illegal G code was used during cylindrical interpolation or polar coordinate interpolation.
- The G07.1 command was issued during the tool radius compensation.

Remedy

- Correct the program.

P482 Illegal axis (mill)

Details

- A rotary axis was commanded during the milling mode.
- Milling was executed though an illegal value was set for the milling axis No.
- Cylindrical interpolation or polar coordinate interpolation was commanded during mirror image.
- Cylindrical interpolation or polar coordinate interpolation was commanded before the tool compensation was completed after the T command.
- G07.1 was commanded when cylindrical interpolation was not possible (there is no rotary axis, or external mirror image is ON).
- An axis other than a cylindrical coordinate system axis was commanded during cylindrical interpolation.

Remedy

- Correct the machining program, parameters and PLC interface signals.

P484 R-pnt ret incomplete (mill)

Details

- Movement was commanded to an axis that had not completed reference position return during the milling mode.
- Movement was commanded to an axis that had not completed reference position return during cylindrical interpolation or polar coordinate interpolation.

Remedy

- Carry out manual reference position return.

P485 Illegal modal (mill)

Details

- The milling mode was turned ON during nose R compensation or constant surface speed control.
- A T command was issued during the milling mode.
- The mode was switched from milling to cutting during tool compensation.
- Cylindrical interpolation or polar coordinate interpolation was commanded during the constant surface speed control mode (G96).
- The command unacceptable in the cylindrical interpolation was issued.
- A T command was issued during the cylindrical interpolation or polar coordinate interpolation mode.
- A movement command was issued when the plane was not selected just before or after the G07.1 command.
- A plane selection command was issued during the polar coordinate interpolation mode.
- Cylindrical interpolation or polar coordinate interpolation was commanded during tool radius compensation.
- The G16 plane in which the radius value of a cylinder is "0" was specified.
- A cylindrical interpolation or polar coordinate interpolation command was issued during coordinate rotation by program (G68).

Remedy

- Correct the program.
- Issue G40 or G97 before issuing G12.1.
- Issue a T command before issuing G12.1.
- Issue G40 before issuing G13.1.
- Specify the radius value of a cylinder other than "0", or specify the X axis's current value other than "0" before issuing G12.1/G16.

P486 Milling error

Details

- The milling command was issued during the mirror image (when parameter or external input is turned ON).
- Polar coordinate interpolation, cylindrical interpolation or milling interpolation was commanded during mirror image for facing tool posts.
- The start command of the cylindrical interpolation or polar coordinate interpolation was issued during the normal line control.

Remedy

- Correct the program.

P511 Synchronization M code error

Details

- Two or more synchronization M codes were commanded in the same block.
- The synchronization M code and "!" code were commanded in the same block.
- Synchronization with the M code was commanded in 3rd part system or more. (Synchronization with the M code is valid only in 1st part system or 2nd part system.)

Remedy

- Correct the program.

P530 DEC. POINT ERR

Details

A decimal point was added to the address where the decimal point command is not allowed. ("#1274 ext10/bit0 (Type of address enabling/disabling decimal point command)")

Remedy

Do not add any decimal point to the addresses where the decimal point is not allowed.

P550 No spec: G06.2(NURBS)

Details

There is no NURBS interpolation option.

Remedy

- Check the specifications.

P551 G06.2 knot error

Details

The knot (k) command value is smaller than the value for the previous block.

Remedy

- Correct the program.
- Specify the knot by monotone increment.

P552 Start point of 1st G06.2 err

Details

The block end point immediately before the G06.2 command and the G06.2 first block command value do not match.

Remedy

- Match the G06.2 first block coordinate command value with the previous block end point.

P554 Invld manual interrupt in G6.2

Details

Manual interruption was executed in a block that applies the G06.2 mode.

Remedy

- Execute the manual interruption in the block that does not apply the G06.2 mode.

P555 Invalid restart during G06.2

Details

Restart was attempted from the block that applies G06.2 mode.

Remedy

- Restart from the block that does not apply the G06.2 mode.

P600 No spec: Auto TLM

Details

An automatic tool length measurement command (G37) was issued though it is out of specifications.

Remedy

- Check the specifications.

P601 No spec: Skip

Details

A skip command (G31) was issued though it is out of specifications.

Remedy

- Check the specifications.

P602 No spec: Multi skip

Details

A multiple skip command (G31.1, G31.2 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 illegal axis

Details

No axis was specified in the automatic tool length measurement block. Otherwise, two or more axes were specified.

Remedy

- Specify only one axis.

P605 T & TLM command in a block

Details

The T code is in the same block as the automatic tool length measurement block.

Remedy

- Specify the T code before the automatic tool length measurement block.

P606 T cmnd not found before TLM

Details

The T code was not yet specified in automatic tool length measurement.

Remedy

- Specify the T code before the automatic tool length measurement block.

P607 TLM illegal signal

Details

The measurement position arrival signal turned ON before the area specified by the D command or "#8006 ZONE d". Otherwise, the signal remained OFF to the end.

Remedy

- Correct the program.

P608 Skip during radius compen

Details

A skip command was issued during radius compensation processing.

Remedy

- Issue a radius compensation cancel (G40) command or remove the skip command.

P610 Illegal parameter

Details

- The parameter setting is not correct.
- G114.1 was commanded while the spindle synchronization was selected with the PLC interface signal.
- G113 was commanded while the spindle-spindle polygon machining option was OFF and the spindle synchronization was selected with the PLC interface signal.

Remedy

- Check whether the values are set in descending order (from the largest value) for "#1549 Iv0vR1" to "#1553 Iv0vR5".
- Check whether the values are set in descending order for "#1554 Iv0rd2" to "#1557 Iv0rd5".
- Correct the settings of "#1514 expLinax (Exponential function interpolation linear axis)" and "#1515 expRotax (Exponential function interpolation rotary axis)".
- Correct the program.
- Correct the parameter settings.

P611 No spec: Exponential function

Details

There is no specification for the exponential interpolation.

Remedy

- Check the specifications.

P612 Exponential function error

Details

A travel command for exponential interpolation was issued during mirror image for facing tool posts.

Remedy

- Correct the program.

P700 Illegal command value

Details

Spindle synchronization was commanded to a spindle that is not connected serially.

Remedy

- Correct the program.
- Correct the parameter settings.

P900 No spec: Normal line control

Details

A normal line control command (G40.1, G41.1, or G42.1) was issued though it is out of specifications.

Remedy

- Check the specifications.

P901 Normal line control axis G92

Details

A coordinate system preset command (G92) was issued to a normal line control axis during normal line control.

Remedy

- Correct the program.

P902 Normal line control axis error

Details

- The normal line control axis was set to a linear axis.
- The normal line control axis was set to the linear type rotary axis II axis.
- The normal line control axis has not been set.
- The normal line control axis is the same as the plane selection axis.

Remedy

- Correct the normal line control axis setting.

P903 Plane chg in Normal line ctrl

Details

The plane selection command (G17, G18, or G19) was issued during normal line control.

Remedy

- Delete the plane selection command (G17, G18, or G19) from the program of the normal line control.

P920 No spec: 3D coord conv

Details

There is no specification for 3-dimensional coordinate conversion.

Remedy

- Check the specifications.

P921 Illegal G code at 3D coord

Details

The commanded G code cannot be performed during 3-dimensional coordinate conversion modal.

Remedy

- Refer to "MITSUBISHI CNC 700/70 Series Programming Manual (Machining Center System)" for usable G commands.
- When the basic specification parameter "#1229 set01/bit3 (Initial constant surface speed)" is enabled, disable the parameter or issue the constant surface speed control cancel (G97) command.

P922 Illegal mode at 3D coord

Details

A 3-dimensional coordinate conversion command was issued during a modal for which 3-dimensional coordinate conversion cannot be performed.

Remedy

- Refer to "MITSUBISHI CNC 700/70 Series Programming Manual (Machining Center System)" for usable G commands.

P923 Illegal addr in 3D coord blk

Details

A G code and G68 was commanded in a block though the G code cannot be commanded with G68.

Remedy

- Refer to "MITSUBISHI CNC 700/70 Series Programming Manual (Machining Center System)" for usable G commands.

P930 No spec: Tool axis compen

Details

A tool length compensation along the tool axis command was issued though it is out of specifications.

Remedy

- Check the specifications.

P931 Executing tool axis compen

Details

There is a G code that cannot be commanded during tool length compensation along the tool axis.

Remedy

- Correct the program.

P932 Rot axis parameter error

Details

There is an illegal linear axis name or rotary axis name set in the rotary axis configuration parameters.
There is an illegal setting in the parameter concerning the configuration of the inclined surface machining axis.

Remedy

- Set the correct value and turn the power ON again.

P940 No spec: Tool tip control

Details

There is no specification for tool tip center control.

Remedy

- Check the specifications.

P941 Invalid T tip control command

Details

A tool tip center control command was issued during a modal for which a tool tip center control command cannot be issued.

Remedy

- Correct the program.

P942 Invalid cmnd during T tip ctrl

Details

A G code that cannot be commanded was issued during tool tip center control.

Remedy

- Correct the program.

P943 Tool posture command illegal

Details

In tool tip center control type 1, if the signs at the tool-side rotary axis or table base-side rotary axis start and finish points differ, a tool base-side rotary axis or table workpiece-side rotary axis rotation exists for the same block, and does not pass a singular point.
In tool tip center control type 2, the posture vector command is incorrect.

Remedy

- Correct the program.

P990 PREPRO error

Details

Combining commands that required pre-reading (nose R offset, corner chamfering/corner rounding, geometric I, geometric IB, and compound type fixed cycle for turning machining) resulted in eight or more pre-read blocks.

Remedy

- Delete some or all of the combinations of commands that require pre-reading.

Appendix 2.13 Troubleshooting

(1) Definition of an error status

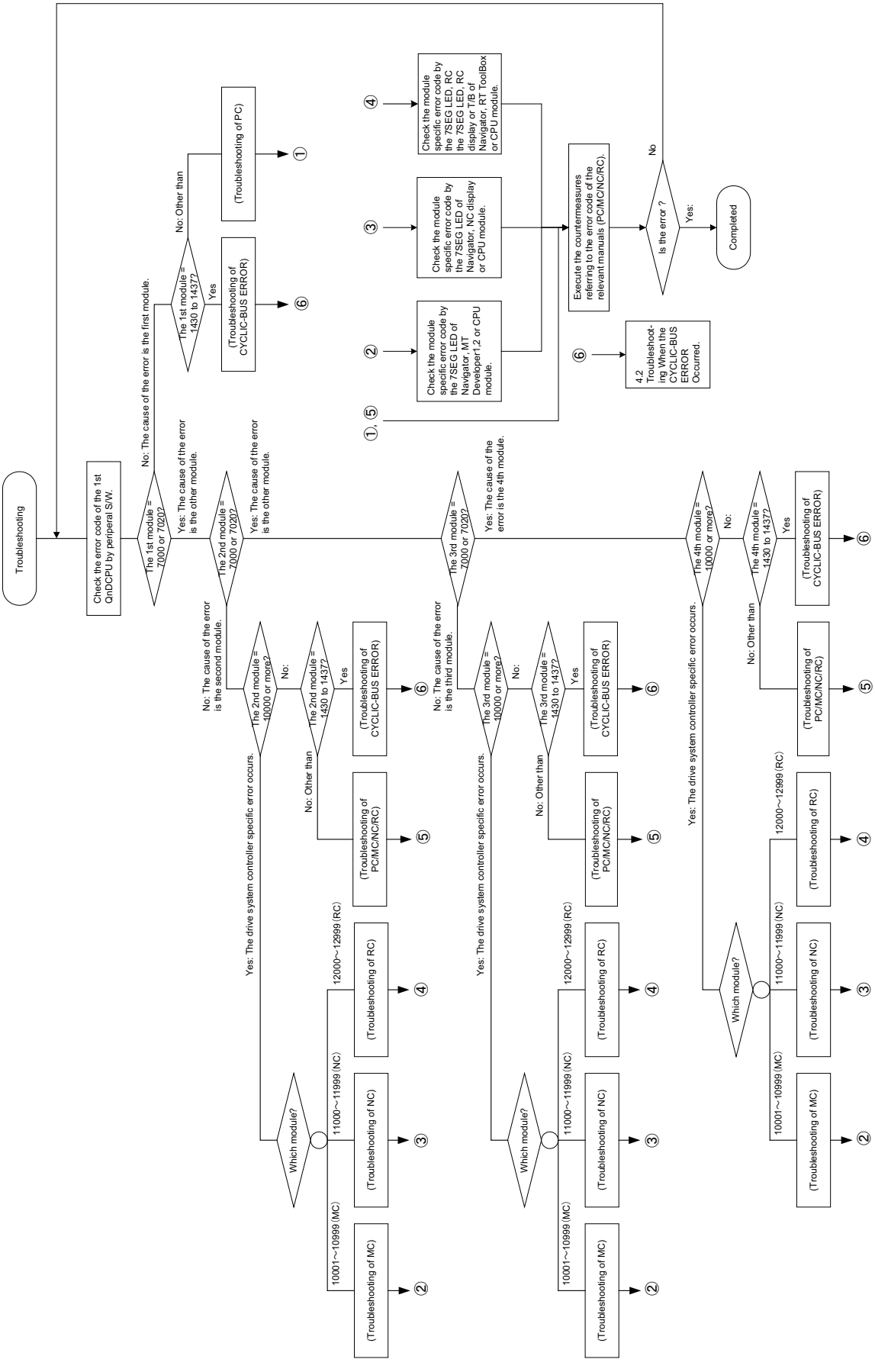
- Power supply = Normal
- The first module (QnUDCPU) has error status. (MODE: light, ERR.LED flicker or light)
- The second to fourth module has error status. (When QnUDCPU, MODE: light, ERR.LED flicker or light. When drive system CPU, 7SEG LED is "AL" × 3 + The specific error code is displayed repeatedly.)

(2) Precondition

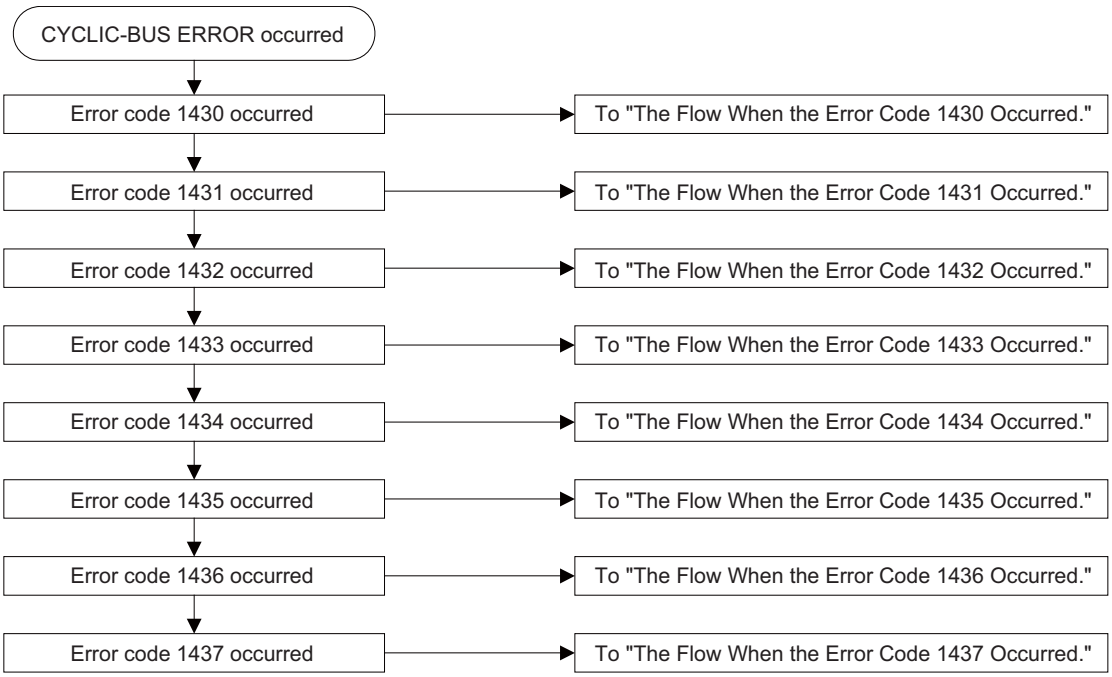
- The first module (QnUDCPU) and the peripheral S/W are able to be communicated.

(3) Term explanation

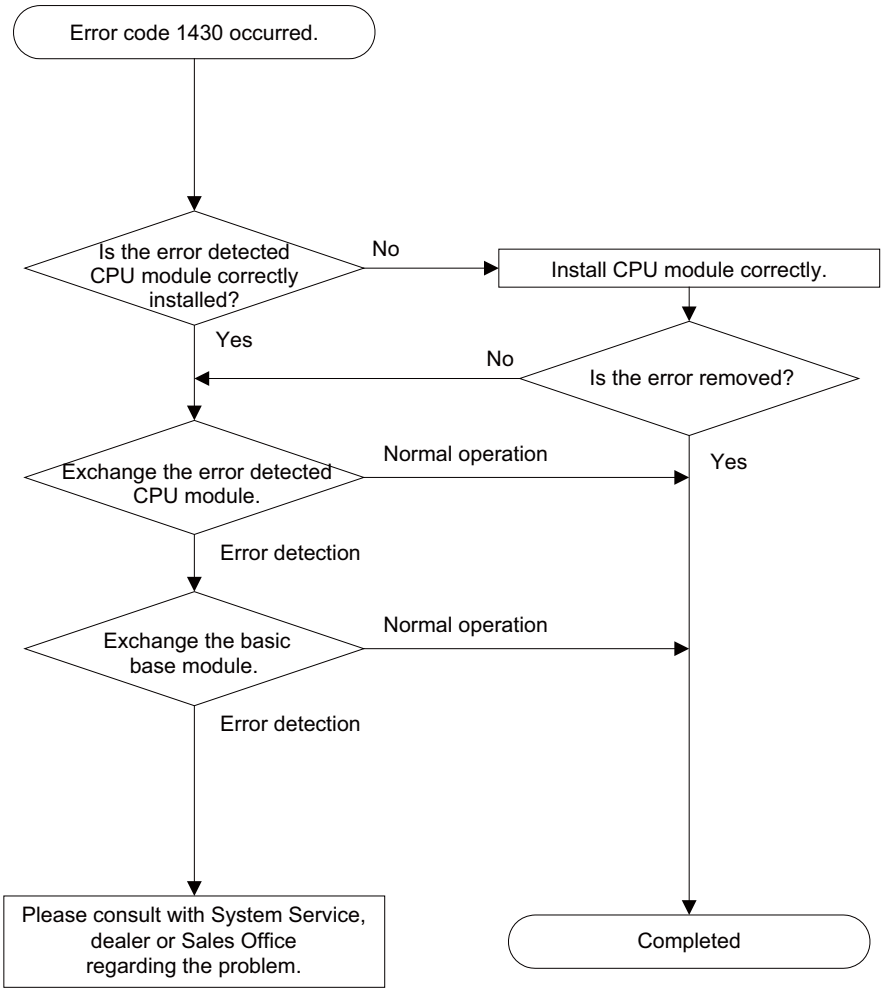
- Peripheral S/W:
  GX Developer1, 2 or Navigator. (The Navigator' diagnosis function is scheduled to be expanded in April '08.)
- Self diagnosis error code:
  Error code 1000 to 12999 displayed by the system monitor function, the PC diagnosis function of GX developer1,2, the diagnosis function of Navigator, the code system alarm function of GOT.
- The module specific error code:
  Error code of each module (MC/NC/RC) that MC, NC, and RC specify each module, differing from the self diagnosis error code.


Troubleshooting
Check the error code of the 1st QnDCPU by periperal S/W.
The 1st module = 7000 or 7020?
No: The cause of the error is the first module.
Yes: The cause of the error is the other module.
The 1st module = 1430 to 14372
No: Other than
Yes
(Troubleshooting of PC)
(Troubleshooting of CYCLIC-BUS ERROR)
①
⑥
The 2nd module = 7000 or 7020?
Yes: The cause of the error is the other module.
No: The cause of the error is the second module.
The 2nd module = 10000 or more?
No:
Yes: The drive system controller specific error occurs.
The 2nd module = 1430 to 14372
No: Other than
Yes
(Troubleshooting of CYCLIC-BUS ERROR)
(Troubleshooting of PC/MC/NC/RC)
⑥
⑤
Which module?
10001~10999 (MC)
11000~11999 (NC)
12000~12999 (RC)
(Troubleshooting of MC)
(Troubleshooting of NC)
(Troubleshooting of RC)
②
③
④
The 3rd module = 7000 or 7020?
Yes: The cause of the error is the 4th module.
No: The cause of the error is the third module.
The 3rd module = 10000 or more?
No:
Yes: The drive system controller specific error occurs.
The 3rd module = 1430 to 14372
No: Other than
Yes
(Troubleshooting of CYCLIC-BUS ERROR)
(Troubleshooting of PC/MC/NC/RC)
⑥
⑤
Which module?
10001~10999 (MC)
11000~11999 (NC)
12000~12999 (RC)
(Troubleshooting of MC)
(Troubleshooting of NC)
(Troubleshooting of RC)
②
③
④
The 4th module = 10000 or more?
No:
Yes: The drive system controller specific error occurs.
The 4th module = 1430 to 14372
No: Other than
Yes
(Troubleshooting of CYCLIC-BUS ERROR)
(Troubleshooting of PC/MC/NC/RC)
⑥
⑤
Which module?
10001~10999 (MC)
11000~11999 (NC)
12000~12999 (RC)
(Troubleshooting of MC)
(Troubleshooting of NC)
(Troubleshooting of RC)
②
③
④
①, ⑤
Check the module specific error code by the 7SEG LED of Navigator, MT Developer1,2 or CPU module.
②
Check the module specific error code by the 7SEG LED of Navigator, NC display or CPU module.
③
Check the module specific error code by the 7SEG LED, RC display or TB of Navigator, RT ToolBox or CPU module.
④
Execute the countermeasures referring to the error code of the relevant manuals (PC/MC/NC/RC).
Is the error ?
No
Yes:
Completed
⑥
4.2 Troubleshooting When the CYCLIC-BUS ERROR Occurred.

Appendix 2.13.1 Troubleshooting when the CYCLIC-BUS ERROR Occurred

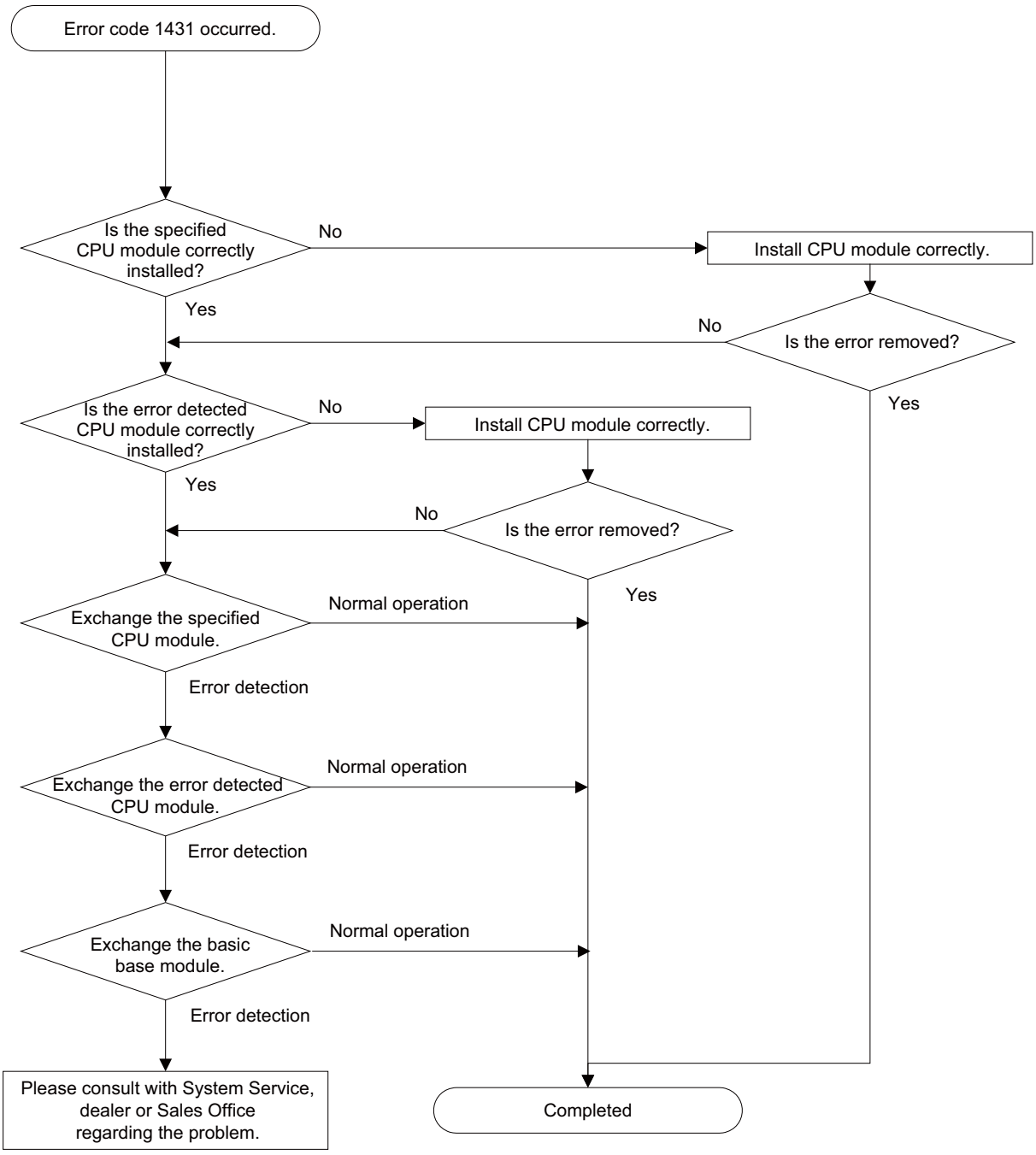


Appendix 2.13.1.1 The Flow When the Error Code 1430 Occurred



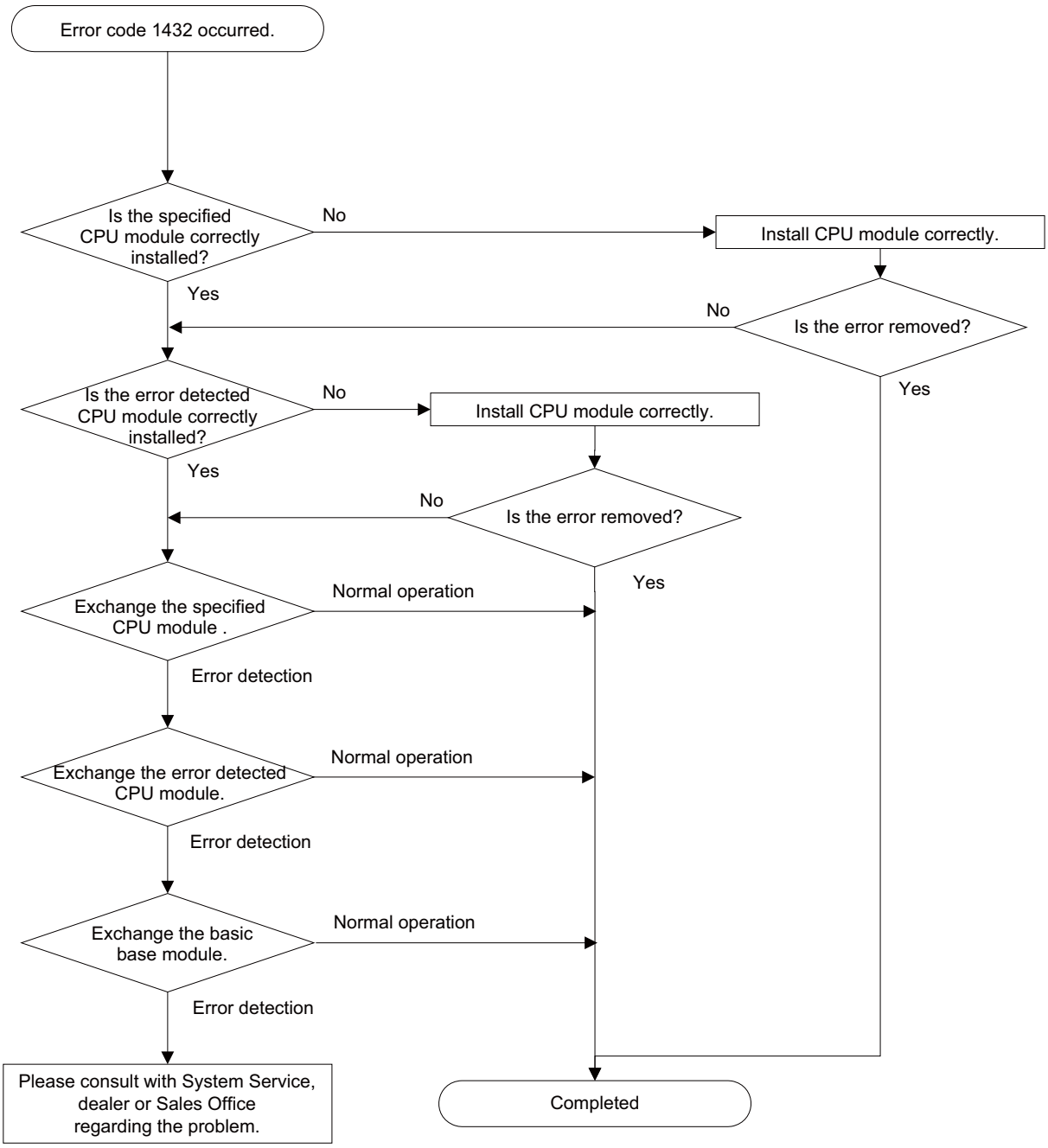
The error detected CPU module : The CPU module that CYCLIC-BUS ERROR occurred.

Appendix 2.13.1.2 The Flow When the Error Code 1431 Occurred



The specified CPU module : The CPU module specified by common information (CPU ordinal No.).
The error detected CPU module : The CPU module that CYCLIC-BUS ERROR occurred.

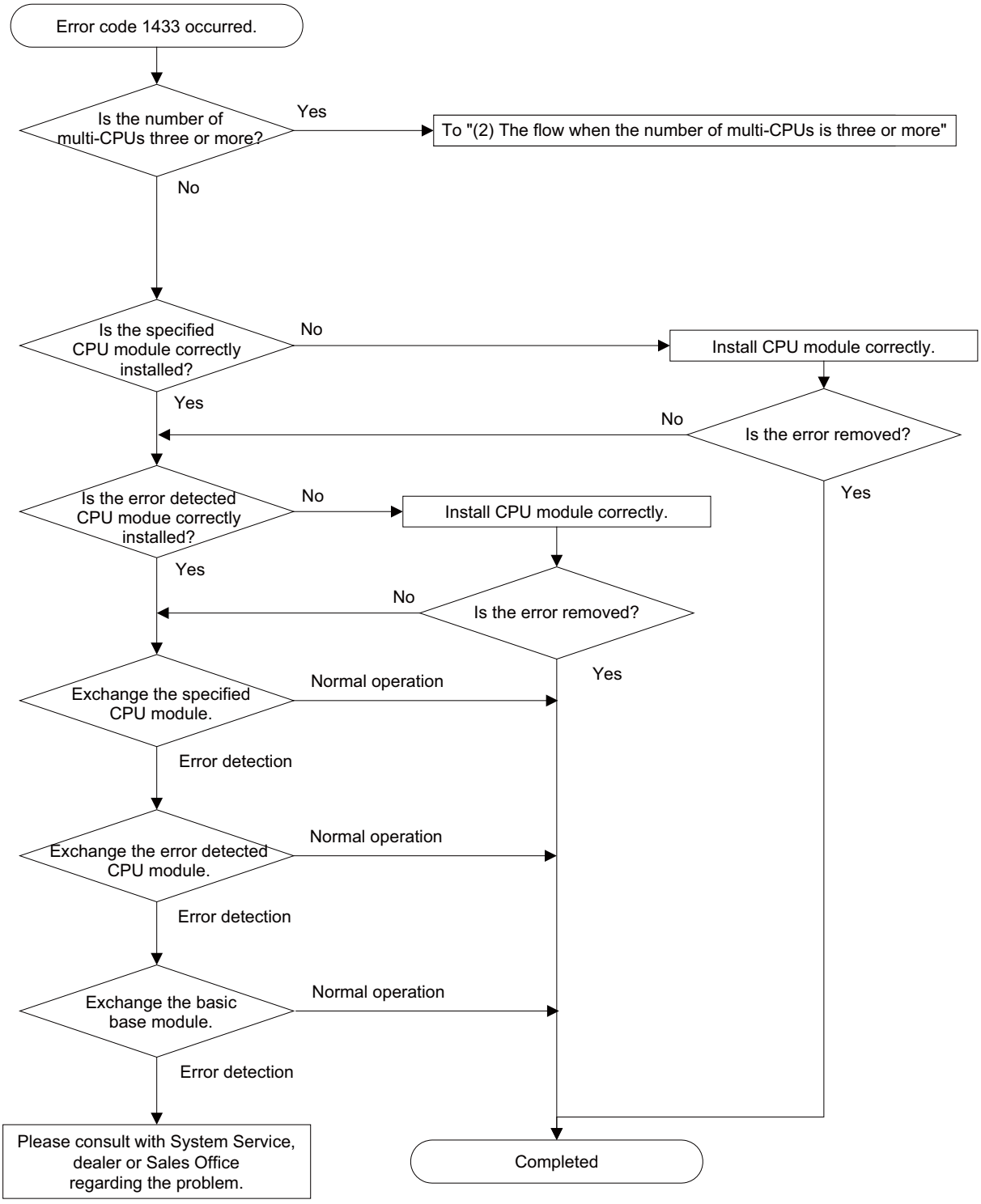
Appendix 2.13.1.3 The Flow When the Error Code 1432 Occurred



The specified CPU module : The CPU module specified by common information (CPU ordinal No.).
The error detected CPU module : The CPU module that CYCLIC-BUS ERROR occurred.

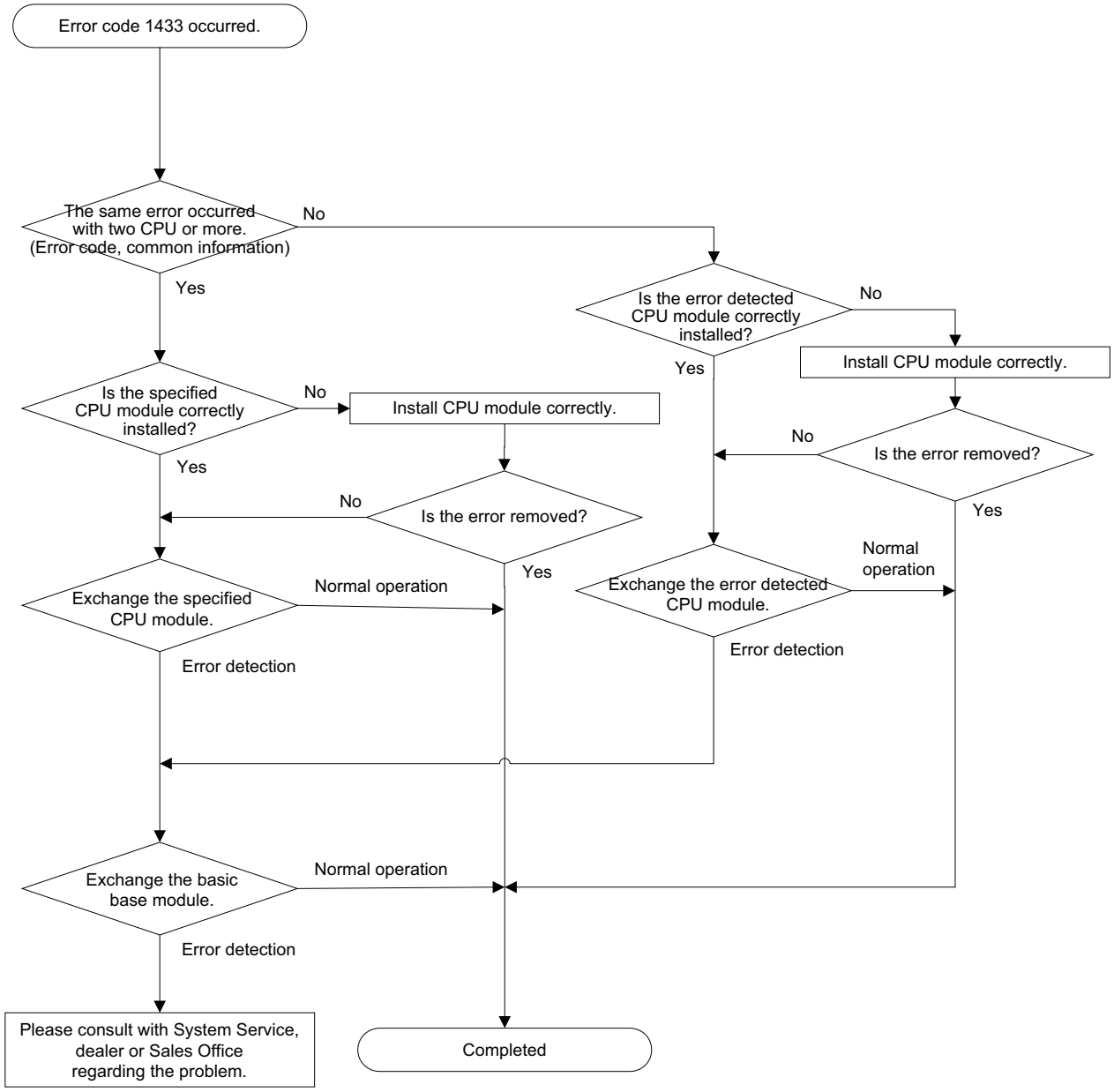
Appendix 2.13.1.4 The Flow When the Error Code 1433 Occurred

(1) The flow when the number of multi-CPUs is less than three



The specified CPU module : The CPU module specified by common information (CPU ordinal No.).
The error detected CPU module : The CPU module that CYCLIC-BUS ERROR occurred.

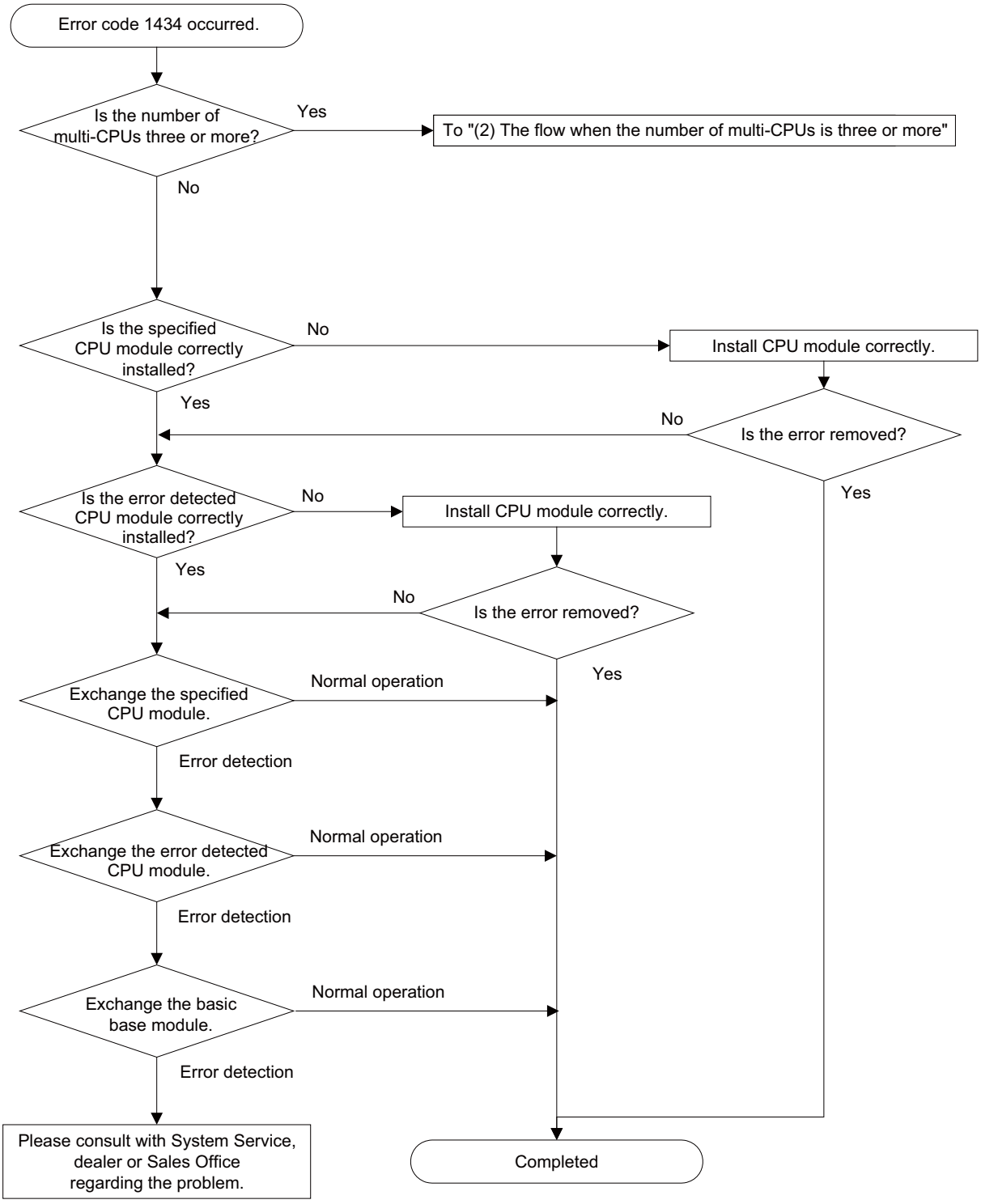
(2) The flow when the number of multi-CPUs is three or more



The specified CPU module : The CPU module specified by common information (CPU ordinal No.).
The error detected CPU module : The CPU module that CYCLIC-BUS ERROR occurred.

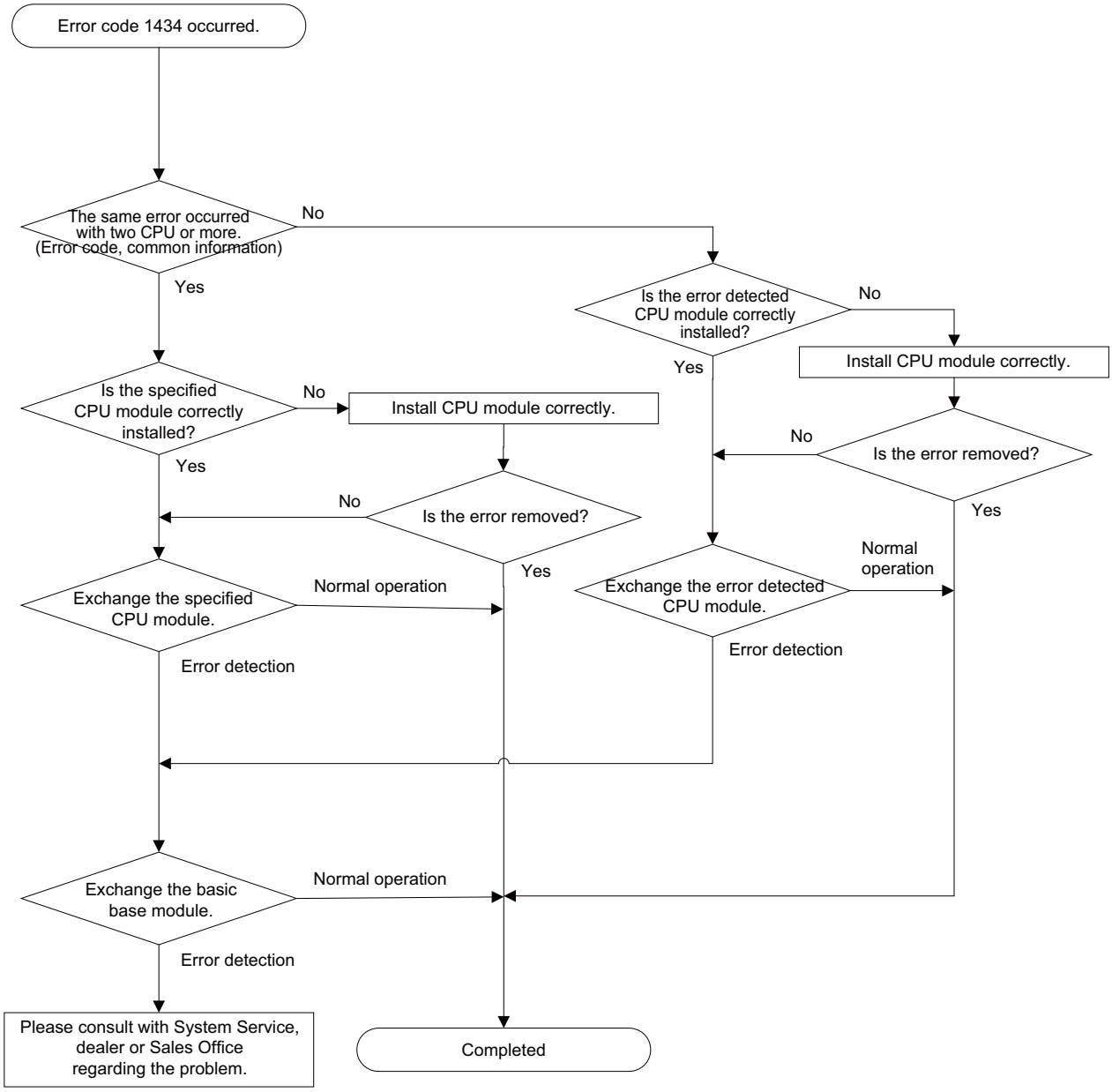
Appendix 2.13.1.5 The Flow When the Error Code 1434 Occurred

(1) The flow when the number of multi-CPUs is less than three



The specified CPU module : The CPU module specified by common information (CPU ordinal No.).
The error detected CPU module : The CPU module that CYCLIC-BUS ERROR occurred.

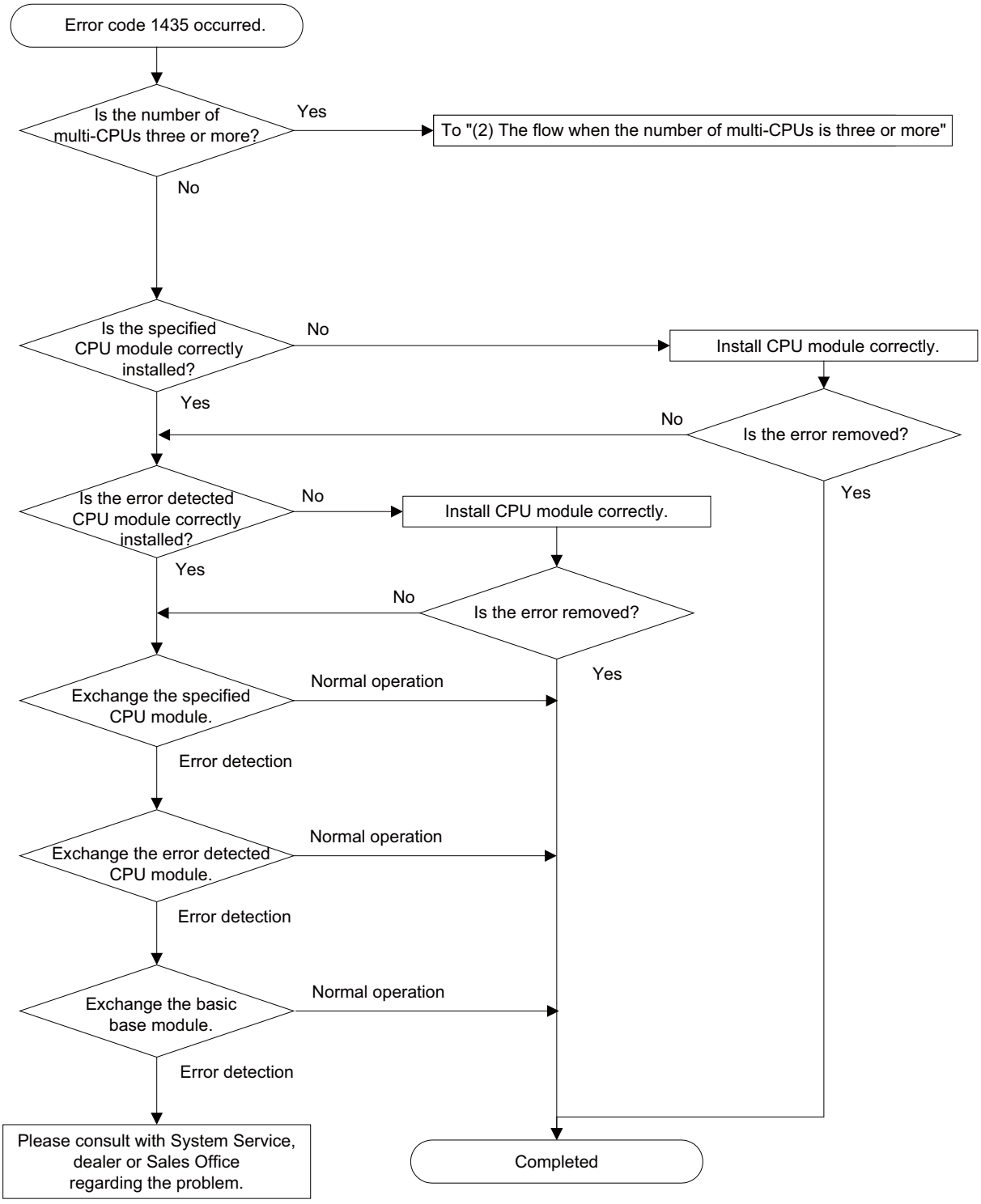
(2) The flow when the number of multi-CPUs is three or more



The specified CPU module : The CPU module specified by common information (CPU ordinal No.).
The error detected CPU module : The CPU module that CYCLIC-BUS ERROR occurred.

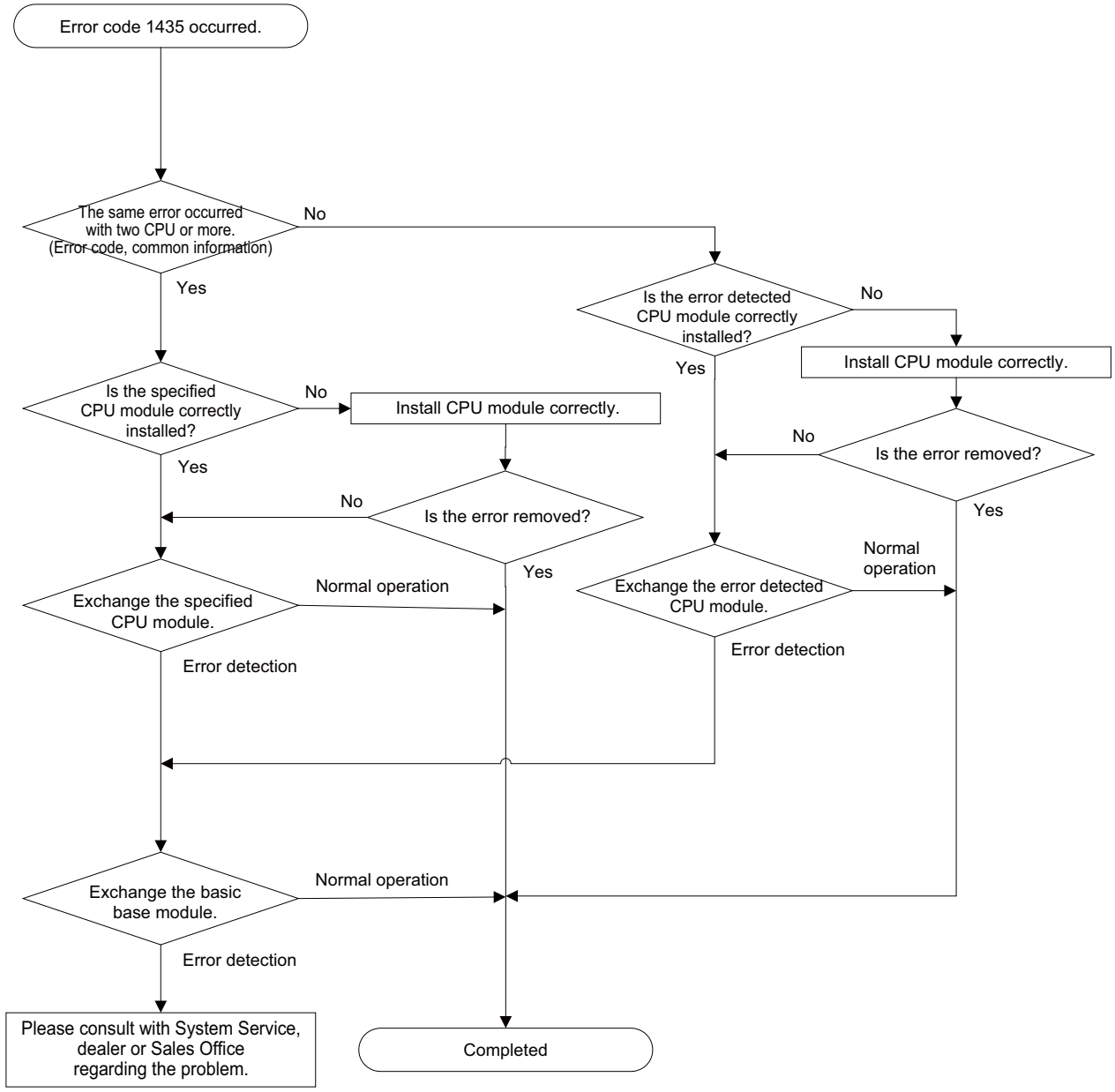
Appendix 2.13.1.6 The Flow When the Error Code 1435 Occurred

(1) The flow when the number of multi-CPUs is less than three



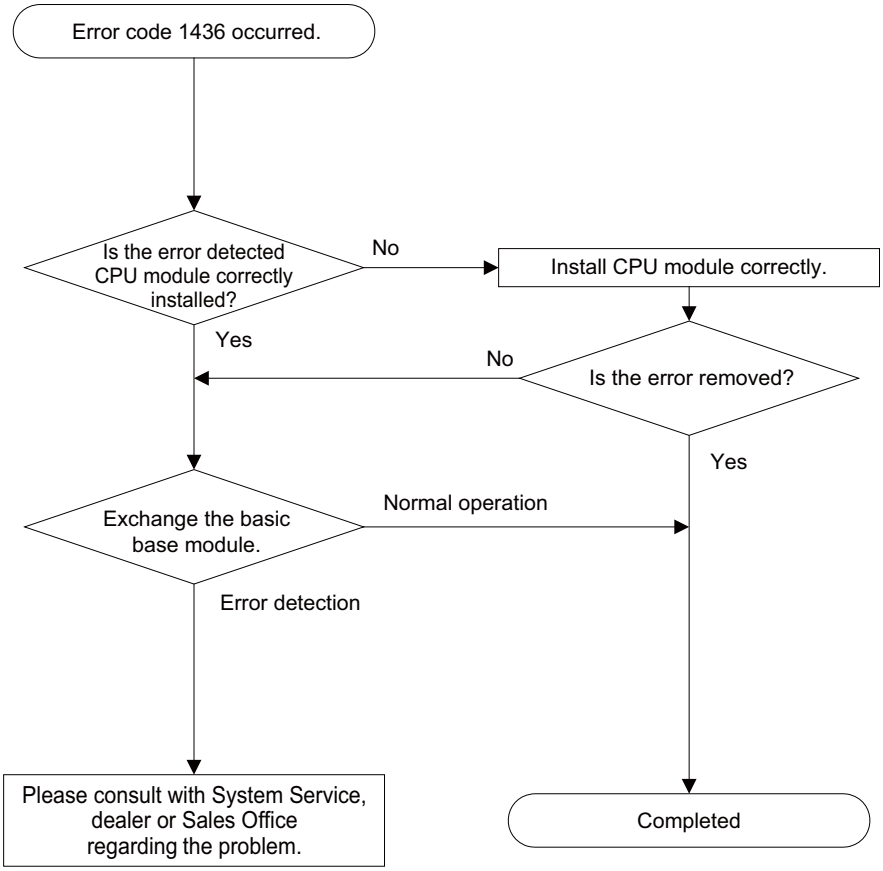
The specified CPU module : The CPU module specified by common information (CPU ordinal No.).
The error detected CPU module : The CPU module that CYCLIC-BUS ERROR occurred.

(2) The flow when the number of multi-CPUs is three or more



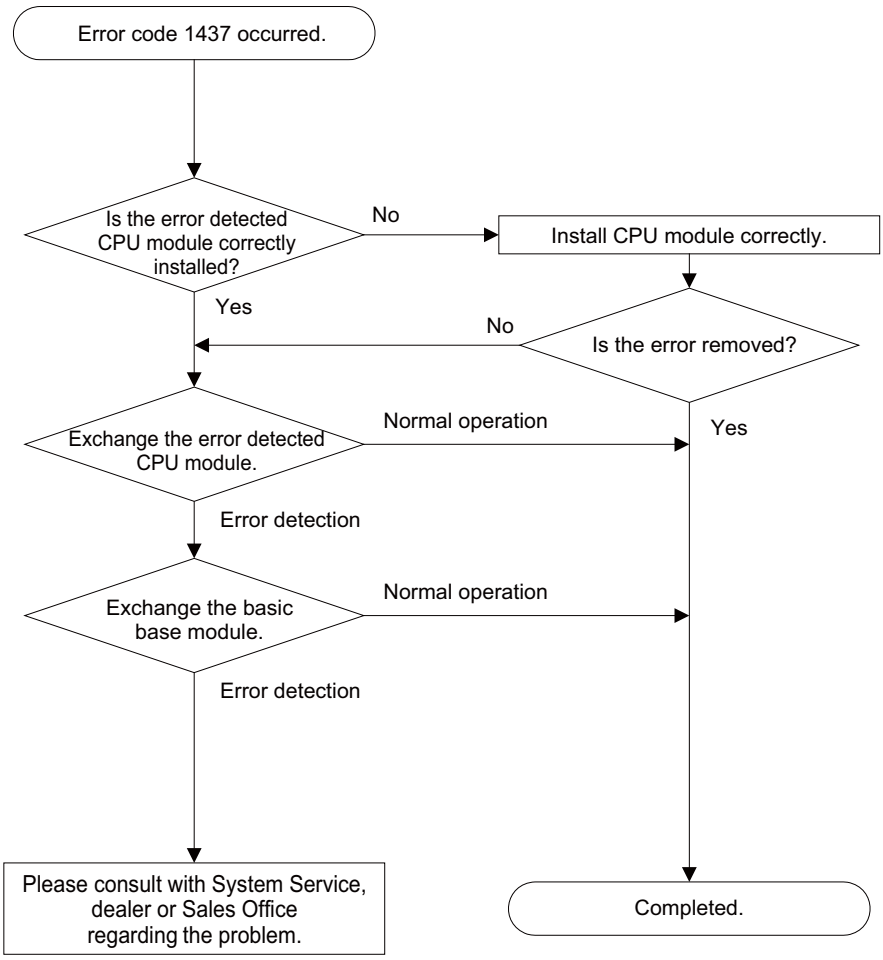
The specified CPU module : The CPU module specified by common information (CPU ordinal No.).
The error detected CPU module : The CPU module that CYCLIC-BUS ERROR occurred.

Appendix 2.13.1.7 The Flow When the Error Code 1436 Occurred



The error detected CPU module : The CPU module that CYCLIC-BUS ERROR occurred.
(When the error code is 1436, the CPU module is the first CPU.)

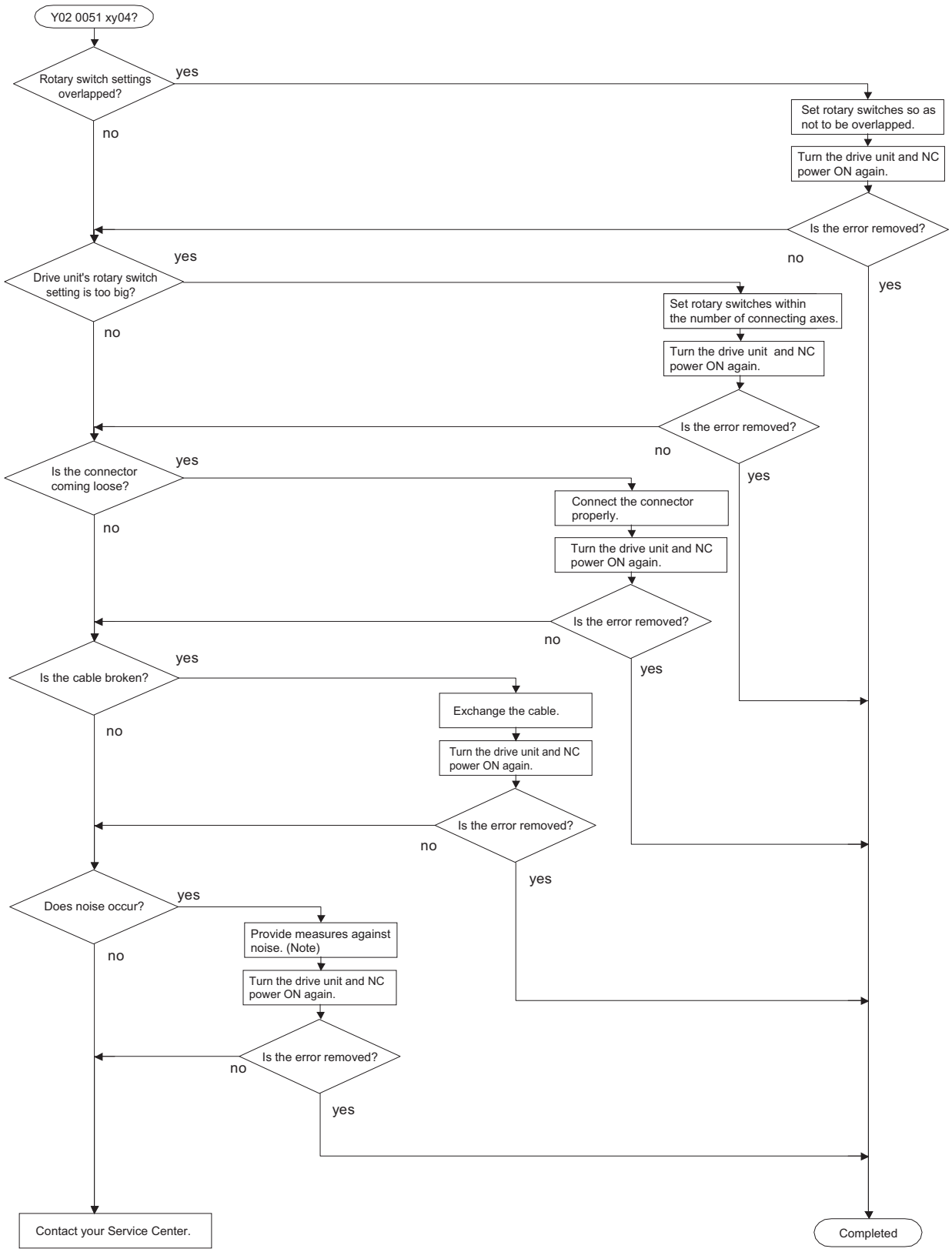
Appendix 2.13.1.8 The Flow When the Error Code 1437 Occurred



The error detected CPU module : The CPU module that CYCLIC-BUS ERROR occurred.
(When the error code is 1437, the CPU module is the first CPU.)

Appendix 2.13.2 Troubleshooting for MCP alarm

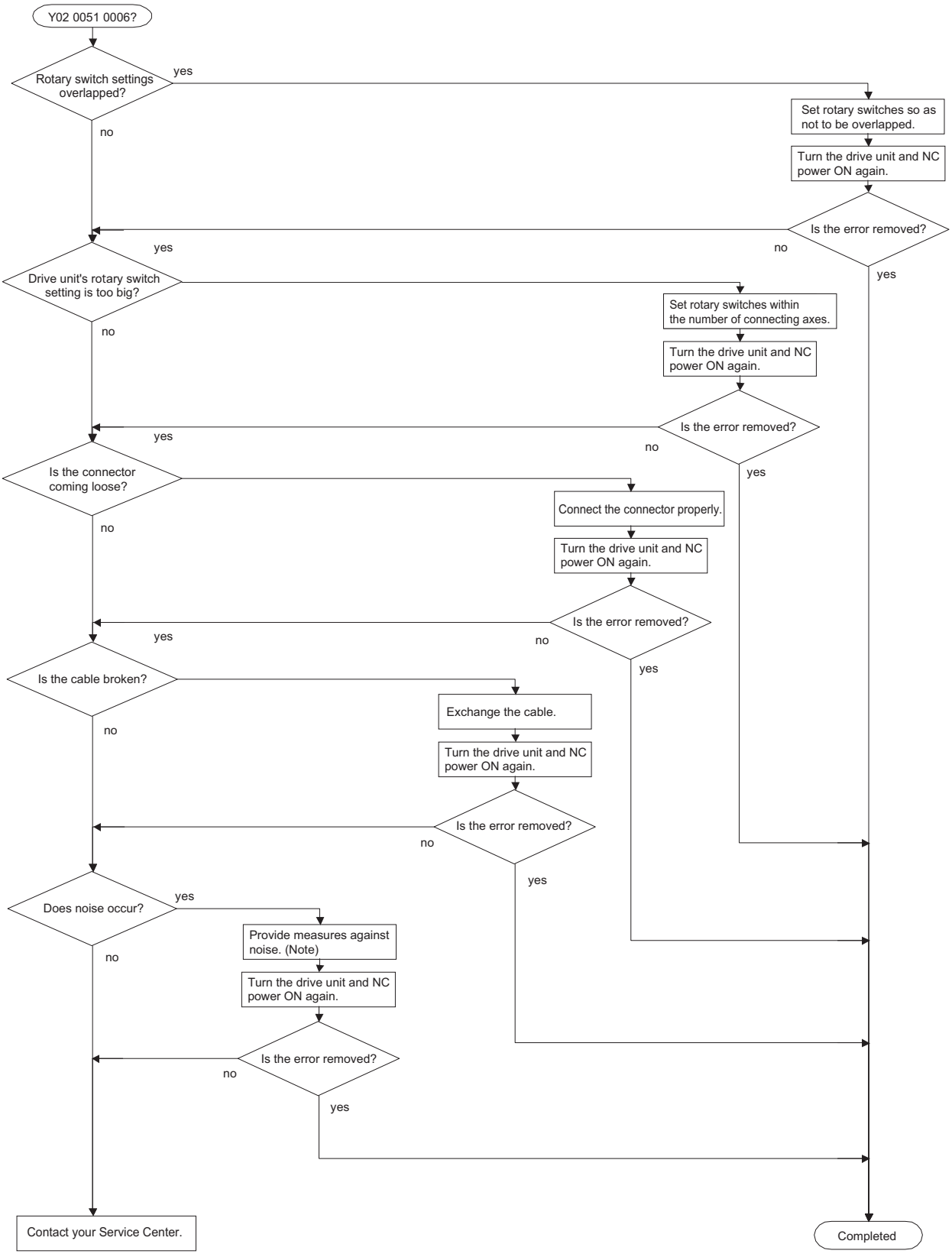
The Flow when the "Y02 SYSTEM ALARM 0051 xy04" occurs.



(Note) Examples of measures.

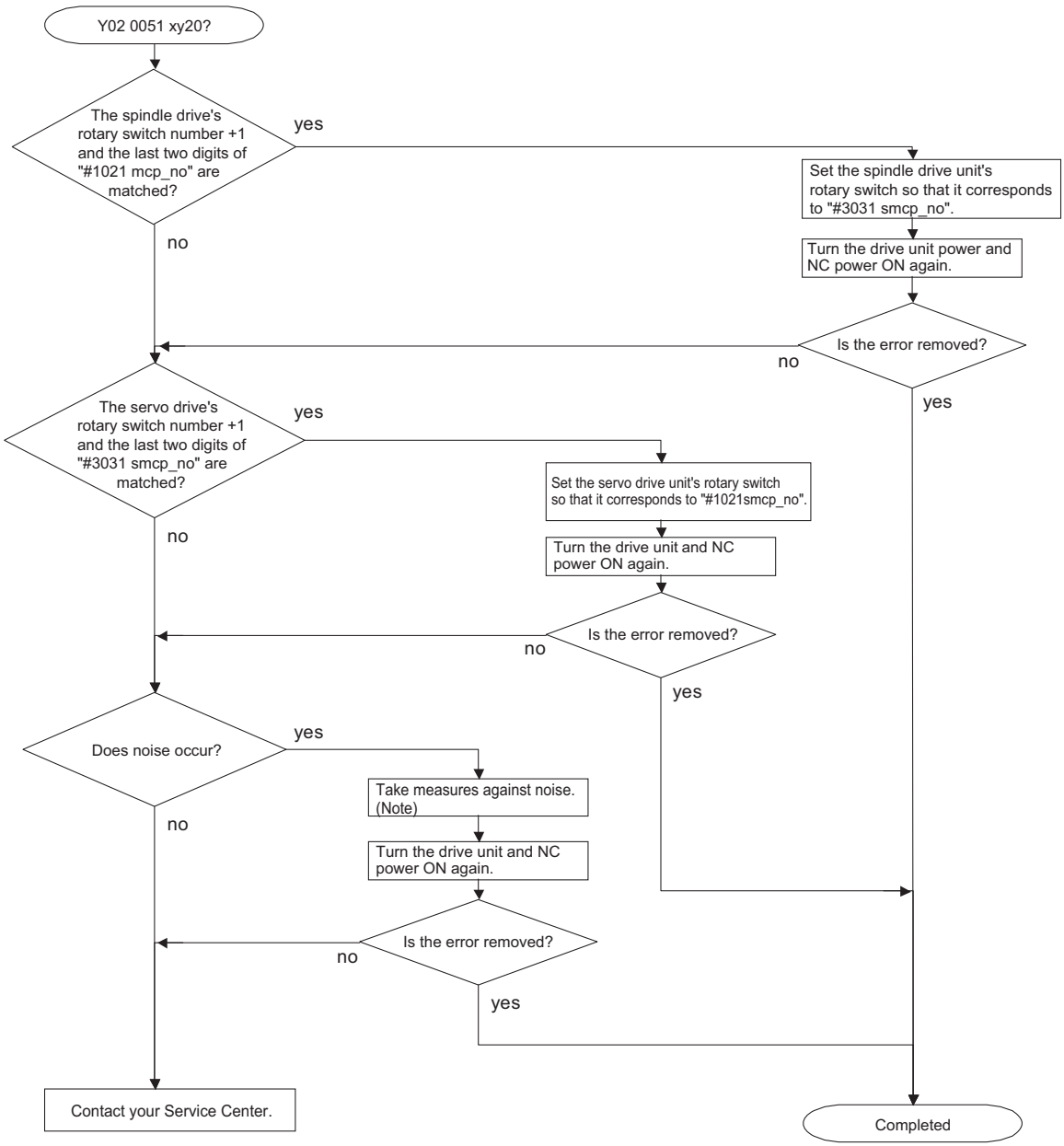
- Check the grounding wire.
- Separate the heavy electrical cable and light electrical cable
- Add a ferrite core

The Flow when the "Y02 SYSTEM ALARM 0051 x006" occurs.



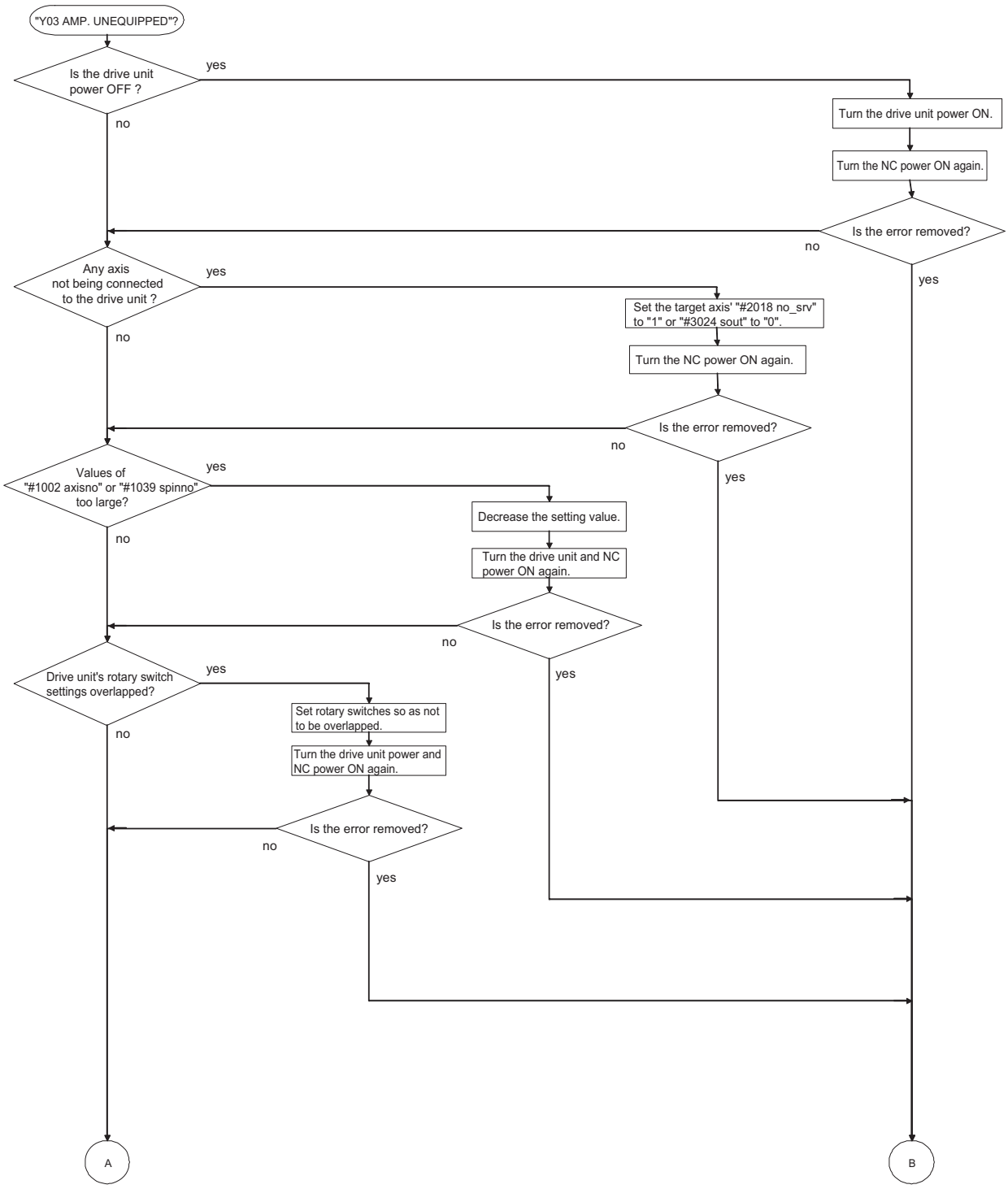
(Note) Examples of measures.
- Check the grounding wire.
- Separate the heavy electrical cable and light electrical cable
- Add a ferrite core

The Flow when the "Y02 SYSTEM ALARM 0051 xy20" occurs.



(Note) Examples of measures.
- Check the grounding wire.
- Separate the heavy electrical cable and light electrical cable
- Add a ferrite core

The Flow when the "Y03 AMP. UNEQUIPPED" occurs.



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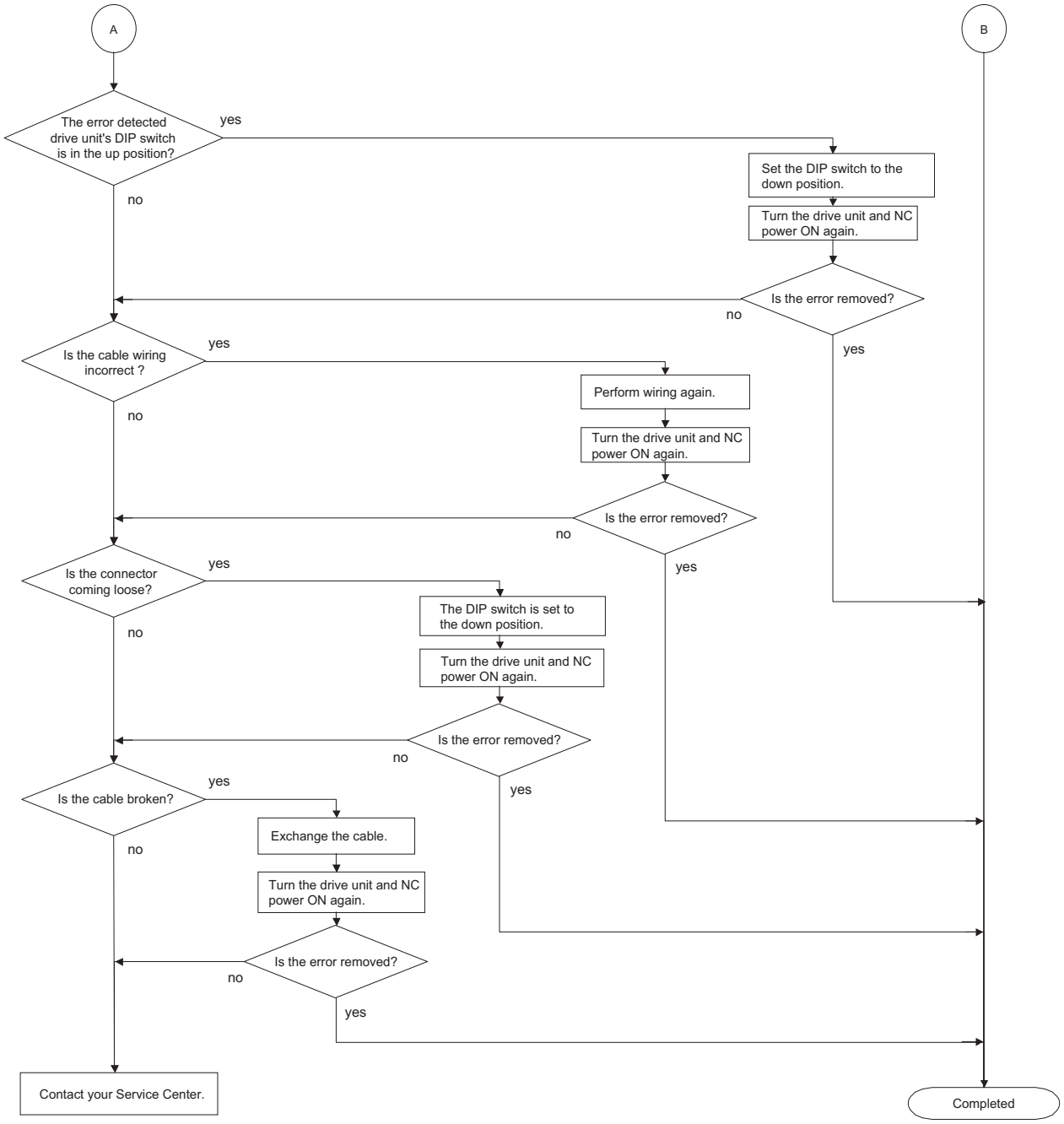
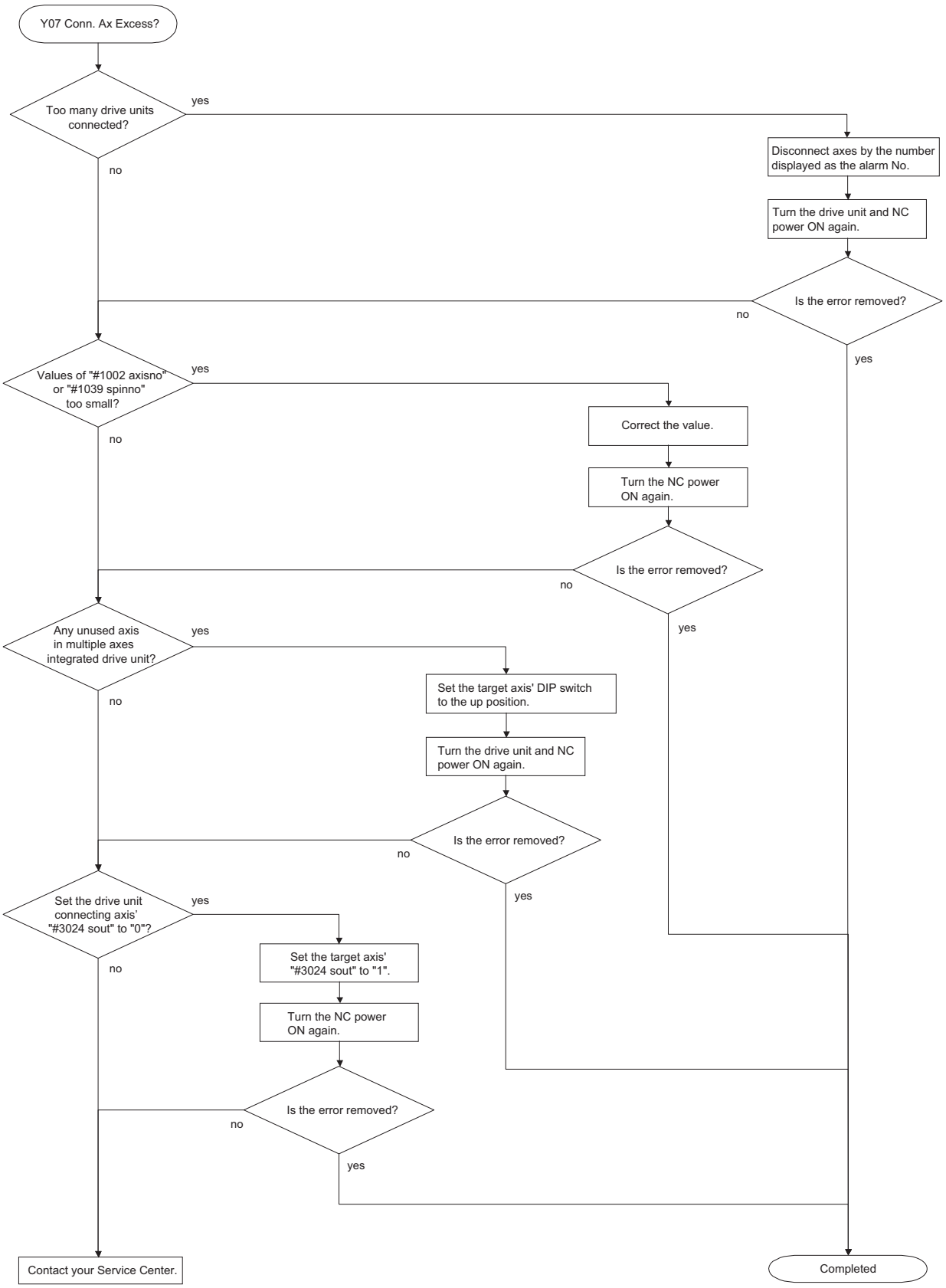


The Flow when the "Y07 Conn. Ax Excess " occurs.



Appendix 2.13.3 Drive System Troubleshooting

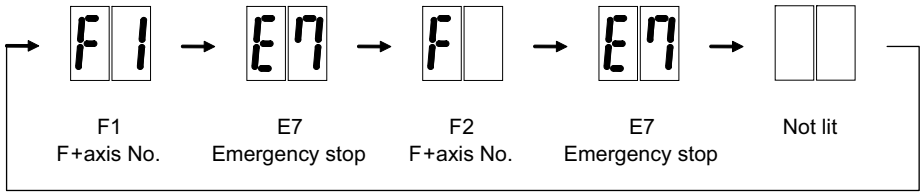
Follow this section to troubleshoot the alarms that occur during setting up or operating the machine. If the state is not improved with the following investigations, the drive unit may be faulty. Exchange the unit with another unit of the same capacity, and check whether the state is improved.

Appendix 2.13.3.1 Troubleshooting at Power ON

If the NC system does not start up correctly and a system error occurs when the NC power is turned ON, the drive unit may not have been started up properly. Check the LED display on the drive unit, and take measures according to this section.

LED display	Symptom	Cause of occurrence	Investigation method	Remedies
AA	Initial communication with the CNC was not completed correctly.	The drive unit axis No. setting is incorrect.	Is there any other drive unit that has the same axis No. set?	Set correctly.
		The CNC setting is incorrect.	Is the No. of CNC controlled axes correct?	Set correctly.
		Communication with CNC is incorrect.	Is the connector (CN1A, CN1B) connected?	Connect correctly.
			Is the cable broken?	Replace the cable.
Ab	Initial communication with the CNC was not carried out.	The axis is not used, the setting is for use inhibiting.	Is the DIP switch set correctly?	Set correctly.
		Communication with CNC is incorrect.	Is the connector (CN1A, CN1B) connected?	Connect correctly.
			Is the cable broken?	Replace the cable.
12	An error was detected in the unit's memory and IC during the self-diagnosis at power ON.	The CPU peripheral circuit is abnormal.	Check the repeatability.	Replace the unit.
			Check whether there is any abnormality with the unit's surrounding environment, etc.	Improve the surrounding environment.

The drive unit has started up normally if the following type of emergency stop (E7) is displayed on the display unit's LED display.



Normal drive unit LED display at NC power ON (for 1st axis)

Appendix 2.13.3.2 Troubleshooting for Each Alarm No.

Alarm No.	Axis selection error
11	Setting of the axis No. selection switch is incorrect.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the setting of the axis selection switch (rotary switch) on the top of the unit.	The same axis No. is set for the L and M axes.	Correctly set the axis No. 0 = No. 1 axis, 1 = No. 2 axis, ...	○	○
		The value is duplicated with other axis.	Correctly set the axis No. 0 = No. 1 axis, 1 = No. 2 axis, ...		
		No abnormality is found in particular.	Replace the drive unit.		

Alarm No.	Memory error 1
12	A CPU error or an internal memory error was detected during the power ON self-check.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check whether the servo or spindle software version was changed recently.	The version was changed.	There is a possibility that the spindle software was downloaded into servo, or the servo software was downloaded into spindle. Download servo/spindle software again.	○	○
		The version was not changed.	Check the investigation item No. 2.		
2	Check the repeatability.	The error is always repeated.	Replace the drive unit.	○	○
		The state returns to normal once, but occurs sometimes thereafter.	Check the investigation item No. 3.		
3	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No.	Software processing error 1
13	Software processing has not finished within the specified time.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check whether the servo or spindle software version was changed recently.	The version was changed.	Change software version back to the original.	○	○
		The version was not changed.	Check the investigation item No. 2.		
2	Check the repeatability.	The error is always repeated.	Replace the drive unit.	○	○
		The state returns to normal once, but occurs sometimes thereafter.	Check the investigation item No. 3.		
3	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No. 16	Magnetic pole position detection error An error was detected in the magnetic pole detection for controlling the motor.				
	Investigation items	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the parameters.	The parameters specified with the adjustment are not set.	Replace the drive unit.		○
		Correct parameters are set.	Check the investigation item No. 2.		
2	Check the repeatability.	The error is always repeated.	Replace the drive unit.		○
		The state returns to normal once, but occurs sometimes thereafter.	Check the investigation item No. 3.		
3	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.			○

Alarm No. 17	A/D converter error An error was detected in the A/D converter for detecting current FB.				
	Investigation items	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the repeatability.	The error is always repeated.	Replace the drive unit.	○	○
		The state returns to normal once, but occurs sometimes thereafter.	Check the investigation item No. 2.		
2	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No. 18	Motor side detector: Initial communication error Initial communication with the motor side detector failed.				
	Investigation items	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the servo parameter (SV025.ent) setting value. OSE104: 0, OSA104: 1 Are all others set to 2? (Excluding slave axis for synchronous control)	The value is not set correctly.	Correctly set SV025.		○
		The value is set correctly.	Check the investigation item No. 2.		
2	Jiggle the detector connectors (drive.unit side and detector side) and check if they are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	○
		The connector is not disconnected.	Check the investigation item No. 3.		
3	Turn the power OFF, and check the detector cable connection with a tester.	The connection is faulty.	Replace the detector cable.	○	○
		The connection is normal.	Check the investigation item No. 4.		
4	Replace with another unit, and check whether the fault is on the unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	○
		The alarm is on the detector side.	Check the investigation item No. 5.		
5	Check whether there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No. 1A	Machine side detector: Initial communication error Initial communication with the linear scale or the ball screw side detector failed.				
	Investigation items	Investigation results	Remedies	SV	SP
1	Check the servo parameter (SV025.pen) setting value. Are the serial communication type detector parameters set for the pulse type detector?	The value is not set correctly.	Correctly set SV025.	○	
		The value is set correctly.	Check the investigation item No. 2.		
2	Jiggle the detector connectors (drive.unit side and detector side) and check if they are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	
		The connector is not disconnected.	Check the investigation item No. 3.		
3	Turn the power OFF, and check the detector cable connection with a tester.	The connection is faulty.	Replace the detector cable.	○	
		The connection is normal.	Check the investigation item No. 4.		
4	Replace with another unit, and check whether the fault is on the unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	
		The alarm is on the detector side.	Check the investigation item No. 5.		
5	Check whether there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	

Alarm No. 1B	Machine side detector: Error 1 The machine side detector detected an error. As details defer from detector to detector, refer to the separate table (1).				
	Investigation items	Investigation results	Remedies	SV	SP
1	Check whether the servo axis has moved and the spindle has rotated when an alarm occurred.	The axis has operated.	Check the investigation item No. 3.	○	○
		The axis has not operated.	Check the investigation item No. 2.		
2	Check whether the operation at low speed is normal.	The axis has operated.	Check the investigation item No. 3.	○	○
		The axis has not operated.	Check the cautions at power ON. [1] Wiring check [2] Parameter check		
3	Jiggle the detector connectors (drive.unit side and detector side) and check if they are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	○
		The connector is not disconnected.	Check the investigation item No. 4.		
4	Turn the power OFF, and check the detector cable connection with a tester.	The connection is faulty.	Replace the detector cable.	○	○
		The connection is normal.	Check the investigation item No. 5.		
5	Replace with another unit, and check whether the fault is on the unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	○
		The alarm is on the detector side.	Check the investigation item No. 6.		
6	Check whether there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No. 1C	Machine side detector: Error 2 The machine side detector detected an error. As details defer from detector to detector, refer to the separate table (1).				
	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	

Alarm No. 1D	Machine side detector: Error 3 The machine side detector detected an error. As details defer from detector to detector, refer to the separate table (1).				
	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	

Alarm No. 1E	Machine side detector: Error 4 The machine side detector detected an error. As details defer from detector to detector, refer to the separate table (1).				
	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	

Alarm No. 1F	Machine side detector: Communication error
	An error was detected in communication data with the linear scale or the ball screw side detector. Or the communication was interrupted.

	Investigation items	Investigation results	Remedies	SV	SP
1	Jiggle the detector connectors (drive.unit side and detector side) and check if they are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	
		The connector is not disconnected.	Check the investigation item No. 2.		
2	Is the detector cable wired in the same conduit as the motor's power cable, or are the two cables laid in parallel near each other?	The cables are wired near each other. (Noise is entering from the power cable.)	Improve the cable wiring.	○	
		The wires are sufficiently separated.	Check the investigation item No. 3.		
3	Is the motor FG wire connected only to the drive unit which drives it? (Is the motor grounded to one point?)	The motor FG wire is grounded on the motor side.	Ground the motor to one point, connecting the wires together on the drive unit side.	○	
		The motor is grounded to one point.	Check the investigation item No. 4.		
4	Turn the power OFF, and check the detector cable connection with a tester. (Is the cable shielded?)	The connection is faulty.	Replace the detector cable.	○	
		The connection is normal.	Check the investigation item No. 5.		
5	Replace with another unit, and check whether the fault is on the unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	
		The alarm is on the detector side.	Check the investigation item No. 6.		
6	Check whether there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	

Alarm No. 21	Machine side detector: No signal
	When an excessive error alarm occurred, no signal from the machine side detector was detected.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the servo parameter (SV025.pen) setting value. Are the pulse type detector parameters set for a serial communication type detector?	The value is not set correctly.	Correctly set SV025.	○	
		The value is set correctly.	Check the investigation item No. 3.		
2	Jiggle the detector connectors (drive.unit side and detector side) and check if they are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	
		The connector is not disconnected.	Check the investigation item No. 4.		
3	Turn the power OFF, and check the detector cable connection with a tester.	The connection is faulty.	Replace the detector cable.	○	
		The connection is normal.	Check the investigation item No. 5.		
4	Replace with another unit, and check whether the fault is on the unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	
		The alarm is on the detector side.	Check the investigation item No. 6.		
5	Check whether there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	

Alarm No. 23	Excessive speed error A difference between the speed command and speed feedback was continuously exceeding 50 r/min for longer than the setting time.				
	Investigation items	Investigation results	Remedies	SV	SP
1	Check the U, V and W wiring between the spindle drive unit and spindle motor.	The wires are not correctly connected.	Correctly connect.		○
		The wires are correctly connected.	Check the investigation item No. 2.		
2	Check the spindle parameter (SP017, SP018, SP019, SP020, SP117 and SP129 or later) setting value.	The correct values are not set.	Correctly set.		○
		The correct values are set.	Check the investigation item No. 3.		
3	Measure the acceleration/ deceleration time up to the point where the spindle speed reaches its maximum. If the alarm occurs when forward run is changed to reverse run, measure the acceleration/ deceleration time from the forward run's maximum speed to reverse run's maximum speed. (Vice versa when the change is opposite.)	12sec or more.	Increase the spindle acceleration/ deceleration time constant setting value.		○
		Less than 12sec.	Check the investigation item No. 4.		
4	Check the load amount when the alarm occurred during cutting.	Load amount is 120% or more.	Reduce the load.		○
		Load amount is 119% or less.	Check the investigation item No. 5.		
5	Check the fluctuation of the input voltage into the power supply unit.	Voltage drop during acceleration does not satisfy the motor voltage.	Review the power supply capacity.		○
		Voltage drop during acceleration satisfies the motor voltage.	Check the investigation item No. 6.		
6	Check the capacity of the drive unit.	The capacity does not satisfy the motor output.	Increase the capacity.		○
		The capacity satisfies the motor output.	Replace the unit.		

Alarm No. 24	Grounding The motor power cable is in contact with FG (Frame Ground).				
	Investigation items	Investigation results	Remedies	SV	SP
1	Measure the insulation across the power cables (U,V,W) for connected motors and the ground. (Carry out a megger test.)	Less than 100kΩ.	The motor or power cable may be ground faulted.	○	○
		100kΩ or more.	Check the investigation item No. 2.		
2	Has oil come in contact with the motor or power cable?	Oil has come in contact.	Take measures so that oil does not come in contact. Check the motor's cannon connector and the inside of the terminal box, and clean as necessary.	○	○
		Oil has not come in contact.	Check the investigation item No. 3.		
3	Measure the insulation again.	Less than 1MΩ.	Replace the motor or cable.	○	○
		1MΩ or more.	Check the investigation item No. 2.		
4	Measure the resistance across the U, V, W phase terminals of the servo/ spindle drive unit and the ground. (Do not measure the insulation as the unit could be damaged.)	Less than 100kΩ.	Replace the drive unit.	○	○
		100kΩ or more.	Replace the power supply unit.		

Alarm No. 25	Absolute position data lost
	The absolute position was lost, as the backup battery voltage dropped in the absolute position detector.

	Investigation items	Investigation results	Remedies	SV	SP
1	Is warning 9F occurring at the same time?	The warning is occurring.	Check the investigation item No. 2.	○	
		The warning is not occurring.	Check the investigation item No. 3.		
2	Measure the battery voltage with a tester.	Less than 3V.	Replace the battery, and establish the zero point.	○	
		3V or more.	Check the NC bus cable connection.		
3	Did alarm No.18 occur when the power was turned ON the last time?	Alarm No.18 occurred.	Turn the drive unit control power ON again, and establish the zero point.	○	
		Alarm No.18 did not occur.	Check the investigation item No. 4.		
4	Was the detector cable or battery cable left disconnected from the unit for a long time?	The unit was left disconnected for a long time. Guide at delivery: 20 hours or more After 5 years: 10 hours or more	Turn the drive unit control power ON again, and establish the zero point.	○	
		The cables were not left disconnected.	Check the investigation item No. 5.		
5	Check the detector cable or battery cable connection with a tester.	The connection is faulty.	Replace the cable.	○	
		The connection is normal.	Replace the drive unit.		

Alarm No. 26	Unused axis error
	A power module error occurred in the axis whose axis No. selection switch was set to "F"(free axis).

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the repeatability.	The error is always repeated.	Replace the drive unit.	○	○
		The state returns to normal once, but occurs sometimes thereafter.	Check the investigation item No. 2.		
2	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No. 27	Machine side detector: Error 5
	The machine side detector detected an error. As details defer from detector to detector, refer to the separate table (1).

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	

Alarm No. 28	Machine side detector: Error 6
	The machine side detector detected an error. As details defer from detector to detector, refer to the separate table (1).

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	

Alarm No. 29	Machine side detector: Error 7
	The machine side detector detected an error. As details defer from detector to detector, refer to the separate table (1).

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	

Alarm No. 2A	Machine side detector: Error 8
	The machine side detector detected an error. As details defer from detector to detector, refer to the separate table (1).

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	

Alarm No. 2B	Motor side detector: Error 1
	The motor side detector (linear scale in the case of linear motor) detected an error. As details defer from detector to detector, refer to the separate table (1).

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	○

Alarm No. 2C	Motor side detector: Error 2
	The motor side detector (linear scale in the case of linear motor) detected an error. As details defer from detector to detector, refer to the separate table (1).

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	○

Alarm No. 2D	Motor side detector: Error 3
	The motor side detector (linear scale in the case of linear motor) detected an error. As details defer from detector to detector, refer to the separate table (1).

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	○

Alarm No. 2E	Motor side detector: Error 4
	The motor side detector (linear scale in the case of linear motor) detected an error. As details defer from detector to detector, refer to the separate table (1).

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	○

Alarm No. 2F	Motor side detector: Communication error
	An error was detected in communication data with the motor side detector or with the linear scale of a linear servo system. Or the communication was interrupted.

	Investigation items	Investigation results	Remedies	SV	SP
1	Jiggle the detector connectors (drive.unit side and detector side) and check if they are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	○
		The connector is not disconnected.	Check the investigation item No. 2.		
2	Is the detector cable wired in the same conduit as the motor's power cable, or are the two cables laid in parallel near each other?	The cables are wired near each other. (Noise is entering from the power cable.)	Improve the cable wiring.	○	○
		The wires are sufficiently separated.	Check the investigation item No. 3.		
3	Is the motor FG wire connected only to the drive unit which drives it? (Is the motor grounded to one point?)	The motor FG wire is grounded on the motor side.	Ground the motor to one point, connecting the wires together on the drive unit side.	○	○
		The motor is grounded to one point.	Check the investigation item No. 4.		
4	Turn the power OFF, and check the detector cable connection with a tester. (Is the cable shielded?)	The connection is faulty.	Replace the detector cable.	○	○
		The connection is normal.	Check the investigation item No. 5.		
5	Replace with another unit, and check whether the fault is on the unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	○
		The alarm is on the detector side.	Check the investigation item No. 6.		
6	Check whether there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No. 31	Overspeed
	The motor was detected to rotate at a speed exceeding the allowable speed. (In the case of linear motor, it was detected to move at a speed exceeding the allowable speed.)

	Investigation items	Investigation results	Remedies	SV	SP
1	Check if the unit in which the alarm was detected is servo or spindle.	The alarm was detected in servo.	Check the investigation item No. 2.	○	○
		The alarm was detected in spindle.	Check the investigation item No. 3.		
2	Check the servo parameters SV001 (PC1), SV002 (PC2), SV018 (PIT) and SV025 (MTYP) settings.	The settings are incorrect.	Correctly set.	○	
		Correctly set.	Check the investigation item No. 5.		
3	Check the spindle parameter SP017 (TSP) setting.	The setting is incorrect. The alarm is detected at 115% of SP017.	Correctly set.		○
		Correctly set.	Check the investigation item No. 4.		
4	Check the PLG output waveform.	There is a problem.	Adjust the PLG output waveform.	○	○
		Normal.	Check the investigation item No. 5.		
5	Check whether the speed waveform is overshooting.	The waveform is overshooting.	Increase the acceleration/ deceleration time constant.	○	○
		The waveform is not overshooting.	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)		
			Check the investigation item No. 6.		
6	Check the repeatability.	The alarm occurs when the motor is stopped.	Replace the detector or detector cable.	○	○
		The alarm occurs at all time.	Check the investigation item No. 7.		

Alarm No. 32	Power module overcurrent
	Overcurrent protection function in the power module has started its operation.

	Investigation items	Investigation results	Remedies	SV	SP
1	Disconnect the power cable (U, V, W) from the unit's terminal block and motor, and check whether a short-circuit between the power cable or whether conduction at both end of wiring occurs with a tester.	Short-circuited or not conducted.	Replace the power cables (U, V, W).	○	○
		There is no problem.	Check the investigation item No. 2.		
2	Check the motor insulation with a (megger) tester under the condition of the investigation item No. 1. (between motor power and ground earth)	Less than 1MΩ. (Grounding)	Replace the motor.	○	○
		1MΩ or more. (Normal)	Check the investigation item No. 3.		
3	Check the parameter setting values. [1] Refer to the adjustment procedure.	The value is not set correctly.	Correctly set.	○	○
		The value is set correctly.	Check the investigation item No. 4.		
4	Jiggle the detector connectors (drive.unit side and detector side) and check if they are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	○
		The connector is not disconnected.	Check the investigation item No. 5.		
5	Turn the power OFF, and check the detector cable connection with a tester.	The connection is faulty.	Replace the detector cable.	○	○
		The connection is normal.	Check the investigation item No. 6.		
6	Check the repeatability.	The state returns to normal once, but occurs sometimes thereafter.	Check the investigation item No. 8.	○	○
		The error is always repeated.	Check the investigation item No. 7.		
7	Replace with another unit, and check whether the fault is on the unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	○
		The alarm is on the detector side.	Replace the detector.		
8	Check for any abnormalities in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No. 34	NC-DRV communication: CRC error An error was detected in the data received from the CNC.				
	Investigation items	Investigation results	Remedies	SV	SP
1	Manually shake the connection connectors between NC and drive unit, battery unit and drive unit, or among multiple drive units to check if they are disconnected. Also, check if an excessive force is not applied on them.	The connector is disconnected (or loose).	Correctly install.	○	○
		The connector is not disconnected.	Check the investigation item No. 2.		
2	Turn the power OFF, and check the connection of the communication cables indicated in item 1 with a tester. Or, replace with a correct cable.	The connection is faulty.	Replace the communication cable.	○	○
		The connection is normal.	Check the investigation item No. 3.		
3	Check whether the NC or drive unit software version was changed recently.	The version was changed.	Change software version back to the original.	○	○
		The version was not changed.	Check the investigation item No. 4.		
4	Replace with another drive unit, and check whether the fault is on the NC side or drive unit side.	The alarm is on the drive unit side.	Replace the drive unit.	○	○
		The alarm is on the unit connections.	Check the investigation item No. 5.		
5	Check for any abnormalities in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No. 35	NC command error The travel command data that was received from the CNC was excessive.				
	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "34" items.			○	○

Alarm No. 36	NC-DRV communication: Communication error The communication with the CNC was interrupted.				
	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "34" items.			○	○

Alarm No. 37	Initial parameter error An incorrect parameter was detected among the parameters received from the CNC at the power ON.				
	Investigation items	Investigation results	Remedies	SV	SP
1	Check if the unit in which the alarm was detected is servo or spindle.	The alarm was detected in servo.	Check the investigation item No. 2.	○	○
		The alarm was detected in spindle.	Check the investigation item No. 3.		
2	An error parameter No. is displayed on the NC diagnosis screen. Check the servo parameter with the parameter adjustment procedure.	Wrong parameters were set. SV001 to SV065	Correct the parameter. Set the value within the designated setting range.	○	
		-1 The electronic gears are overflowing.	Check SV001, SV002 and SV018.		
		-2 The absolute position detection parameter is valid when OSE104 and OSE105 are connected. (Absolute position control cannot be used.)	In order to use the absolute position control function, an absolute position option is required.		
		Correct parameters were set.	Check the investigation item No. 4.		
3	An error parameter No. is displayed on the NC diagnosis screen. Check the servo parameter with the parameter adjustment procedure.	SP001 to SP384	Set the value within the designated setting range.		○
4	Check the alarm No. "34" items.			○	○

Alarm No. 38	NC-DRV communication: Protocol error 1
	An error was detected in the communication frames received from the CNC.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "34" items.			○	○

Alarm No. 39	NC-DRV communication: Protocol error 2
	An error was detected in the axis information data received from the CNC.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "34" items.			○	○

Alarm No. 3A	Overcurrent
	Excessive current was detected in the motor drive current.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check whether vibration is occurring.	Vibration is occurring.	[1] Set a filter. [2] Lower the speed loop gain (SV005/ SP005).	○	○
		There is no vibration.	Check the investigation item No. 2.		
2	The speed loop gain setting is larger than the standard value. Servo: SV005 / Spindle: SP005	The setting is too large.	Set an appropriate value.	○	○
		The setting is approximately the same as the standard value.	Check the investigation item No. 3.		
3	Check the current loop gain. Servo: SV009,SV010,SV011,SV012 Spindle: SP081,SP082,SP083,SP084	The setting is incorrect.	Set the standard value.	○	○
		The standard value is set.	Check the investigation item No. 4.		
4	Disconnect the power cable (U,V,W) from the terminal block and the cannon plug from the motor. Check the insulation with a tester.	The power cable is short-circuited.	Replace the motor power cable.	○	○
		There is no problem.	Check the investigation item No. 5.		
5	Check the insulation between the motor power cable and FG.	There is a ground fault at the power cable.	Replace the motor power cable.	○	○
		There is no problem.	Check the investigation item No. 6.		
6	Connect the cannon plug, and check the insulation between the power cable and FG.	There is a ground fault in the motor.	Replace the motor. (With the absolute position system, the zero point must be established.)	○	○
		There is no problem.	Check the investigation item No. 7.		
7	Check if there is any abnormality in the motor's ambient environment. (Ex. Ambient temperature, cutting water)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No. 3B	Power module overheat
	Thermal protection function in the power module has started its operation.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check that the fan is rotating correctly.	Large amounts of cutting oil or cutting chips, etc., are adhered, or the rotation is slow.	Clean or replace the fan.	○	○
		The fan is rotating properly.	Check the investigation item No. 2.		
2	Check whether the heat dissipating fins are dirty.	Cutting oil or cutting chips, etc., are adhered, and the fins are clogged.	Clean the fins.	○	○
		The fan is rotating properly.	Check the investigation item No. 3.		
3	Measure the drive unit's ambient temperature.	55° C or more.	Improve the ventilation and cooling for the power distribution panel.	○	○
		Less than 55° C	Check the investigation item No. 4.		
4	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No. 42	Feedback error 1
	An error was detected in the feedback signals of the position detector in a servo system, or in PLG's feedback signals in a spindle system.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check SP019 and SP020.	Parameter is set incorrectly.	Correctly set.		○
		Parameter is set correctly.	Check the investigation item No. 2.		
2	Check the alarm No. "2C" items.				○

Alarm No. 43	Feedback error 2
	Excessive difference was detected in position data between the motor side detector and the machine side detector in a servo system. In a spindle system, an error was detected in the encoder feedback signals.

	Investigation items	Investigation results	Remedies	SV	SP
1	Jiggle the detector connectors (drive unit side and detector side) and check if they are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	
		The connector is not disconnected.	Check the investigation item No. 2.		
2	Is the detector cable wired in the same conduit as the motor's power cable, or are the two cables laid in parallel near each other?	The cables are wired near each other. (Noise is entering from the power cable.)	Improve the cable wiring.	○	
		The wires are sufficiently separated.	Check the investigation item No. 3.		
3	Is the motor FG wire connected only to the drive unit which drives it? (Is the motor grounded to one point?)	The motor FG wire is grounded on the motor side.	Ground the motor to one point, connecting the wires together on the drive unit side.	○	
		The motor is grounded to one point.	Check the investigation item No. 4.		
4	Turn the power OFF, and check the detector cable connection with a tester. (Is the cable shielded?)	The connection is faulty.	Replace the detector cable.	○	
		The connection is normal.	Check the investigation item No. 5.		
5	Replace with another unit, and check whether the fault is on the unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	
		The alarm is on the detector side.	Check the investigation item No. 6.		
6	Check whether there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	
7	Check SP019 and SP020.	Parameter is set incorrectly.	Correctly set.	○	
		Parameter is set correctly.	Check the investigation item No. 8.		
8	Check the alarm No. "1B" items.			○	

Alarm No. 45	Fan stop
	A cooling fan built in the drive unit stopped, and overheat occurred in the power module.

	Investigation items	Investigation results	Remedies	SV	SP
1	Turn the unit power ON again, and confirm the rotation of the fan. Note) Assure more than 10 seconds for the time from when the power is turned OFF till when it is turned ON. For the fan used for the drive unit, assuring more than 10 seconds for the time from when the power is turned OFF till when it is turned ON is required.	The fan is rotating, and an alarm did not occur again.	Continue to use. The power may be turned ON without assuring more than 10 seconds for the time from when the power is turned OFF till when it is turned ON. Leave for more than 10 seconds, and turn the power ON again.	○	○
		The fan did not rotate. Or, an alarm occurred again.	Check the investigation item No. 2.		
2	Check if the connector connected to a fan is disconnected.	The connector is disconnected.	Correctly connect the connector.	○	○
		The connector is not disconnected.	Check the investigation item No. 3.		
3	Check if oil or cutting chips are adhered to the fan.	Oil or cutting chips are adhered.	Improve the use environment and replace the drive unit.	○	○
		Oil or cutting chips are not adhered. The cable may be broken.	Replace the drive unit.		

Alarm No. 46	Motor overheat Thermal protection function of the motor or in the detector, has started its operation.				
	Investigation items	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the repeatability.	The alarm occurs before operation.	Check the investigation item No. 2.	○	○
		The alarm occurs occasionally after operation is started.	Check the investigation item No. 5.		
2	Jiggle the detector connectors (drive.unit side and detector side) and check if they are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	○
		The connector is not disconnected.	Check the investigation item No. 3.		
3	Turn the power OFF, and check the detector cable connection with a tester. (Is the cable shielded?)	The connection is faulty.	Replace the cable.	○	○
		The connection is normal.	Check the investigation item No. 4.		
4	When using MDS-B-HR, check if the motor is validated while the parameter is not set.	SV034/bit2 is set to "0".	Set SP034/bit2 to "1".	○	
		SV034/bit2 ＝ 1	Check the investigation item No. 5.		
5	Check the overload % (servo) or load meter (spindle).	The load is large.	Servo: Check the investigation item No. 6. Spindle: Check the investigation item No. 8.	○	○
		The load is not large.	Check the investigation item No. 9.		
6	Is the unbalance torque high?	The constant load torque (friction + unbalance) is 60% or more.	Select the motor so that the constant load torque is 60% or less.	○	
		The constant load torque is less than 60%.	Check the investigation item No. 7.		
7	Was the overload alarm (50) forcibly reset by turning the drive unit power OFF?	The alarm was forcibly reset.	Do not turn the drive unit's power OFF when an overload alarm occurs. (The NC power can be turned OFF.)	○	○
		The alarm was not forcibly reset.	Check the investigation item No. 9.		
8	Check the parameter settings.	The parameter is not set correctly.	Correctly set.		○
		The value is set correctly.	Check the investigation item No. 9.		
9	Measure the motor temperature when the alarm occurs.	The motor is hot.	Check the investigation item No. 10.	○	○
		The motor is not hot.	Check the investigation item No. 12.		
10	When using a motor with fan, check whether the fan is stopped, or it is clogged with dust, etc.	The motor fan was stopped.	Check the investigation item No. 11.	○	○
		The motor fan wind flow is poor.	Clean the fan.		
11	Check the fan wiring.	There is no problem.	Check the investigation item No. 12.	○	○
		The cable is broken.	Replace the cable.		
		The cable is not broken.	Replace the fan.		
12	Replace the drive unit or motor with another drive unit or motor, and check whether the fault is on the drive unit side or motor side.	The alarm is on the drive unit side.	Replace the drive unit.	○	○
		The alarm is on the motor side.	Replace the motor.		
13	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Alarm No. 48	Motor side detector: Error 5 The motor side detector (linear scale in the case of linear motor) detected an error. As details defer from detector to detector, refer to the separate table (1).				
	Investigation items	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "1B" items.			○	○

Alarm No. 49	Motor side detector: Error 6 The motor side detector (linear scale in the case of linear motor) detected an error. As details defer from detector to detector, refer to the separate table (1).				
	Investigation items	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "1B" items.			○	

Alarm No. 4A	Motor side detector: Error 7
	The motor side detector (linear scale in the case of linear motor) detected an error. As details defer from detector to detector, refer to the separate table (1).

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	○

Alarm No. 4B	Motor side detector: Error 8
	The motor side detector (linear scale in the case of linear motor) detected an error. As details defer from detector to detector, refer to the separate table (1).

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "1B" items.			○	○

Alarm No. 4E	NC command mode error
	The mode outside the specification was input in spindle control mode selection.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the wiring and setting environment. 1) Correctly grounded? 2) Any noise generating devices around the unit? 3) Are the speed/position detector cables correctly shielded?	1) The grounding is incomplete.	Correctly ground.		
		2) The alarm occurs easily when a specific device operates.	Use noise measures on the device described on the left.		
		3) The cable is not correctly shielded.	Correctly shield the cable.		○
		No abnormality is found in particular.	Replace the drive unit.		

Alarm No.	Overload 1
50	Overload detection level became over 100%. The motor or the drive unit is overloaded.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the overload parameters. Servo: SV021, SV022 Spindle: SP063, SP064	The standard values (below) are not set. Servo: SV021 = 60, SV022 = 150 Spindle: SV063 = 60, SP064 = 110	Set the standard values.	○	○
		The standard values are set.	Check the investigation item No. 2.		
2	Check the overload % (servo) or load meter (spindle).	The load is large.	Servo: Check the investigation item No. 3. Spindle: Check the investigation item No. 7.	○	○
		The load is not large.	Check the investigation item No. 9.		
3	Check whether machine resonance is occurring.	Resonance is occurring.	Adjust the parameters. [1] Set the notch filter. [2] Lower VGN1(SV005).	○	
		Resonance is not occurring.	Check the investigation item No. 4.		
4	Check whether the shaft sways when the motor is stopped. (Hunting)	The motor is hunting.	Adjust the parameters. [1] Increase VGN1 (SV005). [2] Lower VIA (SV008).	○	
		The motor is not hunting.	Check the investigation item No. 5.		
5	Check the brake operation. [1] Check the brake relay. [2] Check the connector (CN20) connection.	The motor brakes are not released.	Correct the faulty section.	○	
		The motor brake operation is normal.	Check the investigation item No. 6.		
6	Check the load current with the NC Servo Monitor, and investigate the machine load.	The cutting load is large.	Lower the cutting load.	○	
		There is interference with the positioning pin.	When using the positioning pin, turn the servo OFF when stopped.		
		An excessive force is applied from the machine.	Check whether the ball screw is bent, or whether there is a fault in the guide.		
		The machine load is not large.	Check the investigation item No. 8.		
7	Check the PLG output waveform.	There is a problem.	Adjust the PLG output waveform.		○
		Normal.	Check the investigation item No. 8.		
8	Confirm the motor capacity selection again.	The motor performance is insufficient.	Lower the acceleration/deceleration rate or cutting load.	○	○
		The motor performance is sufficient.	Check the investigation item No. 9.		
9	Replace the drive unit.	Improved.	Replace the drive unit.	○	○
		Not improved.	Replace the motor.		

(Note) NR and PR resetting are not possible when the overload level is 50% or more. Do not forcibly reset (AR) by turning the unit power OFF.
If AR resetting is used at 50% or higher, the level is set to 80% when the power is turned ON next. (Servo)

Alarm No. 51	Overload 2
	Current command of more than 95% of the unit's max. current was being continuously given for longer than 1 second in a servo system. In a spindle system, current command of more than 95% of the motor's max. current was being continuously given for longer than 1 second.

	Investigation items	Investigation results	Remedies	SV	SP
1	Did the alarm occur immediately after READY ON?	The alarm occurred after ready ON before operation starts.	Check the investigation item No. 2.	○	
		The alarm occurred after normal operation.	Check the investigation item No. 5.		
2	Check that the PN voltage is supplied to the drive unit. [1] Is the CHARGE lamp ON?	The voltage is not supplied.	Correctly supply the PN voltage.	○	
		Approx. 300V is correctly supplied.	Check the investigation item No. 3.		
3	Check the motor power cable (U, V, W phases). [1] The power cable is not connected. [2] Is the cable connected to the motor for another axis?	The connections are incorrect.	Connect correctly.	○	
		The connections are correct.	Check the investigation item No. 4.		
4	Check the detector cable connection. [1] Is the cable connected to the detector for another axis?	The connections are incorrect.	Connect correctly.	○	
		The connections are correct.	Check the investigation item No. 5.		
5	Check whether the machine has collided.	The machine has collided.	Check the machining program and soft limit settings.	○	
		The machine has not collided.	Check the investigation item No. 6.		
6	Check whether the current value on the NC Servo Monitor screen is saturated during acceleration/ deceleration.	The current is saturated during acceleration/deceleration.	Increase the acceleration/deceleration time constant.	○	
		The current value during acceleration/ deceleration is appropriate.	Check the investigation item No. 7.		
7	Check the detector FB.	The FB signal is abnormal.	Replace the detector. (With the absolute position system, the zero point must be established.)	○	
		The FB signal is normal.	Replace the drive unit.		
8	Check the load meter value.	The load is large.	Lower the load.		○
		The load is not large.	Check the investigation item No. 9.		
9	Check the PLG output waveform.	There is a problem.	Adjust the PLG output waveform.		○
		Normal.	Replace the drive unit.		

Alarm No. 52	Excessive error 1
	A difference between the actual and theoretical motor positions during servo ON exceeded the setting value.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the excessive error detection width. SV023 (Servo) SP102 (Orientation control) SP154, SP155 (C-axis control) SP177/bitD, SP186 (Spindle synchronous control) SP193/bitD, SP218 (Synchronous tap)	The excessive error detection width is too small. Servo standard value: SV023 ={RAPID/(60*PGN1)}/2 For the spindle, a value larger than the droop amount: Droop amount = {(Spindle rotation speed)*(No. of pulses)}/{60*(position loop gain)}	Set appropriate values.	○	○
		Appropriate values are set.	Check the investigation item No. 2.		
2	Check the position detector polarity. SV017/bit4 (Servo) SP097/bit5 (Orientation control) SP129/bit5 (C-axis control) SP177/bit5 (Spindle synchronous control) SP193/bit5 (Synchronous tap control)	The polarity is reversed.	Correctly set the parameters.	○	○
		Normal.	Check the investigation item No. 3.		
3	Check the alarm No. "51" items.			○	○

Alarm No. 53	Excessive error 2
	A difference between the actual and theoretical motor positions during servo OFF exceeded the setting value.

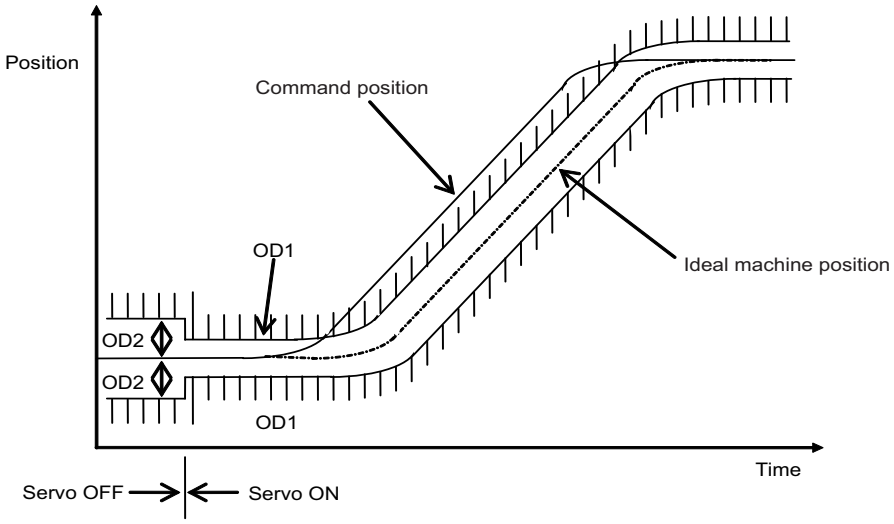
	Investigation items	Investigation results	Remedies	SV	SP
1	Check the follow-up function while the NC is in the servo OFF state.	The axis detachment function (NC parameter) is invalid. (Note) For the axis detachment function, refer to the NC manual.	Check the investigation item No. 2.	○	
		The axis detachment function (NC parameter) is valid. (Note) For the axis detachment function, refer to the NC manual.	Check the investigation item No. 3.		
2	Check whether the axis has moved during servo OFF, and check the motor brake operation.	The axis has moved.	Adjust the brakes, etc. so that the axis does not move.	○	
		The axis has not moved.	Check the investigation item No. 3.		
3	Check the excessive error detection width. SV026 (Servo)	The excessive error detection width is too small. SV026 ={RAPID / (60*PGN1)} / 2	Set an appropriate value.	○	
		An appropriate value is set.	Check for problems on the NC side, such as the position FB follow-up control.		

Alarm No. 54	Excessive error 3
	When an excessive error 1 occurred, detection of the motor current failed.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check that the PN voltage is supplied to the drive unit. [1] Is the CHARGE lamp ON?	The voltage is not supplied.	Correctly supply the PN voltage.	○	
		Approx. 300V is correctly supplied.	Check the investigation item No. 2.		
2	Check the motor power cable (U, V, W phases). [1] The power cable is not connected. [2] Is the cable connected to the motor for another axis?	The connections are incorrect.	Connect correctly.	○	
		The connections are correct.	Replace the drive unit.		

Supplement (servo)

Depending on the ideal machine position in respect to the command position, the actual machine position could enter the actual shaded section shown below, which is separated more than the distance set in OD1.



Alarm No. 58	Collision detection 1: G0
	When collision detection function was valid, the disturbance torque in rapid traverse (G0) exceeded the collision detection level.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check whether the machine has collided.	The machine has collided.	Check the machining program and soft limit settings.	○	
		The machine has not collided.	Increase the detection level (SV060). (The detection level should be set as 1.5-times the maximum torque or more.)		

Alarm No. 59	Collision detection 1: G1
	When collision detection function was valid, the disturbance torque in cutting feed (G1) exceeded the collision detection level.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check whether the machine has collided.	The machine has collided.	Check the machining program and soft limit settings.	○	
		The machine has not collided.	Increase the detection level (SV035.clG1). (Set the detection level larger than the maximum cutting load.)		

Alarm No. 5A	Collision detection 2
	When collision detection function was valid, the command torque reached the max. motor torque.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check whether the machine has collided.	The machine has collided.	Check the machining program and soft limit settings.	○	
		The machine has not collided.	Check the investigation item No. 2.		
2	Check whether the current value on the NC Servo Monitor screen is saturated during acceleration/ deceleration.	The current is saturated during acceleration/deceleration.	Check the investigation item No. 3.	○	
		The current value during acceleration/ deceleration is appropriate.	Investigate the cause of the load fluctuation.		
3	Can the acceleration/deceleration time constant be changed?	The constant can be changed.	Increase the acceleration/deceleration time constant.	○	
		The constant cannot be changed.	Set to ignore collision detection method 2.		

Alarm No. 5B	Safety observation: Commanded speed error
	In safety monitoring mode, the commanded speed was detected to exceed the safe speed.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the commanded speed on the NC side.	The commanded speed and safe speed limit value are the same.	Reduce the commanded speed on the NC side or increase the safe speed limit value.	○	○
		The commanded speed is slower than the safe speed.	Replace the drive unit.		

Alarm No. 5D	Safety observation: Door state error
	In safety monitoring mode, the door state signal from the NC and the same signal from the drive unit don't match. Otherwise, door open state was detected in normal mode.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the DI input timing.	NC side and drive unit side inputs do not match one another within 500ms.	Review the DI input sequence. Check if the cable for the DI input signal is broken.	○	○
		Both NC side and drive unit side input timings match one another within 500ms.	Investigate the wiring and connection environment.		

Alarm No. 5E	Safety observation: Feedback speed error In safety monitoring mode, the motor speed was detected to exceed the safe speed.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the DI input timing.	The feedback speed and safe speed limit value are the same.	Reduce the commanded speed on the NC side or increase the safe speed limit value.	○	○
		The feedback speed is slower than the safe speed.	Replace the drive unit.		
2	Check the wiring and setting environment. 1) Correctly grounded? 2) Any noise generating devices around the unit? 3) Are the speed/position detector cables correctly shielded?	1) The grounding is incomplete.	Correctly ground.	○	○
		2) The alarm occurs easily when a specific device operates.	Use noise measures on the device described on the left.		
		3) The cable is not correctly shielded.	Correctly shield the cable.		
		No particular problems found.	Replace the drive unit.		

Alarm No. 61	Power supply: Power module overcurrent Overcurrent protection function in the power module has started its operation.

	Investigation items	Investigation results	Remedies	CV
1	Check the state of the operation when the alarm occurs, and check the repeatability.	The alarm occurs each time immediately after 200VAC is supplied or after READY is turned ON.	Replace the unit.	○
		The alarm occurs frequently during READY ON.	Check the investigation item No. 3.	
		The alarm occurs after continuous operation for a long time. The unit is hot.	Check the investigation item No. 2.	
2	Check the load state of all motors, and the starting/stopping frequency.	The total load of all motors exceeds the rated capacity of the power supply unit.	Lower the motor load and operation frequency.	○
		The total does not exceed the capacity.	Check the investigation item No. 3.	
3	Check the power capacity.	The power capacity is insufficient.	Increase the power capacity.	○
		The specified power capacity is secured.	Check the investigation item No. 4.	
4	Measure the voltage across wires. [1] Is the voltage 170V or more even when the motor is accelerating?	The voltage drops to 170V or less occasionally.	Increase the power capacity.	○
		The difference of the voltage across wires is 10V or more.	Improve the power phase balance.	
		The difference of the voltage across wires is less than 10V.	Check the investigation item No. 5.	
5	Measure the power voltage with a synchroscope, and check whether there is any distortion. [1] Are there any other devices causing the power distortion?	The power voltage is distorted.	Improve the source of the distortion. Install an AC reactor.	○
		The power voltage waveform is not abnormal.	Check the investigation item No. 6.	
6	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Noise, grounding, etc.)	Take remedies according to the causes of the abnormality in the ambient environment.		○

Alarm No.	Power supply: Frequency error
62	The input power supply frequency increased above the specification range.

	Investigation items	Investigation results	Remedies	CV
1	Check the state of the operation when the alarm occurs, and check the repeatability.	The alarm occurs each time immediately after the power is turned ON. Or, the alarm occurs occasionally regardless of the operation state.	Check the investigation item No. 2.	○
		The alarm occurs only while the motor is accelerating/decelerating.	Check the investigation item No. 3.	
2	Measure the power voltage waveform during normal operation.	The frequency is deviated from 50Hz ± 3% or 60Hz ± 3%.	Review the power facilities.	○
		The voltage waveform dips at some sections.	Improve the source of the distortion. Install an AC reactor.	
		There is no problem.	Check the investigation item No. 4.	
3	Measure the power voltage when the motor is accelerating/decelerating.	The frequency greatly fluctuates during acceleration/deceleration.	Review the power facilities.	○
		The voltage waveform during deceleration dips in some sections.	Improve the source of the distortion. Install an AC reactor.	
		There is no problem.	Check the investigation item No. 4.	
4	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Noise, grounding, etc.)	Take remedies according to the causes of the abnormality in the ambient environment.		○

Alarm No.	Power supply: Phase interruption
67	An open-phase condition was detected in input power supply circuit.

	Investigation items	Investigation results	Remedies	CV
1	Check the voltage for each input phase.	There are phases with no voltage.	Correct the power supply.	○
		There is no problem.	Check the investigation item No. 2.	
2	Check the alarm No. "71" items.			○

Alarm No.	Power supply: Watchdog
68	The system does not operate correctly.

	Investigation items	Investigation results	Remedies	CV
1	Check the repeatability.	The alarm occurs each time READY is turned ON.	Replace the unit.	○
		The alarm occurs occasionally.	Check the investigation item No. 2.	
2	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Noise, grounding, etc.)	Take remedies according to the causes of the abnormality in the ambient environment.		○

Alarm No.	Power supply: Grounding
69	The motor power cable is in contact with FG (Frame Ground).

	Investigation items	Investigation results	Remedies	SV	SP
1	Measure the insulation across the power cables (U,V,W) for all motors and the ground. (Carry out a megger test.)	Less than 100kΩ. (Grounding)	The motor or power cable may be ground faulted.	○	○
		100kΩ or more. (Normal)	Check the investigation item No. 2.		
2	Has oil come in contact with the motor or power cable?	Oil has come in contact.	Take measures so that oil does not come in contact. Check the motor's cannon connector and the inside of the terminal box, and clean as necessary.	○	○
		Oil has not come in contact.	Check the investigation item No. 3.		
3	Measure the insulation again.	Less than 1MΩ. (Grounding)	Replace the motor or cable.	○	○
		1MΩ or more. (Normal)	Check the investigation item No. 2.		
4	Measure the resistance across the U, V, W phase terminals of the servo/ spindle drive unit and the ground. (Do not measure the insulation as the unit could be damaged.)	Less than 100kΩ.	Replace the drive unit.	○	○
		100kΩ or more.	Replace the power supply unit.		
5	Check whether there is any axis in which alarm has occurred.	There is an axis in which alarm has occurred.	Check the alarm No. "24" items.	○	○
		There is no axis in which alarm has occurred.	Check the investigation item No. 2.		

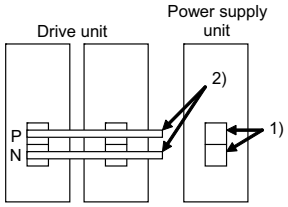
Alarm No.	Power supply: External contactor welding
6A	A contact of the external contactor is welding.

	Investigation items	Investigation results	Remedies	CV
1	Check whether any alarm has occurred on the drive unit side.	An alarm has occurred.	Remove the cause of the alarm on the drive side, and check the investigation item No. 2.	○
		An alarm has not occurred.	Check the investigation item No. 2.	
2	Check whether the contactor's contact has melted.	The contactor has melted.	Replace the contactor.	○
		The contactor has not melted.	Check the investigation item No. 3.	
3	Check that the contactor excitation wiring is correctly connected from the power supply unit's MC1 terminal.	The connection is incorrect.	Correctly connect.	○
		The connection is correct.	Replace the power supply unit.	

Alarm No.	Power supply: Rush relay welding
6B	A resistor relay for rush short circuit fails to be OFF.

	Investigation items	Investigation results	Remedies	CV
1	Check whether any alarm has occurred on the drive unit side.	An alarm has occurred.	Remove the cause of the alarm on the drive side, and check the investigation item No. 2.	○
		An alarm has not occurred.	Check the investigation item No. 2.	
2	Check the repeatability.	The alarm occurs each time READY is turned ON.	Replace the unit.	○
		The alarm occurs occasionally.	Check the investigation item No. 3.	
3	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Noise, grounding, etc.)	Take remedies according to the causes of the abnormality in the ambient environment.		○

Alarm No.	Power supply: Main circuit error
6C	An error was detected in charging operation of the main circuit capacitor.

	Investigation items	Investigation results	Remedies	CV
1	Check the CHARGE lamp state when the alarm occurs.	The CHARGE lamp remains ON for some time.	Replace the power supply unit.	○
		The lamp turns ON instantly, but when the alarm occurs and the contactor turns OFF, the lamp turns OFF immediately.	Check the investigation item No. 2.	
		The lamp never turns ON.	Check the investigation item No. 2. Then replace the unit.	
2	Disconnect the power supply unit's PN terminal block wiring, and measure the resistance value at 1) and 2) shown below. 	1) The power supply unit side is abnormal.	Replace the power supply unit.	○
		2) The drive unit side is abnormal.	Disconnect the PN wiring, and then check the drive unit side.	
		1) and 2) are both normal.	Replace the power supply unit.	

Tester measurement point	Polarity +	Polarity -	Normal	Abnormal
1)	P	N	Several 100Ω	Short-circuit/∞Ω
	N	P	∞Ω	Several 100Ω
2)	P	N	Several 100Ω	Short-circuit/∞Ω
	N	P	∞Ω	Several 100Ω

Alarm No.	Power supply: Memory error/AD error
6E	An error was detected in the internal memory or A/D converter.

	Investigation items	Investigation results	Remedies	CV
1	Check the repeatability.	The alarm occurs each time READY is turned ON.	Replace the unit.	○
		The alarm occurs occasionally.	Check the investigation item No. 2.	
2	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Noise, grounding, etc.)	Take remedies according to the causes of the abnormality in the ambient environment.		○

Alarm No.	Power supply error
6F	No power supply is connected to the drive unit, or a communication error was detected.

	Investigation items	Investigation results	Remedies	CV
1	Check the LED display on the power supply unit.	"F" is flickering.	An A/D converter error has occurred. Check the alarm No. "6E" items.	○
		Another alarm code is flickering.	Check items of each alarm No.	
		"0" is displayed.	Check the investigation item No. 2.	
		"F" is displayed.	Check the investigation item No. 2.	
		"8" is displayed.	Check the alarm No. "68" items.	
		"b", "C", "d" is displayed.	Check the investigation item No. 3.	
		Something else is displayed.	Check the alarm No. "68" items.	
2	Check the rotary switch setting.	0 or 4 is set.	Check the investigation item No. 3.	○
		A value other than the above is set.	Correctly set the rotary switch.	
3	Check the communication cable (CN4) connected with the drive unit.	There is a problem with the wiring or shield.	Replace the cable.	○
		There is no problem.	Replace the unit.	

(Note) Alarm 6F is detected at the same time other power supply alarms occur.

Alarm No.	Power supply: External emergency stop error
70	A mismatch of the external emergency stop input and CNC emergency stop input continued for 30 seconds.

	Investigation items	Investigation results	Remedies	CV
1	Check the connection between external emergency stop and NC emergency stop.	Not wired.	Correctly wire the external emergency stop and NC emergency stop.	○
2	Check whether there is any abnormality with the unit's surrounding environment, etc.	No abnormality is found in particular.	Replace the drive unit.	○
		The grounding is incomplete.	Take remedies according to the causes of the abnormality. Additionally ground and review.	

Alarm No.	Power supply: Instantaneous power interruption
71	The power was momentarily interrupted.

	Investigation items	Investigation results	Remedies	CV
1	Investigate the sequence to check whether the contactor has been turned OFF with an emergency stop button, etc.	The contactor has been turned OFF externally.	Review the machine sequence. When turning the contactor OFF with external means, such as an emergency stop button, this alarm can be avoided by inputting NC emergency stop at the same time.	○
		The contactor has not been turned OFF.	Check the investigation item No. 2.	
2	Check the repeatability.	The alarm occurs each time READY is turned ON.	Check the investigation item No. 3.	○
		The alarm occurs at a certain operation.	Check the investigation item No. 1. If there is no problem, check the investigation item No. 3.	
		The alarm occurs occasionally during operation.	Check the investigation item No. 4.	
3	Check whether the power input wire and contactor are correctly wired.	The wiring is incorrect.	Correctly connect.	○
		There is no problem.	Check the investigation item No. 4.	
4	Check the power voltage waveform with a synchroscope.	An instantaneous power failure or voltage drop occurs frequently.	Correct the power facility.	○
		There is no problem.	Replace the unit.	

Alarm No.	Power supply: Fan stop
72	A cooling fan built in the power supply unit stopped, and overheat occurred in the power module.

	Investigation items	Investigation results	Remedies	CV
1	Turn the unit power ON again, and confirm the rotation of the fan. Note) Assure more than 10 seconds for the time from when the power is turned OFF till when it is turned ON. For the fan used for the drive unit, assuring more than 10 seconds for the time from when the power is turned OFF till when it is turned ON is required.	The fan is rotating, and an alarm did not occur again.	Continue to use. The power may be turned ON without assuring more than 10 seconds for the time from when the power is turned OFF till when it is turned ON. Leave for more than 10 seconds, and turn the power ON again.	○
		The fan did not rotate. Or, an alarm occurred again.	Check the investigation item No. 2.	
2	Check if the connector connected to a fan is disconnected.	The connector is disconnected.	Correctly connect the connector.	○
		The connector is not disconnected.	Check the investigation item No. 3.	
3	Check if oil or cutting chips are adhered to the fan.	Oil or cutting chips are adhered.	Improve the use environment and replace the drive unit.	○
		Oil or cutting chips are not adhered. The cable may be broken.	Replace the drive unit.	

Alarm No. 73	Power supply: Over regeneration
	Over-regeneration detection level became over 100%. The regenerative resistor is overloaded. This alarm cannot be reset for 15 min from the occurrence. Leave the drive system energized for more than 15 min, then turn the power ON to reset the alarm.

	Investigation items	Investigation results	Remedies	CV
1	Check the alarm occurrence state and regenerative load displayed on the NC Monitor screen while changing the operation mode.	The regenerative load value increases when the power is turned ON and the motor is not rotated.	Check whether the state is affected by power fluctuation, grounding or noise. If there is no problem, replace the unit.	○
		The regenerative load value increases each time the motor decelerates, and the alarm occurs.	A-CR: Check the investigation item No. 2. C1-CV: Check the investigation item No. 4.	
		The regenerative load value increases each time the motor decelerates, but the alarm does not occur when the operation mode is eased.	A-CR: Check the investigation item No. 2. C1-CV: Ease the operation mode.	
2	Check whether the parameter (regenerative resistor type) of the drive unit controlling the power supply unit is correct.	The setting is incorrect.	Correctly set. (Check the alarm No. "6D" items.)	○
		The setting is correct.	Check the investigation item No. 3.	
3	Check the regenerative resistor's state. [1] Is oil adhered? [2] Measure the resistance value.	The regenerative resistor is abnormal.	Replace the regenerative resistor.	○
		There is no problem.	Check the investigation item No. 4.	
4	Check the alarm No. "75" items.			○

Alarm No. 75	Power supply: Overvoltage
	L+ and L- bus voltage in main circuit exceeded the allowable value. As the voltage between L+ and L- is high immediately after this alarm, another alarm may occur if this alarm is reset in a short time. Wait more than 5 min before resetting so that the voltage drops.

	Investigation items	Investigation results	Remedies	CV
1	Check the repeatability.	The alarm occurs each time the motor decelerates.	Check the investigation item No. 3.	○
		The alarm occurs occasionally.	Check the investigation item No. 2.	
2	Check the power supply's alarm history.	Auxiliary regeneration frequency over (E8) occurs just before the over-voltage occurs.	Limit the occurrence of the excessive instantaneous regeneration by not decelerating multiple axes at the same time.	○
		Others.	Check the investigation item No. 3.	
3	Check the power capacity.	The power capacity is insufficient.	Increase the power capacity.	○
		The specified power capacity is secured.	Check the investigation item No. 4.	
4	Measure the voltage across wires. [1] Is the voltage 170V or more even when the motor is accelerating?	The voltage drops to 170V or less occasionally.	Increase the power capacity.	○
		The difference of the voltage across wires is 10V or more.	Improve the power phase balance.	
		The difference of the voltage across wires is less than 10V.	Check the investigation item No. 5.	
5	Measure the power voltage with a synchroscope, and check whether there is any distortion. [1] Are there any other devices causing the power distortion?	The power voltage is distorted.	Improve the source of the distortion. Install an AC reactor.	○
		The power voltage waveform is not abnormal.	Check the investigation item No. 6.	
6	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Noise, grounding, etc.)	Take remedies according to the causes of the abnormality in the ambient environment.		○

Alarm No. 76	Power supply: External emergency stop setting error
	The rotary switch setting of external emergency stop is not correct, or a wrong external emergency stop signal is input.

	Investigation items	Investigation results	Remedies	CV
1	Check the rotary switch setting.	When using external emergency stop, rotary switch is not set to "4".	Set the rotary switch to "4".	○
2	Check whether there is any abnormality with the unit's surrounding environment, etc.	No abnormality is found in particular.	Replace the drive unit.	○
		The grounding is incomplete.	Take remedies according to the causes of the abnormality. Additionally ground and review.	

Alarm No. 77	Power supply: Power module overheat
	Thermal protection function in the power module has started its operation.

	Investigation items	Investigation results	Remedies	CV
1	Check that the fan is rotating correctly.	Large amounts of cutting oil or cutting chips, etc., are adhered, or the rotation is slow.	Clean or replace the fan.	○
		The fan is rotating properly.	Check the investigation item No. 2.	
2	Check whether the heat dissipating fins are dirty.	Cutting oil or cutting chips, etc., are adhered, and the fins are clogged.	Clean the fins.	○
		The fins are normal.	Check the investigation item No. 3.	
3	Measure the power supply unit's ambient temperature.	55° C or more.	Improve the ventilation and cooling for the power distribution panel.	○
		Less than 55° C	Check the investigation item No. 4.	
4	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○

Alarm No. 88	Watchdog
	The system does not operate correctly.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check whether the servo or spindle software version was changed recently.	The version was changed.	Change software version back to the original.	○	○
		The version was not changed.	Check the investigation item No. 2.		
2	Check the repeatability.	The error is always repeated.	Replace the drive unit.	○	○
		The state returns to normal once, but occurs sometimes thereafter.	Check the investigation item No. 3.		
3	Check whether there is any abnormality with the unit's surrounding environment, etc. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	○

Appendix 2.13.3.3 Troubleshooting for Each Warning No.

Warning No. 9E	Absolute position detector: Revolution counter error
	An error was detected in the revolution counter of the absolute position detector. The absolute position data cannot be compensated.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check whether there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	Take remedies according to the causes of the abnormality in the ambient environment.		○	
2	Check the repeatability.	Occurs frequently.	Replace the detector.	○	○
		Is not repeated.	Check the investigation item No. 1.		

Warning No. 9F	Battery voltage drop
	The battery voltage that is supplied to the absolute position detector dropped. The absolute position data is retained.

	Investigation items	Investigation results	Remedies	SV	SP
1	Measure the battery (MDS-A-BT) voltage.	Less than 3V.	Replace the battery unit.	○	
		3V or more.	Check the investigation item No. 2.		
2	Check whether the NC bus cable is disconnected.	The connector is disconnected.	Connect correctly.	○	
		The connector is not disconnected.	Check the investigation item No. 3.		
3	Check whether the battery wire in the detector cable is broken.	The cable is broken.	Replace the cable.	○	
		The cable is not broken.	Check the investigation item No. 4.		
4	Replace the drive unit.	Improved.	Replace the drive unit.	○	
		Not improved.	Replace the detector. (With the absolute position system, the zero point must be established.)		

(Note) When warning 9F occurs, do not turn the drive unit power OFF to ensure that the absolute position data is held. Replace the battery with the drive unit power ON.

Warning No. A6	Fan stop warning
	A cooling fan built in the drive unit stopped.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the alarm No. "45" items.			○	○

Warning No. E1	Overload warning
	Overload detection level became over 80%.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check if the motor is hot.	Motor is not hot.	Check the alarm No. "50" items.		○
		Motor is hot.	Check the investigation item No. 2.		
2	Check if an error occurs when executing acceleration/deceleration operation.	Error is not found in operation. Thus, operation is possible.	Ease the operation patter, if possible. If no alarm occurs, operation can be continued as it is.		○
		Error is found in operation.	Check the investigation item 3 or later of Alarm No. 50.		
3	Check the alarm No. "50" items.			○	○

Warning No. E4	Set parameter warning
	An incorrect parameter was detected among the parameters received from the CNC.

	Investigation items	Investigation results	Remedies	SV	SP
1	Check the error parameter No.	SV001 to SP256 SP001 to SP256	Set the value within the designated setting range.	○	○
2	Check the spindle control input 4/bit 0 to 2.	Selected other than 000, 001, 010 and 100 when the alarm occurred.	Correctly select.		○

Warning No. E6	Control axis detachment warning
	Control axis detachment was commanded.

	Investigation items	Investigation results	Remedies	SV	SP
1	The status in which removal of the control axis was commanded from the NC is indicated.			○	

Warning No. E7	In NC emergency stop state Emergency stop was input from the CNC.				
	Investigation items	Investigation results	Remedies	SV	SP
1	Check if the emergency stop is applied on the NC side.	The emergency stop is applied.	Check the investigation item No. 2.	○	○
		The emergency stop is cancelled.	Check the investigation item No. 3.		
2	Cancel the emergency stop.	Normally starts up.	Normal.	○	○
		"E7" remains displayed.	Check the investigation item No. 3.		
3	Check whether an alarm is occurring in another drive unit.	An alarm is occurring in another drive unit.	Reset the alarm in the other drive unit.	○	○
		An alarm is not occurring.	Check the investigation item No. 4.		
4	Turn the power of NC and 200VAC (400V) ON again.			○	○

Warning No. E9	Instantaneous power interruption warning The power was momentarily interrupted.			
	Investigation items	Investigation results	Remedies	CV
1	Check the alarm No. "71" items.			○

Warning No. EA	In external emergency stop state External emergency stop signal was input.			
	Investigation items	Investigation results	Remedies	CV
1	Check whether the specifications allow use of the external emergency stop.	Use is not allowed.	Invalidate the external emergency stop.	○
		Use is allowed.	Check the investigation item No. 2.	
2	Measure the input voltage of the 24V is input. Replace the power supply unit. CN23 connector. (While emergency stop is cancelled.)	24V is input.	Replace the power supply unit.	○
		24V is not input.	Check whether the external emergency stop cable is broken, or check the external contact operation.	

Warning No. EB	Power supply: Over regeneration warning Over-regeneration detection level became over 80%.			
	Investigation items	Investigation results	Remedies	CV
1	Check the alarm No. "73" items.			○

Warning No. EE	Power supply: Fan stop warning A cooling fan built in the power supply unit stopped.			
	Investigation items	Investigation results	Remedies	CV
1	Check the alarm No. "72" items.			○

Appendix 2.13.3.4 Parameter Numbers during Initial Parameter Error

If an initial parameter error (alarm 37) occurs, the alarm and the No. of the parameter set exceeding the setting range will appear on the NC Diagnosis screen as shown below.

S02 Initial parameter error ○○○○ □
○○○○ : Error parameter No.
□ : Axis name

If an error No. larger than the servo parameter No. is displayed for the servo drive unit (MDS-D/DH-V1/V2), the alarm is occurring for several related parameters.

Error parameter No.	Details	Related parameters
2301	The following settings are overflowing. - Electronic gears - Position loop gain - Speed feedback	SV001, SV002 SV003, SV018 SV019, SV020 SV049
2302	The absolute position detection parameter is valid when OSE104 and OSE105 are connected.	SV017, SV025

Appendix 2.13.3.5 Troubleshooting the Spindle System when There is No Alarm or Warning

If an abnormality is observed in the spindle system but no alarm or warning has occurred, refer to the following table and check the state.

[1] The rotation speed command and actual rotation speed do not match

	Investigation items	Investigation results	Remedies
1	Check the speed command.	The speed command is not input correctly.	Input the correct speed command.
		The speed command is correct.	Check the investigation item No. 2.
2	Check whether there is slipping between the motor and spindle. (When connected with a belt or clutch.)	There is slipping.	Repair the machine side.
		No particular problems found.	Check the investigation item No. 3.
3	Check the spindle parameters (SP026, SP129 and following).	The correct values are not set.	Set the correct values.
		The correct values are set.	Replace the spindle drive unit.

[2] The starting time is long or has increased in length

	Investigation items	Investigation results	Remedies
1	Check whether the friction torque has increased.	The friction torque has increased.	Repair the machine side.
		No particular problems found.	Check the investigation item No. 2.
2	Manually rotate the motor bearings and check the movement.	The bearings do not rotate smoothly.	Replace the spindle motor.
		The bearings rotate smoothly.	Check the investigation item No. 3.
3	Check whether the torque limit signal has been input.	The signal has been input.	Do not input this signal.
		The signal is not input.	Replace the drive unit.

[3] The motor stops during cutting

	Investigation items	Investigation results	Remedies
1	Check the load rate during cutting.	The load meter sways over 120% during cutting.	Reduce the load.
		No particular problems found.	Check the investigation item No. 2.
2	Carry out the same investigations and remedies as section [4].		

[4] The vibration and noise (gear noise), etc., are large

	Investigation items	Investigation results	Remedies
1	Check the machine's dynamic balance. (Coast from the maximum speed.)	The same noise is heard during coasting.	Repair the machine side.
		No particular problems found.	Check the investigation item No. 2.
2	Check whether there is a resonance Repair the machine side. point in the machine. (Coast from the maximum speed.)	Vibration and noise increase at a set rotation speed during coasting.	Repair the machine side.
		No particular problems found.	Check the investigation item No. 3.
3	Check the machine's backlash.	The backlash is great.	Repair the machine side.
		No particular problems found.	Check the investigation item No. 4.
4	Check the spindle parameter settings. (SP005:VGN1, SP006:VIA1, SP007:VIL1, SP008:VGN2, SP009:VIA2, SP010:VIL2, SP014:PY1)	The vibration and noise levels will increase when the setting value is set to approx. half.	Change the setting value. Note that the impact response will drop.
		The symptoms do not change even if the above value is set.	Return the setting values to the original values. Check the investigation item No. 5.
5	Jiggle the detector connectors (drive.unit side and detector side) and check if they are disconnected.	The connector is disconnected (or loose).	Correctly connect the connector.
		The connector is not disconnected (or loose).	Check the investigation item No. 6.
6	Turn the power OFF, and check the connection of the speed detector cable with a tester.	The connection is faulty or disconnected.	Replace the detector cable. Correct the connection.
		The connection is normal.	Replace the drive unit.

[5] The spindle coasts during deceleration

	Investigation items	Investigation results	Remedies
1	Check whether there is slipping between the motor and spindle. (When connected with a belt or clutch.)	There is slipping.	Repair the machine side.
		No particular problems found.	Replace the drive unit.

[6] The rotation does not stabilize

	Investigation items	Investigation results	Remedies
1	Check the spindle parameter SP005 (SP008) setting.	The rotation stabilizes when the settings values are both set to approx. double.	Change the setting value. Note that the gear noise may increase.
		The symptoms do not change even if the above value is set.	Return the setting values to the original values. Check the investigation item No. 2.
2	Manually shake the speed detector connectors (spindle drive unit side and speed detector side) to check if they are disconnected.	The connector is disconnected (or loose).	Correctly connect the connector.
		The connector is not disconnected (or loose).	Check the investigation item No. 3.
3	Turn the power OFF, and check the connection of the speed detector cable with a tester. (Especially check the shield wiring.)	The connection is faulty or disconnected.	Replace the detector cable. Correct the connection.
		The connection is normal.	Check the investigation item No. 4.
4	Check the wiring and setting environment. 1) Correctly grounded? 2) Are there any noise-generating devices near the drive unit?	1) The grounding is incomplete.	Correctly ground.
		2) The alarm occurs easily when a specific device operates.	Use noise measures on the device described on the left.
		No particular problems found.	Replace the spindle drive unit.

[7] The speed does not rise above a set level

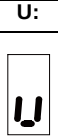
	Investigation items	Investigation results	Remedies
1	Check the speed command. Check whether the override input is input from the machine operation panel.	The speed command is not input correctly.	Input the correct speed command.
		The speed command is correct.	Check the investigation item No. 2.
2	Check whether the load has suddenly become heavier.	The load has become heavier.	Repair the machine side.
		No particular problems found.	Check the investigation item No. 3.
3	Manually rotate the motor bearings and check the movement.	The bearings do not rotate smoothly.	Replace the spindle motor.
		The bearings rotate smoothly.	Check the investigation item No. 4.
4	Manually shake the speed detector connectors (spindle drive unit side and speed detector side) to check if they are disconnected.	The connector is disconnected (or loose).	Correctly connect the connector.
		The connector is not disconnected (or loose).	Check the investigation item No. 5.
5	Turn the power OFF, and check the connection of the speed detector cable with a tester. (Especially check the shield wiring.)	The connection is faulty or disconnected.	Replace the detector cable. Correct the connection.
		The waveform is normal.	Replace the spindle drive unit.

Appendix 3

Display on 7-segment LED

Appendix 3 Display on 7-segment LED

The following characters can be used on 7-segment LED display of CNC CPU module.

0	1	2	3	4	5	6	7	8	9	(SP)	~	=	-	*	_
A:	B:	C:	D:	E:	F:	G:	H:	I:	J:	K:	L:	M:	N:	O:	P:
Q:	R:	S:	T:	U:	V:	W:	X:	Y:	Z:						
															

CNC state is displayed with the characters in the table above.

Display on 7-segment LED	State	Remarks
	Normal	Only the period in the first digit flickers.
	WDT error	
	- CNC CPU battery voltage detection level low (Less than 2.7V) - The battery voltage to be supplied to the absolute position detector dropped and the alarm "S52 Servo warning 009F" occurred. (Note 1)	
	- CNC CPU battery voltage detection level low (Less than 2.5V) - The battery voltage to be supplied to the absolute position detector dropped and the alarm "Z71 Abs encoder failure" occurred. - The absolute position was lost and the alarm "Z70 Abs data error 0101" occurred. (Note 1)	
	Alarm	“AL” flickers 3 times, and then the details appear. (See Appendix 3.1 "Detailed Display of Alarm/Stop Codes")
	Stop code	“STP” flickers 3 times, and then the details appear.(See Appendix 3.1 "Detailed display of alarm/stop codes")
Others	Detailed display of alarm/stop codes	7-segment LED displays the details of the alarm/stop code occurred (See Appendix 3.1 "Detailed display of alarm/ stop codes")

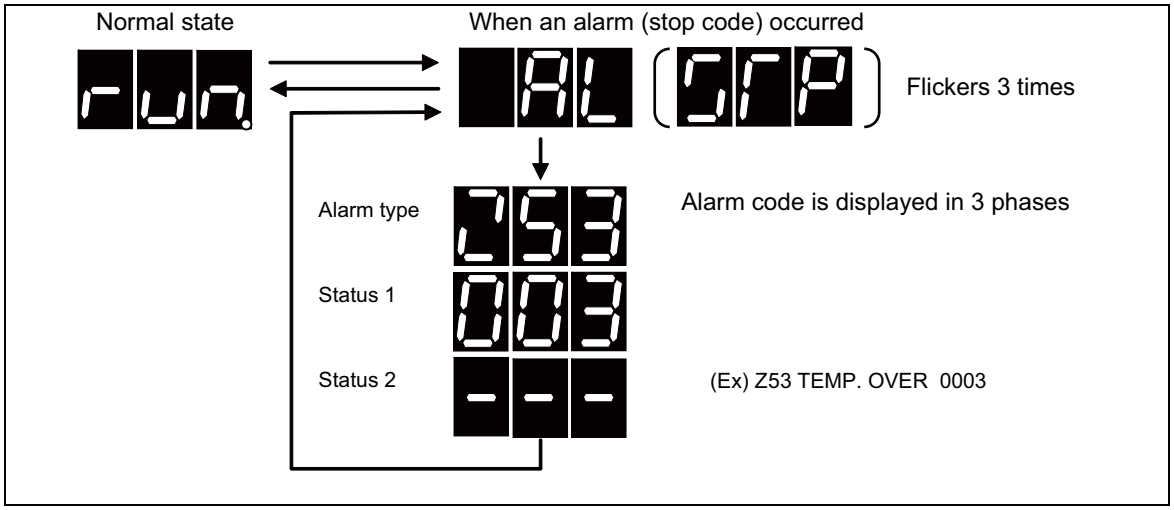
(Note 1) CNC CPU LED display will not change even if a battery alarm occurs to another CPU, such as a PLC CPU.

(Note 2) If any of the following alarms occurs independently, 7-segment LED still displays the normal state, “run.”.

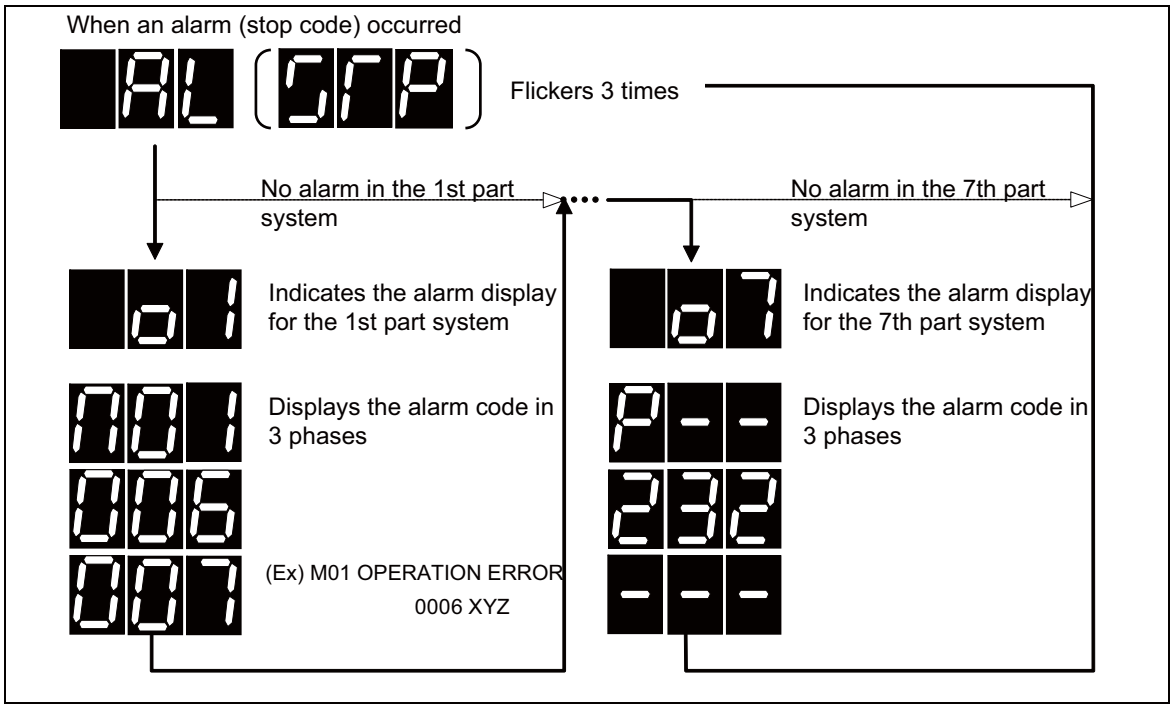
- EMG EMERGENCY STOP EXIN
- M01 OPERATION ERROR 0109 (Block start interlock)
- M01 OPERATION ERROR 0110 (Cutting block start interlock)

Appendix 3.1 Detailed display of alarm/stop codes

An alarm/stop code occurrence is displayed in 2 steps, report and details .
Alarm (“AL”) or stop code (“STP”) display flickers 3 times.
Details: Alarm code is displayed in 3 phases.



When multi-part system is used, the part system No. shows first, and then the alarm code appears.



Appendix 3.2 Notes

(1) Display priority

When several alarms occurred at the same time, the most crucial alarm is selected according to the following chart and displayed.

Alarm type	Priority
WDT error	High ↑ ↓ Low
Battery alarm	
Multi-CPU error	
System alarm	
Servo alarm	
MCP alarm	
Emergency stop	
Built-in PLC alarm	
Program error	
Servo warning	
MCP warning	
System warning	
Operation error	
Stop code	

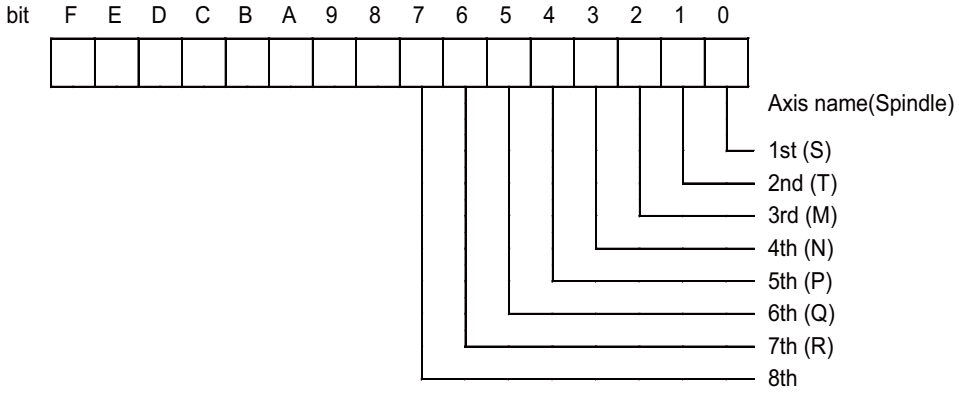
(2) Display of axes

Each axis is allocated to each bit according to the following rule. Hexadecimal number is displayed on 7-segment LED.

(Note 1) "*" in the first digit indicates the spindle.

(Note 2) "_" in the first digit indicates PLC axis.

(Note 3) When an error occurred on several axes, one of the axes is indicated. The indication priority is; (1) NC axis, (2) PLC axis and then (3) spindle.



(Example 1) “004” (bit2 is ON) for 3rd NC axis

(Example 2) “003” (bit0 and bit1 is ON) for 1st and 2nd NC axis

(Example 3) “*01” (bit0 is ON) for spindle(S)

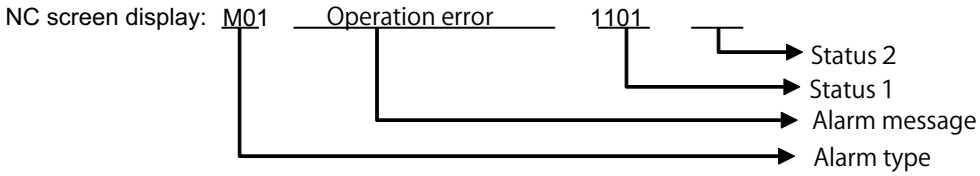
(Example 4) "_28" (bit3 and bit5 are ON) for 4th PLC axis and 6th PLC axis

(Example 5) "011" (bit0 and bit1 are ON) for 1st and 5th NC axes, 2nd PLC axis and spindle(S)

(3) Status display

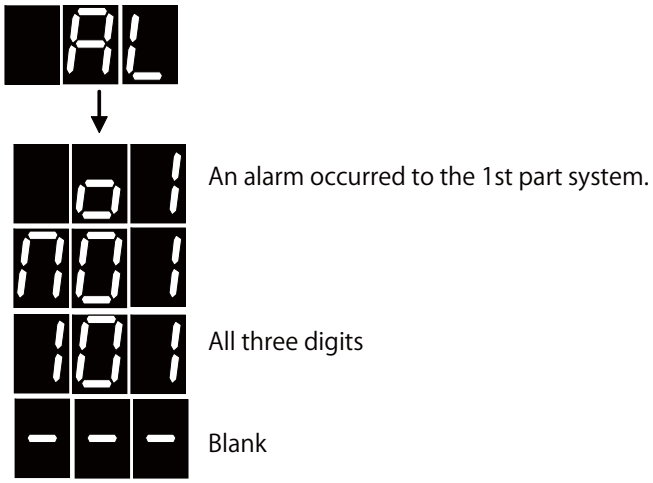
Each alarm type has a different display method for the status with over 3 digits. Refer to Appendix 3.3 "Examples of LED Display" for the display methods in details.

Also, for an alarm without Status 2, the Status 1 will be displayed in twice according to its number of digits.



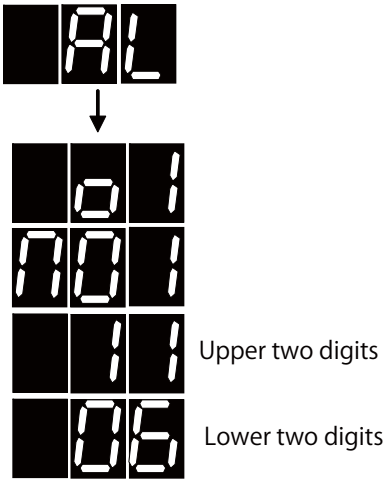
(a) When the Status 1 is a three-digit number (The highest-order digit is "0" when displayed in HEX.)

(EX) M01 Operation error 0101

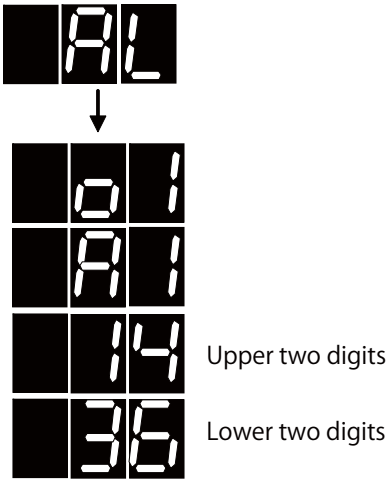


(b) When the Status 1 is a four-digit number

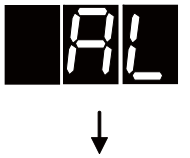
(Ex.1) M01 Operation error 1106

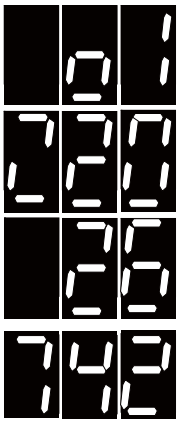


(Ex.2) A01 Multi CPU error 1436



(c) When the Status 1 is a five-digit number
(Ex.) Z20 Power ON again 26742





Upper two digits

Lower three digits

Appendix 3.3 Examples of LED Display

This section shows an example of LED display for each error.

(1) Multi-CPU error

Alarm/warning code									7-segment LED display (Transition)
									1L 1C 1R / 2L 2C 2R / 3L 3C 3R
A01 MULTI CPU ERROR 1436									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Error code in high order			Error code in low order			

(Note) An error code is displayed in high/low order with 2 digits each.

(2) System alarm

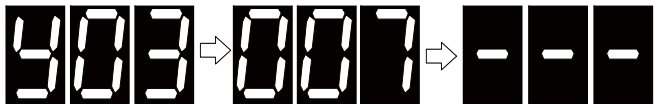
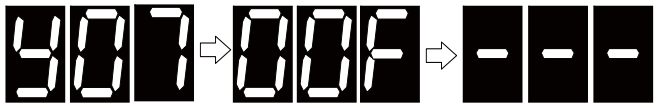
Alarm/warning code									7-segment LED display (Transition)
									1L 1C 1R / 2L 2C 2R / 3L 3C 3R
Z70 ABS ILLEGAL 0001 X									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Axis name			
Z71 DETECTOR ERROR 0002 Y									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Axis name			
Z73 ABS WARNING 0003 XYZ									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Axis name			

(3) Servo alarm

Alarm/warning code									7-segment LED display (Transition)
									1L 1C 1R / 2L 2C 2R / 3L 3C 3R
S01 SERVO ALARM : PR 0031 X									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Axis name			
S02 INIT PARAM ERR 2225 3 (3rd PLC axis)									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Axis name			
S02 INIT PARAM ERR 13225 S									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Axis name			
S03 SERVO ALARM : NR 0052 Y									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Axis name			
S04 SERVO ALARM : AR 006F Y									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Axis name			

(Note) Status 1 for [S02 Initial parameter error] displays the last 3 digits.

(4) MCP alarm

Alarm/warning code									7-segment LED display (Transition)		
									1L 1C 1R	2L 2C 2R	3L 3C 3R
Y02 SYSTEM ALARM 0051 0004											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Error details					
Y03 AMP UNEQUIPPED XYZ											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Axis name			Blank					
Y06 mcp_no ERROR											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Blank			Blank					
Y07 Conn Ax Excess 000F											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Blank					
Y09 Set Ax No Exces 0001 0001											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Error channel					
Y10 Drv SW different X											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Axis name			Blank					
Y11 Node detect error 8002 0100											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Channel, station No.					
Y14 VIR. AX AMP EQU. X											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Axis name			Blank					
Y20 Safety OBS ERR 0008											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Blank					

(Note) Axis Nos. of “Data ID” or “Recv frame No.” error under [Y02 System alarm 0051] are not displayed in the error display area.

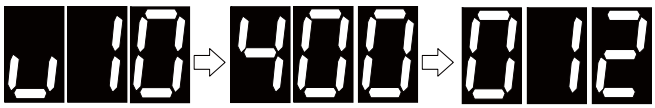
(5) Emergency stop

Alarm/warning code									7-segment LED display (Transition)		
									1L 1C 1R	2L 2C 2R	3L 3C 3R
EMG EMERGENCY STOP											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Cause			Blank					

(Note) The following table shows the LED display of emergency stop causes for status 1.

Emergency stop cause	LED display
PLC	PLC
SRV	SRV
STOP	STP
SPIN	SPN
DATA	DAT
PARA	PAR
STP2	SP2
LAD	LAD
MULT	MLT
IPWD	IPD
CVIN	CVN
MCT	MCT
SUIN	SIN
LINK	LNK
APLC	APL

(6) Bulit-in PLC Alarms

Alarm/warning code									7-segment LED display (Transition)		
									1L 1C 1R	2L 2C 2R	3L 3C 3R
U10 Illegal PLC 0400 0012											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Step No.					

(Note) Status 1 and 2 display the last 3 digits.

(7) Program error

Alarm/warning code									7-segment LED display (Transition)		
									1L 1C 1R	2L 2C 2R	3L 3C 3R
P273 MACRO OVERCALL											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Blank					

(8) Servo warning

Alarm/warning code									7-segment LED display (Transition)		
									1L 1C 1R	2L 2C 2R	3L 3C 3R
S51 PARAMETER ERROR 2205 Z											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Axis name					
S51 PARAMETER ERROR 13225 T											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Axis name					
S52 SERVO WARNING 00E0 X											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Axis name					

(Note) Status 1 for [S51 Parameter error] displays the last 3 digits.

(9) MCP warning

Alarm/warning code									7-segment LED display (Transition)		
									1L 1C 1R	2L 2C 2R	3L 3C 3R
Y21 Safety OBS WRG 0001 Z											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Axis name					
Y51 PARAMETER ERROR 0012 Z											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Axis name					

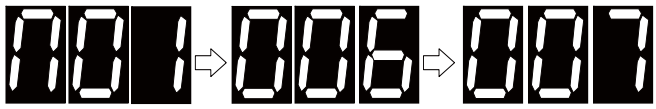
(10) System warning

Alarm/warning code									7-segment LED display (Transition) 1L 1C 1R / 2L 2C 2R / 3L 3C 3R
Z30 ETHERNET ERROR 0006 0003									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Communication type			
Z53 TEMP. OVER 0003									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Blank			
Z55 RIO NOT CONNECT 0007 0007									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Control unit			Board unit			
Z59 TIME CONSTANT									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Blank			Blank			
Z20 Power ON again 1002									(Note 1)
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Para No. Up 2 digits			Para No. Low 2 digits			
Z20 Power ON again 26701									(Note 1)
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Para No. Up 2 digits			Para No. Low 3 digits			
Z20 Power ON again									(Note 2)
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Blank			Blank			

(Note 1) The Nos. of parameters which are validated by turning the power ON again will be displayed divided into upper and lower digits.
A 4-digit parameter No. will be divided into upper 2 digits and lower 2 digits.
A 5-digit parameter No. will be divided into upper 2 digits and lower 3 digits.

(Note 2) The alarm "Z20 Power ON again" will occur when inputting parameter data or SRAM.BIN data, but the parameter No. will not be displayed. And the display on 7-segment LED will be blank.

(11) Operation error

Alarm/warning code									7-segment LED display (Transition) 1L 1C 1R / 2L 2C 2R / 3L 3C 3R
M01 OPERATION ERROR 0006 XYZ									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Axis name			
M01 OPERATION ERROR 1005 XYZ									(Note 1)
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Axis name			
M01 OPERATION ERROR 1106									(Note 2)
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No. Up 2 digits			Alarm No. Low 2 digits			

(Note 1) The alarms with two status, alarm No. and axis name, like [M01 Operation error 1005], "10" will be displayed as "A".

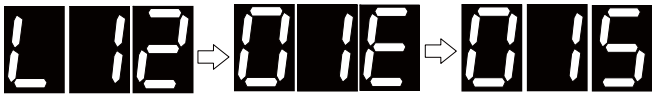
(Note 2) A 4-digit alarm No., like [M01 Operation error 1106], will be divided into upper 2 digits and lower 2 digits when displayed.

(12) Stop code

Alarm/warning code									7-segment LED display (Transition) 1L 1C 1R / 2L 2C 2R / 3L 3C 3R
T01 CAN’T CYCLE ST 0105									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Blank			
T02 FEED HOLD 0202									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Blank			
T03 BLOCK STOP 0301									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Blank			
T10 FIN WAIT 0001									
1L	1C	1R	2L	2C	2R	3L	3C	3R	
Alarm type			Alarm No.			Blank			

(Note) The factors “In dwell execution” or “unclamp signal wait” under [T10 FIN WAIT] are not displayed in the error display area.

(13) Network Errors

Alarm/warning code									7-segment LED display (Transition)		
									1L 1C 1R	2L 2C 2R	3L 3C 3R
L10 DN INIT. ERR. 1 00E0 0010											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			I/O No.					
L11 DN INIT. ERR. 2 0007 0010											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			I/O No.					
L12 DN LINK ERROR 001E 15											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Slave No.					
L13 DN MESSAGE ERR. 258											
1L	1C	1R	2L	2C	2R	3L	3C	3R			
Alarm type			Alarm No.			Blank					

(Note) The slave node No. of [L12 DN LINK ERROR] will be displayed in decimal.

Appendix 3 Display on 7-segment LED

Revision History

Date of revision	Manual No.	Revision details
Dec. 2006	IB(NA)1500265-A	First edition created.
Jan. 2007	IB(NA)1500265-B	Second edition created. • "I. Procedures for starting up" was entirely revised. • Multi CPU alarms and parameters were added. • Explanations of CNC data input/output were moved to the Instruction Manual. • Mistakes were corrected.
Feb.2007	IB(NA)1500265-C	Third edition created. • The following sections were added to "I. Setup Procedures". 2.5.1 Screen Transition to the CNC Monitor 2.5.3 Setting the Date and Time 3.7 Data Backup 3.8 Data Restoration • Mistakes were corrected.
Nov.2007	IB(NA)1500265-E	Fourth edition created. • The construction of chapters and sections was revised. • The following sections were added to "2. Initial Setup". 2.2.1 Initial Setup Flow of GOT 2.2.3.2 Installing Using Compact Flash Card 2.2.4.1 Direct Setting of IP Address Using GOT Utility 2.4.1 Initial Setup Flow of CNC CPU 2.4.2 Connecting Battery to CNC CPU 2.4.3 Initializing CNC CPU Internal Data (Clearing SRAM Data) • "3. Setting Machine Parameters" was added. • "4. Cable" was deleted. • "Appendix 2.1.3 Servo/Spindle alarms" was revised. • "Appendix 3. Display of 7-segment LED" was added. • Mistakes were corrected.
Jan.2008	IB(NA)1500265-F	Fifth edition created. • Mistakes were corrected.
Feb.2008	IB(NA)1500265-G	Sixth edition created. • "2.2 GOT Initial Setup" was revised. • Mistakes were corrected.
Sep.2009	IB(NA)1500265-J	Seventh edition created. • Contents were revised to correspond to C70 software version B2. • Mistakes were corrected.
Jul.2010	IB(NA)1500265-K	Eighth edition created. • Reviewed "Precautions for Safety". • Corrected the alarms and parameter below. #1284 ext20 bit0: Spindle speed clamp check P134 G96 G96 Clamp Err. M01 1043 No spindle speed clamp • Corrected the mistakes.
Dec. 2010	IB(NA)1500265-L	Ninth edition created. • Contents were revised to correspond to C70 software version C5. • The following section was added to "4.3 Setting Multi-CPU Parameters". 4.2.1 Types of Memory and Backup Data • The construction of "6. Setting Machine Parameters" was revised and the title was changed. Also, the following section was added. 6.1.3 Data Protection Key • Corrected the mistakes.

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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.
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MODEL	C70
MODEL CODE	100—015
Manual No.	IB-1500265

IB(NA)1500265(ENG)-L(1012)MEE

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