MELSEC Q series

Programmable Controller

User's Manual
(Hardware Design,
Maintenance and Inspection)

QCPU

01072009
SH(NA)-080483
Version P

●SAFETY PRECAUTIONS●

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.

In this manual, the safety precautions are classified into two levels: "◇! DANGER" and "△! CAUTION".

◇! DANGER	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
△! CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "△! CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠ DANGER

● Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.

(1) Configure external safety circuits, such as an emergency stop circuit, protection circuit, and protective interlock circuit for forward/reverse operation or upper/lower limit positioning.

(2) The programmable controller stops its operation upon detection of the following status, and the output status of the system will be as shown below.

Status	Q series module	AnS/A series module
Overcurrent or overvoltage protection of the power supply module is activated.	All outputs are turned off	All outputs are turned off
The CPU module detects an error such as a watchdog timer error by the self-diagnostic function.	All outputs are held or turned off according to the parameter setting.	All outputs are turned off

All outputs may turn on when an error occurs in the part, such as I/O control part, where the CPU module cannot detect any error. To ensure safety operation in such a case, provide a safety mechanism or a fail-safe circuit external to the programmable controller. For a fail-safe circuit example, refer to LOADING AND INSTALLATION in this manual.

(3) Outputs may remain on or off due to a failure of an output module relay or transistor. Configure an external circuit for monitoring output signals that could cause a serious accident.

[Design Precautions]

⚠ DANGER

- In an output module, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.

- Configure a circuit so that the programmable controller is turned on first and then the external power supply.
  If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.

- For the operating status of each station after a communication failure, refer to relevant manuals for the network.
  Incorrect output or malfunction due to a communication failure may result in an accident.

- When changing data of the running programmable controller from a peripheral connected to the CPU module or from a personal computer connected to an intelligent function module, configure an interlock circuit in the sequence program to ensure that the entire system will always operate safely.
  For program modification and operating status change, read relevant manuals carefully and ensure the safety before operation.
  Especially, in the case of a control from an external device to a remote programmable controller, immediate action cannot be taken for a problem on the programmable controller due to a communication failure.
  To prevent this, configure an interlock circuit in the sequence program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.

⚠ CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables.
  Keep a distance of 100mm (3.94 inches) or more between them.
  Failure to do so may result in malfunction due to noise.

- When a device such as a lamp, heater, or solenoid valve is controlled through an output module, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on.
  Take measures such as replacing the module with one having a sufficient current rating.

[Installation Precautions]

⚠ CAUTION

- Use the programmable controller in an environment that meets the general specifications in this manual.
  Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.

- To mount the module, while pressing the module mounting lever located in the lower part of the module, fully insert the module fixing projection(s) into the hole(s) in the base unit and press the module until it snaps into place.
  Incorrect mounting may cause malfunction, failure or drop of the module.
  When using the programmable controller in an environment of frequent vibrations, fix the module with a screw.
  Tighten the screw within the specified torque range.
  Undertightening can cause drop of the screw, short circuit or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

- When using an extension cable, connect it to the extension cable connector of the base unit securely.
  Check the connection for looseness.
  Poor contact may cause incorrect input or output.

- When using a memory card, fully insert it into the memory card slot.
  Check that it is inserted completely.
  Poor contact may cause malfunction.

- Shut off the external power supply for the system in all phases before mounting or removing the module. Failure to do so may result in damage to the product.
  A module can be replaced online (while power is on) on any MELSECNET/H remote I/O station or in the system where a CPU module supporting the online module change function is used.
  Note that there are restrictions on the modules that can be replaced online, and each module has its predetermined replacement procedure.
  For details, refer to this manual and in the manual for the corresponding module.

- Do not directly touch any conductive part of the module.
  Doing so can cause malfunction or failure of the module.

- When using a Motion CPU module and modules designed for motion control, check that the combinations of these modules are correct before applying power.
  The modules may be damaged if the combination is incorrect.
  For details, refer to the user's manual for the Motion CPU module.

[Wiring Precautions]

⚠ DANGER

- Shut off the external power supply for the system in all phases before wiring.
  Failure to do so may result in electric shock or damage to the product.

- After wiring, attach the included terminal cover to the module before turning it on for operation.
  Failure to do so may result in electric shock.

⚠ DANGER

- Ground the FG and LG terminals to the protective ground conductor dedicated to the programmable controller.
  Failure to do so may result in electric shock or malfunction.

- Use applicable solderless terminals and tighten them within the specified torque range. If any spade solderless terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.

- Check the rated voltage and terminal layout before wiring to the module, and connect the cables correctly.
  Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.

- Connectors for external connection must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered.
  Incomplete connections could result in short circuit, fire, or malfunction.

- Tighten the terminal screw within the specified torque range.
  Undertightening can cause short circuit, fire, or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

- Prevent foreign matter such as dust or wire chips from entering the module.
  Such foreign matter can cause a fire, failure, or malfunction.

[Wiring Precautions]

DANGER

- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring.
  Do not remove the film during wiring.
  Remove it for heat dissipation before system operation.

- Mitsubishi programmable controllers must be installed in control panels.
  Connect the main power supply to the power supply module in the control panel through a relay terminal block.
  Wiring and replacement of a power supply module must be performed by maintenance personnel who is familiar with protection against electric shock. (For wiring methods, refer to this manual).

[Startup and Maintenance Precautions]

DANGER

- Do not touch any terminal while power is on.
  Doing so will cause electric shock.

- Correctly connect the battery connector.
  Do not charge, disassemble, heat, short-circuit, solder, or throw the battery into the fire.
  Doing so will cause the battery to produce heat, explode, or ignite, resulting in injury and fire.

- Shut off the external power supply for the system in all phases before cleaning the module or retightening the terminal screws or module fixing screws.
  Failure to do so may result in electric shock.
  Undertightening the terminal screws can cause short circuit or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

[Startup and Maintenance Precautions]

⚠ CAUTION

- Before performing online operations (especially, program modification, forced output, and operation status change) for the running CPU module from the peripheral connected, read relevant manuals carefully and ensure the safety.
  Improper operation may damage machines or cause accidents.

- Do not disassemble or modify the modules.
  Doing so may cause failure, malfunction, injury, or a fire.

- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm (9.85 inches) away in all directions from the programmable controller.
  Failure to do so may cause malfunction.

- Shut off the external power supply for the system in all phases before mounting or removing the module. Failure to do so may cause the module to fail or malfunction.
  A module can be replaced online (while power is on) on any MELSECNET/H remote I/O station or in the system where a CPU module supporting the online module change function is used.
  Note that there are restrictions on the modules that can be replaced online, and each module has its predetermined replacement procedure.
  For details, refer to this manual and the manual for the corresponding module.

- After the first use of the product, do not mount/remove the module to/from the base unit, and the terminal block to/from the module more than 50 times (IEC 61131-2 compliant) respectively.
  Exceeding the limit of 50 times may cause malfunction.

- Do not drop or apply shock to the battery to be installed in the module.
  Doing so may damage the battery, causing the battery fluid to leak inside the battery.
  If the battery is dropped or any shock is applied to it, dispose of it without using.

- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.
  Failure to do so may cause the module to fail or malfunction.

[Disposal Precautions]

⚠ CAUTION

- When disposing of this product, treat it as industrial waste.
  When disposing of batteries, separate them from other wastes according to the local regulations.
  (For details of the Battery Directive in EU countries, refer to Appendix 4.)

[Transportation Precautions]

⚠ CAUTION

- When transporting lithium batteries, follow the transportation regulations.
  (For details of the regulated models, refer to Appendix 3.)

REVISIONS

*The manual number is given on the bottom left of the back cover.

Print date	Manual number	Revision
Jun., 2004	SH(NA)-080483ENG-A	First edition
Dec., 2004	SH(NA)-080483ENG-B	Addition Section 12.2.21 Partial correction CONTENTS, Section 2.1.5, 5.2.1, 5.3, 9.1.2, 9.2.4, 10.3.1, 10.4, 10.5, 10.6.1, 11.1, 11.3.1, 11.3.2, 11.4, 11.5, 12.2.1, 12.3.1, 12.3, 12.6, 12.7, Appendix 2.1, Appendix 2.2, Appendix 3.1
May, 2005	SH(NA)-080483ENG-C	Addition Section 12.2.22, 12.2.23, 12.2.24, Appendix 2.4, Appendix 2.5 Partial correction GENERIC TERMS AND ABBREVIATIONS, Chapter 1, Section 2.1.1, 2.1.2, 2.1.5, 2.2, 4.1, 5.2.1, 5.2.2, 5.3, 6.1.4, 7.2.1, 7.2.2, 9.1.3, 10.2, 10.3.2, 10.6.2, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.4, 11.5, 12.2.1, 12.2.2, 12.2.3, 12.2.5, 12.2.7, 12.3.2, 12.4.1, 12.4.2, 12.6, 12.7, Appendix 1.5, Appendix 2.2, Appendix 2.3, Appendix 3
Aug., 2005	SH(NA)-080483ENG-D	Partial correction SAFETY PRECAUTIONS, GENERIC TERMS AND ABBREVIATIONS, Section 2.1.1, 4.1, 5.1, 5.2.1, 5.2.2, 5.3, 7.1.2, 10.6.2, 11.3.3, 12.2.2, 12.3.1, 12.4.2, 12.6, 12.7, Appendix 1.2
Apr., 2006	SH(NA)-080483ENG-E	Model addition QA65B,QA68B Partial correction GENERIC TERMS AND ABBREVIATIONS, Section 1.1, 2.1.1, 2.1.2, 5.1, 5.2.1, 5.2.3, 6.1.1, 6.1.2, 9.1.3, 9.1.5, 9.1.6, 10.3.1, 10.3.3, 12.3.2, Appendix 1.4, Appendix 2.2, 2.4, Index
Aug., 2006	SH(NA)-080483ENG-F	Partial correction SAFETY PRECAUTIONS, Section 2.1.5, 6.1.1, 6.1.2, 9.1.5, 10.2, 10.3.1, 12.5.1, 12.5.2, Appendix 1.3, 1.4
Sep., 2006	SH(NA)-080483ENG-G	Partial correction GENERIC TERMS AND ABBREVIATIONS, Section 7.1.2, 9.1.6, 10.3.1, 11.3.3, 12.3.4, 12.3.6, 12.7
Oct., 2006	SH(NA)-080483ENG-H	Addition Section 12.3.11 Partial correction SAFETY PRECAUTIONS, Section 1.1, 2.1.1, Chapter3, Section 4.1, 4.2.1, 5.1, 5.2.1, 5.2.2, 5.3, 6.1.1, 9.1.1, 9.1.2, 9.1.3, 9.1.5, 9.2.3, 9.2.5, 10.2, 10.3.1, 10.6.1, 10.6.2, 11.3.1, 11.4, 11.5, 12.2.19, 12.3.2, 12.3.3, 12.3.5, 12.3.10, 12.6, 12.7, Appendix 1.2, Appendix 2.2

Japanese manual version SH-080472-S

Print date	Manual number	Revision
Apr., 2007	SH(NA)-080483ENG-I	Universal model QCPU model addition, Revision involving High Performance model QCPU and Redundant CPU serial No.09012 Model addition Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q65WRB Addition Section 4.4, 12.2.25 Partial correction SAFETY PRECAUTIONS, ABOUT MANUALS, GENERIC TERMS AND ABBREVIATIONS, Chapter 1, Section 1.1, 2.1, 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.2, 4.1, 4.2.2, 4.3.2, 5.1, 5.2.1, 5.2.3, 6.1.1, 6.1.2, 6.1.3, 6.1.4, 7.1.1, 7.1.2, 7.1.3, 7.1.5, 7.1.6, 7.1.7, 7.2.2, 9.1.3, 9.1.5, 10.3.1, 10.3.3, 10.4, 10.6.1, 10.6.2, 11.1, 11.2, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.4, 11.5, 12.1, 12.2.1, 12.2.2, 12.2.3, 12.2.10, 12.2.15, 12.2.21, 12.2.22, 12.2.23, 12.3.1, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.8, 12.3.9, 12.3.11, 12.4.1, 12.5.1, 12.5.2, 12.6, 12.7, Appendix 1.1, Appendix 1.3, Appendix 1.4, Appendix 2.2, Appendix 3
Jan., 2008	SH(NA)-080483ENG-J	Revision due to the support for Redundant CPU serial number 09102 Model addition QA6ADP, Q64PN Addition Appendix 2.6 Partial correction SAFETY PRECAUTION, GENERIC TERMS AND ABBREVIATIONS, Section 1.1, 2.1.1, 2.1.2, 2.1.3, 2.1.5, 4.1, 4.2.1, 4.3.1, 4.4.1, Chapter 3, Section 5.1, 5.2.1, 5.2.2, 5.3, 6.1.2, 6.1.3, 9.1.1, 9.1.2, 9.1.5, 9.1.6, 9.2.3, 10.1, 10.3.1, 10.3.3, 10.6.1, 10.6.2, 11.2, 11.3.1, 11.3.4, 12.2.13, 12.2.22, 12.3.3, 12.3.4, 12.3.5, 12.3.9, 12.4.1, 12.4.2, 12.5.1, 12.5.2, 12.6, 12.7, Appendix 1.2, Appendix 2.5, Index
Mar., 2008	SH(NA)-080483ENG-K	Model addition Q13UDHCPU, Q26UDHCPU Addition Section 11.3.1 Partial correction GENERIC TERMS AND ABBREVIATIONS, PRECAUTIONS FOR USE, Chapter 1, Section 1.1, 2.1.2, 2.1.4, 2.1.5, 4.1, 4.4.1, 5.2.1, 5.3, 6.1.1, 6.1.3, 7.1.1, 7.1.6, 7.2.1, 10.3.1, 11.1, 11.2, 11.3.1, 11.3.2, 11.3.4, 12.3.1, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.6, 12.7, Appendix 1.1, Appendix 2.2, Appendix 2.3, Appendix 2.4, Appendix 2.5, Appendix 2.6 Section11.3.1→11.3.2, Section11.3.2→11.3.3, Section11.3.3→11.3.4, Section11.3.4→11.3.5

Print date	Manual number	Revision
May, 2008	SH(NA)-080483ENG-L	Revision due to the addition of Process CPU and Universal model QCPU. Addition Section 12.2.26, 12.2.27, 12.2.28, 12.2.29, 12.2.30, 12.2.31, 12.5.2 Model addition Chapter 1, Section 1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.2, 4.1, 4.3.1, 4.4.1, 6.1.3, 7.1.2, 11.3.2, 12.2.1, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.9, 12.6, 12.7, Appendix1.1, Appendix 2, Appendix 2.4, Appendix 2.5, Appendix 2.6
Sep., 2008	SH(NA)-080483ENG-M	Partial correction SAFETY PRECAUTION, Section 1.1, 2.2, 7.1.6, 7.2.1, 9.1.3, 9.1.5, Appendix 2.6 Addition Appendix 4
Dec., 2008	SH(NA)-080483ENG-N	Universal model QCPU model additions Revision and overall review for support to the Universal model QCPU serial number "10101". Model addition Q00UJCPU, Q00UCPU, Q01UCPU, Q10UDHCPU, Q10UDEHCPU, Q20UDHCPU, Q20UDEHCPU
Mar., 2009	SH(NA)-080483ENG-O	Revision due to the support for Universal model QCPU serial number "11012". Partial correction SAFETY PRECAUTIONS, INTRODUCTION, GENERIC TERMS AND ABBREVIATIONS, Section 1.1, 2.1.3, 2.1.4, 4.1.3, 4.1.5, 4.3.1, 4.3.2, 4.3.5, 4.4.1, 5.2.1, 5.2.3, 5.2.4, 5.3, 6.1.1, 6.1.2, 7.1.2, 7.1.6, CHAPTER 8, Section 9.1.2, 9.1.3, 9.1.5, 9.2, 9.2.4, 10.1, 10.3.1, 10.3.3, CHAPTER 11, Section 11.3.1, 11.3.2, 11.3.3, 12.1, 12.2.1 to 12.2.12, 12.2.14 to 12.2.36, 12.3.11, 12.5.1, 12.6, 12.7, 12.8, Appendix 2.6 Addition 12.2.37 to 12.2.39
Jul., 2009	SH(NA)-080483ENG-P	Revision because of function support by the Universal model QCPU having a serial number "11043" or later Partial correction GENERIC TERMS AND ABBREVIATIONS, Section 2.1.3, 2.1.6, 7.2.2, 11.3.1, 11.3.2, 11.3.3, 11.4, 11.5, 12.3.3, 12.3.4, 12.4, 12.7, 12.8, Appendix 2.6

Memo

INTRODUCTION

This manual provides hardware specifications, maintenance and inspection of the system, and troubleshooting of the CPU modules, power supply modules, and base units required for operating the Q series programmable controllers.

This manual roughly comprises the following three parts.

1) Chapter 1 and 2 — Describes outline of the CPU module and the system configuration to help users understand features of the CPU module and fundamentals of system configuration.

2) Chapter 3 through 7 — Describes the general specifications of operating environments for the CPU module, power supply module, and base units and performance specifications of respective modules.

3) Chapter 8 through 12 — Describes overall maintenance such as installation of the CPU module, daily inspections, and troubleshooting.

■ Relevant CPU module

CPU module	Model
Basic model QCPU	Q00(J)CPU, Q01CPU
High Performance model QCPU	Q02(H)CPU, Q06HCPU, Q12HCPU, Q25HCPU
Process CPU	Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU
Redundant CPU	Q12PRHCPU, Q25PRHCPU
Universal model QCPU	Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UD(E)CPU, Q04UD(E)HCPU, Q06UD(E)HCPU, Q10UD(E)HCPU, Q13UD(E)HCPU, Q20UD(E)HCPU, Q26UD(E)HCPU

Remark

This manual does not describe the functions of the CPU module.
For the functions, refer to the following.

☞ Manuals for the CPU module used. (Function Explanation, Program Fundamentals)

For multiple CPU systems, refer to the following.

☞ QCPU User's Manual (Multiple CPU System)

For redundant systems, refer to the following.

☞ QnPRHCPU User's Manual (Redundant System)

CONTENTS

MANUALS

To understand the main specifications, functions, and usage of the CPU module, refer to the basic manuals.
Read other manuals as well when using a different type of CPU module and its functions.
Order each manual as needed, referring to the following lists.

The numbers in the "CPU module" and the respective modules are as follows.

Number	CPU module
1)	Basic model QCPU
2)	High Performance model QCPU
3)	Process CPU
4)	Redundant CPU
5)	Universal model QCPU

●: Basic manual, ○: Other CPU module manuals

Manual name < Manual number (model code) >	Description	CPU module				
		1)	2)	3)	4)	5)
■ User's manual						
QCPU User's Manual (Hardware Design, Maintenance and Inspection) < SH-080483ENG (13JR73) >	Specifications of the hardware (CPU modules, power supply modules, base units, extension cables, and memory cards), system maintenance and inspection, troubleshooting, and error codes	●	●	●	●	●
QnUCPU Users Manual (Function Explanation, Program Fundamentals) < SH-080807ENG (13JZ27) >	Functions, methods, and devices for programming					●
Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals) < SH-080808ENG (13JZ28) >	Functions, methods, and devices for programming	●	●	●	●	
QCPU User's Manual (Multiple CPU System) < SH-080485ENG (13JR75) >	Information for configuring a multiple CPU system (system configuration, I/O numbers, communication between CPU modules, and communication with the input/output modules and intelligent function modules)	○	○	○		○
QnPRHCPU User's Manual (Redundant System) < SH-080486ENG (13JR76)) >	Redundant system configuration, functions, communication with external devices, and troubleshooting				○	
QnUCPU User's Manual (Communication via Built-in Ethernet Port) < SH-080811ENG (13JZ29) >	Functions for the communication via built-in Ethernet port of the CPU module					○
■ Programming manual						
QCPU Programming Manual (Common Instructions) < SH-080809ENG (13JW10) >	How to use sequence instructions, basic instructions, and application instructions	●	●	●	●	●

Manual name < Manual number (model code) >	Description	CPU module				
		1)	2)	3)	4)	5)
QCPU (Q Mode)/QnACPU Programming Manual (SFC) < SH-080041 (13JF60) >	System configuration, performance specifications, functions, programming, debugging, and error codes for SFC (MELSAP3) programs	○	○	○	○	○
QCPU (Q Mode) Programming Manual (MELSAP-L) < SH-080076 (13JF61) >	Programming methods, specifications, and functions for SFC (MELSAP-L) programs	○	○	○	○	○
QCPU (Q Mode) Programming Manual (Structured Text) < SH-080366E (13JF68) >	Programming methods using structured languages	○	○	○	○	○
QCPU (Q Mode) / QnACPU Programming Manual (PID Control Instructions) < SH-080040 (13JF59) >	Dedicated instructions for PID control	○	○		○	○
QnPHCPU/QnPRHCPU Programming Manual (Process Control Instructions) < SH-080316E (13JF67) >	Dedicated instructions for process control			○	○	

Other relevant manuals

Manual name	Description
CC-Link IE Controller Network Reference Manual < SH-080668ENG (13JV16) >	Specifications, procedures and settings before system operation, parameter setting, programming, and troubleshooting of the CC-Link IE controller network module
Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network) < SH-080049 (13JF92) >	Specifications, procedures and settings before system operation, parameter setting, programming, and troubleshooting of a MELSECNET/H network system (PLC to PLC network)
Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network) < SH-080124 (13JF96) >	Specifications, procedures and settings before system operation, parameter setting, programming, and troubleshooting of a MELSECNET/H network system (remote I/O network)
Q Corresponding Ethernet Interface Module User's Manual (Basic) < SH-080009 (13JL88) >	Specifications, procedures for data communication with external devices, line connection (open/close), fixed buffer communication, random access buffer communication, and troubleshooting of the Ethernet module
Q Corresponding Ethernet Interface Module User's Manual (Application) < SH-080010 (13JL89) >	E-mail function, programmable controller CPU status monitoring function, communication via MELSECNET/H or MELSECNET/10, communication using the data link instructions, and file transfer function (FTP server) of the Ethernet module
CC-Link System Master/Local Module User's Manual < SH-080394E (13JR64) >	System configuration, performance specifications, functions, handling, wiring, and troubleshooting of the QJ61BT11N
Q Corresponding Serial Communication Module User's Manual (Basic) < SH-080006 (13JL86) >	Overview, system configuration, specifications, procedures before operation, basic data communication method with external devices, maintenance and inspection, and troubleshooting for using the serial communication module
Q Corresponding Serial Communication Module User's Manual (Application) < SH-080007 (13JL87) >	Special functions (specifications, usage, and settings and data communication method with external devices of the serial communication module
Q Corresponding MELSEC Communication Protocol Reference Manual < SH-080008 (13JF89) >	Communication method using the MC protocol, which reads/writes data to/ from the CPU module via the serial communication module or Ethernet module
GX Developer Version 8 Operating Manual < SH-080373E (13JU41) >	Operating methods of GX Developer, such as programming and printout

MANUAL PAGE ORGANIZATION

Note (icon)

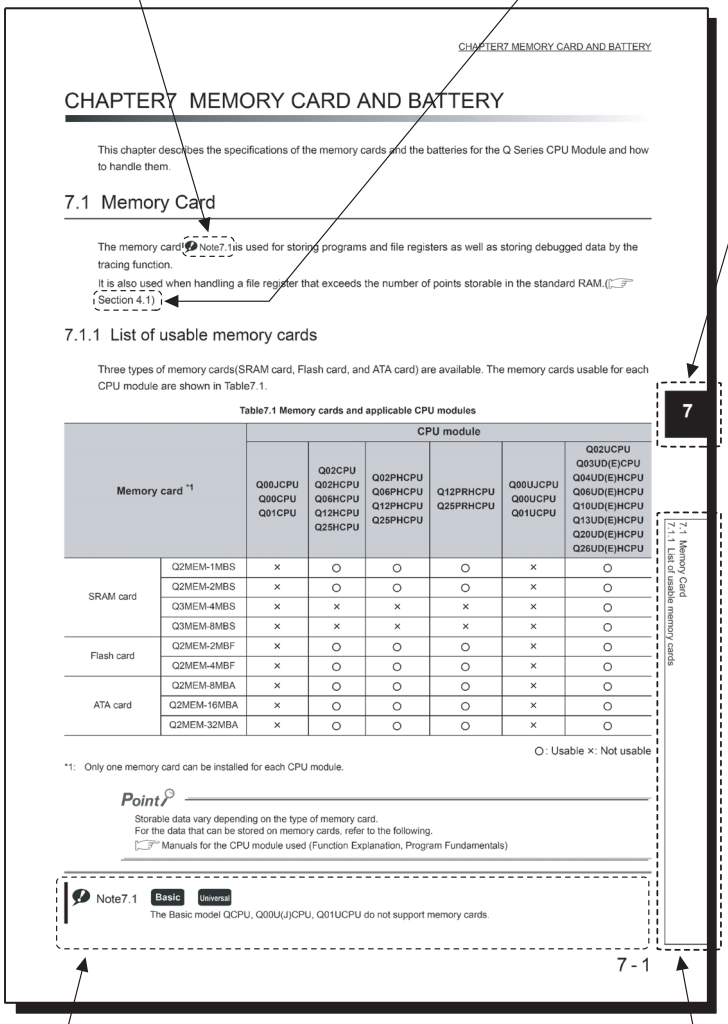
The detailed explanation of "Note●.▲" is provided under the corresponding "Note●.▲" at the bottom of the page.

Reference

The section in this manual or another relevant manual that can be referred to is shown with ☞.

Chapter

The chapter of the current page can be easily identified by this indication on the right side.



CHAPTER7 MEMORY CARD AND BATTERY

CHAPTER7 MEMORY CARD AND BATTERY

This chapter describes the specifications of the memory cards and the batteries for the Q Series CPU Module and how to handle them.

7.1 Memory Card

The memory card Note7.1 is used for storing programs and file registers as well as storing debugged data by the tracing function.

It is also used when handling a file register that exceeds the number of points storable in the standard RAM.(☞ Section 4.1)

7.1.1 List of usable memory cards

Three types of memory cards(SRAM card, Flash card, and ATA card) are available. The memory cards usable for each CPU module are shown in Table7.1.

Table7.1 Memory cards and applicable CPU modules

Memory card *1		CPU module					
		Q00JCPU Q00CPU Q01CPU	Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	Q02PHCPU Q06PHCPU Q12PHCPU Q25PHCPU	Q12PRHCPU Q25PRHCPU	Q00UJCPU Q00UCPU Q01UCPU	Q02UCPU Q03UD(E)CPU Q04UD(E)HCPU Q06UD(E)HCPU Q10UD(E)HCPU Q13UD(E)HCPU Q20UD(E)HCPU Q26UD(E)HCPU
SRAM card	Q2MEM-1MBS	×	○	○	○	×	○
	Q2MEM-2MBS	×	○	○	○	×	○
	Q3MEM-4MBS	×	×	×	×	×	○
	Q3MEM-8MBS	×	×	×	×	×	○
Flash card	Q2MEM-2MBF	×	○	○	○	×	○
	Q2MEM-4MBF	×	○	○	○	×	○
ATA card	Q2MEM-8MBA	×	○	○	○	×	○
	Q2MEM-16MBA	×	○	○	○	×	○
	Q2MEM-32MBA	×	○	○	○	×	○

○: Usable ×: Not usable

*1: Only one memory card can be installed for each CPU module.

Point

Storable data vary depending on the type of memory card.
For the data that can be stored on memory cards, refer to the following.
☞ Manuals for the CPU module used (Function Explanation, Program Fundamentals)

Note7.1 Basic Universal
The Basic model QCPU, Q00U(J)CPU, Q01UCPU do not support memory cards.

7 - 1

7
7.1 Memory Card
7.1.1 List of usable memory cards

Note (detailed explanation)

The detailed note corresponding to each icon is described.

Section title

The section number and title of the current page can be easily identified.

Icons					Description
Basic model QCPU	High Performance model QCPU	Process CPU	Redundant CPU	Universal model QCPU	
Basic	High performance	Process	Redundant	Universal	Icons indicate that specifications described on the page contain some precautions.

In addition, this manual uses the following types of explanations.

Point

In addition to description of the page, notes or functions that require special attention are described here.

Remark

The reference related to the page or useful information are described here.

GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual uses the following generic terms and abbreviations.

*□ indicates a part of the model or version.

(Example): Q33B, Q35B, Q38B, Q312B → Q3□B

Generic term/abbreviation	Description
■ Series	
Q series	Abbreviation for Mitsubishi MELSEC-Q series programmable controller
AnS series	Generic term for compact types of Mitsubishi MELSEC-A Series Programmable Controller
A series	Generic term for large types of Mitsubishi MELSEC-A Series Programmable Controller
■ CPU module type	
CPU module	Generic term for the Basic model QCPU, High Performance model QCPU, Process CPU, Redundant CPU, Universal model QCPU
Basic model QCPU	Generic term for the Q00JCPU, Q00CPU, and Q01CPU
High Performance model QCPU	Generic term for the Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU
Process CPU	Generic term for the Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU
Redundant CPU	Generic term for the Q12PRHCPU and Q25PRHCPU
Universal model QCPU	Generic term for the Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, and Q26UDEHCPU
Built-in Ethernet port QCPU	Generic term for the Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, and Q26UDEHCPU
Motion CPU	Generic term for Mitsubishi motion controllers, Q172CPUN, Q173CPUN, Q172HCPU, Q173HCPU, Q172CPUN-T, Q173CPUN-T, Q172HCPU-T, Q173HCPU-T, Q172DCPU, and Q173DCPU
PC CPU module	Generic term for MELSEC-Q series-compatible PC CPU module, PPC-CPU852(MS)-512, manufactured by CONTEC Co., Ltd.
C Controller module	Generic term for the Q06CCPU-V, Q06CCPU-V-B, and Q12DCCPU-V C Controller modules
■ CPU module model	
QnU(D)(H)CPU	Generic term for the Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, and Q26UDHCPU
■ Base unit type	
Base unit	Generic term for the main base unit, extension base unit, slim type main base unit, redundant power main base unit, redundant power extension base unit, redundant power extension base unit, and multiple CPU high speed main base unit
Main base unit	Generic term for the Q3□B, Q3□SB, Q3□RB, and Q3□DB
Extension base unit	Generic term for the Q5□B, Q6□B, Q6□RB, Q6□WRB, QA1S6□B, QA6□B, and QA6ADP+A5□B/A6□B
Slim type main base unit	Another name for the Q3□SB
Redundant power main base unit	Another name for the Q3□RB
Redundant power extension base unit	Another name for the Q6□RB
Redundant type extension base unit	Another name for the Q6□WRB

Generic term/abbreviation	Description
Redundant type extension base unit	Another name for the Q6□WRB
Multiple CPU high speed main base unit	Another name for the Q3□DB
Redundant base unit	Generic term for the redundant power main base unit, redundant power extension base unit, and redundant type extension base unit
■ Base unit model	
Q3□B	Generic term for the Q33B, Q35B, Q38B, and Q312B main base units
Q3□SB	Generic term for the Q32SB, Q33SB, and Q35SB slim type main base units
Q3□RB	Another name for the Q38RB redundant power main base unit
Q3□DB	Generic term for the Q38DB and Q312DB multiple CPU high speed main base units
Q5□B	Generic term for the Q52B and Q55B extension base units
Q6□B	Generic term for the Q63B, Q65B, Q68B, and Q612B extension base units
Q6□RB	Another name for the Q68RB redundant power extension base unit
Q6□WRB	Another name for Q65WRB extension base unit for redundant system
QA1S6□B	Generic term for the QA1S65B and QA1S68B
QA6□B	Generic term for the QA65B and QA68B extension base units
A5□B	Generic term for the A52B, A55B, and A58B extension base units
A6□B	Generic term for the A62B, A65B, and A68B extension base units
QA6ADP+A5□B/A6□B	Abbreviation for a large type extension base unit where the QA6ADP is mounted
■ Power supply module	
Power supply module	Generic term for the Q series power supply module, slim type power supply module, and redundant power supply module
Q series power supply module	Generic term for the Q61P-A1, Q61P-A2, Q61P, Q61P-D, Q62P, Q63P, Q64P, and Q64PN power supply modules
AnS series power supply module	Generic term for the A1S61PN, A1S62PN, and A1S63 power supply modules
A series power supply module	Generic term for the A61P, A61PN, A62P, A63P, A68P, A61PEU, and A62PEU power supply modules
Slim type power supply module	Abbreviation for the Q61SP slim type power supply module
Redundant power supply module	Generic term for the Q63RP and Q64RP redundant power supply modules
Life detection power supply module	Abbreviation for the Q61P-D life detection power supply module]
■ Network	
MELSECNET/H	Abbreviation for the MELSECNET/H network system
Ethernet	Abbreviation for the Ethernet network system
CC-Link	Abbreviation for the Control & Communication Link
■ Memory card	
Memory card	Generic term for the SRAM card, Flash card, and ATA card
SRAM card	Generic term for the Q2MEM-1MBS, Q2MEM-2MBS, Q3MEM-4MBS, and Q3MEM-8MBS SRAM cards
Flash card	Generic term for the Q2MEM-2MBF and Q2MEM-4MBF Flash cards
ATA card	Generic term for the Q2MEM-8MBA, Q2MEM-16MBA, and Q2MEM-32MBA ATA cards

Generic term/abbreviation	Description
■ Others	
GX Developer	Product name for SW□D5C-GPPW-E GPP function software package compatible with the Q series
PX Developer	Product name for SW□D5C-FBDQ process control FBD software package
QA6ADP	Abbreviation for the QA6ADP QA conversion adapter module
Extension cable	Generic term for the QC05B, QC06B, QC12B, QC30B, QC50B, and QC100B extension cables
Tracking cable	Generic term for the QC10TR and QC30TR tracking cables for the Redundant module
Battery	Generic term for the Q6BAT, Q7BAT, and Q8BAT CPU module batteries, Q2MEM-BAT SRAM card battery, and Q3MEM-BAT SRAM card battery
GOT	Generic term for Mitsubishi Graphic Operation Terminal, GOT-A*** series, GOT-F*** series, and GOT1000 series

USAGE NOTE

First use of the Q series CPU module

Memory must be formatted using GX Developer before first use of the CPU module.
For details of memory formatting, refer to the following.
☞ Operating manual for GX Developer

Batteries
(1) When resuming operation with the CPU module which has been stored without battery:
The CPU module memory must be formatted using GX Developer. (☞ Section 11.4)
(2) When resuming operation with the CPU module in which installed battery life had expired during storage:
The CPU module memory must be formatted using GX Developer. (☞ Section 11.5)

CHAPTER1 OVERVIEW

1.1 Features

This section describes features of the Q series CPU module.

(1) Large number of I/O points that can be controlled

The Q Series CPU module supports the following number of actual I/O points accessible to the I/O modules mounted on the base unit.

(a) Basic model QCPU

- Q00JCPU: 256 points (X/Y0 to FF) : 256 points (X/Y0 to FF)
- Q00CPU, Q01CPU: 1024 points : 1024 points (X/Y0 to 3FF)

Up to 2048 points (X/Y0 to 7FF) are supported as the number of I/O device points usable for refreshing the remote I/O of the CC-Link and link I/O (LX, LY) of the MELSECNET/H.

(b) High Performance model QCPU

One module can support 4096 points (X/Y0 to FFF).
Up to 8192 points (X/Y0 to 1FFF) are supported as the number of I/O device points usable for the remote I/O stations in the MELSECNET/H remote I/O network, the CC-Link data link, and the MELSECNET/MINI-S3 data link.

(c) Process CPU and Redundant CPU

One module can support 4096 points (X/Y0 to FFF).
Up to 8192 points (X/Y0 to 1FFF) are supported as the number of I/O device points usable for the remote I/O stations in the MELSECNET/H remote I/O network and CC-Link data link.

(d) Universal model QCPU

- Q00UJCPU : 256 points (X/Y0 to FF)
- Q00UCPU, Q01UCPU : 1024 points (X/Y0 to 3FF)
- Q02UCPU : 2048 points (X/Y0 to 7FF)
- Q03UD(E)CPU, Q04UD(E)HCPU, Q06UD(E)HCPU, Q10UD(E)HCPU, Q13UD(E)HCPU, Q20UD(E)HCPU, Q26UD(E)HCPU : 4096 points (X/Y0 to FFF)

Up to 8192 points (X/Y0 to 1FFF) are supported as the number of I/O device points usable for the remote I/O stations in the MELSECNET/H remote I/O network and CC-Link data link.

(2) Lineup of CPU

The following lists the lineup of CPU available for various program size.

Table1.1 Program size for each CPU module

CPU module type		Program size
Basic model QCPU	Q00(J)CPU	8K steps
	Q01CPU	14Ksteps
High Performance model QCPU	Q02(H)CPU	28K steps
	Q06HCPU	60K steps
	Q12HCPU	124K steps
	Q25HCPU	252K steps
Process CPU	Q02PHCPU	28K steps
	Q06PHCPU	60K steps
	Q12PHCPU	124K steps
	Q25PHCPU	252K steps
Redundant CPU	Q12PRHCPU	124K steps
	Q25PRHCPU	252K steps
Universal model QCPU	Q00U(J)CPU	10K steps
	Q01UCPU	15K steps
	Q02UCPU	20K steps
	Q03UD(E)CPU	30K steps
	Q04UD(E)HCPU	40K steps
	Q06UD(E)HCPU	60K steps
	Q10UD(E)HCPU	100K steps
	Q13UD(E)HCPU	130K steps
	Q20UD(E)HCPU	200K steps
	Q26UD(E)HCPU	260K steps

(3) High speed processing

High speed processing has been achieved.

Table1.2 Processing speed (LD instruction)

CPU module type		LD instruction processing speed
Basic model QCPU	Q00JCPU	200ns
	Q00CPU	160ns
	Q01CPU	100ns
High Performance model QCPU	Q02CPU	79ns
	Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU	34ns
Process CPU	Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU	
Redundant CPU	Q12PRHCPU, Q25PRHCPU	
Universal model QCPU	Q00UJCPU	120ns
	Q00UCPU	80ns
	Q01UCPU	60ns
	Q02UCPU	40ns
	Q03UD(E)CPU	20ns
	Q04UD(E)HCPU, Q06UD(E)HCPU, Q10UD(E)HCPU, Q13UD(E)HCPU, Q20UD(E)HCPU, Q26UD(E)HCPU	9.5ns

The MELSEC Q series base unit high-speed system bus has achieved faster access to an intelligent function module and link refresh with a network module.

(a) Basic model QCPU

MELSECNET/H link refreshing: 2.2ms/2K words[*1]

*1: The Q01CPU is used without using SB and SW, and the MELSECNET/H network module is mounted on the main base unit.

(b) High Performance model QCPU, Process CPU, Redundant CPU or Universal model QCPU

Access to the intelligent function module: 20μs/word (approximately 7 times[*2])

MELSECNET/H link refreshing: 4.6ms/8K words (approximately 4.3 times[*2])

*2: These are the values resulted from the following comparison:
- Comparing Q02HCPU with Q2ASHCPU-S1
- Comparing Q25PHCPU with Q4ARCPU
- Comparing Q25PRHCPU with Q4ARCPU

(4) Increase in debugging efficiency through high-speed communication with GX Developer

High speed communications at 115.2Kbps maximum are available by using RS-232 which reducing the time required for writing and reading of programs and monitoring. Also, the communication time efficiency of debugging has been increased.

In addition, High Performance model QCPUs (except for the Q02CPU), Process CPUs, Redundant CPUs and Universal model QCPUs support USB, so that high-speed communications of 12Mbps are available.

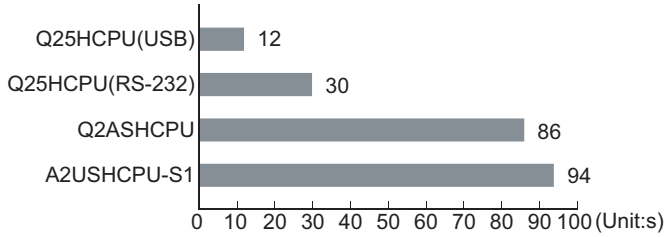


Figure 1.1 26K step program transfer time

(5) AnS/A series I/O modules and special function modules are available

The AnS/A series compatible extension base units (QA1S6□B, QA6□B and QA6ADP+A5□B/A6□B) allow the High Performance model QCPU to use the AnS/A series I/O modules and special function modules.

(6) Saved space by downsizing

The installation space for the Q series has been reduced by approx. 60% compared with the AnS series.

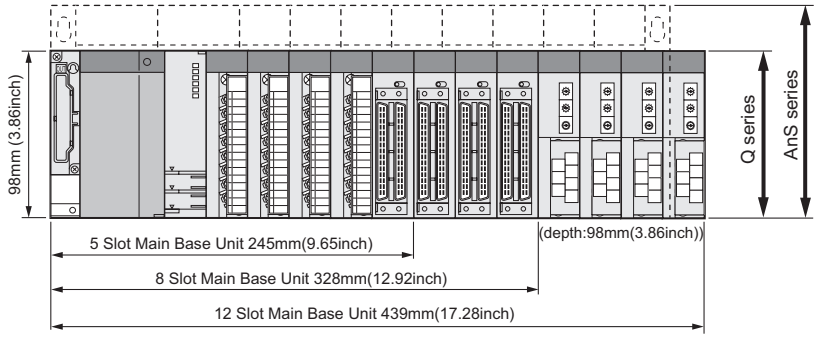


Figure 1.2 Installation area comparison between Q series and AnS series

(7) Connection of up to 7 extension base units.

Up to seven extension base units can be connected to the Q series CPU module.
The overall extension cable length is 13.2m (43.31feet), which allows flexible layout of base units.

(8) Memory extension Note1.1 by memory card

Memory card installation connector is incorporated so that a maximum 32M bytes of memory card can be connected. (32M bytes memory card can be connected only when an ATA card is used.)
By installing a large size memory card, large size files can be managed such as comment setting to all data devices and saving old programs in a memory as correction data.
Even when a memory card is not installed, a program can be stored into the standard ROM through the standard ROM incorporated in the CPU module, and file registers can be handled by the standard RAM.

Point

For the High Performance model QCPU, the number of usable file register points differs depending on the function version and serial number.
For details, refer to Appendix 2.2.

Note1.1 **Basic**

The Basic model QCPU, Q00(J)CPU, and Q01UCPU do not support memory cards.

(9) Automatic writing to standard ROM Note1.2,Note1.3

Parameters and programs can be written to the standard ROM of the CPU module without using GX Developer. When the boot operation is handled by the standard ROM, users do not need to have GX Developer (personal computer) on hand for modifications of parameters and programs since those can be stored in a memory card and written to the standard ROM of the CPU module.The Q Series CPU module enables writing the parameters or programs saved on a memory card into the standard ROM of the CPU modules without using GX Developer.

(10)Forced on and off of external I/O Note1.2

Forced on and off of external input and output is available using GX Developer even when the CPU module is running or program is being processed.
Also, wiring test and operation test can be conducted without halting the CPU module by forcibly turning on or off the I/O.

(11)Remote password can be set

When access to an Ethernet module, serial communication module, or modem interface module is made from the outside, whether access to the CPU module is enabled or not can be selected with a remote password.

(12)Remote I/O network of MELSECNET/H Note1.2

A MELSECNET/H remote I/O system can be configured by installing a MELSECNET/H remote master station.

Point

- The remote password can be set up when the Ethernet module, serial communication module, or modem interface module of function version B or later is used.
- The MELSECNET remote I/O network can be implemented when the MELSECNET/H network module of function version B or later is used.

Note1.2 **Basic**

The Basic model QCPU does not support the following functions.
- Automatic writing into the standard ROM
- Forced on/off of the external I/O
- MELSECNET/H remote I/O network

Note1.3 **Universal**

The Universal model QCPU does not support the following function.
- Parameter setting of automatic write to standard ROM

(13)Supporting the multiple CPU system

Multiple CPU systems can be constructed in combination with CPU modules, motion CPU(s), and PC CPU module(s).

For details of the multiple CPU system, refer to the following.

☞ QCPU User's Manual (Multiple CPU System)

(14)Supporting the redundant power supply system

The redundant power supply system can be configured using a redundant base unit and redundant power supply modules.

The system can continue operation even if one of the power supply modules fails, since the other will supply the power.

(15)Direct connection to Ethernet Note1.4

The Built-in Ethernet port QCPU module allows direct connections to Ethernet.

For details of the functions, refer to the following.

☞ QnUCPU User's Manual (Communication via Built-in Ethernet Port)

Note1.4 Universal

Applicable only to the Built-in Ethernet port QCPU.

CHAPTER2 SYSTEM CONFIGURATION

This chapter describes system configurations, precautions, and components of the Q Series CPU module.

2.1 System Configuration

This section describes system configurations for a single CPU system with the Basic model QCPU, High Performance model QCPU, Process CPU, or Universal module, and a system configuration when using GOT by bus connection.
For a multiple CPU system and redundant system (when using the Redundant CPU), refer to the following.

☞ QCPU User's Manual (Multiple CPU System)
☞ QnPRHCPU User's Manual (Redundant System)

2.1.1 Overall configuration

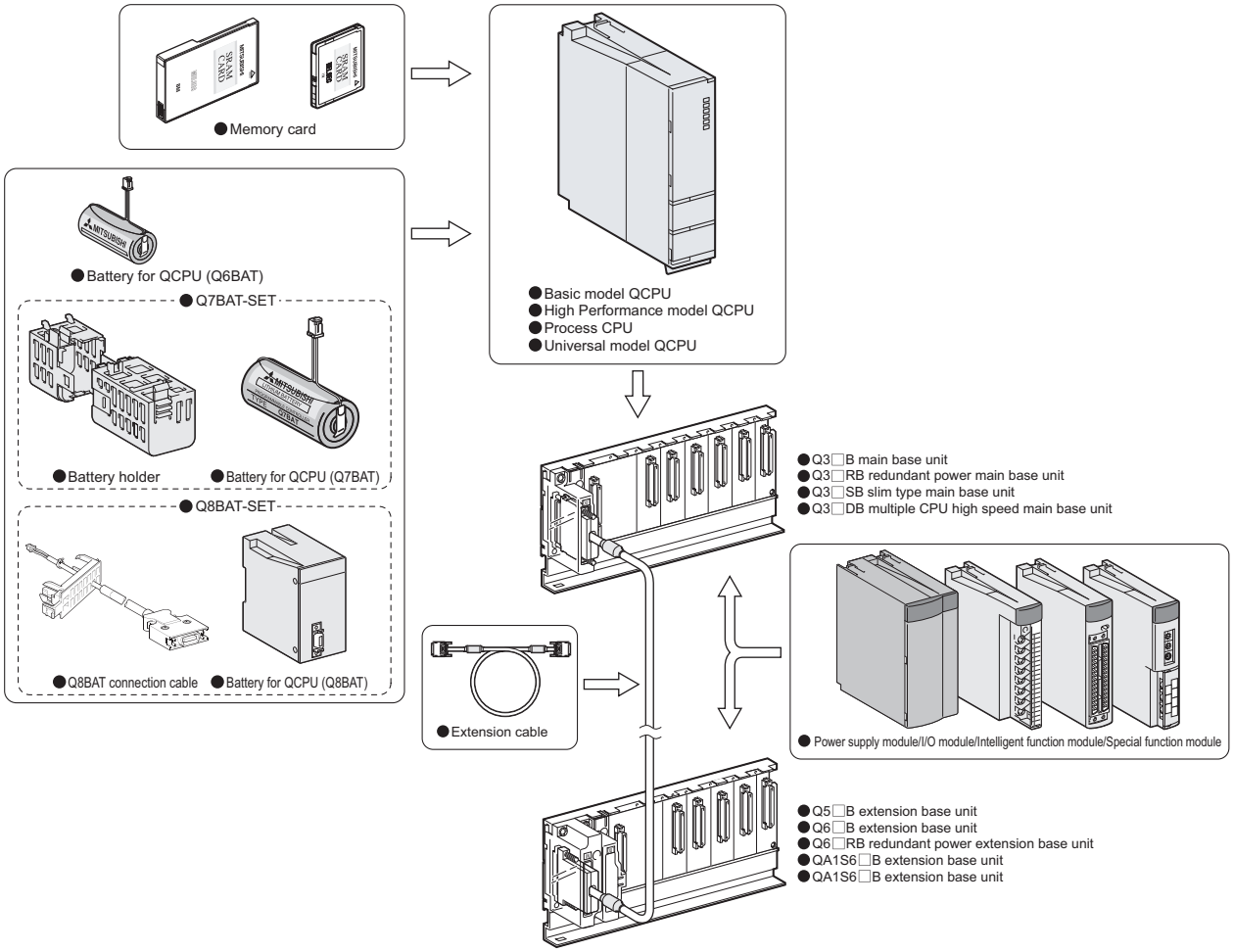


Figure 2.1 System configuration

The combination of modules depends on the devices used in the configuration.
For the applicable combinations, refer to the following.

- Combination of a CPU module and the base unit, battery, and memory card.
  ☞ Section 2.1.2
- Combination of the base unit and power supply module. ☞ CHAPTER 5
- Combination of the main base unit and extension base unit. ☞ CHAPTER 6
- Combination of a CPU module and a intelligent function module or special function module.
  ☞ User's manual for each module

2.1.2 Component list

(1) Basic model QCPU

Table2.1 Configuration with the Basic model QCPU

Applicable main base unit*1	Main base unit	Q33B, Q35B, Q38B, Q312B
	Redundant power main base unit	Q38RB
	Slim type main base unit	Q32SB, Q33SB, Q35SB
	Multiple CPU high speed transmission base unit	Q38DB, Q312DB
Applicable extension base unit	Model requiring no power supply module	Q52B, Q55B
	Model requiring a Q series power supply module	Q63B, Q65B, Q68B, Q612B
	Redundant power extension base unit	Q68RB
Maximum number of extension bases of extension base unit	Q00JCPU: 2 extension bases Q00CPU, Q01CPU: 4 extension bases	
Maximum number of mounted I/O modules	Q00JCPU: 16 modules Q00CPU, Q01CPU: 24 modules	
Extension cable	QC05B, QC06B, QC12B, QC30B, QC50B, QC100B	
Total length of extension cables	13.2m (43.31 feet)	
Applicable memory card	----	
Applicable battery	Q6BAT	

*1: The Q00JCPU does not require a power supply module and the main base unit since the module is an integrated combination of a power supply module and the main base unit.

(2) High Performance model QCPU

Table2.2 Configuration with the High Performance model QCPU

Applicable main base unit	Main base unit	Q33B, Q35B, Q38B, Q312B
	Redundant power main base unit	Q38RB
	Slim type main base unit	Q32SB, Q33SB, Q35SB
	Multiple CPU high speed transmission base unit	Q38DB, Q312DB
Applicable extension base unit	Model requiring no power supply module	Q52B, Q55B
	Model requiring a Q series power supply module	Q63B, Q65B, Q68B, Q612B
	Redundant power extension base unit	Q68RB
	Model requiring a AnS series power supply module*1	QA1S65B, QA1S68B
	Model requiring A series power supply module*1	QA65B, QA68B, QA6ADP+A6□B
	Model requiring no A series power supply module*1	QA6ADP+A5□B
Maximum number of extension bases of extension base unit	7 extension bases	
Maximum number of mounted I/O modules	64 modules	
Extension cable	QC05B, QC06B, QC12B, QC30B, QC50B, QC100B	
Total length of extension cables	13.2m (43.31 feet)	
Applicable memory card	Q2MEM-1MBS, Q2MEM-2MBS, Q2MEM-2MBF, Q2MEM-4MBF, Q2MEM-8MBA, Q2MEM-16MBA, Q2MEM-32MBA	
Applicable battery	Q6BAT, Q7BAT, Q8BAT	

*1: The A/AnS series extension base units are applicable only when the main base unit (Q33B, Q35B, Q38B, Q312B) is used.

(3) Process CPU

Table2.3 Configuration with the Process CPU

Applicable main base unit	Main base unit	Q33B, Q35B, Q38B, Q312B
	Redundant power main base unit	Q38RB
	Multiple CPU high speed transmission base unit	Q38DB, Q312DB
Applicable extension base unit	Model requiring no power supply module	Q52B, Q55B
	Model requiring a Q-series power supply module	Q63B, Q65B, Q68B, Q612B
	Redundant power extension base unit	Q68RB
Maximum number of extension bases of extension base unit	7 extension bases	
Maximum number of mounted I/O modules	64 modules	
Extension cable	QC05B, QC06B, QC12B, QC30B, QC50B, QC100B	
Total length of extension cables	13.2m (43.31 feet)	
Applicable memory card	Q2MEM-1MBS, Q2MEM-2MBS, Q2MEM-2MBF, Q2MEM-4MBF, Q2MEM-8MBA, Q2MEM-16MBA, Q2MEM-32MBA	
Applicable battery	Q6BAT, Q7BAT, Q8BAT	

(4) Universal model QCPU

Table2.4 Configuration with the Universal model QCPU

Applicable main base unit[*1]	Main base unit	Q33B, Q35B, Q38B, Q312B
	Redundant power main base unit	Q38RB
	slim type main base unit	Q32SB, Q33SB, Q35SB
	Multiple CPU high speed transmission base unit	Q38DB, Q312DB
Applicable extension base unit	Model requiring no power supply module	Q52B, Q55B
	Model requiring a Q-series power supply module	Q63B, Q65B, Q68B, Q612B, Q68RB
	Redundant power extension base unit	Q68RB
Maximum number of extension bases of extension base unit	Q00UJCPU: 2 extension bases Q00UCPU, Q01UCPU, Q02UCPU: 4 extension bases Other than above: 7 extension bases	
Maximum number of mounted I/O modules	Q00UJCPU: 16 modules Q00UCPU, Q01UCPU: 24 modules Q02UCPU: 36 modules Other than above: 64 modules	
Extension cable	QC05B, QC06, QC12B, QC30B, QC50B, QC100B	
Total length of extension cables	13.2m (43.31 feet)	
Applicable memory card[*2]	Q2MEM-1MBS, Q2MEM-2MBS, Q3MEM-4MBS, Q3MEM-8MBS, Q2MEM-2MBF, Q2MEM-4MBF, Q2MEM-8MBA, Q2MEM-16MBA, Q2MEM-32MBA	
Applicable battery	Q6BAT, Q7BAT, Q8BAT	

*1: The Q00JCPU does not require a power supply module and the main base unit since the module is an integrated combination of a power supply module and the main base unit.

*2: Memory cards cannot be used in the Q00U(J)CPU and Q01UCPU.

2.1.3 Precautions for system configuration

This section explains restrictions on configuring a system with the Q series CPU module.

(1) Number of modules that can be installed

The following tables indicate the number of modules that can be installed in a system and restrictions of functions.

(a) When using the Basic model QCPU

Table2.5 Number of modules (units) that can be installed

Product	Model	Number of modules (units) that can be installed per system
CC-Link IE controller network module	• QJ71GP21-SX • QJ71GP21S-SX	One module*1
MELSECNET/H network module	• QJ71LP21 • QJ71BR11 • QJ71LP21-25 • QJ71LP21S-25 • QJ71LP21G • QJ71NT11B	
Q series Ethernet interface module	• QJ71E71 • QJ71E71-B2 • QJ71E71-B5 • QJ71E71-100	One module
Q series CC-Link system master local module	• QJ61BT11 • QJ61BT11N	Up to 2 modules *2
Interrupt module	• QI60	One module *3
GOT	• GOT-A900 Series (for bus connection only)*4 • GOT1000 Series (for bus connection only)*4	Up to 5 units

*1: The number is the total of the CC-Link IE controller network module and MELSECNET/H network module.
*2: Applicable to the function version B or later.
*3: The number indicates interrupt modules with no interrupt pointer setting.
No limitation is placed when the interrupt pointer settings have been completed.
*4: For the applicable GOT models, refer to the following.

☞ GOT-A900 Series User's Manual (GT Work2 Version2/GT Designer2 Version2 Compatible Connection System Manual)
☞ GOT1000 Series Connection Manual

(b) When using the High Performance model QCPU or Process CPU

Table2.6 Applicable number of modules (units)

Product	Model	Number of modules (units) that can be installed per system	
CC-Link IE controller network module*1	• QJ71GP21-SX • QJ71GP21S-SX	Up to 2 modules	Up to 4 modules in total
MELSECNET/H network module	• QJ71LP21 • QJ71BR11 • QJ71LP21-25 • QJ71LP21S-25 • QJ71LP21G • QJ71NT11B	Up to 4 modules	
Q series Ethernet interface module	• QJ71E71 • QJ71E71-B2 • QJ71E71-B5 • QJ71E71-100	Up to 4 modules	
Q series CC-Link system master local module	• QJ61BT11 • QJ61BT11N	No limitation *2	
MELSECNET/MINI-S3 data link module*3	• A1SJ71PT32-S3 • A1SJ71T32-S3	No limitation (but auto refresh can not be set)	
AnS Series special function module*3	• A1SD51S • A1SD21-S1 • A1SJ71J92-S3 (When using GET/PUT service) • A1SJ71AP23Q • A1SJ71AR23Q • A1SJ71AT23BQ	Up to 6 modules in total	
Interrupt module	• A1SI61*3	One in total	
	• QI60		
GOT	GOT-A900 Series (only for bus connection)*4 GOT100 0Series (only for bus connection)*4	Up to 5 units	

*1: Only the High Performance model QCPU whose serial number (first five digits) is "09012" or later and Process CPU whose serial number (first five digits) is "10042" or later can be used.

*2: The following indicates the number of modules that can be controlled with the CC-Link network parameter set by GX Developer.
• The CPU module whose serial number (first five digits) is "08031" or earlier: Up to four modules
• The CPU module whose serial number (first five digits) is "08032" or later: Up to eight modules
When setting parameters with CC-Link dedicated instructions, the number of modules to install is not limited.
For the CC-Link system master/local modules whose parameters can be set by the dedicated instructions, refer to the following.
☞ CC-Link System Master/Local Module User's Manual

*3: Applicable only when the High Performance model QCPU is used.

*4: For applicable GOT modules, refer to the following.
☞ GOT-A900 Series User's Manual (GT Work2 Version2/GT Designer2 Version2 Version2 Compatible Connection System Manual)
☞ GOT1000 Series Connection Manual

(c) When using the Redundant CPU

For modules having a limit to the number of mountable modules, refer to the following.

☞ QnPRHCPU User's Manual (Redundant System)

(d) When using the Universal model QCPU

Table2.7 Applicable number of modules (units)

Product	Model	Number of modules (units) that can be installed per system
CC-Link IE controller network module*1	• QJ71GP21-SX • QJ71GP21S-SX	Up to 4 modules*2 *3
MELSECNET/H network module	• QJ71LP21 • QJ71BR11 • QJ71LP21-25 • QJ71LP21S-25 • QJ71LP21G • QJ71NT11B	
Q series Ethernet interface module	• QJ71E71 • QJ71E71-B2 • QJ71E71-B5 • QJ71E71-100	Up to 4 modules*3
Q series CC-Link system master local module	• QJ61BT11 • QJ61BT11N	No limitation*4 *5
Interrupt module	• QI60	Only one module*6
GOT	GOT1000 Series (only for bus connection)*7	Up to 5 units

*1: Only the CC-Link IE controller network module whose serial number (first five digits) is "09042" or later can be used.

*2: The number is a total of the CC-Link IE controller network modules and MELSECNET/H network modules.

*3: The applicable number of mountable module for the Q00UJCPU, Q00UCPU, and Q01UCPU is one in total, for the Q02UCPU is two modules.

*4: Applicable to the function version B or later.

*5: The following indicates the number of modules that can be controlled by the CC-Link network parameter set by GX Developer.
- Q00UJCPU, Q00UCPU, Q01UCPU: Up to two modules
- Q02UCPU: Up to four modules
- Q03UD(E)CPU, Q04UD(E)HCPU, Q06UD(E)HCPU, Q10UD(E)HCPU Q13UD(E)HCPU, Q20UD(E)HCPU, Q26UD(E)HCPU: Up to eight modules

When setting parameters with CC-Link dedicated instructions, the number of modules that can be installed is not limited. For the CC-Link system master/local modules whose parameters can be set with the dedicated instructions, refer to the following.

☞ CC-Link System Master/Local Module User's Manual

*6: The number indicates interrupt modules that have no interrupt pointer setting. No limitation is placed when the interrupt pointer settings have been completed.

*7: For the applicable GOT models, refer to the following.

☞ GOT1000 Series Connection Manual

(2) Modules with limitations when using a Built-in Ethernet port QCPU

When using a Built-in Ethernet port QCPU, limitations are placed on the module listed in the Table2.8.

Table2.8 Modules restricted when using a Built-in Ethernet port QCPU

Product	Model	First five digits of the serial number
MELSECNET/H module	QJ71LP21-25	Some modules have restrictions depending on the use conditions.*1
	QJ71LP21S-25	
	QJ71LP21G	
	QJ71BR11	
Serial communication module	QJ71C24N	"10042" or later
	QJ71C24N-R2	
	QJ71C24N-R4	
Modem interface module	QJ71CMON	
Web server module	QJ71WS96	"10012" or later
MES interface module	QJ71MES96	

*1: If the MELSECNET module meets the following all conditions, use the MELSECNET/H module whose serial number (first five digits) is “10042” or later.
1. A multiple CPU system containing a Built-in Ethernet port QCPU is configured.
2. To an Ethernet port of a Built-in Ethernet port QCPU, GX Developer or GOT is connected.
3. From GX Developer or GOT, access is made to another station through a MELSECNET/H module controlled by another CPU.
4. The access target on another station is an A/QnA series CPU module.

(3) Number of available slots

Empty slots are included in the number of available slots (modules) in the base unit.
(A slot is occupied by setting the slot as "Empty, 0 point" as shown in Figure 2.2)
The number of available slots (modules) varies depending on the base unit.

☞ CHAPTER 6

For the assignment concepts of base units and I/O numbers, refer to the following.

☞ User's manual for the CPU module used (Function Explanation, Program Fundamentals)

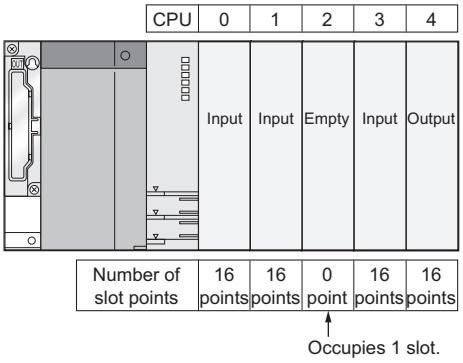


Figure 2.2 Number of modules including empty slots

(4) Precautions for the number of modules to mount

Mount modules within the range of the number of available slots.

When the total number of slots for the main base unit and extension base units exceeds the number of available slots (for example, six 12-slot base units are used), mount modules only on the available slots so that no error occurs.

If a module is mounted on a invalid slot, "SP.UNIT LAY ERR." (error code: 2124) occurs.

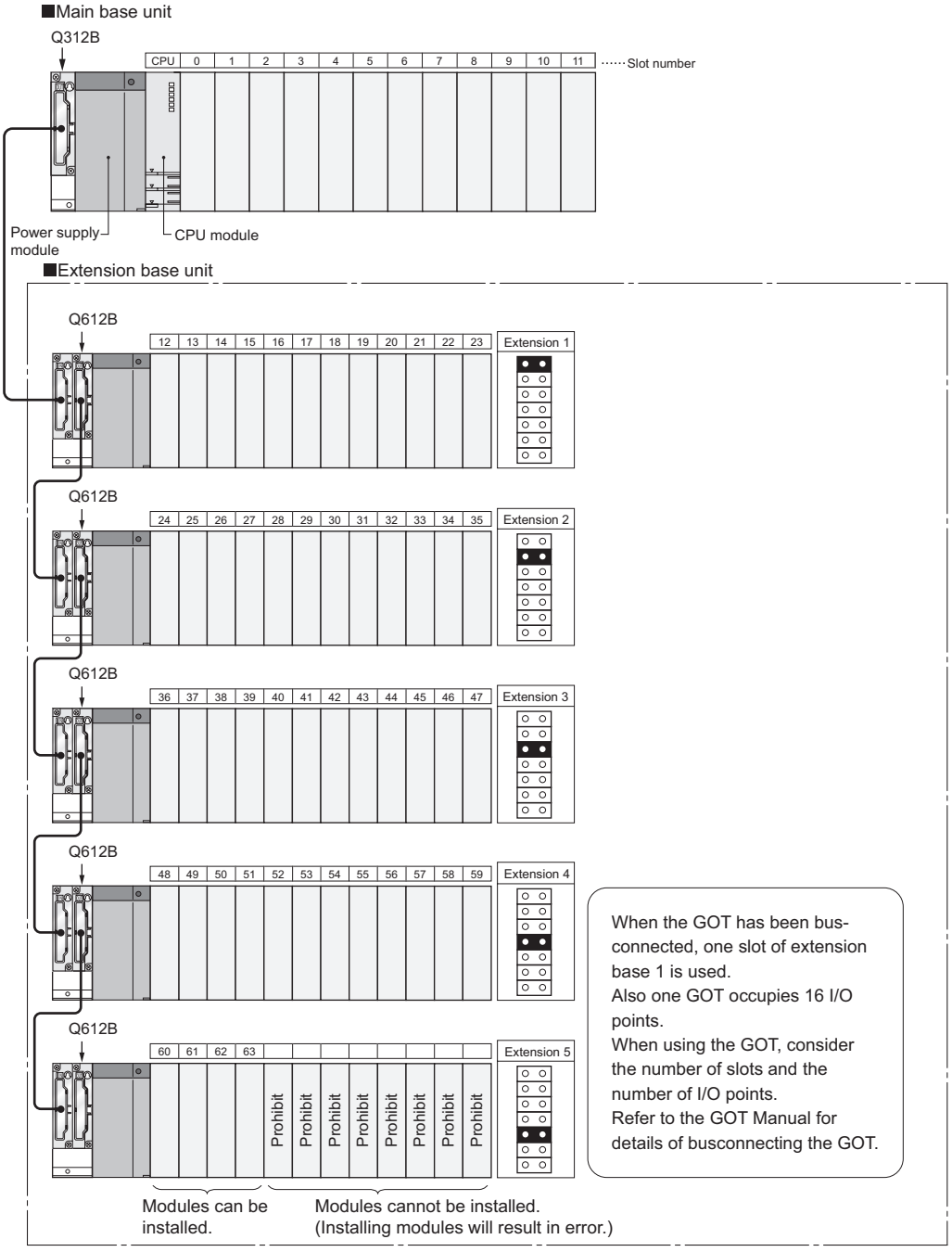


Figure 2.3 Configuration example with the High Performance model QCPU

(5) Precautions when using AnS/A series modules

1) When using the AnS series special function modules shown below, a limitation is placed on an accessible device range.
   - A1SJ71J92-S3 type JEMANET interface module
   - A1SD51S type intelligent communication module

Table2.9 Accessible device range

Device	Accessible device range
Input (X), Output (Y)	X/Y0 to 7FF
Internal relay (M), Latch relay (L)	M/L0 to 8191
Link relay (B)	B0 to FFF
Timer (T)	T0 to 2047
Counter (C)	C0 to 1023
Data register (D)	D0 to 6143
Link register (W)	W0 to FFF
Annumciator (F)	F0 to 2047

2) The modules listed below cannot be used.

Table2.10 Incompatible modules

Product	Model
MELSECNET/10 network module	A1SJ71LP21, A1SJ71BR11, A1SJ71QLP21, A1SJ71QLP21S, A1SJ71QBR11
MELSECNET(II), /B data link module	A1SJ71AP21, A1SJ71AR21, A1SJ71AT21B
Ethernet interface module	A1SJ71QE71N-B2(-B5), A1SJ71E71N-B2(-B5)
Serial communication module, computer link module	A1SJ71QC24(N), A1SJ71UC24-R2(-PRF)
Computer link/multidrop link module	A1SJ71UC24-R4*1
CC-Link system master/local module	A1SJ61QBT11, A1SJ61BT11
Modem interface module	A1SJ71CMO-S3
ME-NET interface module	A1SJ71ME81

*1: Only multidrop link function can be used. The computer link function and printer function cannot be used.

3) The QnA/A series dedicated instructions for the following modules cannot be used.
   Rewriting using the FROM or TO instruction is required.

Table2.11 Modules requiring instruction rewriting

Product	Model
High speed counter module	A1SD61, A1SD62, A1SD62D(-S1), A1SD62E
MELSECNET/MINI-S3	A1SJ71PT32-S3, A1SJ71T32-S3
Positioning module	A1SD75P1-S3(P2-S3/P3-S3)
ID module	A1SJ71ID1-R4, A1SJ71ID2-R4

4) System configurations and functions are partially restricted when writing the parameters set under the "High speed interrupt fixed scan interval" setting.
   For the restrictions, refer to the following.
   ☞ User's manual for the CPU module used (Function Explanation, Program Fundamentals)

5) For restrictions on mounting the A series module on the QA6□B or QA6ADP+A5□B/A6□B, refer to the following.

☞ QA65B/QA68B Extension Base Unit User's Manual

☞ QA6ADP QA Conversion Adapter Module User's Manual

6) For restrictions on using varying AnS/A series compatible extension base units, refer to Section 10.4.

2.1.4 Bus connection of GOT

In the system with the Q series CPU module, the GOT can be connected on the bus using the extension cable connector of the main base unit or extension base unit.
This section describes the system configuration of a GOT on the bus.
For details of bus connection of the GOT, refer to the following.

☞ GOT-A900 Series User's Manual (Connection)
☞ GOT1000 Series Connection Manual

(1) GOT recognized by CPU module

When a GOT is connected by bus, the CPU module recognizes the GOT as an intelligent function module with 16 I/O points.
Therefore, the I/O must be assigned to the CPU module in the GOT setup.
(When connecting a GOT on the bus, one extension base (16 points x 10 slots) must be occupied by the GOT.)
For details of the GOT setup, refer to the following.

☞ GOT-A900 Series Operating Manual (Extension Function /Option Function)
☞ GT15 User's Manual

(2) Maximum number of GOTs

Up to five GOTs can be connected on the bus.

(3) Precautions

- When connecting a GOT on the bus, position the GOT in the base subsequent to base units. Do not position the GOT between base units.

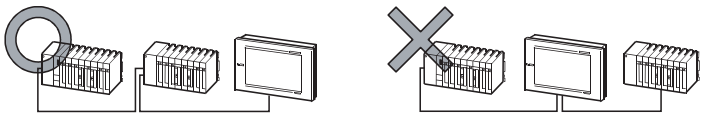


Figure 2.4 Precaution for connecting GOT by bus

- Extension cables for connecting a GOT on the bus must be a maximum of 13.2m (43.31 feet) in total length.
- A bus extension connector box (A9GT-QCNB) is required when a first GOT connected on the bus is installed 13.2 m (43.31 feet) or more away from the main base unit. (Note that the bus extension connector box cannot be used for the Q00JCPU.)
  For details of the A9GT-QCNB, refer to the following.
  ☞ A9GT-QCNB Type Bus Extension Connector Box User's Manual
- When using a redundant base unit (Q3□RB/Q6□RB/Q6□WRB) as the base unit, a GOT cannot be connected on the bus.)

• When using the QA1S6☐B as a extension base unit, install the GOT in the base subsequent to the extension base units but assign the I/O number subsequent to Q6☐B/Q5☐B.

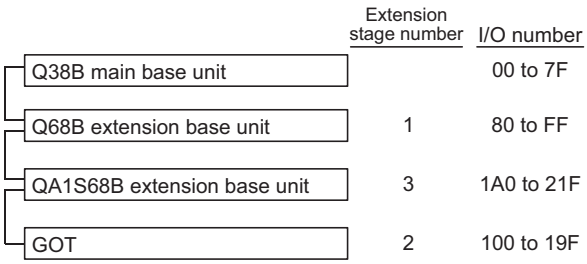
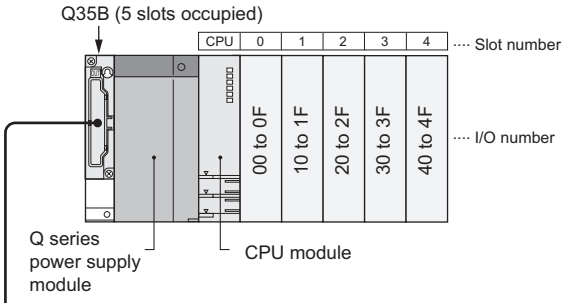


Figure 2.5 I/O number when 16-point modules are mounted on all slots

• When using the QA6☐B,QA6ADP+A5☐B/A6 ☐B as a extension base unit, the GOT cannot be connected to the bus.
• Before starting up the CPU module, initialize the GOT (Set up the extension base and slot number in the GOT setup.) that is to be connected to the bus.
(Set up the extension base and slot number in the GOT setup.)
• Apply the power to the CPU module and GOT by either of the following way.
1) Simultaneously turn on the CPU module and GOT.
2) Turn on the CPU module first, and then the GOT.
• Only the GOT1000, GOT-A900, and GOT-F900 series can be used. (Basic operating systems and communication driver that are compatible with the Q mode must be installed.)
The GOT800 series, A77GOT, and A64GOT cannot be used.

(4) Outline of system configuration

■Main base unit ···The figure shows the configuration when 16-point modules are loaded to each slot.



■Extension base unit ···The figure shows the configuration when 16-point modules are loaded to each slot.

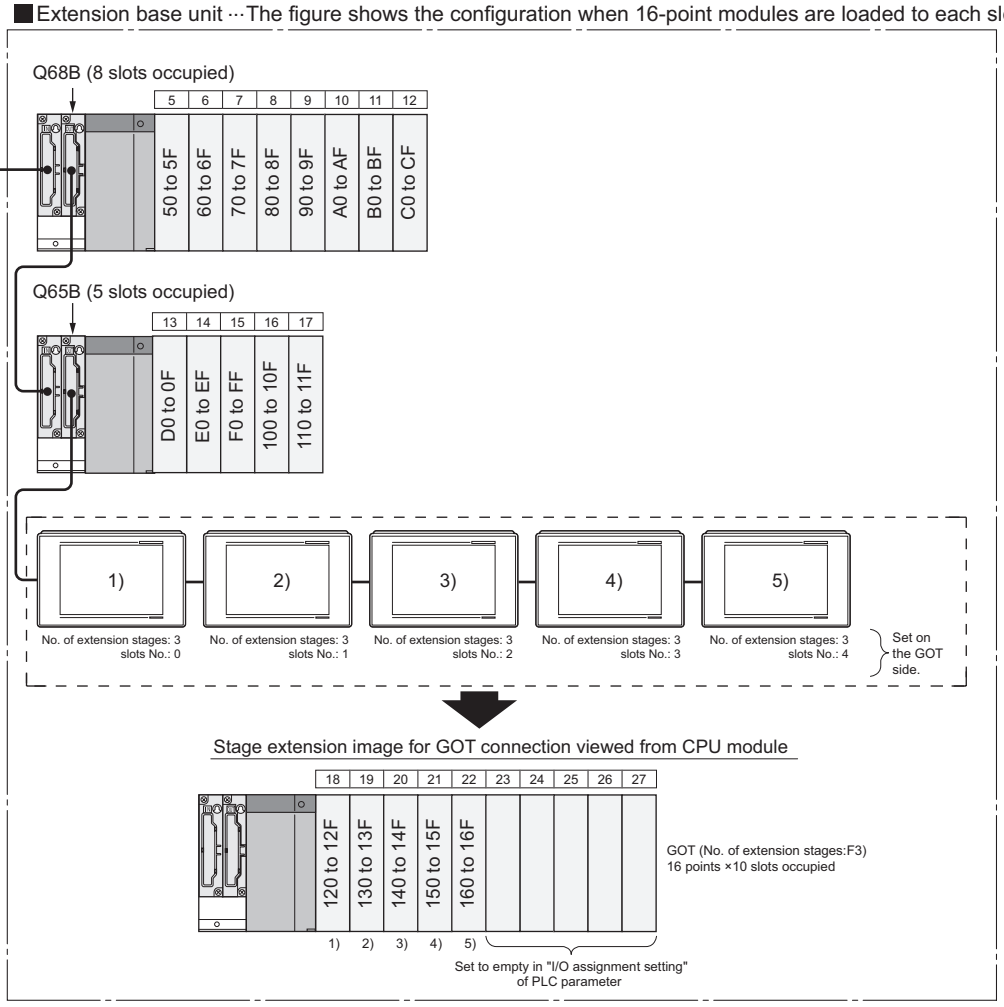


Figure 2.6 System configuration example with GOT

Table2.12 Restrictions on the system configuration and applicable base units, extension cables and power supply modules

Maximum number of extension bases for bus connection of GOT	When using Q00JCPU or Q00UJCPU : 2 When using Q00CPU, Q01CPU, Q00UCPU, Q01UCPU, or Q02UCPU : 4 When using High Performance model QCPU, Process CPU, Q03UD(E)CPU, Q04UD(E)HCPU, Q06UD(E)HCPU, Q10UD(E)HCPU, Q13UD(E)HCPU, Q20UD(E)HCPU, or Q26UD(E)HCPU : 7	The final base is occupied by GOT
Maximum number of I/O modules that can be mounted	When using Q00JCPU or Q00UJCPU : 16 - (No. of connected GOTs) modules When using Q00CPU, Q01CPU, Q00UCPU, or Q01UCPU : 24 - (No. of connected GOTs) modules When using Q02UCPU : 36 - (No. of connected GOTs) modules When using High Performance model QCPU, Process CPU, Q03UD(E)CPU, Q04UD(E)HCPU, Q06UD(E)HCPU, Q10UD(E)HCPU, Q13UD(E)HCPU, Q20UD(E)HCPU, or Q26UD(E)HCPU : 64 - (No. of connected GOTs) modules	
Applicable main base unit	Q33B, Q35B, Q38B, Q312B, Q38DB, Q312DB	
Applicable extension base unit	Model requiring no power supply module	Q52B, Q55B
	Model requiring a Q-series power supply module	Q63B, Q65B, Q68B, Q612B
	Model requiring a AnS series power supply module Note2.2	QA1S65B, QA1S68B
Applicable extension cable	QC05B, QC06B, QC12B, QC30B, QC50B, QC100B	
Q series power supply module Note2.1	Q61P-A1, Q61P-A2, Q61P, Q61P-D, Q62P, Q63P, Q64P, Q64PN	
AnS series power supply module Note2.2	A1S61PN, A1S62PN, A1S63P	

Note2.1 **Basic** **Universal**

Because the Q00JCPU and Q00UJCPU is the CPU module with a power supply module and main base unit incorporated, the main base unit (Q3□B) and Q series power supply module are not required.

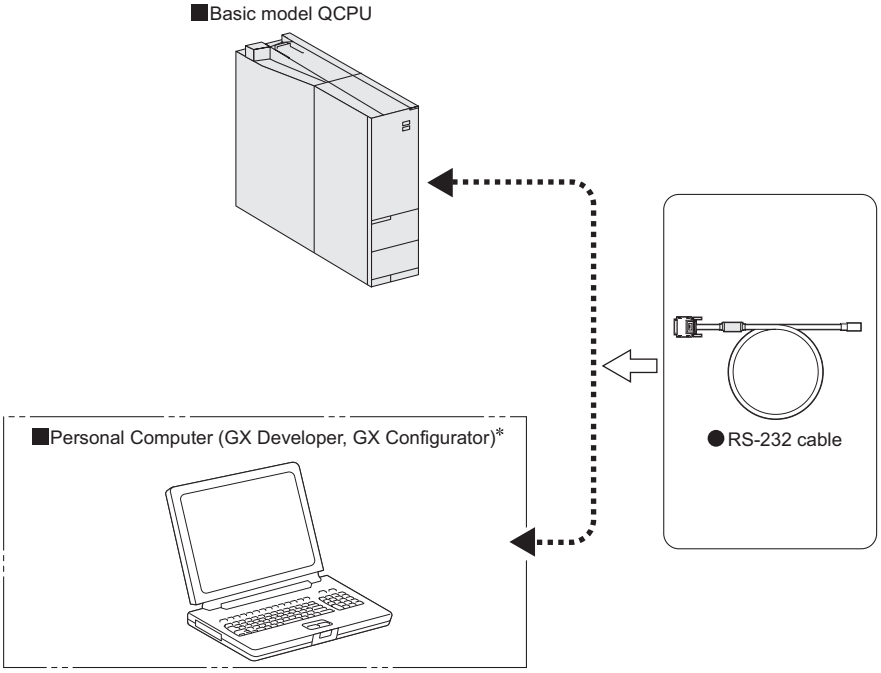
Note2.2 **High performance**

Usable only when the High Performance model QCPU is used.

2.1.5 Peripheral device configuration

This section describes peripheral devices that can be used in a system where the Basic model QCPU, High Performance model QCPU, Process CPU, or Universal model QCPU is installed.

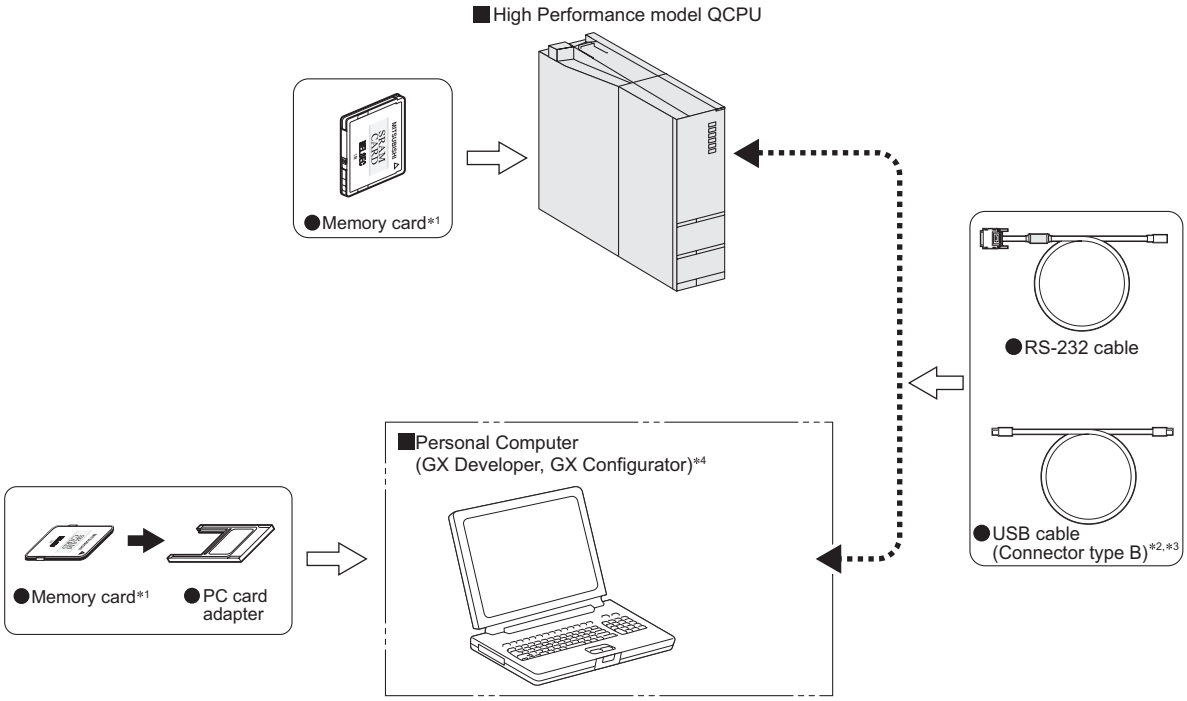
(1) When using the Basic model QCPU



*1: For the versions of GX Developer and GX Configurator that can be used with the Basic model QCPU, refer to Section 2.1.6.

Figure 2.7 Configuration of peripheral devices

(2) When using High Performance model QCPU



*1: Format ATA cards by GX Developer only. (☞ Section 7.1.4)

*2: Not applicable to the Q02CPU.

*3: For writing to memory cards and USB cable details, refer to the following.

☞ GX Developer operating manual

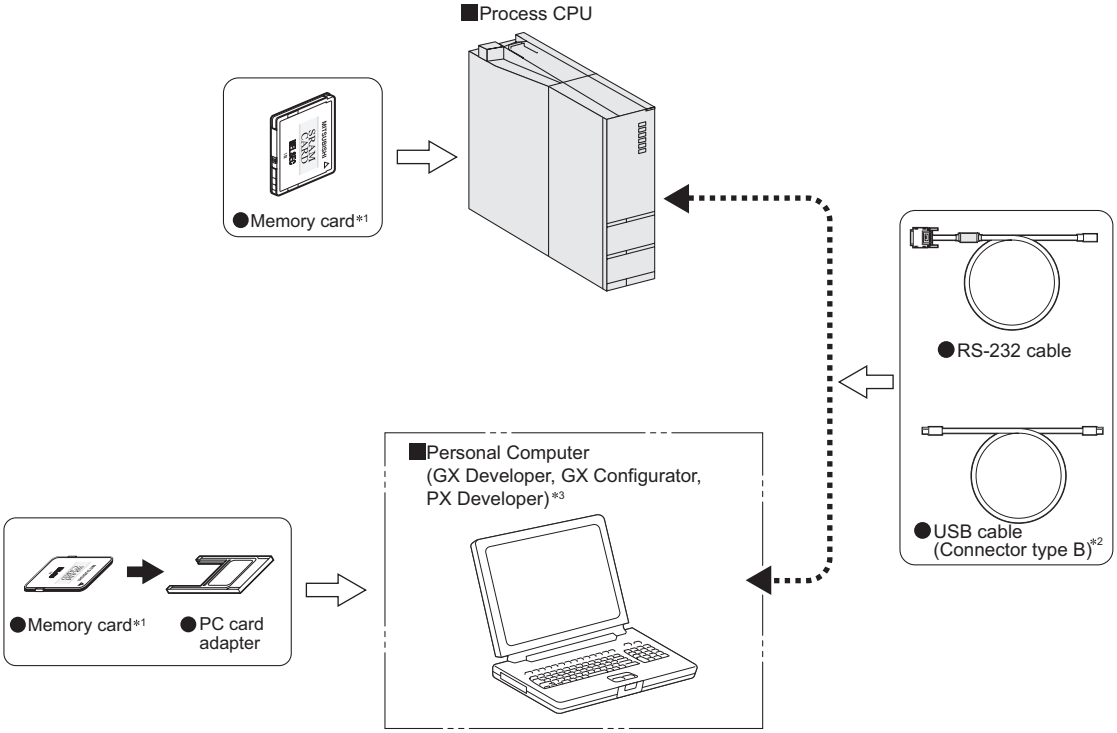
*4: For the GX Developer and GX Configurator versions that can be used with the Process CPU, refer to Section 2.1.6.

*5: For inquiries and orders of a programming unit (EPU01) and connection cable (EPU20R2CBL), please contact your local Mitsubishi Electric Engineering Co., Ltd. sales office.

*6: Programming units cannot be used when the "High speed interrupt fixed scan interval" parameter is written to the High Performance model QCPU whose serial number (first five digits) is "04012".

Figure 2.8 Configuration of peripheral devices

(3) When using the Process CPU



*1: Format ATA cards by GX Developer only. (☞ Section 7.1.4)

*2: For writing to memory cards and USB cable details, refer to the following.

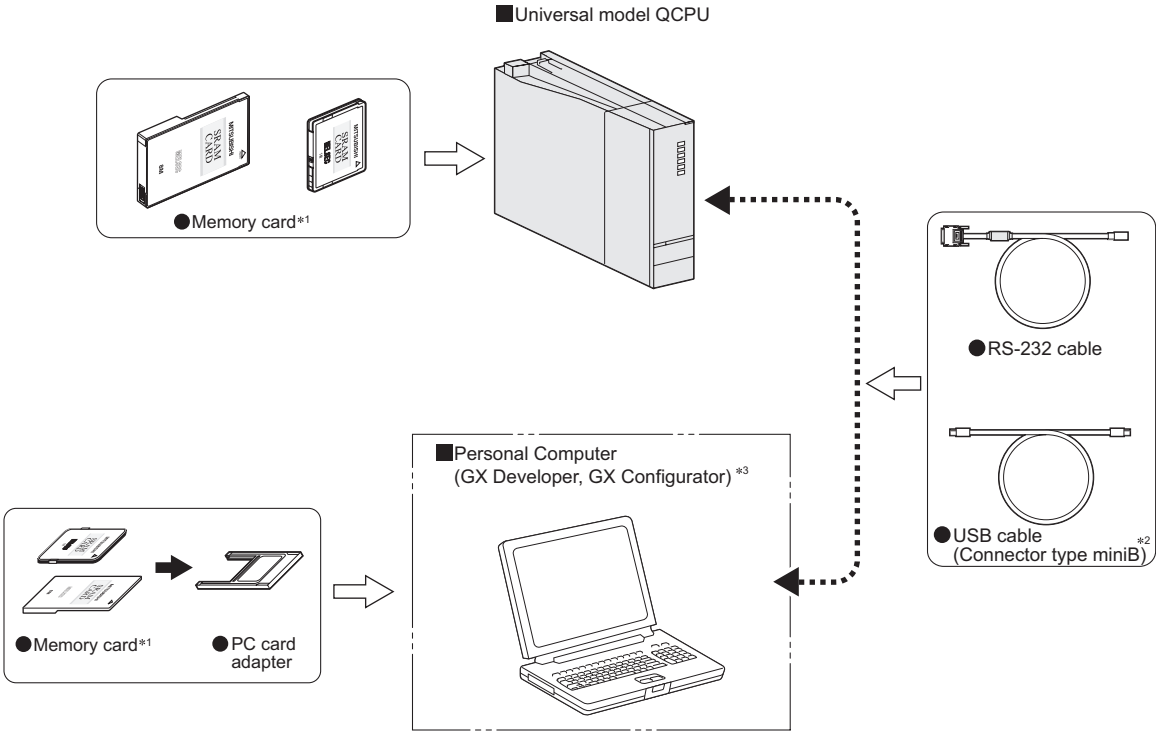
☞ GX Developer operating manual

*3: For the GX Developer and GX Configurator versions that can be used with the Process CPU, refer to the Section 2.1.6.

Figure 2.9 Configuration of peripheral devices

(4) When using the Universal model QCPU

(a) QnU(D)(H)CPU



*1: Format ATA cards by GX Developer only. (☞ Section 7.1.4)

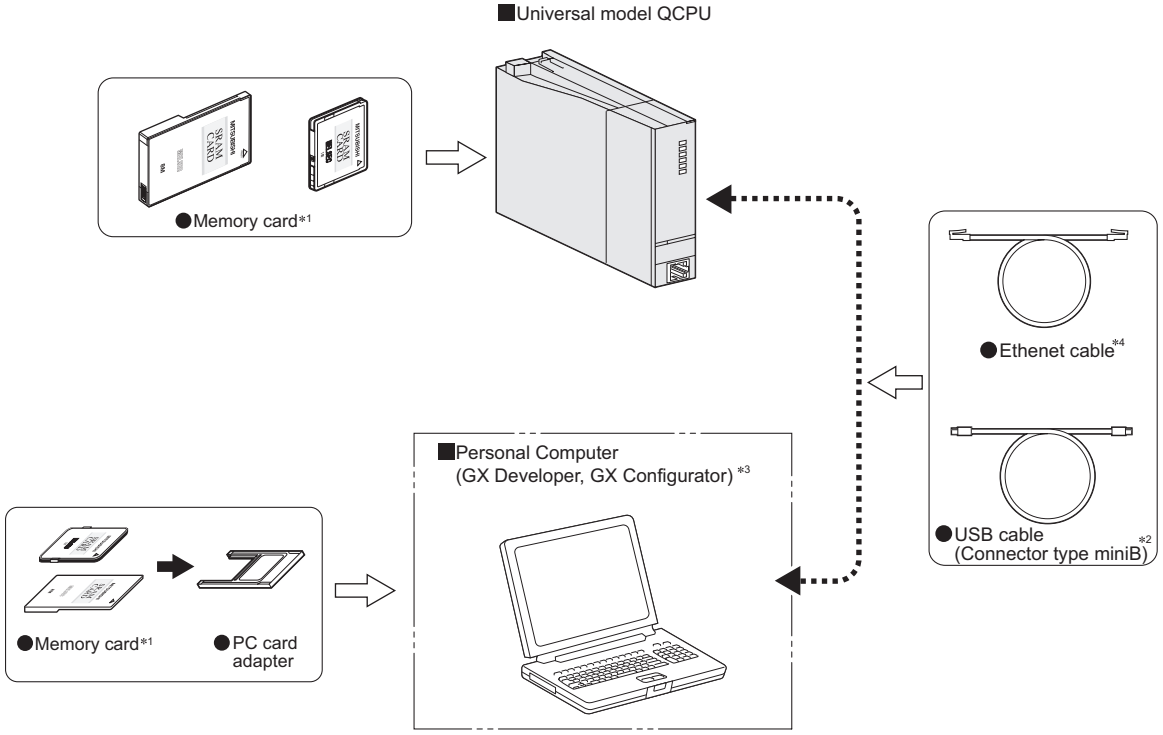
*2: For writing to memory cards and USB cable details, refer to the following.

☞ GX Developer operating manual

*3: For the GX Developer and GX Configurator versions that can be used with the Universal model QCPU, refer to Section 2.1.6.

Figure 2.10 Configuration of peripheral devices

(b) Built-in Ethernet QCPU



*1: Format ATA cards by GX Developer only. (☞ Section 7.1.4)

*2: For writing to memory cards and USB cable details, refer to the following.

☞ GX Developer operating manual

*3: For the GX Developer and GX Configurator versions that can be used with the Universal model QCPU, refer to Section 2.1.6.

*4: Use the following Ethernet cables

- For 10BASE-T connection: Cables compliant to Ethernet standards, category 3 or higher (STP/UTP cables).
- For 100BASE-TX connection: Cables compliant to Ethernet standards, category 5 or higher (STP/UTP cables (In an environment subject to electric noise, use shielded twisted pair (STP) cables)).

Figure 2.11 Configuration of peripheral devices

2.1.6 Applicable softwares

The following table indicates software versions applicable to the system.

(1) GX Developer and PX Developer versions applicable to a single CPU system

Table2.13 Applicable GX Developer and PX Developer

CPU module		Software version	
		GX Developer	PX Developer
Basic model QCPU		Version 7.00A or later	N/A
High Performance model QCPU		Version 4.00A or later	
Process CPU	Q02PHCPU Q06PHCPU	Version 8.68W or later	Version 1.18U or later
	Q12PHCPU Q25PHCPU	Version 7.10L or later*1	Version 1.00A or later
Universal model QCPU	Q02UCPU Q03UDCPU Q04UDHCPU Q06UDHCPU	Version 8.48A or later	N/A
	Q13UDHCPU Q26UDHCPU	Version 8.62Q or later	
	Q03UDECPU Q04UDEHCPU Q06UDEHCPU Q13UDEHCPU Q26UDEHCPU	Version 8.68W or later	
	Q00UJCPU Q00UCPU Q01UCPU Q10UD(E)HCPU Q20UD(E)HCPU	Version 8.76E or later	

*1: When using PX Developer, use GX Developer of Version 7.20W or later.

(2) GX Configurator versions applicable to a single CPU system

The table Table2.14 indicates software versions of GX Configurator applicable to a single CPU system.
The applicable versions depend on a intelligent function module used.
For the applicable versions of GX Configurator, refer to the user's manual for the intelligent function module used.

(a) When Basic model QCPU, Hogh Performance model QCPU, and Process QCPU are used

Table2.14 Applicable GX Configurator

CPU module	Software version	
	Product name	Version
Basic modelQCPU	GX Configurator-AD	Version 1.10L or later
	GX Configurator-DA	Version 1.10L or later
	GX Configurator-SC	Version 1.10L or later
	GX Configurator-CT	Version 1.10L or later
	GX Configurator-TI	Version 1.10L or later
	GX Configurator-TC	Version 1.10L or later
	GX Configurator-FL	Version 1.10L or later
	GX Configurator-QP	Version 2.10L or later
	GX Configurator-PT	Version 1.10L or later
	GX Configurator-AS	Version 1.13P or later
	GX Configurator-MB	Version 1.00A or later
	GX Configurator-DN	Version 1.10L or later
High Performance model QCPU	GX Configurator-AD	SW0D5C-QADU 00A or later
	GX Configurator-DA	SW0D5C-QDAU 00A or later
	GX Configurator-SC	SW0D5C-QSCU 00A or later
	GX Configurator-CT	SW0D5C-QCTU 00A or later
	GX Configurator-TI	Version 1.00A or later
	GX Configurator-TC	SW0D5C-QCTU 00A or later
	GX Configurator-FL	SW0D5C-QFLU 00A or later
	GX Configurator-QP	Version 2.00A or later
	GX Configurator-PT	Version 1.00A or later
	GX Configurator-AS	Version 1.13P or later
	GX Configurator-MB	Version 1.00A or later
	GX Configurator-DN	Version 1.00A or later
Process CPU	GX Configurator-AD	Version 1.13P or later
	GX Configurator-DA	Version 1.13P or later
	GX Configurator-SC	Version 1.13P or later
	GX Configurator-CT	Version 1.13P or later
	GX Configurator-TI	Version 1.13P or later
	GX Configurator-TC	Version 1.13P or later
	GX Configurator-FL	Version 1.13P or later
	GX Configurator-QP	Version 2.13P or later
	GX Configurator-PT	Version 1.13P or later
	GX Configurator-AS	Version 1.13P or later
	GX Configurator-MB	Version 1.00A or later
	GX Configurator-DN	Version 1.13P or later

(b) When Universal model QCPU is used

Table2.15 Applicable GX Configurator

Product	Version used in combination with Universal model QCPU			
	Q02U,Q03UD,Q04UDH,or Q06UDHCPU in use	Q13UDH or Q26UDHCPU in use	Q03UDE,Q04UDEH,Q06UDEH,Q13UDEH, or Q26UDEHCPU in use	Q00U(J),Q01U,Q10UDH,Q20UDH,Q10UDEH, or Q20UDEHCPU
GX Developer	Version 8.48A or later	Version 8.62Q or later	Version 8.68W or later	Version 8.78G or later
GX Configurator-AD	Version 2.05F or later*1	Version 2.05F or later*2	Version 2.05F or later*3	Version 2.05F or later*4
GX Configurator-DA	Version 2.06G or later*1	Version 2.06G or later*2	Version 2.06G or later*3	Version 2.06G or later*4
GX Configurator-SC	Version 2.12N or later*1	Version 2.12N or later*2	Version 2.17T or later*3	Version 2.17T or later*4
GX Configurator-CT	Version 1.25AB or later*1	Version 1.25AB or later*2	Version 1.25AB or later*3	Version 1.25AB or later*4
GX Configurator-TI	Version 1.24AA or later*1	Version 1.24AA or later*2	Version 1.24AA or later*3	Version 1.24AA or later*4
GX Configurator-TC	Version 1.23Z or later*1	Version 1.23Z or later*2	Version 1.23Z or later*3	Version 1.23Z or later*4
GX Configurator-FL	Version 1.23Z or later*1	Version 1.23Z or later*2	Version 1.23Z or later*3	Version 1.23Z or later*4
GX Configurator-QP	Version 2.25B or later	Version 2.29F or later	Version 2.29F or later*5	Not available
GX Configurator-PT	Version 1.23Z or later*1	Version 1.23Z or later*2	Version 1.23Z or later*3	Version 1.23Z or later*4
GX Configurator-AS	Version 1.21X or later*1	Version 1.21X or later*2	Version 1.21X or later*3	Version 1.21X or later*4
GX Configurator-MB	Version 1.08J or later*1	Version 1.08J or later*2	Version 1.08J or later*3	Version 1.08J or later*4
GX Configurator-DN	Version 1.23Z or later*1	Version 1.23Z or later*2	Version 1.24AA or later*3	Version 1.24AA or later*4

*1: The software can be used by installing GX Developer Version 8.48A or later
*2: The software can be used by installing GX Developer Version 8.62Q or later
*3: The software can be used by installing GX Developer Version 8.68W or later
*4: The software can be used by installing GX Developer Version 8.78G or later
*5: The software can be used by connecting USB

2.2 Checking Serial Number and Function Version

The serial number and function version of the CPU module can be checked on the rating plate, on the front of the module, and on the System monitor screen in GX Developer.

(1) Checking on the rating plate

The rated plate is located on the side face of the CPU module.

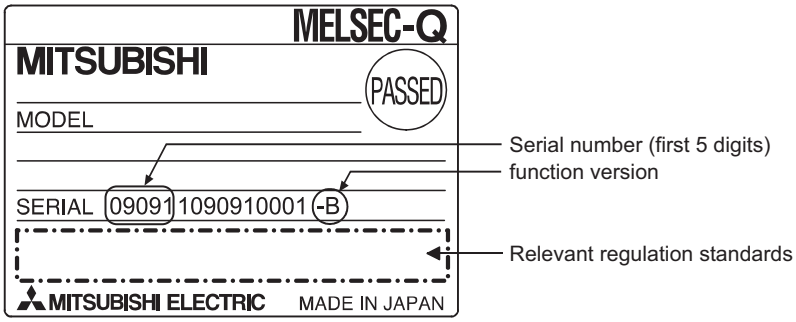


Figure 2.12 Plate rated

(2) Checking on the front of the module

The serial number is shown on the rating plate located on the front (at the bottom) of the module.
This does not apply to the following CPU modules.

- Modules manufactured in mid-September, 2007 or earlier.
- Redundant CPUs manufactured in March 2008 or earlier.
- Redundant CPUs and Q00JCPU.

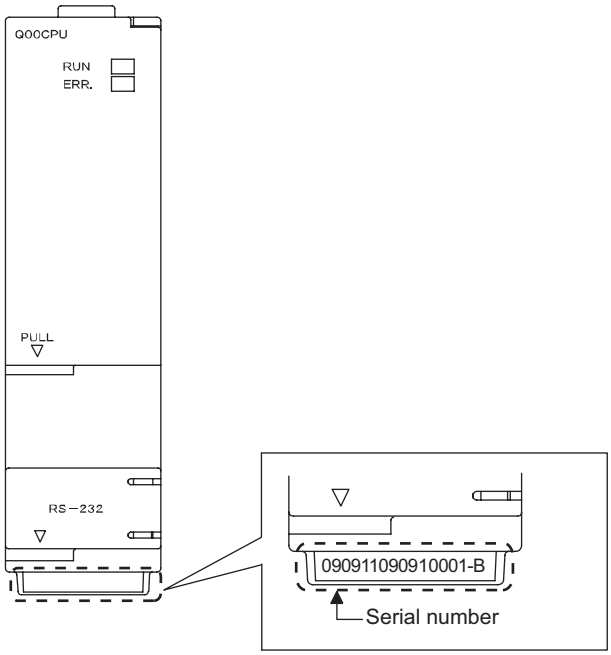


Figure 2.13 Display on the front of the module

Remark

Attaching a serial number label to the front of each Redundant CPU was started from March 2008.
However, some of the modules manufactured at the beginning of it may not have the label.

(3) Checking on the System monitor screen (Product information list screen)

To display the screen for checking the serial number and function version, select [Diagnostics] → [System monitor] and click the Product Inf. List button in GX Developer.

On the screen, the serial number and function version of intelligent function modules can also be checked.

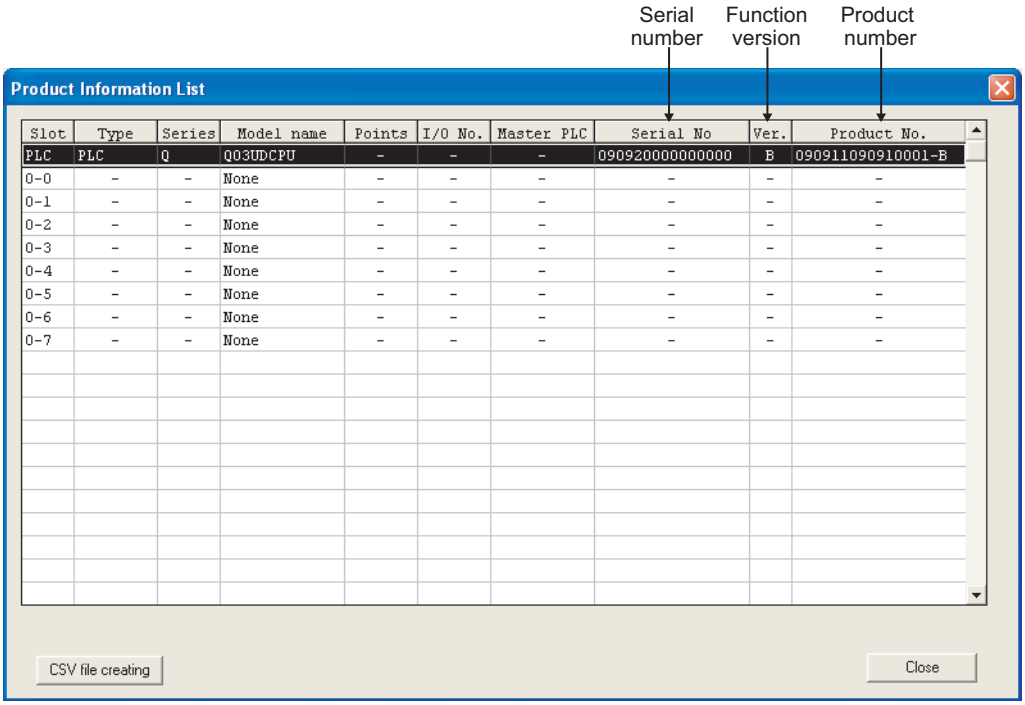


Figure 2.14 System monitor

[Serial No., Ver., and Product No.]

- The serial number of the module is displayed in the "Serial No." column.
- The function version of the module is displayed in the "Ver." column.
- The serial number (product number) printed on the rating plate of the module is displayed in the "Product No." column.*1

  Note that "-" is displayed for a modules that does not support the product number display.

*1: The product number is displayed only for the Universal model QCPU.

Point

The serial number displayed on the Product information list screen of GX Developer may differ from that on the rating plate and on the front of the module.

- The serial number on the rating plate and on the front of the module indicates the management information of the product.
- The serial number displayed on the Product information list screen indicates the functional information of the product.
  The functional information of the product is upgraded when a new function is added.

CHAPTER3 GENERAL SPECIFICATIONS

The general specification of the programmable controller are shown in Table3.1.

Table3.1 General specifications

Item	Specification					
Operating ambient temperature	0 to 55℃					
Storage ambient temperature	-25 to 75℃ *3					
Operating ambient humidity	5 to 95%RH *4, non-condensing					
Storage ambient humidity	5 to 95%RH *4, non-condensing					
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2		Frequency	Acceleration	Amplitude	Sweep count
		Under intermittent vibration	5 to 9Hz	----	3.5mm (0.14 inches)	10 times each in X, Y, Z directions
			9 to 150Hz	9.8m/s^2	----	
		Under continuous vibration	5 to 9Hz	----	1.75mm (0.069 inches)	----
			9 to 150Hz	4.9m/s^2	----	
Shock resistance	Compliant with JIS B 3502, IEC 61131-2 (147 m/s^2, 3 times in each of 3 directions X, Y, Z)					
Operating ambience	No corrosive gases					
Operating altitude*5	2000m (6562 feet) max.					
Installation location	Inside control panel					
Overvoltage category *1	II max.					
Pollution level *2	2 max.					
Equipment category	Class I					

*1: This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities.
The surge voltage withstand level for up to the rated voltage of 300 V is 2500 V.

*2: This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

*3: The storage ambient temperature is -20 to 75℃ if the system includes the AnS/A series modules.

*4: The operating ambient humidity and storage ambient humidity are 10 to 90%RH if the system includes the AnS/A series modules.

*5: Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0m. Doing so can cause a malfunction.
When using the programmable controller under pressure, please contact your sales representative.

Memo

CHAPTER4 HARDWARE SPECIFICATIONS OF THE CPU MODULE

4.1 Performance Specifications

4.1.1 Basic model QCPU

Table4.1 to 4.5 show the performance specifications of the CPU module.

Table4.1 Performance specifications

Item		Basic model QCPU		
		Q00JCPU	Q00CPU	Q01CPU
Control method		Stored program repeat operation		
I/O control mode		Refresh mode (Direct access I/O is available by specifying direct access I/O (DX□, DY□).)		
Program language	Sequence control language	Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, function block, and structured text (ST)		
	Process control language	----		
Processing speed (sequence instruction)	LD X0	200ns	160ns	100ns
	MOV D0 D1	700ns	560ns	350ns
Processing speed (redundant function)	Tracking execution time (increased scan time)	----		
Constant scan (Function for keeping regular scan time)		1 to 2000ms (Setting available in1ms unit.) (Setting by parameters.)		
Program size *1, *2		8K steps (32K bytes)		14K steps (56K bytes)
Memory size *1	Program memory (drive 0)	58K bytes	94K bytes	
	Memory card (RAM) (drive 1)	----		
	Memory card (ROM) (drive 2)	----		
	Standard RAM (drive 3)	0	128K bytes *3	
	Standard ROM (drive 4)	58K bytes	94K bytes	
	CPU shared memory *3 , *4	----	1K bytes	

*1: The unit of the file size stored in the memory area varies depending on the CPU module. For details, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

*2: The maximum number of executable sequence steps is as shown below.(Program size) - (File header size (default: 34 steps))
For details, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

*3: The size has been increased for the function upgrade of the CPU module. (☞ Appendix 2)

*4: The CPU shared memory is not latched.
(☞ QCPU User's Manual (Multiple CPU System)
The CPU shared memory is cleared by turning on the programmable controller or resetting the CPU module.

Table4.1 Performance specifications

Item			Basic model QCPU		
			Q00JCPU	Q00CPU	Q01CPU
Max. number of files stored	Program memory		6 *5		
	Memory card (RAM)		----		
	Memory card (ROM)	Flash card	----		
		ATA card	----		
	Standard RAM		----	1	
	Standard ROM		6 *5		
No. of times of writing data into the standard ROM			Max. 100000 times		
No. of I/O device points (No. of points usable on program.)			2048 points (X/Y0 to 7FF)		
No. of I/O points (No. of points accessible to the actual I/O module.)			256 points (X/Y0 to FF)	1024 points (X/Y0 to 3FF)	
No. of device points	Internal relay [M]		8192 points by default (M0-8191) (changeable)		
	Latch relay [L]		2048 points by default (L0 to 2047) (changeable)		
	Link relay [B]		2048 points by default (B0 to 7FF) (changeable)		
	Timer [T]		512 points by default (T0 to 511) (changeable) (Sharing of low- and high-speed timers)		
			The low- and high-speed timers are specified by the instructions. The measurement unit of the low- and high-speed timers is set up by parameters. (Low-speed timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)		
	Retentive timer [ST]		0 point by default (sharing of the low- and high-speed retentive timers) (changeable) The low- and high-speed retentive timers are specified by the instructions. The measurement unit of the low- and high-speed retentive timers is set up by parameters. (Low-speed retentive timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed retentive timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)		
	Counter [C]		• Normal counter: 512 points by default (C0 to 511) (changeable) • Interrupt counter: 128 points max. (0 point by default, setting by parameters)		
	Data register [D]		11136 points by default (D0 to 11135) (changeable)		
	Link register [W]		2048 points by default (W0 to 7FF) (changeable)		
	Annunciator [F]		1024 points by default (F0 to 1023) (changeable)		
	Edge relay [V]		1024 points by default (V0 to 1023) (changeable)		
	File register	[R]	----	32768 points (R0 to 32767)/block (The number of device points is fixed.)	
		[ZR]	----	65536 points (ZR0 to 65535) (The number of device points is fixed.)	
	Link special relay [SB]		1024 points (SB0 to 3FF) (The number of device points is fixed.)		
	Link special register [SW]		1024 points (SW0 to 3FF) (The number of device points is fixed.)		

*5: Each of parameter, intelligent function module parameter, sequence program, SFC program, device comment, and device initial value files can be stored.

*6: The number of points can be changed within the setting range.

(☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

Table4.1 Performance specifications

Item		Basic model QCPU		
		Q00JCPU	Q00CPU	Q01CPU
No. of device points	Step relay [S] *7	2048 points (S0 to 127/block) (The number of device points is fixed.)		
	Index register [Z]	10 points (Z0 to 9) (The number of device points is fixed.)		
	Pointer [P]	300 points (P0 to 299) (The number of device points is fixed.)		
	Interrupt pointer [I]	128 points (I0 to 127) (The number of device points is fixed.) The cyclic interval of system interrupt pointers I28 to 31 can be set up by parameters. (2 to 1000ms, 1ms unit) Default values I28: 100ms, I29: 40ms, I30: 20ms, I31: 10ms		
	Special relay [SM]	1024 points (SM0 to 1023) (The number of device points is fixed.)		
	Special register [SD]	1024 points (SD0 to 1023) (The number of device points is fixed.)		
	Function input [FX]	16 points (FX0 to F) (The number of device points is fixed.)		
	Function output [FY]	16 points (FY0 to F) (The number of device points is fixed.)		
	Function register [FD]	5 points (FD0 to 4) (The number of device points is fixed.)		
No. of device tracking words		----		
Link direct device		Device for accessing the link device directly. Exclusively used for CC-Link IE controller network and MELSECNET/H. Specified form: J□□\X□□, J□□\Y□□, J□□\W□□, J□□\B□□, J□□\SW□□, J□□\SB□□		
Intelligent function module device		Device for accessing the buffer memory of the intelligent function module directly. Specified form: U□□\G□□		
Latch range		L0 to 2047 (default) (Latch range can be set up for B, F, V, T, ST, C, D, and W.) (Setting by parameters.)		
RUN/PAUSE contact		One contact can be set up in X0 to 7FF for each of RUN and PAUSE. (Setting by parameters.)		
Clock function		Year, month, date, hour, minute, second and day of the week (Automatic leap year detection) Accuracy: -3.2 to +5.27s(TYP.+1.98s)/d at 0℃ Accuracy: -2.57 to +5.27s(TYP.+2.22s)/d at 25℃ Accuracy: -11.68 to +3.65s(TYP.-2.64s)/d at 55℃		
Allowable momentary power failure time		20ms or less (100VAC or more)	Varies depending on the power supply module.	
5VDC internal current consumption		0.26A *8	0.25A	0.27A
External dimensions	H	98mm(3.86 inches)	98mm(3.86 inches)	
	W	245mm(9.65 inches) *9	27.4mm(1.08 inches)	
	D	98mm(3.86 inches)	89.3mm(3.52 inches)	
Weight		0.66kg *9	0.13kg	

*7: The step relay is the device for the SFC function.
*8: The value includes those of the CPU module and base unit.
*9: The value includes those of the CPU module, base unit, and power supply module.

Remark

For the general specifications, refer to CHAPTER 3.

4.1.2 High Performance model QCPU

Table4.2 Performance specifications

Item		High Performance model QCPU				
		Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU
Control method		Stored program repeat operation				
I/O control mode		Refresh mode (Direct access I/O is available by specifying direct access I/O (DX□, DY□).)				
Program language	Sequence control language	Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, function block, and structured text (ST)				
	Process control language	----				
Processing speed (sequence instruction)	LD X0	79ns	34ns			
	MOV D0 D1	237ns	102ns			
Processing speed (redundant function)	Tracking execution time (increased scan time)	----				
Constant scan (Function for keeping regular scan time)		0.5 to 2000ms (Setting available in 0.5ms unit.) (Setting by parameters.)				
Program size *1, *2		28K steps (112K bytes)		60K steps (240K bytes)	124K steps (496K bytes)	252K steps (1008K bytes)
Memory size*1	Program memory (drive 0)	112K bytes		240K bytes	496K bytes	1008K bytes
	Memory card (RAM) (drive 1)	Size of the installed memory card (2M bytes max.)				
	Memory card (ROM) (drive 2)	Size of the installed memory card (Flash card: 4M bytes max., ATA card: 32M bytes max.)				
	Standard RAM (drive 3)	64K bytes	128K bytes *3		256K bytes *3	
	Standard ROM (drive 4)	112K bytes		240K bytes	496K bytes	1008K bytes
	CPU shared memory *3 , *4	8K bytes				

*1: The unit of the file size stored in the memory area varies depending on the CPU module. For details, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

*2: The maximum number of executable sequence steps is as shown below.(Program size) - (File header size (default: 34 steps))
For details, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

*3: The size has been increased for the function upgrade of the CPU module. (☞ Appendix 2)

*4: The CPU shared memory is not latched.
(☞ QCPU User's Manual (Multiple CPU System)
The CPU shared memory is cleared by turning on the programmable controller or resetting the CPU module.

Table4.2 Performance specifications

Item			High Performance model QCPU				
			Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU
Max. number of files stored	Program memory		28		60	124	252 *5
	Memory card (RAM)		287(When the Q2MEM-2MBS is used)				
	Memory card (ROM)	Flash card	288				
		ATA card	512				
	Standard RAM		3 *6				
	Standard ROM		28		60	124	252
No. of times of writing data into the standard ROM			Max. 100000 times				
No. of I/O device points (No. of points usable on program.)			8192 points (X/Y0 to 1FFF)				
No. of I/O points (No. of points accessible to the actual I/O module.)			4096 points (X/Y0 to FFF)				
No. of device points *7	Internal relay [M]		8192 points by default (M0-8191) (changeable)				
	Latch relay [L]		8192 points by default (L0 to 8191) (changeable)				
	Link relay [B]		8192 points by default (B0 to 1FFF) (changeable)				
	Timer [T]		2048 points by default (T0 to 2047) (sharing of low- and high-speed timers) (changeable)				
			The low- and high-speed timers are specified by the instructions. The measurement unit of the low- and high-speed timers is set up by parameters. (Low-speed timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)				
	Retentive timer [ST]		0 point by default (sharing of the low- and high-speed retentive timers) (changeable) The low- and high-speed retentive timers are specified by the instructions. The measurement unit of the low- and high-speed retentive timers is set up by parameters. (Low-speed retentive timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed retentive timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)				
	Counter [C]		• Normal counter, 1024 points by default (C0 to 1023) (changeable) • Interrupt counter: 256 points max. (0 point by default, setting by parameters)				
	Data register [D]		12288 points by default (D0 to 12287) (changeable)				
	Link register [W]		8192 points by default (W0 to 1FFF) (changeable)				
	Annunciator [F]		2048 points by default (F0 to 2047) (changeable)				
	Edge relay [V]		2048 points by default (V0 to 2047) (changeable)				

*5: The CPU module can execute up to 124 programs. The CPU module cannot execute 125 or more programs.

*6: Extended by the upgraded functions of CPU module (☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals))

*7: The number of points can be changed within the setting range. (☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

Table4.2 Performance specifications

Item				High Performance model QCPU				
				Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU
No. of device points	File register*8	[R]	Standard RAM	32768 points (R0 to 32767)	32768 points(R0 to 32767) Up to 65536 points can be used by block switching in units of 32768 points		32768 points(R0 to 32767) Up to 131072 points can be used by block switching in units of 32768 points	
			SRAM card (1M bytes)	Up to 517120 points can be used by block switching in units of 32768 points (R0 to 32767).				
			SRAM card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points (R0 to 32767).				
			Flash card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points (R0 to 32767).				
			Flash card (4M bytes)	Up to 1042432 points can be used by block switching in units of 32768 points (R0 to 32767).				
		[ZR]	Standard RAM	32768 points (ZR0 to 32767)	65536 point (ZR0 to 65535) Block switching not required.		131072 points (ZR0 to 131071) Block switching not required.	
			SRAM card (1M bytes)	517120 points (ZR0 to 517119), Block switching not required.				
			SRAM card (2M bytes)	1041408 points (ZR0 to 1041407), Block switching not required.				
			Flash card (2M bytes)	1041408 points (ZR0 to 1041407), Block switching not required.				
			Flash card (4M bytes)	1042432 points (ZR0 to 1042431), Block switching not required.				
	Link special relay [SB]			2048 points (SB0 to 7FF) (The number of device points is fixed.)				
	Link special register [SW]			2048 points (SW0 to 7FF) (The number of device points is fixed.)				
	Step relay [S] *9			8192 points (S0 to 8191) (The number of device points is fixed.)				
	Index register [Z]			16 points (Z0 to 15) (The number of device points is fixed.)				
	Pointer [P]			4096 points (P0 to 4095) (The number of device points is fixed.), The use ranges of the local pointers and common pointers can be set up by parameters.				
	Interrupt pointer [I]			256 points (I0 to 255) (The number of device points is fixed.) The constant cyclic interval of system interrupt pointers I28 to 31 can be set up by parameters. (0.5 to 1000ms, 0.5ms unit) Default values I28: 100ms, I29: 40ms, I30: 20ms, I31: 10ms				

*8: Read only when Flash card is used. ATA card is unusable.

*9: The step relay is the device for the SFC function.

Table4.2 Performance specifications

Item		High Performance model QCPU				
		Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU
No. of device points	Special relay [SM]	2048 points (SM0 to 2047) (The number of device points is fixed.)				
	Special register [SD]	2048 points (SM0 to 2047) (The number of device points is fixed.)				
	Function input [FX]	16 points (FX0 to F) (The number of device points is fixed.)				
	Function output [FY]	16 points (FY0 to F) (The number of device points is fixed.)				
	Function register [FD]	5 points (FD0 to 4) (The number of device points is fixed.)				
No. of device tracking words		----				
Link direct device		Device for accessing the link device directly. Dedicated to CC-Link IE controller network *10 and MELSECNET/H. Specified form: J□□\X□□, J□□\Y□□, J□□\W□□, J□□\B□□, J□□\SW□□, J□□\SB□□				
Intelligent function module device		Device for accessing the buffer memory of the intelligent function module directly. Specified form: U□□\G□□				
Latch range		L0 to 8191 (default) (Latch range can be set up for B, F, V, T, ST, C, D, and W.) (Setting by parameters.)				
RUN/PAUSE contact		One contact can be set up in X0 to 1FFF for each of RUN and PAUSE. (Setting by parameters.)				
Clock function		Year, month, date, hour, minute, second, and day of the week (Automatic leap year detection) Accuracy: -3.18 to +5.25s(TYP.+2.12s)/d at 0℃ Accuracy: -3.93 to +5.25s(TYP.+1.90s)/d at 25℃ Accuracy: -14.69 to +3.53s(TYP.-3.67s)/d at 55℃				
Allowable momentary power failure time		Varies depending on the power supply module.				
5VDC internal current consumption		0.60A	0.64A			
External dimensions	H	98mm (3.86 inches)				
	W	27.4mm (1.08 inches)				
	D	89.3mm (3.52 inches)				
Weight		0.20kg				

*10: For use of CC-Link IE controller network, check the versions of the CPU module and GX Developer.
(☞ Appendix 2.2)

Remark

For the general specifications, refer to CHAPTER 3.

4.1.3 Process CPU

Table4.3 Performance specifications

Item		Process CPU			
		Q02PHCPU	Q06PHCPU	Q12PHCPU	Q25PHCPU
Control method		Stored program repeat operation			
I/O control mode		Refresh mode (Direct access I/O is available by specifying direct access I/O (DX□, DY□).)			
Program language	Sequence control language	Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, function block and structured text (ST)			
	Process control language	FBD for process control (Programming by PX Developer.)			
Processing speed (sequence instruction)	LD X0	34ns			
	MOV D0 D1	102ns			
Processing speed (redundant function)	Tracking execution time (increased scan time)	----			
Constant scan (Function for keeping regular scan time)		0.5 to 2000ms (Setting available in 0.5ms unit.) (Setting by parameters.)			
Program size *1, *2		28K steps (112 bytes)	60K steps (240 bytes)	124K steps (496 bytes)	252K steps (1008 bytes)
Memory size*1	Program memory (drive 0)	112K bytes	240K bytes	496K bytes	1008K bytes
	Memory card (RAM) (drive 1)	Size of the installed memory card (2M bytes max.)			
	Memory card (ROM) (drive 2)	Size of the installed memory card (Flash card: 4M bytes max., ATA card: 32M bytes max.)			
	Standard RAM (drive 3)	128K bytes		256K bytes *3	
	Standard ROM (drive 4)	112K bytes	240K bytes	496K bytes	1008K bytes
	CPU shared memory *3	8K bytes			

*1: The unit of the file size stored in the memory area varies depending on the CPU module. For details, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

*2: The maximum number of executable sequence steps is as shown below.(Program size) - (File header size (default: 34 steps))
For details, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

*3: The CPU shared memory is not latched.
(☞ QCPU User's Manual (Multiple CPU System)
The CPU shared memory is cleared by turning on the programmable controller or resetting the CPU module.

Table4.3 Performance specifications

Item			Process CPU			
			Q02PHCPU	Q06PHCPU	Q12PHCPU	Q25PHCPU
Max. number of files stored	Program memory		28	60	124	252 *4
	Memory card (RAM)		287(When the Q2MEM-2MBS is used)			
	Memory card (ROM)	Flash card	288			
		ATA card	512			
	Standard RAM		3 *5			
	Standard ROM		28	60	124	252
No. of times of writing data into the standard ROM			Max. 100000 times			
No. of I/O device points (No. of points usable on program.)			8192 points (X/Y0 to 1FFF)			
No. of I/O points (No. of points accessible to the actual I/O module.)			4096 points (X/Y0 to FFF)			
No. of device points *6	Internal relay [M]		8192 points by default (M0 to 8191) (changeable)			
	Latch relay [L]		8192 points by default (L0 to 8191) (changeable)			
	Link relay [B]		8192 points by default (B0 to 1FFF) (changeable)			
	Timer [T]		2048 points by default (T0 to 2047) (sharing of low- and high-speed timers) (changeable) The low- and high-speed timers are specified by the instructions. The measurement unit of the low- and high-speed timers is set up by parameters. (Low-speed timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)			
	Retentive timer [ST]		0 point by default (sharing of low- and high-speed retentive timers) (changeable) The low- and high-speed retentive timers are specified by the instructions. The measurement unit of the low- and high-speed retentive timers is set up by parameters. (Low-speed retentive timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed retentive timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)			
	Counter [C]		• Normal counter, 1024 points by default (C0 to 1023) (changeable) • Interrupt counter: 256 points max. (0 point by default, setting by parameters)			
	Data register [D]		12288 points by default (D0 to 12287) (changeable)			
	Link register [W]		8192 points by default (W0 to 1FFF) (changeable)			
	Annunciator [F]		2048 points by default (F0 to 2047) (changeable)			
	Edge relay [V]		2048 points by default (V0 to 2047) (changeable)			

*4: The CPU module can execute up to 124 programs. The CPU module cannot execute 125 or more programs.

*5: Extended by the upgraded functions of CPU module (☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals))

*6: The number of points can be changed within the setting range. (☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals))

Table4.3 Performance specifications

Item				Process CPU			
				Q02PHCPU	Q06PHCPU	Q12PHCPU	Q25PHCPU
No. of device points	File register*7	[R]	Standard RAM	Up to 65536 points can be used by block switching in units of 32768 points (R0 to 32767).		Up to 131072 points can be used by block switching in units of 32768 points (R0 to 32767).	
			SRAM card (1M bytes)	Up to 517120 points can be used by block switching in units of 32768 points (R0 to 32767).			
			SRAM card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points (R0 to 32767).			
			Flash card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points (R0 to 32767).			
			Flash card (4M bytes)	Up to 1042432 points can be used by block switching in units of 32768 points (R0 to 32767).			
		[ZR]	Standard RAM	65536 points (ZR0 to 65535), block switching not required.		131072 points (ZR0 to 131071), block switching not required.	
			SRAM card (1M bytes)	517120 points (ZR0 to 517119), block switching not required.			
			SRAM card (2M bytes)	1041408 points (ZR0 to 1041407), block switching not required.			
			Flash card (2M bytes)	1041408 points (ZR0 to 1041407), block switching not required.			
			Flash card (4M bytes)	1042432 points (ZR0 to 1042431), block switching not required.			
	Link special relay [SB]			2048 points (SB0 to 7FF) (The number of device points is fixed.)			
	Link special register [SW]			2048 points (SW0 to 7FF) (The number of device points is fixed.)			
	Step relay [S] *8			8192 points (S0 to 8191) (The number of device points is fixed.)			
	Index register [Z]			16 points (Z0 to 15) (The number of device points is fixed.)			
	Pointer [P]			4096 points (P0 to 4095) (The number of device points is fixed.), The use ranges of the local pointers and common pointers can be set up by parameters.			
	Interrupt pointer [I]			256 points (I0 to 255) (The number of device points is fixed.) The constant cyclic interval of system interrupt pointers I28 to 31 can be set up by parameters. (0.5 to 1000ms, 0.5ms unit) Default values I28: 100ms, I29: 40ms, I30: 20ms, I31: 10ms			

*7: Read only when Flash card is used. ATA card is unusable.

*8: The step relay is the device for the SFC function.

Table4.3 Performance specifications

Item		Process CPU			
		Q02PHCPU	Q06PHCPU	Q12PHCPU	Q25PHCPU
No. of device points	Special relay [SM]	2048 points (SM0 to 2047) (The number of device points is fixed.)			
	Special register [SD]	2048 points (SD0 to 2047) (The number of device points is fixed.)			
	Function input [FX]	16 points (FX0 to F) (The number of device points is fixed.)			
	Function output [FY]	16 points (FY0 to F) (The number of device points is fixed.)			
	Function register [FD]	5 points (FD0 to 4) (The number of device points is fixed.)			
No. of device tracking words		----			
Link direct device		Device for accessing the link device directly. Exclusively used for CC-Link IE controller network*9 and MELSECNET/H. Specified form: J□□\X□□, J□□\Y□□, J□□\W□□, J□□\B□□, J□□\SW□□, J□□\SB□□			
Intelligent function module device		Device for accessing the buffer memory of the intelligent function module directly. Specified form: U□□\G□□			
Latch range		L0 to 8191(default) (Latch range can be set up for B, F, V, T, ST, C, D, and W.) (Setting by parameters.)			
RUN/PAUSE contact		One contact can be set up in X0 to 1FFF for each of RUN and PAUSE. (Setting by parameters.)			
Clock function		Year, month, date, hour, minute, second, and day of the week (Automatic leap year detection) Accuracy: -3.18 to +5.25s(TYP.+2.12s)/d at 0℃ Accuracy: -3.93 to +5.25s(TYP.+1.90s)/d at 25℃ Accuracy: -14.69 to +3.53s(TYP.-3.67s)/d at 55℃			
Allowable momentary power failure period		Varies depending on the power supply module.			
5VDC internal current consumption		0.64A			
External dimensions	H	98mm (3.86 inches)			
	W	27.4mm (1.08 inches)			
	D	89.3mm (3.52 inches)			
Weight		0.20kg			

*9: For use of CC-Link IE controller network, check the versions of the CPU module and GX Developer. (☞ Appendix 2.2)

Remark

For the general specifications, refer to CHAPTER 3.

4.1.4 Redundant CPU

Table4.4 Performance specifications

Item		Redundant CPU	
		Q12PRHCPU	Q25PRHCPU
Control method		Stored program repeat operation	
I/O control mode		Refresh mode (Direct access I/O is available by specifying direct access I/O (DX□, DY□).)	
Program language	Sequence control language	Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, function block and structured text (ST)	
	Process control language	FBD for process control (Programming by PX Developer.)	
Processing speed (sequence instruction)	LD X0	34ns	
	MOV D0 D1	102ns	
Processing speed (redundant function)	Tracking execution time (increased scan time)	Device memory 48k words: 10ms Device memory 100k words: 15ms (☞ QnPRHCPU User's Manual (Redundant System))	
Constant scan (Function for keeping regular scan time)		0.5 to 2000ms (Setting available in 0.5ms unit.) (Setting by parameters.)	
Program size *1, *2		124K steps (496 bytes)	252K steps (1008 bytes)
Memory size*1	Program memory (drive 0)	496K bytes	1008K bytes
	Memory card (RAM) (drive 1)	Size of the installed memory card (2M bytes max.)	
	Memory card (ROM) (drive 2)	Size of the installed memory card (Flash card: 4M bytes max., ATA card: 32M bytes max.)	
	Standard RAM (drive 3)	Size of the installed memory card (2M bytes max.)	
	Standard ROM (drive 4)	496K bytes	1008K bytes
	CPU shared memory	----	

*1: The unit of the file size stored in the memory area varies depending on the CPU module. For details, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

*2: The maximum number of executable sequence steps is as shown below.(Program size) - (File header size (default: 34 steps))
For details, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

Table4.4 Performance specifications

Item			Redundant CPU	
			Q12PRHCPU	Q25PRHCPU
Max. number of files stored	Program memory		124	252 *3
	Memory card (RAM)		287(When the Q2MEM-2MBS is used)	
	Memory card (ROM)	Flash card	288	
		ATA card	512	
	Standard RAM		3 *4	
	Standard ROM		124	252
No. of times of writing data into the standard ROM			Max. 100000 times	
No. of I/O device points (No. of points usable on program.)			8192 points (X/Y0 to 1FFF)	
No. of I/O points (No. of points accessible to the actual I/O module.)			4096 points (X/Y0 to FFF)	
No. of device points*5	Internal relay [M]		8192 points by default (M0 to 8191) (changeable)	
	Latch relay [L]		8192 points by default (L0 to 8191) (changeable)	
	Link relay [B]		8192 points by default (B0 to 1FFF) (changeable)	
	Timer [T]		2048 points by default (T0 to 2047) (sharing of low- and high-speed timers) (changeable) The low- and high-speed timers are specified by the instructions. The measurement unit of the low- and high-speed timers is set up by parameters. (Low-speed timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)	
	Retentive timer [ST]		0 point by default (sharing of low- and high-speed retentive timers) (changeable) The low- and high-speed retentive timers are specified by the instructions. The measurement unit of the low- and high-speed retentive timers is set up by parameters. (Low-speed retentive timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed retentive timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)	
	Counter [C]		• Normal counter, 1024 points by default (C0 to 1023) (changeable) • Interrupt counter: 256 points max. (0 point by default, setting by parameters)	
	Data register [D]		12288 points by default (D0 to 12287) (changeable)	
	Link register [W]		8192 points by default (W0 to 1FFF) (changeable)	
	Annunciator [F]		2048 points by default (F0 to 2047) (changeable)	
	Edge relay [V]		2048 points by default (V0 to 2047) (changeable)	

*3: The CPU module can execute up to 124 programs. The CPU module cannot execute 125 or more programs.

*4: Extended by the upgraded functions of CPU module (☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals))

*5: The number of points can be changed within the setting range. (☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals))

Table4.4 Performance specifications

Item				Redundant CPU	
				Q12PRHCPU	Q25PRHCPU
No. of device points	File register[*6]	[R]	Standard RAM	Up to 131072 points can be used by block switching in units of 32768 points (R0 to 32767).	
			SRAM card (1M bytes)	Up to 517120 points can be used by block switching in units of 32768 points (R0 to 32767).	
			SRAM card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points (R0 to 32767).	
			Flash card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points (R0 to 32767).	
			Flash card (4M bytes)	Up to 1042432 points can be used by block switching in units of 32768 points (R0 to 32767).	
		[ZR]	Standard RAM	131072 points (ZR0 to 131071), block switching not required.	
			SRAM card (1M bytes)	517120 points (ZR0 to 517119), block switching not required.	
			SRAM card (2M bytes)	1041408 points (ZR0 to 1041407), block switching not required.	
			Flash card (2M bytes)	1041408 points (ZR0 to 1041407), block switching not required.	
			Flash card (4M bytes)	1042432 points (ZR0 to 1042431), block switching not required.	
	Link special relay [SB]			2048 points (SB0 to 7FF) (The number of device points is fixed.)	
	Link special register [SW]			2048 points (SW0 to 7FF) (The number of device points is fixed.)	
	Step relay [S] [*7]			8192 points (S0 to 8191) (The number of device points is fixed.)	
	Index register [Z]			16 points (Z0 to 15) (The number of device points is fixed.)	
	Pointer [P]			4096 points (P0 to 4095) (The number of device points is fixed.), The use ranges of the local pointers and common pointers can be set up by parameters.	
	Interrupt pointer [I]			256 points (I0 to 255) (The number of device points is fixed.) The constant cyclic interval of system interrupt pointers I28 to 31 can be set up by parameters. (0.5 to 1000ms, 0.5ms unit) Default values I28: 100ms, I29: 40ms, I30: 20ms, I31: 10ms	

*6: Read only when Flash card is used. ATA card is unusable.

*7: The step relay is the device for the SFC function.

Table4.4 Performance specifications

Item		Redundant CPU	
		Q12PRHCPU	Q25PRHCPU
No. of device points	Special relay [SM]	2048 points (SM0 to 2047) (The number of device points is fixed.)	
	Special register [SD]	2048 points (SD0 to 2047) (The number of device points is fixed.)	
	Function input [FX]	16 points (FX0 to F) (The number of device points is fixed.)	
	Function output [FY]	16 points (FY0 to F) (The number of device points is fixed.)	
	Function register [FD]	5 points (FD0 to 4) (The number of device points is fixed.)	
No. of device tracking words		Max. 100k words (☞ QnPRHCPU User's Manual (Redundant System))	
Link direct device		Device for accessing the link device directly. Exclusively used for CC-Link IE controller network*8 and MELSECNET/H. Specified form: J□□\X□□, J□□\Y□□, J□□\W□□, J□□\B□□, J□□\SW□□, J□□\SB□□	
Intelligent function module device		Device for accessing the buffer memory of the intelligent function module directly. Specified form: U□□\G□□	
Latch range		L0 to 8191 (default) (Setting by parameters.) (Latch range can be set up for B, F, V, T, ST, C, D, and W.)	
RUN/PAUSE contact		One contact can be set up in X0 to 1FFF for each of RUN and PAUSE. (Setting by parameters.)	
Clock function		Year, month, date, hour, minute, second, and day of the week (Automatic leap year detection) Accuracy: -3.2 to +5.27s (TYP.+2.07s)/d at 0℃ Accuracy: -2.77 to +5.27s (TYP.+2.22s)/d at 25℃ Accuracy: -12.14 to +3.65s (TYP.-2.89s)/d at 55℃	
Allowable momentary power failure time		Varies depending on the power supply module.	
5VDC internal current consumption		0.89A	
External dimensions	H	98mm (3.86 inches)	
	W	55.2mm (2.17 inches)	
	D	89.3mm (3.52 inches)	
Weight		0.30kg	

*8: For use of CC-Link IE controller network, check the versions of the CPU module and GX Developer. (☞ Appendix 2.2)

Remark

For the general specifications, refer to CHAPTER 3.

4.1.5 Universal model QCPU

(1) Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UD(E)CPU

Table4.5 Performance specifications

Item			Universal model QCPU				
			Q00UJCPU	Q00UCPU	Q01UCPU	Q02UCPU	Q03UDCPU Q03UDECPU
Control method			Stored program repeat operation				
I/O control mode			Refresh mode (Direct access I/O is available by specifying direct access I/O (DX□, DY□).)				
Program language	Sequence control language		Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, function block and structured text (ST)				
	Process control language		----				
Processing speed (sequence instruction)	LD X0		120ns	80ns	60ns	40ns	20ns
	MOV D0 D1		240ns	160ns	120ns	80ns	40ns
Processing speed (redundant function)	Tracking execution time (increased scan time)		----				
Constant scan (Function for keeping regular scan time)			0.5 to 2000ms (Setting available in 0.5ms unit.) (Setting by parameters.)				
Program size *1, *2			10K steps (40K bytes)		15K steps (60K bytes)	20Ksteps (80K bytes)	30K steps (120K bytes)
Memory size*1	Program memory (drive 0)		40K bytes		60K bytes	80K bytes	120K bytes
	Memory card (RAM) (drive 1)		----			Size of the installed memory card (8M bytes max.)	
	Memory card (ROM) (drive 2)		----			Size of the installed memory card (Flash card: 4M bytes max., ATA card: 32M bytes max.)	
	Standard RAM (drive 3)		----	128K bytes			192K bytes
	Standard ROM (drive 4)		256K bytes	512K bytes			1024K bytes
	CPU shared memory *3	QCPU standard memory	----	8K bytes			
		Multiple CPU high speed transmis-sion area	----				32K bytes

*1: The unit of the file size stored in the memory area varies depending on the CPU module. For details, refer to the following.
☞ QnUCPU User's Manual (Function Explanation, Program Fundamentals)

*2: The maximum number of executable sequence steps is as shown below.(Program size) - (File header size (default: 34 steps))
For details, refer to the following.
☞ QnUCPU User's Manual (Function Explanation, Program Fundamentals)

*3: The CPU shared memory is not latched.
(☞ QCPU User's Manual (Multiple CPU System)
The CPU shared memory is cleared by turning on the programmable controller or resetting the CPU module.

Table4.5 Performance specifications

Item			Universal model QCPU				
			Q00UJCPU	Q00UCPU	Q01UCPU	Q02UCPU	Q03UDCPU Q03UDECPU
Max. number of files stored	Program memory		32			64	124
	Memory card (RAM)		----			319 (When the Q3MEM-8MBS is used)	
	Memory card (ROM)	Flash card	----			288	
		ATA card	----			511	
	Standard RAM		----				
	Standard ROM		128				256
No. of times of writing data into the program memory			Max. 100000 times*4				
No. of times of writing data into the standard ROM			Max. 100000 times*5				
No. of I/O device points (No. of points usable on program.)			8192 points (X/Y0 to 1FFF)				
No. of I/O points (No. of points accessible to the actual I/O module.)			256 points (X/Y0 to FF)	1024 points (X/Y0 to 3FF)		2048 points (X/Y0 to 7FF)	4096 points (X/Y0 to FFF)
No. of device points	Internal relay [M]*6		8192 points by default (M0-8191) (changeable)				
	Latch relay [L]*6		8192 points by default (L0-8191) (changeable)				
	Link relay [B]*6		8192 points by default (B0 to 1FFF) (changeable)				
	Timer [T]*6		2048 points by default (T0 to 2047) (changeable) (Sharing of low- and high-speed timers) The low- and high-speed timers are specified by the instructions. The measurement unit of the low- and high-speed timers is set up by parameters. (Low-speed timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)				
	Retentive timer [ST]*6		0 point by default (sharing of the low- and high-speed retentive timers) (changeable) The low- and high-speed retentive timers are specified by the instructions. The measurement unit of the low- and high-speed retentive timers is set up by parameters. (Low-speed retentive timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed retentive timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)				
	Counter [C]*6		• Normal counter, 1024 points by default (C0 to 1023) (changeable)				
	Data register [D]*6		12288 points by default (D0 to 12287) (changeable)				
	Extended data register [D]		----	0 points by default (changeable)			
	Link register [W]*6		8192 points by default (W0 to 1FFF) (changeable)				
	Extended link register [W]		----	0 points by default (changeable)			
	Annunciator [F]*6		2048 points by default (F0 to 2047) (changeable)				
	Edge relay [V]*6		2048 points by default (V0 to 2047) (changeable)				
	Link special relay [SB]*6		2048 points by default (SB0 to 7FF) (changeable)				
	Link special register [SW]*6		2048 points by default (SW0 to 7FF) (changeable)				

*4: The one write operation may not be counted as one writing to a program memory.
The number of writing to the program memory can be checked by the special register (SD682 and SD683).

*5: The one write operation may not be counted as one writing to the standard ROM.
The number of writing to the standard ROM can be checked by the special register (SD687 and SD688).

*6: The number of points can be changed within the setting range. (☞ QnUCPU User's Manual (Function Explanation, Program Fundamentals))

Table4.5 Performance specifications

Item				Universal model QCPU				
				Q00UJCPU	Q00UCPU	Q01UCPU	Q02UCPU	Q03UDCPU Q03UDECPU
No. of device points	File register*7	[R]	Standard RAM	----	32768 points (R0 to 32767) Up to 65536 points can be used by block switching in units of 32768 points			32768 points (R0 to 32767) Up to 98304 points can be used by block switching in units of 32768 points
			SRAM card (1M bytes)	----			32768 points (R0 to 32767) Up to 517120 points can be used by block switching in units of 32768 points	
			SRAM card (2M bytes)	----			32768 points (R0 to 32767) Up to 1041408 points can be used by block switching in units of 32768 points	
			SRAM card (4M bytes)	----			32768 points (R0 to 32767) Up to 2087936 points can be used by block switching in units of 32768 points	
			SRAM card (8M bytes)	----			32768 points (R0 to 32767) Up to 4184064 points can be used by block switching in units of 32768 points	
			Flash card (2M bytes)	----			32768 points (R0 to 32767) Up to 1041408 points can be used by block switching in units of 32768 points	
			Flash card (4M bytes)	----			32768 points (R0 to 32767) Up to 2087936 points can be used by block switching in units of 32768 points	
		[ZR]	Standard RAM	----	65536 points (ZR0 to 65535) Block switching not required.			98304 points (ZR0 to 98303) Block switching not required.
			SRAM card (1M bytes)	----			517120 points (ZR0 to 517119), Block switching not required.	
			SRAM card (2M bytes)	----			1041408 points (ZR0 to 1041407), Block switching not required.	
			SRAM card (4M bytes)	----			2087936 points (ZR0 to 2087935), Block switching not required.	
			SRAM card (8M bytes)	----			4184064 points (ZR0 to 4184063), Block switching not required.	
			Flash card (2M bytes)	----			1041408 points (ZR0 to 1041407), Block switching not required.	
			Flash card (4M bytes)	----			2087936 points (ZR0 to 2087935), Block switching not required.	
	Step relay [S] *8			8192 points (S0 to 8191) (The number of device points is fixed.)*9				
	Index register / Standard devise register [Z]			max. 20 points (Z0 to 19)				
	Index register [Z] (32-bit modification specification of ZR device)			----	max. 10 points (Z0 to 18) (Index register (Z) is used in double words.)			

*7: Read only when a Flash card is used. ATA card is unusable.

Table4.5 Performance specifications

Item			Universal model QCPU				
			Q00UJCPU	Q00UCPU	Q01UCPU	Q02UCPU	Q03UDCPU Q03UDECPU
No. of device points	Pointer [P]		512 points (P0 to 511), The use ranges of the local pointers and common pointers can be set up by parameters			4096 points (P0 to 4095), The use ranges of the local pointers and common pointers can be set up by parameters.	
	Interrupt pointer [I]		128 points (I0 to 127) The constant cyclic interval of system interrupt pointers I28 to 31 can be set up by parameters. (0.5 to 1000ms, 0.5ms unit) Default values I28: 100ms, I29: 40ms, I30: 20ms, I31: 10ms			256 points (I0 to 255) The constant cyclic interval of system interrupt pointers I28 to 31 can be set up by parameters. (0.5 to 1000ms, 0.5ms unit) Default values I28: 100ms, I29: 40ms, I30: 20ms, I31: 10ms	
	Special relay [SM]		2048 points (SM0 to 2047) (The number of device points is fixed.)				
	Special register [SD]		2048 points (SM0 to 2047) (The number of device points is fixed.)				
	Function input [FX]		16 points (FX0 to F) (The number of device points is fixed.)				
	Function output [FY]		16 points (FY0 to F) (The number of device points is fixed.)				
	Function register [FD]		5 points (FD0 to 4) (The number of device points is fixed.)				
No. of device tracking words			----				
Link direct device			Device for accessing the link device directly. Dedicated to CC-Link IE controller network and MELSECNET/H. Specified form: J□□\X□□, J□□\Y□□, J□□\W□□, J□□\B□□, J□□\SW□□, J□□\SB□□				
Intelligent function module device			Device for accessing the buffer memory of the intelligent function module directly. Specified form: U□□\G□□				
Specifications of built-in Ethernet port CPU module *10	Data transmission speed		----				100/10Mbps
	Communication mode		----				Full-duplex/Half-duplex
	Transmission method		----				Base band
	Max. distance between hub and node		----				100m (328.08 feet.)
	Max. number of connectable nodes	10BASE-T	----				Cascade connection: Up to four bases
		100BASE-TX	----				Cascade connection: Up to two bases
	Number of connections *11		----				16 for a total of socket communication, MELSOFT connection, and MC protocol and 1 for FTP

*8: The step relay is the device for the SFC function.
*9: The device points can be changed to 0 for the Universal model QCPU if the serial number (first five digits) is "10042".
*10: Applicable only to the Q03UDECPU.
*11: The number indicates the total number of TCP/IP and UDP/IP protocols.

Table4.5 Performance specifications

Item		Universal model QCPU				
		Q00UJCPU	Q00UCPU	Q01UCPU	Q02UCPU	Q03UDCPU Q03UDECPU
Latch range		L0 to 8191 (8192 points by default) (Latch range can be set up for B, F, V, T, ST, C, D, and W.) (Setting by parameters.)				
RUN/PAUSE contact		One contact can be set up in X0 to 1FFF for each of RUN and PAUSE. (Setting by parameters.)				
Clock function		Year, month, date, hour, minute, second, and day of the week (Automatic leap year detection) Accuracy: -2.96 to +3.74s (TYP.+1.24s)/d at 0℃ Accuracy: -2.34 to +3.74s (TYP.+1.63s)/d at 25℃ Accuracy: -11.48 to +2.12s (TYP.-3.03s)/d at 55℃			Year, month, date, hour, minute, second, and day of the week (Automatic leap year detection) Accuracy: -2.96 to +3.74s (TYP.+1.42s)/d at 0℃ Accuracy: -3.18 to +3.74s (TYP.+1.50s)/d at 25℃ Accuracy: -13.20 to +2.12s (TYP.-3.54s)/d at 55℃	
Allowable instantaneous power failure period		20ms or less (100VAC or more)	Varies depending on the power supply module.			
5VDC internal current		0.37A*12	0.33A		0.23A	0.33A*13
External dimensions	H	98mm (3.86 inches)	98mm (3.86 inches)			
	W	245mm (9.65 inches)*14	27.4mm (1.08 inches)			
	D	98mm (3.86 inches)	89.3mm (3.52 inches)*15			
Weight		0.70kg*14	0.15kg		0.20kg*15	

*12: The value includes those of the CPU module and base unit.
*13: The current consumption in the Q03UDECPU is 0.46A
*14: The value includes those of the CPU module, base unit, and power supply module.
*15: The values for the Q03UDECPU are as follows.
External dimensions (D): 115mm (4.53 inches)
Weight: 0.22kg

Remark

For the general specifications, refer to CHAPTER 3.

(2) Q04UD(E)HCPU, Q06UD(E)HCPU, Q10UD(E)HCPU, Q13UD(E)HCPU, Q20UD(E)HCPU, Q26UD(E)HCPU

Table4.6 Performance specifications

Item			Universal model QCPU					
			Q04UDHCPU Q04UDEHCPU	Q06UDHCPU Q06UDEHCPU	Q10UDHCPU Q10UDEHCPU	Q13UDHCPU Q13UDEHCPU	Q20UDHCPU Q20UDEHCPU	Q26UDHCPU Q26UDEHCPU
Control method			Stored program repeat operation					
I/O control mode			Refresh mode (Direct access I/O is available by specifying direct access I/O (DX□, DY□).)					
Program language	Sequence control language		Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, function block and structured text (ST)					
	Process control language		----					
Processing speed (sequence instruction)	LD X0		9.5ns					
	MOV D0 D1		19ns					
Processing speed (redundant function)	Tracking execution time (increased scan time1)		----					
Constant scan (Function for keeping regular scan time)			0.5 to 2000ms (Setting available in 0.5ms unit.) (Setting by parameters.)					
Program size *1, *2			40K steps (160K bytes)	60K steps (240K bytes)	100K steps (400K bytes)	130K steps (520K bytes)	200K steps (800K bytes)	260K steps (1040K bytes)
Memory size*1	Program memory (drive 0)		160K bytes	240K bytes	400K bytes	520K bytes	800K bytes	1040K bytes
	Memory card (RAM) (drive 1)		Size of the installed memory card (8M bytes max.)					
	Memory card (ROM) (drive 2)		Size of the installed memory card (Flash card: 4M bytes max., ATA card: 32M bytes max.)					
	Standard RAM (drive 3)		256K bytes	768K bytes	1024K bytes		1280K bytes	
	Standard ROM (drive 4)		512K bytes	1024K bytes	2048K steps		4096K steps	
	CPU shared memory *3	QCPU standard memory	8K bytes					
		Multiple CPU high speed transmission area	32K bytes					

*1: The unit of the file size stored in the memory area varies depending on the CPU module. For details, refer to the following.
☞ QnUCPU User's Manual (Function Explanation, Program Fundamentals)

*2: The maximum number of executable sequence steps is as shown below.(Program size) - (File header size (default: 34 steps))
For details, refer to the following.
☞ QnUCPU User's Manual (Function Explanation, Program Fundamentals)

*3: The CPU shared memory is not latched.
(☞ QCPU User's Manual (Multiple CPU System)
The CPU shared memory is cleared by turning on the programmable controller or resetting the CPU module.

Table4.6 Performance specifications

Item			Universal model QCPU					
			Q04UDHCPU	Q06UDHCPU	Q10UDHCPU	Q13UDHCPU	Q20UDHCPU	Q26UDHCPU
			Q04UDEHCPU	Q06UDEHCPU	Q10UDEHCPU	Q13UDEHCPU	Q20UDEHCPU	Q26UDEHCPU
Max. number of files stored	Program memory		124		252*4			
	Memory card (RAM)		319(When the Q3MEM-8MBS is used)					
	Memory card (ROM)	Flash card	288					
		ATA card	511					
	Standard RAM		3					
	Standard ROM		256					
No. of times of writing data into the program memory			Max. 100000 times*5					
No. of times of writing data into the standard ROM			Max. 100000 times*6					
No. of I/O device points (No. of points usable on program.)			8192 points (X/Y0 to 1FFF)					
No. of I/O points (No. of points accessible to the actual I/O module.)			4096 points (X/Y0 to FFF)					
No. of device points*7	Internal relay [M]		8192 points by default (M0-8191) (changeable)					
	Latch relay [L]		8192 points by default (L0-8191) (changeable)					
	Link relay [B]		8192 points by default (B0 to 1FFF) (changeable)					
	Timer [T]		2048 points by default (T0 to 2047) (changeable) (Sharing of low- and high-speed timers) The low- and high-speed timers are specified by the instructions. The measurement unit of the low- and high-speed timers is set up by parameters. (Low-speed timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)					
	Retentive timer [ST]		0 point by default (sharing of the low- and high-speed retentive timers) (changeable) The low- and high-speed retentive timers are specified by the instructions. The measurement unit of the low- and high-speed retentive timers is set up by parameters. (Low-speed retentive timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed retentive timer: 0.1 to 100.0ms, 0.1ms unit, 10.0ms by default)					
	Counter [C]		• Normal counter, 1024 points by default (C0 to 1023) (changeable)					
	Data register [D]		12288 points by default (D0 to 12287) (changeable)					
	Extended data register [D]		0 points by default (changeable)					
	Link register [W]		8192 points by default (W0 to 1FFF) (changeable)					
	Extended link register [W]		0 points by default (changeable)					
	Annunciator [F]		2048 points by default (F0 to 2047) (changeable)					
	Edge relay [V]		2048 points by default (V0 to 2047) (changeable)					
	Link special relay [SB]		2048 points by default (SB0 to 7FF) (changeable)					
	Link special register [SW]		2048 points by default (SW0 to 7FF) (changeable)					

*4: The CPU module can execute up to 124 programs. The CPU module cannot execute 125 or more programs.

*5: The one write operation may not be counted as one writing to a program memory.
The number of writing to the program memory can be checked by the special register (SD682 and SD683).

*6: The one write operation may not be counted as one writing to the standard ROM.
The number of writing to the standard ROM can be checked by the special register (SD687 and SD688).

*7: The number of points can be changed within the setting range. (☞ QnUCPU User's Manual (Function Explanation, Program Fundamentals))

Table4.6 Performance specifications

Item				Universal model QCPU					
				Q04UDHCPU	Q06UDHCPU	Q10UDHCPU	Q13UDHCPU	Q20UDHCPU	Q26UDHCPU
				Q04UDEHCPU	Q06UDEHCPU	Q10UDEHCPU	Q13UDEHCPU	Q20UDEHCPU	Q26UDEHCPU
No. of device points	File register*8	[R]	Standard RAM	32768 points (R0 to 32767) Up to 131072 points can be used by block switching in units of 32768 points	32768 points (R0 to 32767) Up to 393216 points can be used by block switching in units of 32768 points	32768 points (R0 to 32767) Up to 524288 points can be used by block switching in units of 32768 points		32768 points (R0 to 32767) Up to 655360 points can be used by block switching in units of 32768 points	
			SRAM card (1M bytes)	32768 points (R0 to 32767) Up to 517120 points can be used by block switching in units of 32768 points					
			SRAM card (2M bytes)	32768 points (R0 to 32767) Up to 1041408 points can be used by block switching in units of 32768 points					
			SRAM card (4M bytes)	32768 points (R0 to 32767) Up to 2087936 points can be used by block switching in units of 32768 points					
			SRAM card (8M bytes)	32768 points (R0 to 32767) Up to 4184064 points can be used by block switching in units of 32768 points					
			Flash card (2M bytes)	32768 points (R0 to 32767) Up to 1041408 points can be used by block switching in units of 32768 points					
			Flash card (4M bytes)	32768 points (R0 to 32767) Up to 2087936 points can be used by block switching in units of 32768 points					
		[ZR]	Standard RAM	131072 points (ZR0 to 131071) Block switching not required.	393216 points (ZR0 to 393215) Block switching not required.	524288 points (ZR0 to 524287) Block switching not required.		655360 points (ZR0 to 655359) Block switching not required.	
			SRAM card (1M bytes)	517120 points (ZR0 to 517119), Block switching not required.					
			SRAM card (2M bytes)	1041408 points (ZR0 to 1041407), Block switching not required.					
			SRAM card (4M bytes)	2087936 points (ZR0 to 2087935), Block switching not required.					
			SRAM card (8M bytes)	4184064 points (ZR0 to 4184063), Block switching not required.					
			Flash card (2M bytes)	1041408 points (ZR0 to 1041407), Block switching not required.					
			Flash card (4M bytes)	2087936 points (ZR0 to 2087935), Block switching not required.					
	Step relay [S] *9			8192 points (S0 to 8191) (The number of device points is fixed.)*10					
	Index register / Standard devise register [Z]			max. 20 points (Z0 to 19)					
	Index register [Z] (32-bit modification specification of ZR device)			max. 10 points (Z0 to 18) (Index register (Z) is used in double words.)					
	Pointer [P]			4096 points (P0 to 4095), The use ranges of the local pointers and common pointers can be set up by parameters.					

*8: Read only when Flash card is used. ATA card is unusable.
*9: The step relay is the device for the SFC function.
*10: The device points can be changed if the serial number (first five digits) of the Universal model QCPU is "10042" or later.

Table4.6 Performance specifications

Item			Universal model QCPU					
			Q04UDHCPU	Q06UDHCPU	Q10UDHCPU	Q13UDHCPU	Q20UDHCPU	Q26UDHCPU
			Q04UDEHCPU	Q06UDEHCPU	Q10UDEHCPU	Q13UDEHCPU	Q20UDEHCPU	Q26UDEHCPU
No. of device points	Interrupt pointer [I]		256 points (I0 to 255) The constant cyclic interval of system interrupt pointers I28 to 31 can be set up by parameters. (0.5 to 1000ms, 0.5ms unit) Default values I28: 100ms, I29: 40ms, I30: 20ms, I31: 10ms					
	Special relay [SM]		2048 points (SM0 to 2047) (The number of device points is fixed.)					
	Special register [SD]		2048 points (SM0 to 2047) (The number of device points is fixed.)					
	Function input [FX]		16 points (FX0 to F) (The number of device points is fixed.)					
	Function output [FY]		16 points (FY0 to F) (The number of device points is fixed.)					
	Function register [FD]		5 points (FD0 to 4) (The number of device points is fixed.)					
No. of device tracking words			----					
Link direct device			Device for accessing the link device directly. Dedicated to CC-Link IE controller network and MELSECNET/H. Specified form: J□□\X□□, J□□\Y□□, J□□\W□□, J□□\B□□, J□□\SW□□, J□□\SB□□					
Intelligent function module device			Device for accessing the buffer memory of the intelligent function module directly. Specified form: U□□\G□□					
Specifications of Ethernet port built in the CPU module *11	Data transmission speed		100/10Mbps					
	Communication mode		Full-duplex/Half-duplex					
	Transmission method		Base band					
	Max. distance between hub and node		100m (328.08 feet)					
	Max. number of connectable nodes	10BASE-T	Cascade connection: Up to four bases					
		100BASE-TX	Cascade connection: Up to two bases					
	Number of connections *12		16 for a total of socket communication, MELSOFT connection, and MC protocol and 1 for FTP					

*11: Applicable only to the Built-in Ethernet port QCPU.
*12: The number indicates the total number of TCP/IP and UDP/IP protocols.

Table4.6 Performance specifications

Item		Universal model QCPU					
		Q04UDHCPU	Q06UDHCPU	Q10UDHCPU	Q13UDHCPU	Q20UDHCPU	Q26UDHCPU
		Q04UDEHCPU	Q06UDEHCPU	Q10UDEHCPU	Q13UDEHCPU	Q20UDEHCPU	Q26UDEHCPU
Latch range		L0 to 8191 (8192 points by default) (Latch range can be set up for B, F, V, T, ST, C, D, and W.) (Setting by parameters.)					
RUN/PAUSE contact		One contact can be set up in X0 to 1FFF for each of RUN and PAUSE. (Setting by parameters.)					
Clock function		Year, month, date, hour, minute, second, and day of the week (Automatic leap year detection) Accuracy: -2.96 to +3.74s (TYP.+1.42s)/d at 0℃ Accuracy: -3.18 to +3.74s (TYP.+1.50s)/d at 25℃ Accuracy: -13.20 to +2.12s (TYP.-3.54s)/d at 55℃					
Allowable instantaneous power failure period		Varies depending on the power supply module.					
5VDC internal current		0.39A*13					
External dimensions	H	98mm (3.86 inches)					
	W	27.4mm (1.08 inches)					
	D	89.3mm (3.52 inches)*14					
Weight		0.20kg*15					

*13: The current consumption Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU and Q26UDEHCPU is 0.49A

*14: The values for the Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, and Q26UDEHCPU are as follows.
External dimensions (D): 115mm (4.53 inches)
Weight: 0.22kg

Remark

For the general specifications, refer to CHAPTER 3.

4.2 Basic Model QCPU

4.2.1 Part names

(1) Q00JCPU

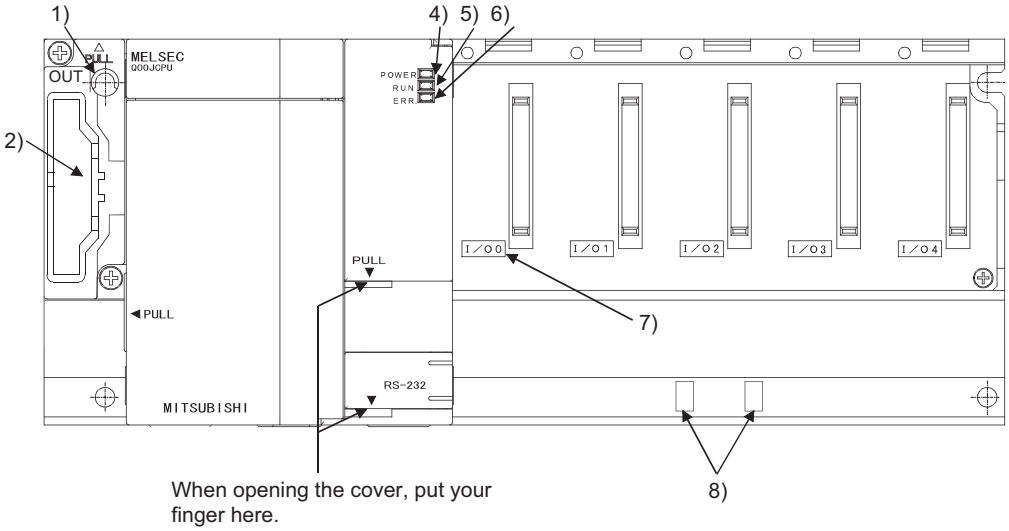


Figure 4.1 Front face

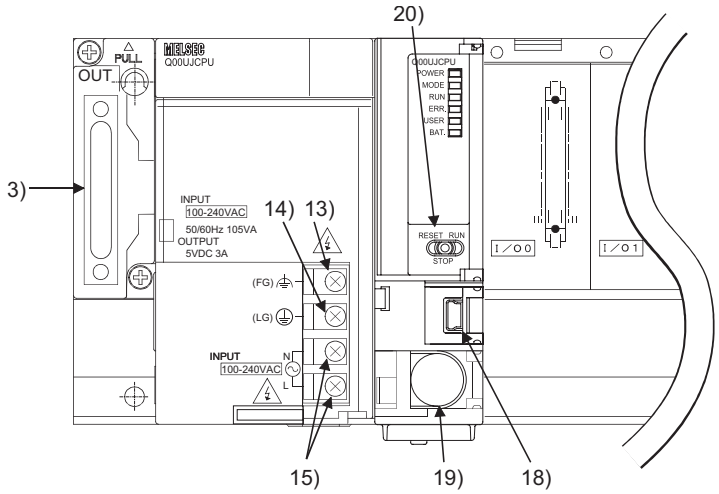


Figure 4.2 With front cover open

Table4.7 Part names

No.	Name	Application
1)	Base mounting hole	Pear-shaped hole for mounting the unit to a panel such as a control box. (For M4 screw)
2)	Cover	Protective cover for extension cable connector. Remove this cover when connecting an extension base unit.
3)	Extension cable connector	Connector for transferring signals to or from the extension base unit. Connect an extension cable.
4)	POWER LED	Power indicator LED for 5VDC. Turns on in green during normal output of 5VDC.

Table4.7 Part names

No.	Name	Application
5)	RUN LED	Indicates the operating status of the CPU module. On : During operation with the RUN/STOP/RESET switch set to "RUN". Off : During stop with the RUN/STOP/RESET switch set to "STOP" When the error that stops operation is detected. Flash : When parameters/program is written during STOP and the RUN/STOP/RESET switch is moved from "STOP" to "RUN". To turn on the RUN LED after writing the program, perform the following operations. •Set the RUN/STOP/RESET switch from "RUN" to "STOP" to "RUN". •Perform reset with the RUN/STOP/RESET switch.(☞ Section 4.2.3) •Power on the programmable controller again. To turn on the RUN LED after writing the parameters, perform the following operations. •Perform reset with the RUN/STOP/RESET switch. •Power on the programmable controller again. (If the RUN/STOP/RESET switch is set from "STOP" to "RUN" to "STOP" to "RUN" after changing the parameter values, the new values are not reflected on the parameters related to the intelligent function module, such as the network parameters.)
6)	ERR. LED	On : When the self-diagnostic error that will not stop operation is detected. •When continuation of operation at error detection is set in the parameter. •When the annunciator (F) is turned on by the SET/OUT instruction. •When battery low occurs. Off : Normal Flash : When the error that stops operation is detected. When reset operation is performed with the RUN/STOP/RESET switch.
7)	Module connector	Connector used for mounting an I/O or intelligent function module. (To the connector of the spare space where no module is mounted, fit the accessory connector cover or the blank cover module (QG60) to prevent dust from entering.)
8)	DIN rail adaptor mounting holes	Holes for mounting a DIN rail adaptor.
9)	FG terminal	Ground terminal connected with the shield pattern of the printed circuit board.
10)	LG terminal	Power filter ground having a half potential of the input voltage.
11)	Power input terminals	Power input terminals for connection of a 100VAC to 200VAC power supply.
12)	Battery	Backup battery for use of the program memory, standard RAM, clock function and backup power time function.
13)	Battery fixing hook	Hook for holding the battery.
14)	Battery connector pin	For connection of the battery lead wires. (Lead wires are disconnected from the connector when shipping to prevent the battery from consuming.)
15)	RS-232 connector *1	Connector for connecting a peripheral device by RS-232. Can be connected by the RS-232 connection cable (QC30R2).
16)	RUN/STOP/RESET switch *2	RUN : Executes sequence program operation. STOP : Stops sequence program operation. RESET : Performs hardware reset, operation error reset, operation initialization or like. (☞ Section 4.2.3)

(2) Q00CPU, Q01CPU

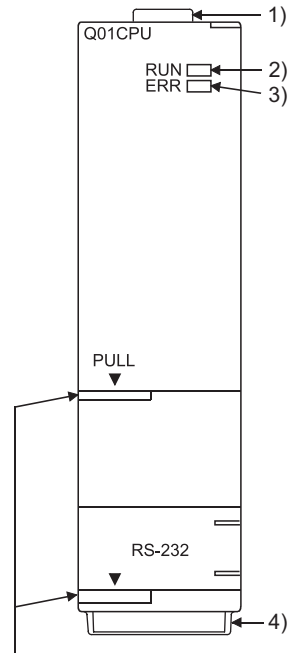


Figure 4.3 Front face

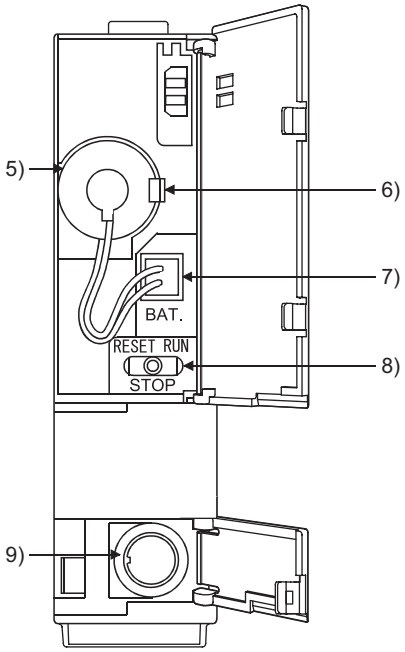


Figure 4.4 With front cover open

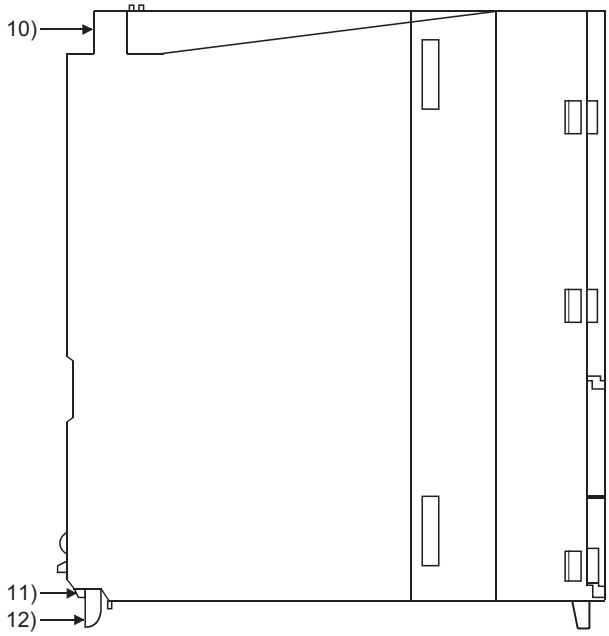


Figure 4.5 Side face

Table4.8 Part names

No.	Name	Application
1)	Module fixing hook	Hook used to fix the module to the base unit. (Single-motion installation)
2)	RUN LED	Indicates the operating status of the CPU module. On : During operation with the RUN/STOP/RESET switch set to "RUN". Off : During stop with the RUN/STOP/RESET switch set to "STOP". Flash : When parameters/program is written during STOP and the RUN/STOP/RESET switch is set from "STOP" to "RUN". To turn on the RUN LED after writing the program, perform the following operations. •Move the RUN/STOP/RESET switch from "RUN" to "STOP" to "RUN". •Perform reset with the RUN/STOP/RESET switch.(☞ Section 4.2.3) •Power on the programmable controller again To turn on the RUN LED after writing the parameters, perform the following operations. •Perform reset with the RUN/STOP/RESET switch. •Power on the programmable controller again. (If the RUN/STOP/RESET switch is set from "STOP" to "RUN" to "STOP" to "RUN" after changing the parameter values, the new values are not reflected on the parameters related to the intelligent function module, such as the network parameters.)
3)	ERR. LED	On : When the self-diagnostic error that will not stop operation is detected. •When continuation of operation at error detection is set in the parameter. •When the annunciator (F) is turned on by the SET/OUT instruction. •When battery low occurs. Off : Normal Flash : When the error that stops operation is detected. When reset operation is performed with the RUN/STOP/RESET switch.
4)	Serial number	Shows the serial number printed on the rating plate.
5)	Battery	Backup battery for use of the program memory, standard RAM, clock function and backup power time function.
6)	Battery fixing hook	Hook for holding the battery.
7)	Battery connector pin	For connection of the battery lead wires. (Lead wires are disconnected from the connector when shipping to prevent the battery from consuming.)
8)	RUN/STOP/RESET switch*2	RUN : Executes sequence program operation. STOP : Stops sequence program operation. RESET : Performs hardware reset, operation error reset, operation initialization or like. (☞ Section 4.2.3)
9)	RS-232 connector*1	Connector for RS-232 connection Can be connected by the RS-232 connection cable (QC30R2).
10)	Module fixing screw hole	Hole for the screw used to fix to the base unit. (M3×12 screw)
11)	Module fixing projection	Projection used to secure the module to the base unit.
12)	Module mounting lever	Lever used to mount the module to the base unit.

*1: When a cable is connected to the RS-232 connector at all times, clamp the cable to prevent a poor connection, moving, and disconnection by unintentional pulling.
The Q6HLD-R2 type RS-232 Connector Disconnection Prevention Holder is available as a clamp for RS-232 connector.

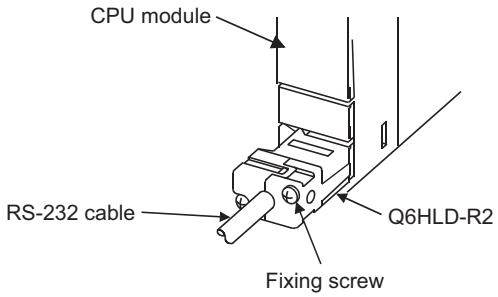


Figure 4.6 RS-232 cable fixing processing

*2: Operate the RUN/STOP/RESET switch with your fingertips.
To prevent the switch from being damaged, do not use any tool such as screw driver.

4.2.2 Switch operation at the time of writing program

Programs can be written to the Basic model QCPU in either the STOP or RUN status.

(1) When writing program with RUN/STOP/RESET switch set to "STOP"

When writing a program with the Basic model QCPU placed in the STOP status using the RUN/STOP/RESET switch, operate the switch in the following procedure.

1) RUN/STOP/RESET switch: STOP
   RUN LED: Off, from CPU module STOP status to Program write
2) RUN/STOP/RESET switch: Perform reset.(☞ Section 4.2.3)
3) RUN/STOP/RESET switch: STOP to RUN
   RUN LED: On, CPU module RUN status

(2) When it is desired to place the Basic model QCPU in RUN status without resetting it after program write

Operate the RUN/STOP/RESET switch from STOP to RUN, STOP and then RUN.
After the second STOP to RUN operation, the CPU module is put in the RUN status.
At this time, the device memory data are those saved before program write.

(3) When writing program after remote STOP using GX Developer

When writing a program with the Basic model QCPU stopped by remote STOP using GX Developer, no operation is needed for the RUN/STOP/RESET switch.
When remote RUN is performed using GX Developer, the Basic model QCPU is placed in the RUN status.

(4) When performing online change of program

When the online change of a program is performed, the RUN/STOP/RESET switch need not be operated.

Point

The program modified online during boot operation is written to the program memory.
After making online program change, also write the program to the standard ROM of the boot source memory. If the program is not written in the standard ROM, the old program will be executed at the next boot operation.
For details of the boot operation, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

4.2.3 Reset operation

For the Basic model QCPU, the RUN/STOP/RESET switch of the CPU module is used to switch between the RUN status and STOP status and to perform RESET operation.
When using the RUN/STOP/RESET switch to reset the CPU module, moving the RUN/STOP/RESET switch to the reset position will not reset it immediately.

Point

Hold the RUN/STOP/RESET switch in the RESET position until reset processing is complete (the flashing ERR. LED turns off).
If you release your hand from the RUN/STOP/RESET switch during reset processing (the ERR. LED is flashing), the switch will return to the STOP position and reset processing cannot be completed.

Perform reset operation with the RUN/STOP/RESET switch as shown in Figure 4.7.

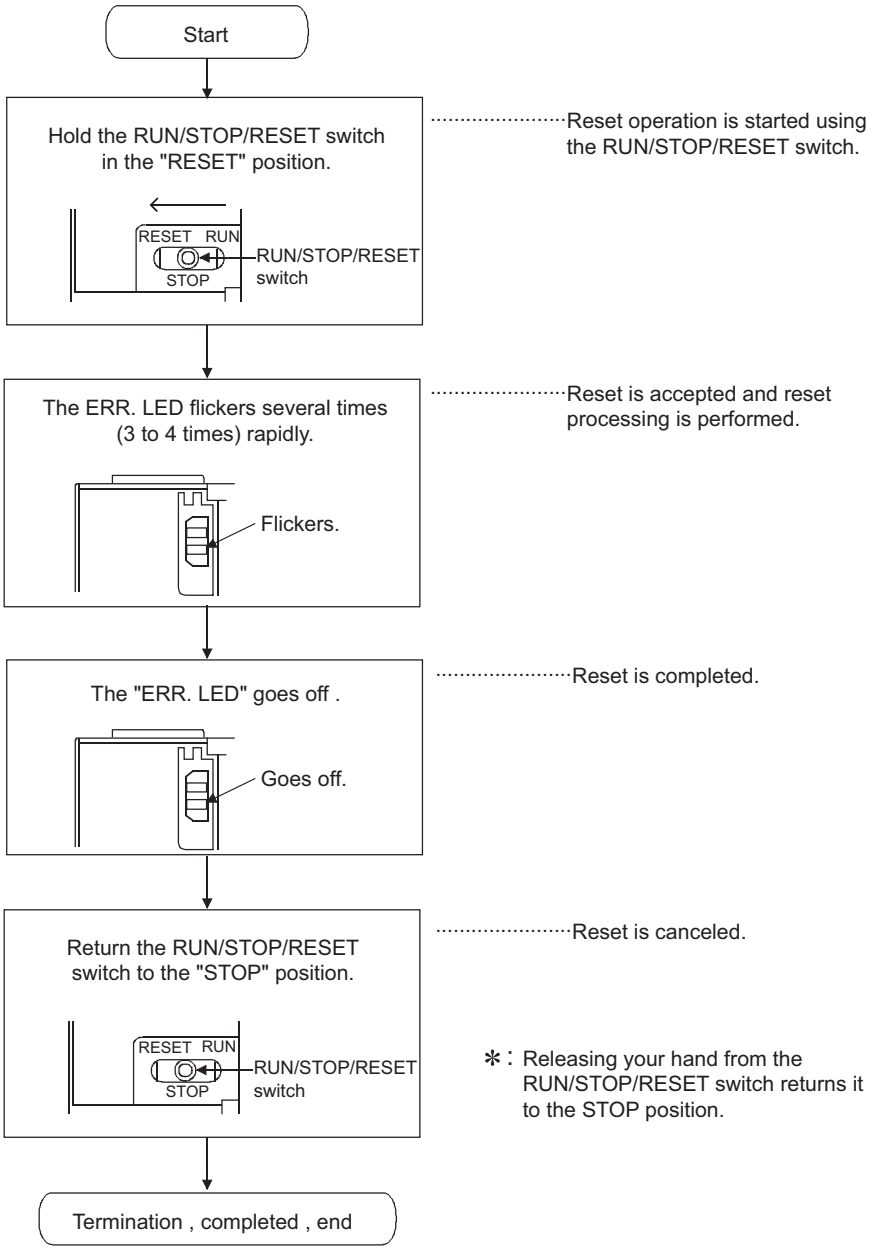


Figure 4.7 Reset operation

Point

Operate the RUN/STOP/RESET switch with your fingertips.
To prevent the switch from being damaged, do not use any tool such as screw driver.

4.2.4 Latch clear operation

For the Basic model QCPU, latch clear is performed by the remote latch clear operation of GX Developer.
Latch clear cannot be executed by operating the switches of the CPU module.

Point

- The valid/invalid for latch clear in the clear range of latch clear operation can be set for each device. The setting can be mode in the device setting of the PLC parameter.
- For the remote latch clear operation by GX Developer, refer to the following.
  ☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

4.3 High Performance Model QCPU, Process CPU and Redundant CPU

4.3.1 Part names

(1) Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU

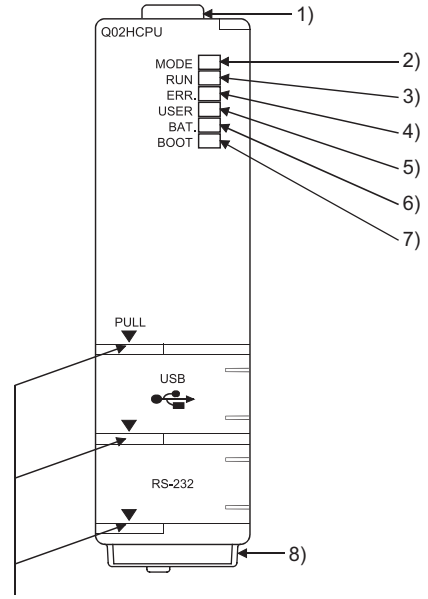


Figure 4.8 Front face

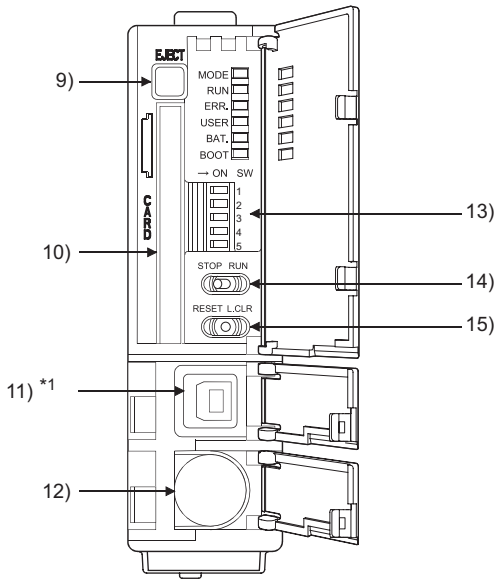


Figure 4.9 With front cover open

*1: Not provided for Q02CPU.

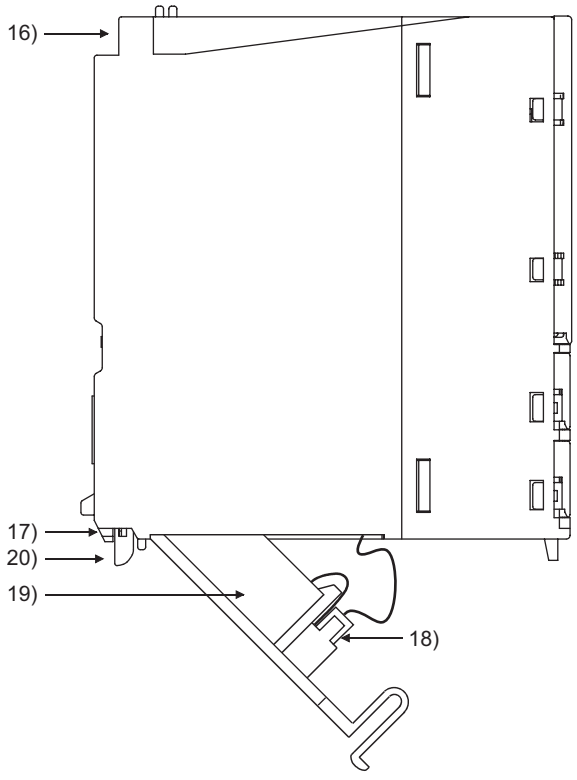


Figure 4.10 Side face

(2) Q12PRHCPU, Q25PRHCPU

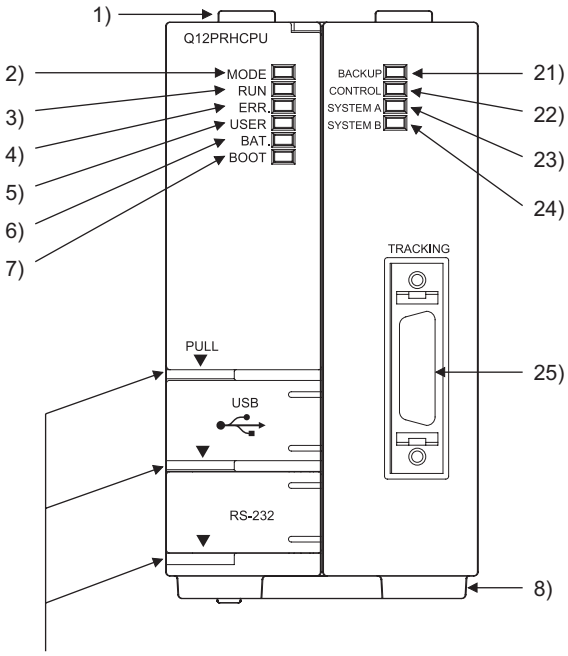


Figure 4.11 Front face

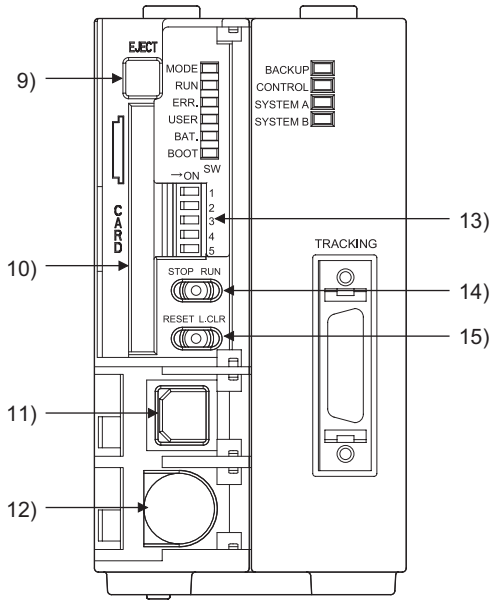


Figure 4.12 With front cover open

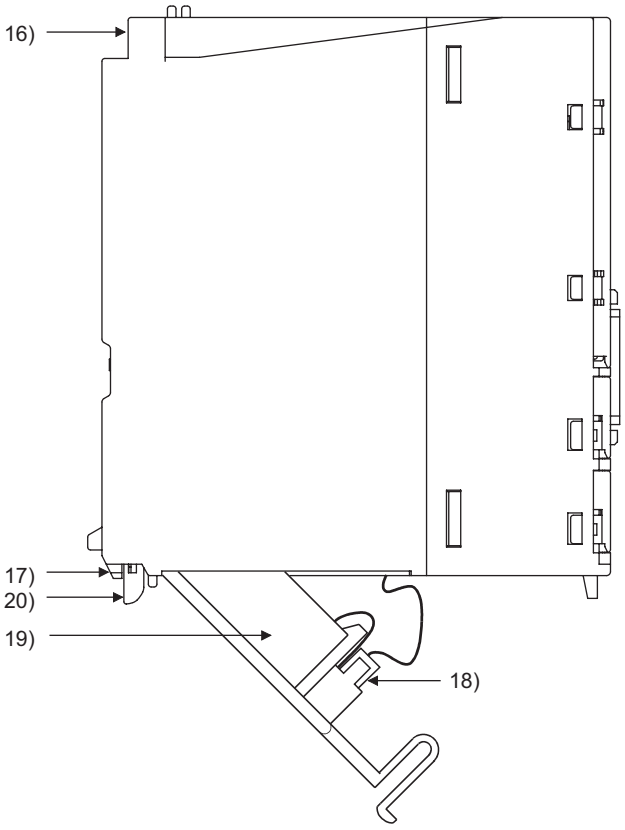


Figure 4.13 Side face

Table4.9 Part Names

No.	Name	Application
1)	Module fixing hook	Hook used to secure the module to the base unit. (Single-motion installation)
2)	MODE LED	Indicates the mode of the CPU module. On (green) : Q mode Flash (green) : Forced on and off for external I/O registered
3)	RUN LED	Indicates the operating status of the CPU module. On : The RUN/STOP switch is set to "RUN" and the module is running. Off : The RUN/STOP switch is set to "STOP." (The standby system Redundant CPU module in the backup mode does not turn on even when the RUN/STOP switch is set to "RUN" but the module is stopped.) When an error is detected and operation must be halted due to the error Flash : Parameters or programs are written with the RUN/STOP switch set to "STOP" and then the RUN/STOP switch is turned from "STOP" to "RUN." When the operation mode is changed from the backup mode to the separate mode in the Redundant CPU system, the RUN LED of the standby system side CPU module flashes. To turn on the RUN LED after writing the program, perform the following operations. •Set the RUN/STOP switch from "RUN" → "STOP" → "RUN". •Reset with the RESET/L. CLR switch. •Restart the programmable controller power. To turn on the RUN LED after writing the parameters, perform the following operations. •Reset with the RESET/L. CLR switch. •Restart the programmable controller power. (If the RUN/STOP switch is set from "RUN" → "STOP" → "RUN" after changing the parameters, network parameters and intelligent function module parameters will not be updated.)
4)	ERR. LED	On : Detect on of self-diagnosis error which will not stop operation, except battery error. (When operation continued at error detection is set in the parameter setting.) Off : Normal Flash : Detection of the error that stops operation. When automatic write to standard ROM is completed normally. (The BOOT LED flashes together.)
5)	USER LED	On : Error detected by CHK instruction or annunciator (F) turned ON Off : Normal Flash : Execution of latch clear
6)	BAT. LED	On : Battery error due to reduction in battery voltages of CPU module or memory card. Off : Normal
7)	BOOT LED	On : Start of boot operation Off : Non-execution of boot operation Flash : When automatic write to standard ROM is completed normally. (The ERR. LED flashes together.)

Table4.9 Part Names

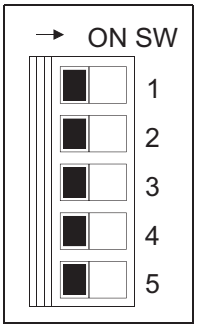
<table>
<tr><th>No.</th><th>Name</th><th>Application</th></tr>
<tr><td>8)</td><td>Serial number</td><td>Shows the serial number printed on the rating plate.</td></tr>
<tr><td>9)</td><td>Memory card EJECT button</td><td>Used to eject the memory card from the CPU module.</td></tr>
<tr><td>10)</td><td>Memory card installing connector</td><td>Connector used for installing the memory card to the CPU module.</td></tr>
<tr><td>11)</td><td>USB connector</td><td>Connector for connection with USB-compatible peripheral device. (Connector type B)
Can be connected by USB-dedicated cable.
(Not available for Q02CPU.)</td></tr>
<tr><td>12)</td><td>RS-232 connector *1</td><td>Connector for connecting a peripheral device by RS-232.
Can be connected by RS-232 connection cable (QC30R2).</td></tr>
<tr><td rowspan="5">13)</td><td rowspan="5">DIP switches *2
 
</td><td>Used to set the items for operation of the CPU module.
For the system protection and the valid parameter drives of the DIP switches, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)</td></tr>
<tr><td>SW1 : Used to set system protection. Inhibits all the writing and control instructions to the CPU module. (Factory-default is off)
Off : No protection
On : Protection</td></tr>
<tr><td>SW2, SW3 : Used to specify parameter-valid drive.
(Both SW2 and SW3 are preset to off as factory default)
<table>
<tr><th>SW2</th><th>SW3</th><th>Parameter Drive</th></tr>
<tr><td>OFF</td><td>OFF</td><td>Program memory (Drive 0)</td></tr>
<tr><td>ON</td><td>OFF</td><td>SRAM card (Drive 1)</td></tr>
<tr><td>OFF</td><td>ON</td><td>Flash card/ATA card (Drive 2)</td></tr>
<tr><td>ON</td><td>ON</td><td>Standard ROM (Drive 4)</td></tr>
</table>
(Parameters cannot be stored in standard RAM (Drive 3).)</td></tr>
<tr><td>SW4 : Must not be used. Normally off. (Factory default: Off)</td></tr>
<tr><td>SW5 : Must not be used. Normally off. (Factory default: Off)</td></tr>
<tr><td>14)</td><td>RUN/STOP switch *3</td><td>RUN : Executes sequence program operation.
STOP : Stops sequence program operation.</td></tr>
<tr><td>15)</td><td>RESET/L. CLR switch*3</td><td>RESET : Used to perform hardware reset, operation fault rest, operation initialization, etc.
(If this switch is left in the RESET position, the whole system will be reset and the system will not operate properly.
After performing reset, always return this switch to the neutral position.)
L. CLR : Used to turn "Off" or clear to "zero" all latch area data set in the parameter.
Used to clear the sampling trace settings.</td></tr>
<tr><td>16)</td><td>Module fixing screw hole</td><td>Hole for the screw used to fix to the base unit. (M3×12 screw)</td></tr>
<tr><td>17)</td><td>Module fixing projection</td><td>Projection used to fix the module to the base unit.</td></tr>
<tr><td>18)</td><td>Battery connector pin</td><td>For connection of battery lead wires.
(Lead wires are disconnected from the connector when shipping to prevent the battery from consuming.)</td></tr>
<tr><td>19)</td><td>Battery</td><td>Backup battery for use of program memory, standard RAM, clock function and the backup power time function.</td></tr>
<tr><td>20)</td><td>Module mounting lever</td><td>Lever used to mount the module to the base unit.</td></tr>
</table>

Table4.9 Part Names

<table>
<tr><th>No.</th><th>Name</th><th>Application</th></tr>
<tr><td>21)</td><td>BACKUP LED *4</td><td>Indicates the backup or separate mode while the system is running normally.
On (green) : Backup mode
Off (red) : The status in which control (RUN) cannot be continued by system switching
On (orange) : Separate mode
Off : Debug mode
The LED indication is as shown below when the memory copy from control system to standby system is executed.
<table>
<tr><td rowspan="2"></td><td colspan="2">In backup mode</td><td colspan="2">In separate mode</td></tr>
<tr><td>Control system</td><td>Standby system</td><td>Control system</td><td>Standby system</td></tr>
<tr><td>Memory copy executing</td><td>ON (red)</td><td>ON (red)</td><td>ON (orange)</td><td>ON (orange)</td></tr>
<tr><td>Memory copy normally completed</td><td>ON (red)</td><td>ON (red)</td><td>ON (orange)</td><td>ON (orange)</td></tr>
</table>
For the memory copy from control system to standby system, refer to the following.
☞ QnPRHCPU User's Manual (Redundant System)</td></tr>
<tr><td>22)</td><td>CONTROL LED *4</td><td>Indicates the CPU module operates as control system or standby system.
On : Control system (The standby system is normal and system switching is available.)
Off : Standby system
Note that this LED turns on in the debug mode.</td></tr>
<tr><td>23)</td><td>SYSTEM A LED *4</td><td>The LED of the CPU module on the system A side turns on.
On : System A
Flash : When the tracking cable is disconnected while the system runs normally as the system A.
(It lasts until the system A side tracking cable is connected.)
Off : System B (The SYSTEM B LED turns on.)
Note that this LED turns on in the debug mode.</td></tr>
<tr><td>24)</td><td>SYSTEM B LED *4</td><td>The LED of the CPU module on the system B side turns on.
On : System B
Flash : When the tracking cable is disconnected while the system runs normally as the system B
(It lasts until the system B side tracking cable is connected.)
Off : System A (The SYSTEM A LED turns on)
Note that this LED turns off in the debug mode.</td></tr>
<tr><td>25)</td><td>TRACKING connector *4</td><td>Connector for connecting system A or B with the tracking cable (QC□TR).</td></tr>
</table>

*1: When a cable is connected to the RS-232 connector at all times, clamp the cable to prevent a poor connection, moving, and disconnection by unintentional pulling.
The Q6HLD-R2 type RS-232 Connector Disconnection Prevention Holder is available as a clamp for RS-232 connector.

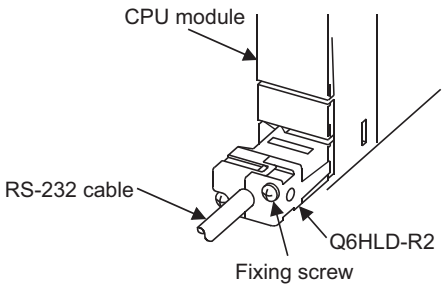


Figure 4.14 RS-232 cable fixing processing

*2: Because the DIP switches are located out of reach of fingertips, operate it with a tool such as screwdriver. Careful attention must be paid to prevent the switch part from being damaged.
*3: Operate the RUN/STOP switch and RESET/L. CLR switch with your fingertips.
To prevent the switch from being damaged, do not use any tool such as screw driver.
*4: Applicable only to the Redundant CPU.

4.3.2 Switch operation after writing program

This section explains the switch operation after a program is written using GX Developer.

(1) When writing program with CPU module set to "STOP" *1

(a) To set to RUN status with device memory data cleared

1) Set the RESET/L. CLR switch to the RESET position once and return it to the original neutral position.
2) Set the RUN/STOP switch to RUN.
3) The CPU module is placed in the RUN status (RUN LED: On).

(b) To set to RUN status with device memory data not cleared (held)

1) Set the RUN/STOP switch to RUN.
2) The RUN LED flashes.
3) Set the RUN/STOP switch to STOP.
4) Set the RUN/STOP switch to RUN again.
5) The CPU module is placed in the RUN status (RUN LED: On).

(2) When a program is written while CPU module is running (online change)*2

No operation is needed for the RUN/STOP switch and RESET/L. CLR switch of the CPU module.
At this time, the device memory data are not cleared.

*1: When a program was written to the program memory during boot operation, also write the program to the boot source memory.
If the program is not written to the boot source memory, the old program will be executed at the next boot operation.

*2: When a program is changed online in the ladder mode, the changed program is written to the program memory.
When performing boot operation, also write the program to the boot source memory after online change. If the program is not written to the boot source memory, the old program will be executed at the next boot operation.

For details of the boot operation, refer to the following.

☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

Point

- Before writing a program to the CPU module, perform the following operation.
  - Set the system protect setting switch (DIP switch: SW1) of the CPU module to off (not protected).
  - Cancel the registered password on GX Developer.
- When the CPU module is placed in the STOP status by the remote STOP operation of GX Developer, it can be put in the RUN status by the remote RUN operation of GX Developer after program write. In that case, No operation is needed for the RUN/STOP switch and RESET/L. CLR switch of the CPU module.
- For details of GX Developer, refer to the following.
  ☞ GX Developer Operating Manual

4.3.3 Reset operation

Reset operation is performed by turning the RESET/L. CLR switch of the CPU module to the RESET side for the High Performance model QCPU, Process CPU, and Redundant CPU.

Point

Be sure to return the RESET/L. CLR switch to the neutral position after resetting. When the system is left with the RESET/L. CLR switch set to the RESET, the entire system is reset, not operated normally.

4.3.4 Latch clear operation

To perform latch clear, operate the RESET/L. CLR switch in the following procedure.

1) RUN/STOP switch : STOP
2) RESET/L. CLR switch : Set the switch to the L. CLR position several times until the USER LED flashes.
   USER LED: Flash : Ready for latch clear
3) RESET/L. CLR switch : Set the switch to the L. CLR position one more time.
   USER LED: Off : Latch clear complete

Point

- The valid/invalid for latch clear in the clear range of latch clear operation can be set for each device. The setting can be mode in the device setting of the PLC parameter.
- In addition to the way of using the RESET/L. CLR switch for latch clear, remote latch clear may be performed from GX Developer.
  For details of remote latch clear operation by GX Developer, refer to the following.
  ☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

4.3.5 Automatic writing to standard ROM

The High Performance model QCPU, Process CPU and Redundant CPU allows data in the memory card to be written into the standard ROM automatically.
For details, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

(1) Procedures for automatic write to standard ROM

Automatic writing to the standard ROM is performed with the following procedures.

(a) Operation with GX Developer (setting automatic writing to standard ROM)

1) Check the "Auto Download all Data from Memory card to Standard ROM" in the PLC parameter boot file setting.
   Set the parameter and program to be booted at the "Boot file" setting section.
   (Set the "Transfer from" to "Standard ROM".)

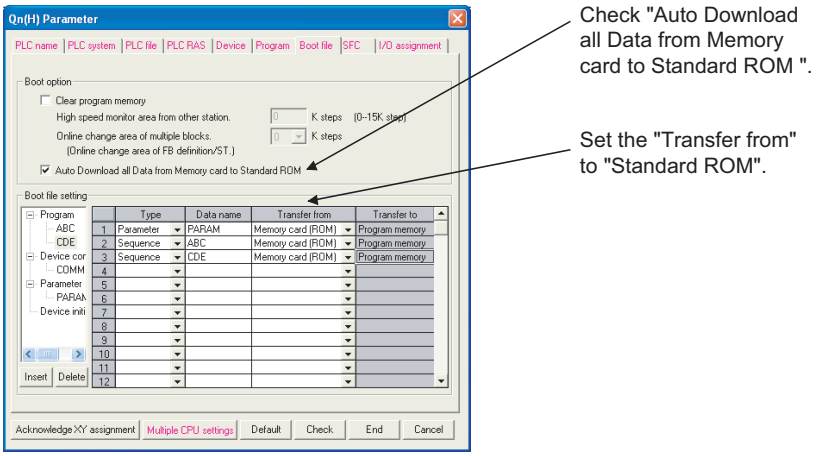


Figure 4.15 Boot file setting

2) Store the set parameters and programs to be booted in the memory card.

(b) Operations on CPU module (automatic writing to standard ROM)

1) Power off the programmable controller.
2) Insert the memory card that contains the parameters and programs to be booted onto the CPU module.
3) Set the DIP switches on the CPU module so that the valid parameter drive is matched with the memory card to be installed.
   - When a SRAM card is installed: SW2 : On, SW3 : Off
   - When a Flash card/ATA card is installed: SW2 : Off, SW3 : On
4) Power on the programmable controller.
   - Boot the file specified in the memory card into the program memory, and write the program in the memory to the standard ROM after completion of the boot.
5) The BOOT LED will flash when automatic write to standard ROM is completed, and the CPU module will be in the stop error status.
6) Turn off the programmable controller.
7) Remove the memory card, and then set the valid parameter drive to the standard ROM with the CPU module's DIP switches.
   - Standard ROM: SW2 : On, SW3 : On

The parameters and programs will be booted from the standard ROM to the program memory when the programmable controller is turned on to enable actual operations.

4.4 Universal Model QCPU

4.4.1 Part names

(1)Q00UJCPU

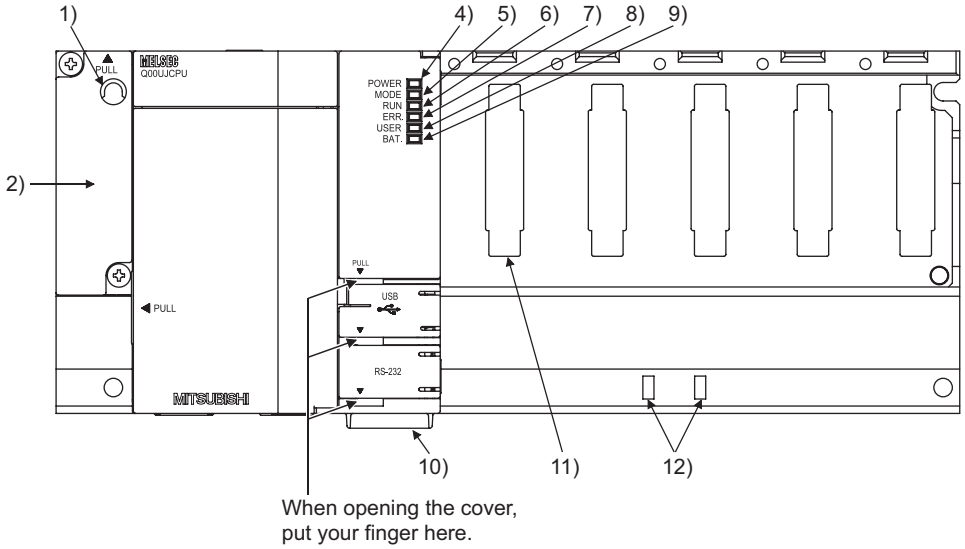


Figure 4.16 Front face

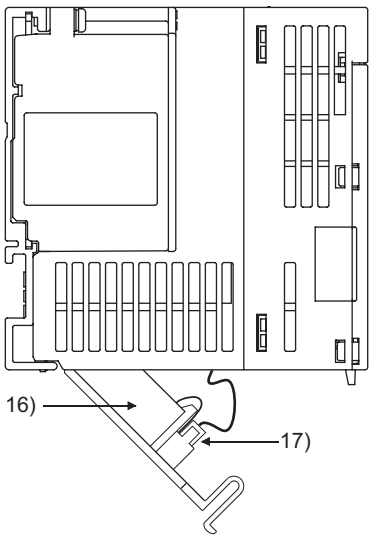


Figure 4.17 Side face

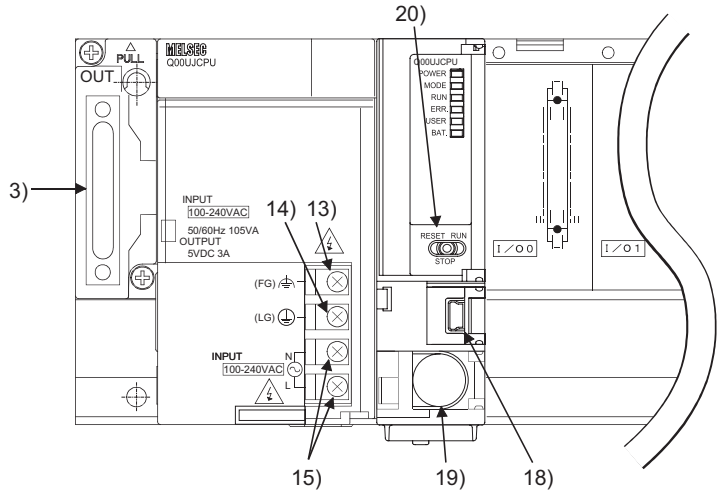


Figure 4.18 With front cover open

Table4.10 Part Names

No.	Name	Application
1)	Base mounting hole	Pear-shaped hole for mounting the unit to a panel such as a control box. (For M4 screw)
2)	Cover	Protective cover for extension cable connector. Remove this cover when connecting an extension base unit.
3)	Extension cable connector	Connector for transferring signals to or from the extension base unit. Connect an extension cable.
4)	POWER LED	Power indicator LED for 5VDC. Turns on in green during normal output of 5VDC.
5)	MODE LED	Indicates the mode of the CPU module. On: Q mode Off: Executional conditioned device test in process Forced on/off of external devices in process
6)	RUN LED	Indicates the operating status of the CPU module. On: During operation with the RUN/STOP/RESET switch set to "RUN". Off: During stop with the RUN/STOP/RESET switch set to "STOP" When the error that stops operation is detected. Flash: When parameters or a program is written during STOP and the RUN/STOP/RESET switch is moved from "STOP" to "RUN". To turn on the RUN LED after writing the program, perform the following operations. • Shift the RUN/STOP/RESET switch from "RUN" to "STOP" to "RUN". • Perform reset with the RUN/STOP/RESET switch. • Power on the programmable controller again. To turn on the RUN LED after writing the parameters, perform the following operations. • Perform reset with the RUN/STOP/RESET switch. • Power on the programmable controller again. (If the RUN/STOP/RESET switch is shifted from "STOP" to "RUN" to "STOP" to "RUN" after changing the parameter values, the new values are not reflected on the parameters related to the intelligent function module, such as the network parameters.)
7)	ERR. LED	On: When the self-diagnostic error that will not stop operation is detected. (When continuation of operation at error detection is set in the parameter) Off: Normal Flash: When the error that stops operation is detected. When reset operation is performed with the RUN/STOP/RESET switch.
8)	USER LED	On: Annunciator (F) turned on. Off: Normal
9)	BAT. LED	Flash (yellow): Battery error due to voltage drop of the CPU module battery. On (green): Keeps on for 5 seconds after competing of restoring the data that are backed up by the latch data backup function to the standard ROM. Flash (green): When data are backed up to the standard ROM by the latch data backup function Off: Normal
10)	Serial number	Shows the serial number printed on the rating plate.
11)	Module connector	Connector used for mounting an I/O or intelligent function module. (To the connector of the spare space where no module is mounted, fit the accessory connector cover or the blank cover module (QG60) to prevent dust from entering.)
12)	DIN rail adopter mounting holes	Holes for mounting a DIN rail adaptor.
13)	FG terminal	Ground terminal connected with the shield pattern of the printed circuit board.
14)	LG terminal	Power filter ground having a half potential of the input voltage.
15)	Power input terminals	Power input terminals for connection of a 100VAC to 200VAC power supply.
16)	Battery	Backup battery for use of the standard RAM, backup power time function.
17)	Battery connector pin	For connection of the battery lead wires. (Lead wires are disconnected from the connector when shipping to prevent the battery from consuming.)

Table4.10 Part Names

No.	Name	Application
18)	USB connector *1	Connector for connection with USB-compatible peripheral devices. (Connector type miniB) Can be connected by USV-dedicated cable.
19)	RS-232 connector *1	Connector for connecting a peripheral device by RS-232. Can be connected by RS-232 connection cable. (QC30R2)
20)	RUN/STOP/RESET switch *2	RUN: Executes sequence program operation. STOP: Stops sequence program operation. RESET: Performs hardware reset, operation error reset, operation initialization or like. (Section 4.4.3)

*1: When a cable is connected to the RS-232 connector at all times, clamp the cable to prevent a poor connection, moving, and disconnection by unintentional pulling.
The Q6HLD-R2 type RS-232 Connector Disconnection Prevention Holder is available as a clamp for RS-232 connector.

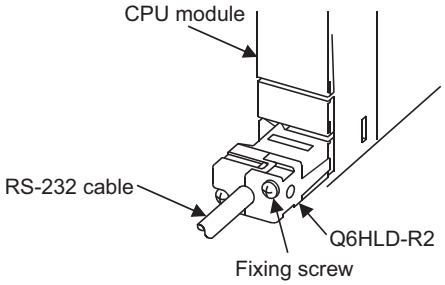


Figure 4.19 RS-232 cable fixing processing

*2: Operate the RUN/STOP/RESET switch with your fingertips.
To prevent the switch from being damaged, do not use any tool such as screw driver.

(2) Q00UCPU, Q01UCPU

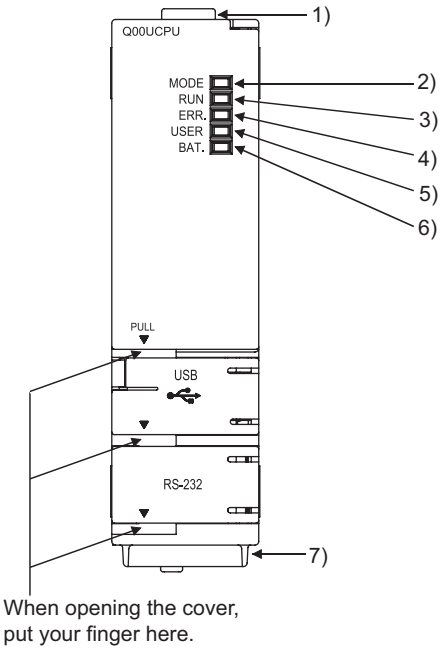


Figure 4.20 Front face

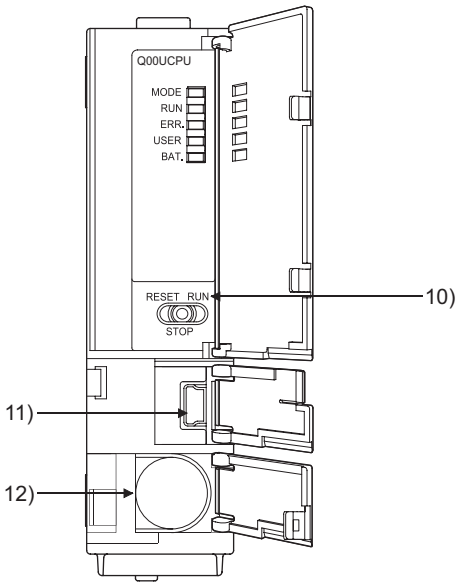


Figure 4.21 with front cover open

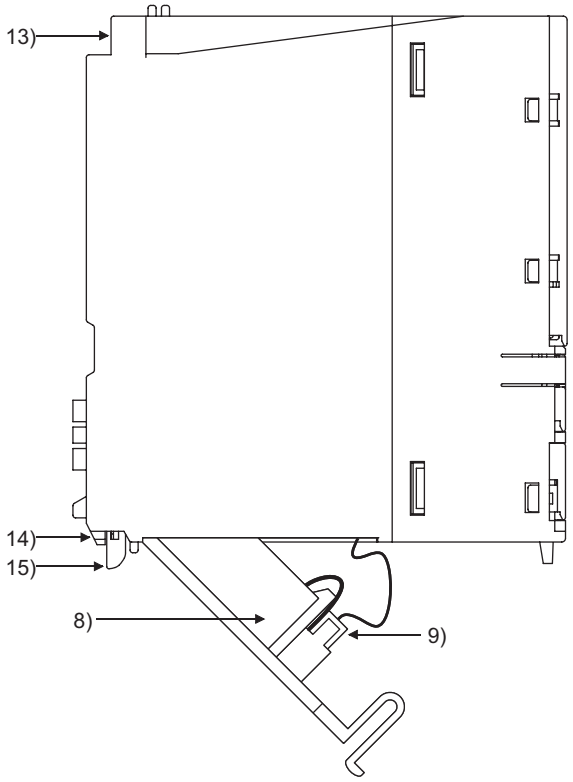


Figure 4.22 Side face

Table4.11 Part Names

No.	Name	Application
1)	Module fixing hook	Hook used to fix the module to the base unit. (Single-motion installation)
2)	MODE LED	Indicates the mode of the CPU module. On : Q mode Flash : Executional conditioned device test is in process Forced on and off function for external I/O is in process.
3)	RUN LED	Indicates the operating status of the CPU module. On: During operation with the RUN/STOP/RESET switch set to "RUN" Off: During stop with the RUN/STOP/RESET switch set to "STOP". When an error that stops operation is detected. Flash: Parameters or programs are written with the RUN/STOP/RESET switch set to "STOP", and then the RUN/STOP/RESET switch is turned from "STOP" to "RUN." To turn on the RUN LED after writing the program, perform the following operations. • Set the RUN/STOP/RESET switch in the order of "RUN" → "STOP" → "RUN". • Perform reset with the RUN/STOP/RESET switch • Power on the programmable controller again. To turn on the RUN LED after writing the parameters, perform the following operations. • Perform reset with the RUN/STOP/RESET switch • Power on the programmable controller again. (If the RUN/STOP/RESET switch is set in the order of "RUN" "STOP" "RUN" after changing the parameters, network parameters and intelligent function module parameters will not be updated.)
4)	ERR. LED	On : Detection of self-diagnosis error which will not stop operation, except battery error. (When operation continued at error detection is set in the parameter setting.) Off : Normal Flash : Detection of the error that stops operation. When reset operation becomes valid with the RUN/STOP/RESET switch.RUN/STOP/RESET.
5)	USER LED	On : Annunciator (F) turned on. Off : Normal
6)	BAT. LED	On (yellow) : Battery error due to battery voltage drop of the memory card. On (green) : Turned on for 5 seconds after restoring of data backed up to the standard ROM by the latch data backup is completed. Flash (green) : Flashes when backup of data to the standard ROM by latch data backup is completed. Off: Normal Flash (yellow): Battery error due to voltage drop of the CPU module battery. On (green): Keeps on for 5 seconds after completing of restoring the data that are backed up by the latch data backup function to the standard ROM. Flash (green): Completion of backup to the standard ROM by the latch data backup function. Off: Normal
7)	Serial number	Shows serial number printed on the rating plate.
8)	Battery	Backup battery for use of the program memory, standard RAM, and backup power time function.
9)	Battery connector pin	For connection of battery lead wires. (Lead wires are disconnected from the connector when shipping to prevent the battery from consuming.)
10)	RUN/STOP/RESET switch *2	RUN: Executes sequence program operation STOP: Stops sequence program operation RESET: Performs hardware reset, operation error reset, operation initialization, and like. (☞ Section 4.4.3)
11)	USB connector *1	Connector for connection with USB-compatible peripheral device. (Connector type miniB) Can be connected by USB-dedicated cable.USB.

Table4.11 Part Names

No.	Name	Application
12)	RS-232 connector *1	Connector for connecting a peripheral device by RS-232. Can be connected by RS-232 connection cable (QC30R2).
13)	Module fixing holes	Hole for the screw used to fix to the base unit. (M3×12 screw)
14)	Module fixing projection	Projection used to secure the module to the base unit.
15)	Module mounting lever	Lever used to mount the module to the base unit.

*1: When a cable is connected to the RS-232 connector at all times, clamp the cable to prevent a poor connection, moving, and disconnection by unintentional pulling.
The Q6HLD-R2 type RS-232 Connector Disconnection Prevention Holder is available as a clamp for RS-232 connector.

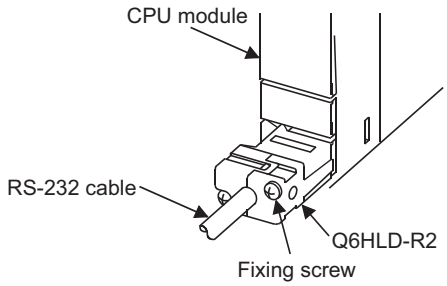


Figure 4.23 RS-232 cable fixing processing

*2: Operate the RUN/STOP/RESET switch with your fingertips.
To prevent the switch from being damaged, do not use any tool such as screw driver.

(3) Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU

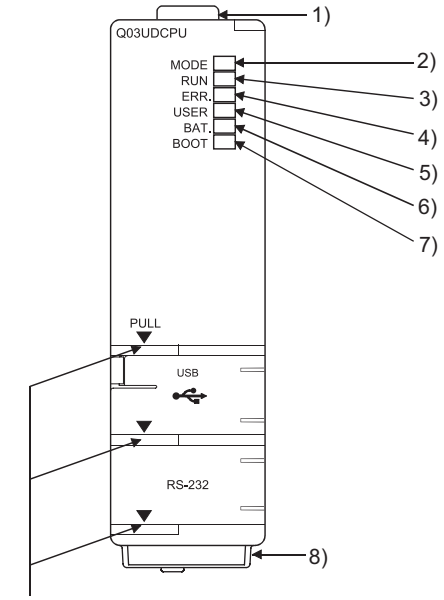


Figure 4.24 Front face

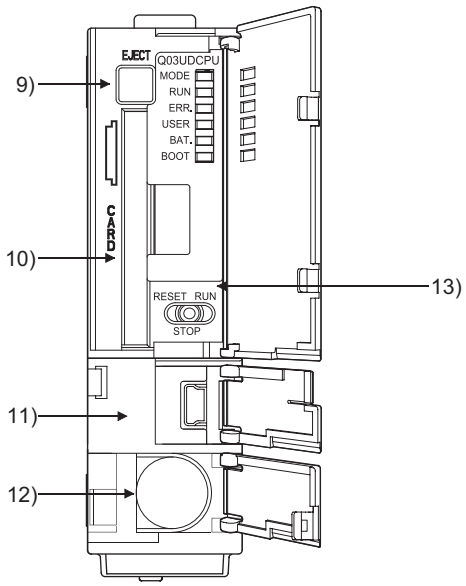


Figure 4.25 With front cover open

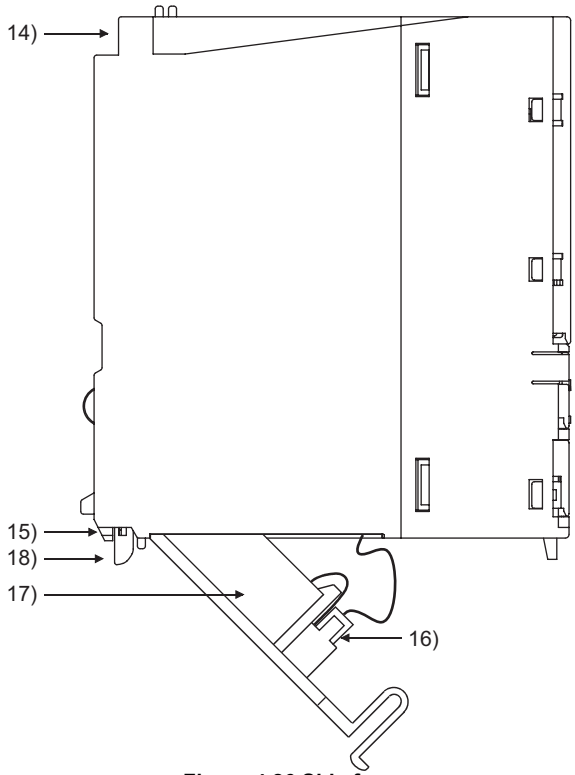


Figure 4.26 Side face

(4) Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU

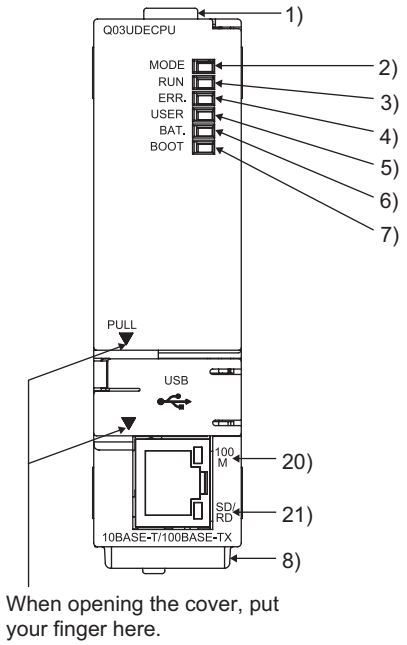


Figure 4.27 Front face

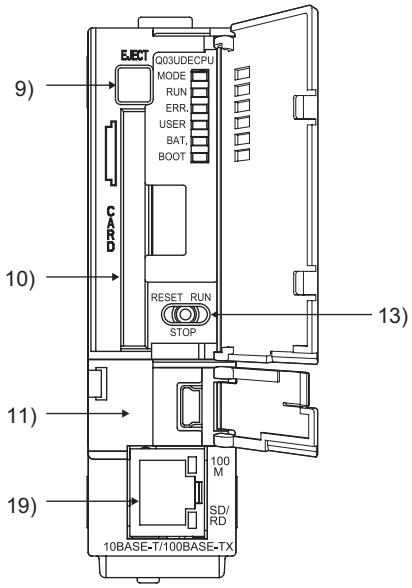


Figure 4.28 With front cover open

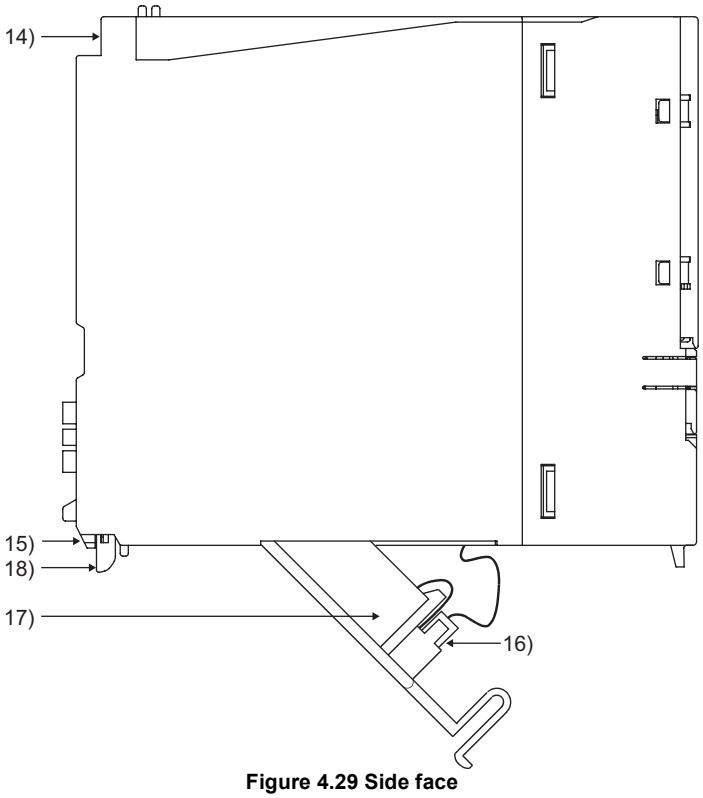


Figure 4.29 Side face

Table4.12 Part names

No.	Name	Application
1)	Module fixing hook	Hook used to fix the module to the base unit. (Single-motion installation)
2)	MODE LED	Indicates the mode of the CPU module. On: Q mode Flash: Executional conditioned device test is in process Forced on and off function for external I/O is in process CPU module change function with memory card is in process
3)	RUN LED	Indicates the operating status of the CPU module. On : During operation with the RUN/STOP/RESET switch set to "RUN" Off : During stop with the RUN/STOP/RESET switch set to "STOP". When an error that stops operation is detected. Flash : Parameters or programs are written with the RUN/STOP/RESET switch set to "STOP", and then the RUN/STOP/RESET switch is turned from "STOP" to "RUN." To turn on the RUN LED after writing the program, perform the following operations. • Set the RUN/STOP/RESET switch in the order of "RUN" → "STOP" → "RUN". • Perform reset with the RUN/STOP/RESET switch. • Power on the programmable controller again. To turn on the RUN LED after writing the parameters, perform the following operations. • Perform reset with the RUN/STOP/RESET switch. • Power on the programmable controller again. (If the RUN/STOP/RESET switch is set in the order of "RUN" → "STOP" → "RUN" after changing the parameters, network parameters and intelligent function module parameters will not be updated.)
4)	ERR. LED	On : Detection of self-diagnosis error which will not stop operation, except battery error. (When operation continued at error detection is set in the parameter setting.) Off : Normal Flash : Detection of the error that stops operation. When reset operation becomes valid with the RUN/STOP/RESET switch.
5)	USER LED	On : Annunciator (F) turned on Off : Normal
6)	BAT. LED	On (yellow) :Battery error due to battery voltage drop of the memory card. Flash (yellow) : Battery error due to voltage drop of the CPU module battery. On (green) : Turned on for 5 seconds after restoring of data backuped to the standard ROM by the latch data backup is completed. Flash (green) : Flashes when backup of data to the standard ROM by latch data backup is completed. Off : Normal
7)	BOOT LED	On : Start of boot operation Off : Non-execution of boot operation

Table4.12 Part names

No.	Name	Application
8)	Serial number	Shows the serial number printed on the rating plate.
9)	Memory card EJECT button	Used to eject the memory card from the CPU module.
10)	Memory card installing connector	Connector used for installing the memory card to the CPU module.
11)	USB connector	Connector for connection with USB-compatible peripheral device. (Connector type miniB) Can be connected by USB-dedicated cable.
12)	RS-232 connector *1	Connector for connecting a peripheral device by RS-232. Can be connected by RS-232 connection cable (QC30R2).
13)	RUN/STOP/RESET switch*2	RUN : Executes sequence program operation. STOP : Stops sequence program operation. RESET : Performs hardware reset, operation error reset, operation initialization or like. (☞ Section 4.4.3)
14)	Module fixing screw hole	Hole for the screw used to secure to the base unit. (M3×12 screw)
15)	Module fixing projection	Projection used to secure the module to the base unit.
16)	Battery connector pin	For connection of battery lead wires. (Lead wires are disconnected from the connector when shipping to prevent the battery from consuming.)
17)	Battery	Backup battery for use of standard RAM, clock function and backup power time function.
18)	Module mounting lever	Lever used to mount the module to the base unit.
19)	Ethernet connector	Connector for connecting an Ethernet device (RJ-45 connector)
20)	100M LED	On: Connected at 100Mbps. Off: Not connected, or connected at 10Mbps
21)	SD/RD LED	On: Data being sent/received Off: No data being sent/received

*1: When a cable is connected to the RS-232 connector at all times, clamp the cable to prevent a poor connection, moving, and disconnection by unintentional pulling.
The Q6HLD-R2 type RS-232 Connector Disconnection Prevention Holder is available as a clamp for RS-232 connector.

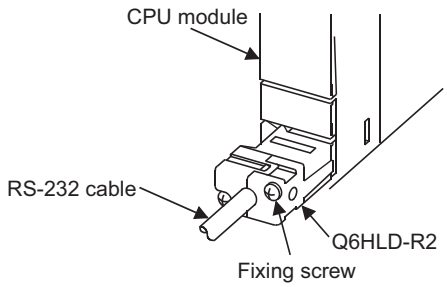


Figure 4.30 RS-232 cable fixing processing

*2: Operate the RUN/STOP/RESET switch with your fingertips.
To prevent the switch from being damaged, do not use any tool such as screw driver.

4.4.2 Switch operation after writing a program

This section explains the switch operation after a program is written using GX Developer.

(1) When writing program with CPU module set to "STOP" *1

(a) To set to RUN status with device memory data cleared

1) Set the RUN/STOP/RESET switch to the RESET position once (Approximately 1 second) and return it to the STOP position.
2) Set the RUN/STOP/RESET switch to the RUN position.
3) The CPU module is placed in the RUN status (RUN LED: On).

(b) To set to RUN status with device memory data not cleared (held)

1) Set the RUN/STOP/RESET switch to the RUN position.
2) The RUN LED flashes.
3) Set the RUN/STOP/RESET switch to the STOP position.
4) Setthe RUN/STOP/RESET switch to the RUN position again.
5) The CPU module is placed in the RUN status (RUN LED: On).

(2) When a program is written while CPU module is running (online change)*2

No operation is needed for the RUN/STOP/RESET switch of the CPU module. At this time, the device memory data are not cleared.

*1: When a program was written to the program memory during boot operation, also write the program to the boot source memory.
If the program is not written to the boot source memory, the old program will be executed at the next boot operation.

*2: When a program is written online in the ladder mode, the changed program is written to the program memory.
When performing boot operation, also write the program to the boot source memory after online change. If the program is not written to the boot source memory, the old program will be executed at the next boot operation

For details of the boot operation, refer to the following.

☞ QnUCPU User's Manual (Functional Description, Program Fundamentals)

Point

When the CPU module is placed in the STOP status by the remote STOP operation of GX Developer, it can be set in the RUN status by the remote RUN operation of GX Developer after program write.
In that case, no operation is needed for the RUN/STOP/RESET switch of the CPU module.
For details of GX Developer, refer to the following.

☞ GX Developer Operating Manual

4.4.3 Reset operation

For the Universal model QCPU, the RUN/STOP/RESET switch of the CPU module is used to switch between the RUN status and STOP status and to perform RESET operation.
When using the RUN/STOP/RESET switch to reset the CPU module, setting the RUN/STOP/RESET switch to the reset position will not reset it immediately.

Point

Hold the RUN/STOP/RESET switch in the RESET position until reset processing is complete (the flashing ERR. LED turns off).
If you release your hand from the RUN/STOP/RESET switch during reset processing (the ERR. LED is flashing), the switch will return to the STOP position and reset processing cannot be completed.

Perform reset operation with the RUN/STOP/RESET switch as shown in Figure 4.31.

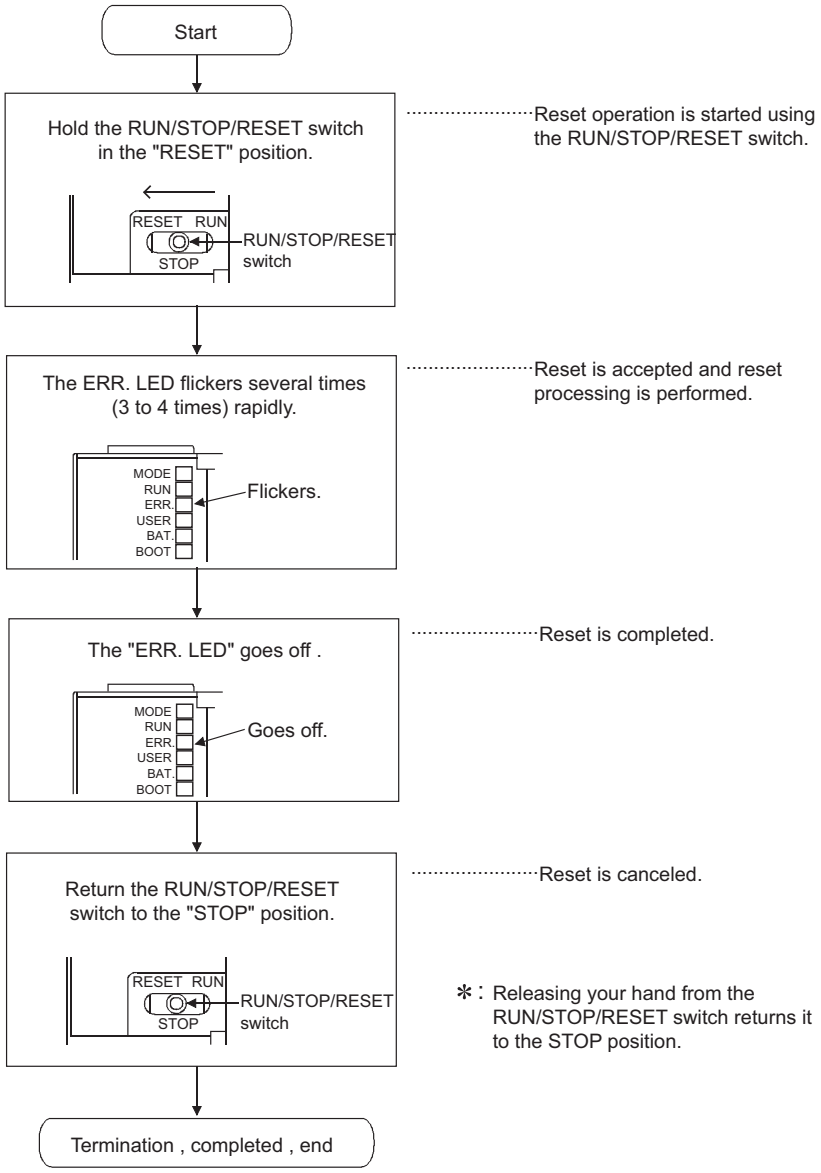


Figure 4.31 Reset operation

Point

Operate the RUN/STOP/RESET switch with your fingertips.
To prevent the switch from being damaged, do not use any tool such as screw driver.

4.4.4 Latch clear operation

For the Universal model QCPU, latch clear is performed by the remote latch clear operation of GX Developer.
Latch clear cannot be executed by operating the switches of the CPU module.

Point

- The valid/invalid for latch clear in the clear range of latch clear operation can be set for each device. The setting can be made in the device setting of the PLC parameter.
- For the remote latch clear operation by GX Developer, refer to the following.
  ☞ QnUCPU User's Manual (Functional Description, Program Fundamentals)

CHAPTER5 POWER SUPPLY MODULE

This chapter describes the specifications of the power supply modules applicable for the programmable controller system (The Q Series power supply module, slim type power supply module, redundant power supply module and AnS/A Series power supply module) and how to select the most suitable module.

5.1 Base Unit that Can Be Used in Combination with Power Supply Module

This section describes the base unit that can be used in combination with the power supply module respectively.
For details of the CPU modules and base units, refer to the following.

CPU modules : ☞ CHAPTER 4
Base units : ☞ CHAPTER 6

For details of the system configuration, refer to CHAPTER 2.

Table5.1 Base unit that can be used in combination with power supply module

Power supply module	Base unit									
	Main base unit				Extension base unit					
	Q33B Q35B Q38B Q312B	Q32SB Q33SB Q35SB	Q38RB	Q38DB Q312DB	Q52B Q55B	Q63B Q65B Q68B Q612B	Q68RB	Q65WRB	QA1S65B QA1S68B	QA65B QA68B *2
Q61P-A1 Q61P-A2 Q61P Q61P-D Q62P Q63P Q64P Q64PN	○	×	×	○	×	○	×	×	×	×
Q61SP	×	○	×	×	×	×	×	×	×	×
Q63RP Q64RP	×	×	○	×	×	×	○	○*1	×	×
A1S61PN A1S62PN A1S63P	×	×	×	×	×	×	×	×	○	×
A61P A61PN A62P A63P A61PEU A62PEU	×	×	×	×	×	×	×	×	×	○

○: Combination available ×: Combination not available

*1: When mounting the Q64RP to the Q65WRB, use the Q64RP whose serial number (first six digits) is "081103" or later.
The vibration condition described in the general specifications may not be met if the serial number (first six digits) of the Q64RP is "081102" or earlier is mounted.

*2: The QA6ADP+A6□B also has the equivalent specifications.

5.2 Specifications

5.2.1 Power supply module specifications

Table5.2 shows the specifications of the power supply modules.

Table5.2 Power supply module specifications

Item		Performance Specifications			
		Q61P-A1	Q61P-A2	Q61P	Q62P
Mounting position		Power supply module mounting slot			
Applicable base unit		Q3□B, Q3□DB, Q6□B			
Input power supply		100 to 120VAC $^{+10\%}_{-15\%}$ (85 to 132VAC)	200 to 240VAC $^{+10\%}_{-15\%}$ (170 to 264VAC)	100 to 240VAC $^{+10\%}_{-15\%}$ (85 to 264VAC)	
Input frequency		50/60Hz ±5%			
Input voltage distortion factor		Within 5% (☞ Section 5.2.4)			
Max. input apparent power		105VA		120VA	105VA
Max. input power		----			
Inrush current		20A within 8ms[*5]			
Rated output current	5VDC	6A			3A
	24VDC	----			0.6A
External output voltage		----			24VDC ±10%
Overcurrent protection[*1]	5VDC	6.6A or more			3.3A or more
	24VDC	----			0.66A or more
Overvoltage protection [*2]	5VDC	5.5 to 6.5V			
	24VDC	----			
Efficiency		70% or more			65% or more
Allowable momentary power failure period [*3]		Within 20ms			
Dielectric withstand voltage		Between input -LG batched and output-FG batched 2830VAC rms/3 cycles (2000m (6562 feet))			
Insulation resistance		Input and LG batched, output and FG batched, batch input-LG, batch output-FG 10MΩ or higher by 500VDC insulation resistance tester			
Noise durability		• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC 61000-4-4, 2KV			
Operation indication		LED indication (Normal: On (green), Error: Off)			
Fuse		Built-in (User-unchangeable)			

Table5.2 Power supply module specifications

Item		Performance Specifications			
		Q61P-A1	Q61P-A2	Q61P	Q62P
Contact output section	Application	$\overline{\text{ERR.}}$ contact (☞ Section 5.3)			
	Rated switching voltage, current	24VDC, 0.5A			
	Minimum switching load	5VDC, 1mA			
	Response time	OFF to ON: 10ms max. ON to OFF: 12ms max.			
	Life	Mechanical : More than 20 million times Electrical : More than 100 thousand times at rated switching voltage, current			
	Surge suppressor	No			
	Fuse	No			
Terminal screw size		M3.5× 7			
Applicable wire size		0.75 to 2mm^2			
Applicable solderless terminal		RAV1.25 - 3.5, RAV2 - 3.5			
Applicable tightening torque		0.66 to 0.89N•m			
External dimensions	H	98mm (3.86 inches)			
	W	55.2mm (2.17 inches)			
	D	90mm (3.55 inches)			
Weight		0.31kg		0.40kg	0.39kg

Table5.3 Power supply module specifications

Item		Performance Specifications
		Q63P
Mounting position		Power supply module mounting slot
Applicable base unit		Q3□B, Q3□DB, Q6□B
Input power supply		24VDC $^{+30\%}_{-35\%}$ (15.6 to 31.2VDC)
Input frequency		----
Input voltage distortion factor		----
Max. input apparent power		----
Max. input power		45W
Inrush current		100A within 1ms (at 24VDC input)
Rated output current	5VDC	6A
	24VDC	----
External output voltage		----
Overcurrent protection*1	5VDC	6.6A or more
	24VDC	----
Overvoltage protection *2	5VDC	5.5 to 6.5V
	24VDC	----
Efficiency		70% or more
Allowable momentary power failure time *3		Within 10ms (at 24VDC input)
Dielectric withstand voltage		Between primary and 5VDC 500VAC
Insulation resistance		10MΩ or more by insulation resistance tester
Noise durability		By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency
Operation indication		LED indication (Normal: On (green), Error: Off)
Fuse		Built-in (User-unchangeable)

Table5.3 Power supply module specifications

Item			Performance Specifications
			Q63P
Contact output section	Application		$\overline{\text{ERR.}}$ contact (☞ Section 5.3)
	Rated switching voltage, current		24VDC, 0.5A
	Minimum switching load		5VDC, 1mA
	Response time		OFF to ON: 10ms max. ON to OFF: 12ms max.
	Life		Mechanical : More than 20 million times Electrical : More than 100 thousand times at rated switching voltage, current
	Surge suppressor		No
	Fuse		No
Terminal screw size			M3.5× 7
Applicable wire size			0.75 to 2mm^2
Applicable solderless terminal			RAV1.25 - 3.5, RAV2 - 3.5
Applicable tightening torque			0.66 to 0.89N•m
External dimensions		H	98mm (3.86 inches)
		W	55.2mm (2.17 inches)
		D	90mm (3.55 inches)
Weight			0.33kg

Table5.4 Power supply module specifications

Item		Performance Specifications	
		Q64P	Q64PN
Mounting position		Power supply module mounting slot	
Applicable base unit		Q3□B, Q3□DB, Q6□B	
Input power supply		100 to 120VAC/200 to 240VAC $^{+10\%}_{-15\%}$ (85V to 132VAC/170 to 264VAC)	100 to 240VAC $^{+10\%}_{-15\%}$ (85V to 264VAC)
Input frequency		50/60Hz ±5%	
Input voltage distortion factor		Within 5% (☞ Section 5.2.4)	
Max. input apparent power		160VA	
Inrush current		20A within 8ms[*5]	
Rated output current	5VDC	8.5A	
	24VDC	----	
Overcurrent protection[*1]	5VDC	9.9A or more	
	24VDC	----	
Overvoltage protection[*2]	5VDC	5.5 to 6.5V	
	24VDC	----	
Efficiency		70% or more	
Allowable momentary power failure time[*3]		Within 20ms	
Dielectric withstand voltage		Between inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000 m (6562 feet))	
Insulation resistance		Input and LG batched, output and FG batched, batch input-LG, batch output-FG 10MΩ or higher by 500VDC insulation resistance tester	
Noise durability		• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC 61000-4-4, 2KV	
Operation indication		LED indication (Normal: On (green), Error: Off)	
Fuse		Built-in (User-unchangeable)	

Table5.4 Power supply module specifications

Item			Performance Specifications	
			Q64P	Q64PN
Contact output section	Application		$\overline{\text{ERR.}}$ contact (☞ Section 5.3)	
	Rated switching voltage, current		24VDC, 0.5A	
	Minimum switching load		5VDC, 1mA	
	Response time		OFF to ON: 10ms max. ON to OFF: 12ms max.	
	Life		Mechanical : More than 20 million times Electrical : More than 100 thousand times at rated switching voltage, current	
	Surge suppressor		None	
	Fuse		None	
Terminal screw size			M3.5 screw	
Applicable wire size			0.75 to 2mm^2	
Applicable solderless terminal			RAV1.25 - 3.5, RAV2 - 3.5	
Applicable tightening torque			0.66 to 0.89N•m	
External dimensions		H	98mm (3.86 inches)	
		W	55.2mm (2.17 inches)	
		D	115mm (4.53 inches)	
Weight			0.40kg	0.47kg

Table5.5 Power supply module specifications

Item		Performance Specifications
		Q61SP
Mounting position		Power supply module mounting slot
Applicable base unit		Q3□SB
Input power supply		100 to 240VAC $^{+10\%}_{-15\%}$ (85 to 264VAC)
Input frequency		50/60Hz ±5%
Input voltage distortion factor		Within 5% (☞ Section 5.2.4)
Max. input apparent power		40VA
Inrush current		20A within 8ms*5
Rated output current	5VDC	2A
	24VDC	----
Overcurrent protection*1	5VDC	2.2A or more
	24VDC	----
Overvoltage protection*2	5VDC	5.5 to 6.5V
	24VDC	----
Efficiency		70% or more
Allowable momentary power failure time*3		Within 20ms (AC100VAC or more)
Dielectric withstand voltage		Between inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000 m (6562 feet))
Insulation resistance		Input and LG batched, output and FG batched, batch input-LG, batch output-FG 10MΩ or higher by 500VDC insulation resistance tester
Noise durability		• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC 61000-4-4, 2KV
Operation indication		LED indication (Normal: On (green), Error: Off)
Fuse		Built-in (User-unchangeable)
Contact output section	Application	$\overline{\text{ERR.}}$ contact (☞ Section 5.3)
	Rated switching voltage, current	24VDC, 0.5A
	Minimum switching load	5VDC, 1mA
	Response time	OFF to ON: 10ms max. ON to OFF: 12ms max.
	Life	Mechanical : More than 20 million times Electrical : More than 100 thousand times at rated switching voltage, current
	Surge suppressor	None
	Fuse	None

Table5.5 Power supply module specifications

Item		Performance Specifications
		Q61SP
Terminal screw size		M3.5 screw
Applicable wire size		0.75 to 2mm^2
Applicable solderless terminal		RAV1.25 - 3.5, RAV2 - 3.5
Applicable tightening torque		0.66 to 0.89N•m
External dimensions	H	98mm (3.86 inches)
	W	27.4mm (1.08 inches)
	D	104mm (4.09 inches)
Weight		0.18kg

Table5.6 Power supply module specifications

Item		Performance Specifications
		Q63RP
Base unit position		Power supply module mounting slot
Applicable base unit		Q3□RB, Q3□RB, Q6□WRB
Input power supply		24V DC(-35%/+30%) (15.6 to 31.2V DC)
Max. input power		65W
Inrush current		150A within 1ms
Rated output current	5VDC	8.5A
	24VDC	----
Overcurrent protection*1	5VDC	9.35A or more
	24VDC	----
Overvoltage protection*2	5VDC	5.5 to 6.5V
	24VDC	----
Efficiency		65% or more
Allowable momentary power failure period*3		Within 10ms(at 24V DC input)
Dielectric withstand voltage		Between primary and 5VDC 500VAC
Insulation resistance		10MΩ or more by insulation resistance tester
Noise durability		By noise simulator of 500Vp-p noise voltage, 1 s noise width and 25 to 60Hz noise frequency
Operation indication		LED indication*6 (Normal operation: On(green) Error:Off(red)
Fuse		Built-in (User-unchangeable)
Contact output section	Application	$\overline{\text{ERR.}}$ contact (☞ Section 5.3)
	Rated switching voltage, current	24VDC, 0.5A
	Minimum switching load	5VDC, 1mA
	Response time	OFF to ON: 10ms max. ON to OFF: 12ms max.
	Life	Mechanical : More than 20 million times Electrical : More than 100 thousand times at rated switching voltage, current
	Surge suppressor	None
	Fuse	None
Terminal screw size		M3.5 Screw
Applicable wire size		0.75 to 2mm^2
Applicable solderless terminal		RAV1.25-3.5, RAV2-3.5, RAV1.25-3.5, RAV2-3.5
Applicable tightening torque		0.66 to 0.89N•m
External dimensions	H	98mm (3.86 inches)
	W	83mm (3.27 inches)
	D	115mm (4.53 inches)
Weight		0.60kg

*6: Although the POWER LED momentarily turns on in red immediately after the power supply is turned on or off, the Q64RP is not faulty.

Table5.7 Power supply module specifications

Item		Performance Specifications
		Q64RP
Mounting position		Power supply module mounting slot
Applicable base unit		Q3□RB, Q6□RB, Q6□WRB[*8]
Input power supply		100 to 120VAC/200 to 240VAC $^{+10\%}_{-15\%}$ (85 to 132VAC/170 to 264VAC)
Input frequency		50/60Hz ±5%
Input voltage distortion factor		Within 5% (☞ Section 5.2.4)
Max. input apparent power		160VA
Inrush current		20A within 8ms[*5]
Rated output current	5VDC	8.5A
	24VDC	----
Overcurrent protection[*1]	5VDC	9.35A or more
	24VDC	----
Overvoltage protection[*2]	5VDC	5.5 to 6.5V
	24VDC	----
Efficiency		65% or more
Allowable momentary power failure time[*3]		Within 20ms
Dielectric withstand voltage		Between inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000 m (6562 feet))
Insulation resistance		Input and LG batched, output and FG batched, batch input-LG, batch output-FG 10MΩ or higher by 500VDC insulation resistance tester
Noise durability		• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC 61000-4-4, 2KV
Operation indication		LED indication (Normal: ON (green), Error: ON (red)) [*7]
Fuse		Built-in (User-unchangeable)

*7: Although the POWER LED momentarily turns on in red immediately after the power supply is turned on or off, the Q64RP is not faulty.

*8: When mounting the Q64RP to the Q65WRB, use the Q64RP whose first 6 digits of serial No. is "081103" or later.
The vibration condition described in the general specifications may not be met if the serial number (first six digits) of the Q64RP is "081102" or earlier is mounted.

Table5.7 Power supply module specifications

Item			Performance Specifications
			Q64RP
Contact output section	Application		$\overline{\text{ERR.}}$ contact (☞ Section 5.3)
	Rated switching voltage, current		24VDC, 0.5A
	Minimum switching load		5VDC, 1mA
	Response time		OFF to ON: 10ms max. ON to OFF: 12ms max.
	Life		Mechanical : More than 20 million times Electrical : More than 100 thousand times at rated switching voltage, current
	Surge suppressor		None
	Fuse		None
Terminal screw size			M3.5 screw
Applicable wire size			0.75 to 2mm^2
Applicable solderless terminal			R1.25-3.5, R2-3.5, RAV1.25-3.5, RAV2-3.5
Applicable tightening torque			0.66 to 0.89N•m
External dimensions		H	98mm (3.86 inches)
		W	83mm (3.27 inches)
		D	115mm (4.53 inches)
Weight			0.47kg

Table5.8 Power supply module specifications

Item		Performance Specifications
		Q61P-D
Mounting position		Power supply module mounting slot
Applicable base unit		Q3□B, Q3□DB, Q6□B
Input power supply*10		100 to 240VAC $^{+10\%}_{-15\%}$ (85 to 264VAC)
Input frequency		50/60Hz ±5%
Input voltage distortion factor		Within 5% (☞ Section 5.2.4)
Max. input apparent power		130VA
Max. input power		----
Inrush current		20A within 8ms*5
Rated output current	5VDC	6A
	24VDC	----
External output voltage		----
Overcurrent protection*1	5VDC	6.6A or more
	24VDC	----
Overvoltage protection *2	5VDC	5.5 to 6.5V
	24VDC	----
Efficiency		70% or more
Allowable momentary power failure period *3		Within 20ms
Dielectric withstand voltage		Between input -LG batched and output-FG batched 2830VAC rms/3 cycles (2000m (6562 feet))
Insulation resistance		Input and LG batched, output and FG batched, batch input - LG, batch output - FG 10MΩ or higher by 500VDC insulation resistance tester
Noise durability		• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC 61000-4-4, 2KV
Operation indication		LED indication (POWER LED, LIFE LED)
Fuse		Built-in (User-unchangeable)
Contact output section	Application	$\overline{\text{ERR.}}$ contact, $\overline{\text{LIFE OUT}}$ contact (☞ Section 5.3)
	Rated switching voltage, current	24VDC, 0.5A
	Minimum switching load	5VDC, 1mA
	Response time	OFF to ON: 10ms max. ON to OFF: 12ms max.
	Life	Mechanical : More than 20 million times Electrical : More than 100 thousand times at rated switching voltage, current
	Surge suppressor	No
	Fuse	No

*10: When using the Q61P-D in the system configured with a A/AnS series module, the power supply modules mounted on the main base unit and extension base unit must be turned on and off simultaneously.

Table5.8 Power supply module specifications

Item		Performance Specifications
		Q61P-D
Terminal screw size		M3.5×7
Applicable wire size		0.75 to 2mm^2
Applicable solderless terminal		RAV1.25 - 3.5, RAV2 - 3.5
Applicable tightening torque		0.66 to 0.89N•m
External dimensions	H	98mm (3.86 inches)
	W	55.2mm (2.17 inches)
	D	90mm (3.55 inches)
Weight		0.45kg

Table5.9 Power supply module specifications

Item		Performance Specifications	
		Q00JCPU (Power supply part)	Q00UJCPU (Power supply part)
Input power supply		100 to 120VAC $^{+10\%}_{-15\%}$ (85 to 264VAC)	
Input frequency		50/60Hz ±5%	
Input voltage distortion factor		Within 5% (☞ Section 5.2.4)	
Max. input apparent power		105VA	
Inrush current		40A within 8ms*5	
Rated output current	5VDC	3A	
Overcurrent protection*1	5VDC	3.3A or more	
Overvoltage protection*2	5VDC	5.5 to 6.5V	
Efficiency		65% or more	
Allowable momentary power failure time*3		Within 20ms (100VAC or more)	
Dielectric withstand voltage		Between inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000 m (6562 feet))	
Insulation resistance		Input and LG batched, output and FG batched, batch input-LG, batch output-FG 10MΩ or higher by 500VDC insulation resistance tester	
Noise durability		• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC61000-4-4, 2KV	
Operation indication		LED indication (The POWER LED of the CPU part: Normal: On (green), Error: Off)	
Fuse		Built-in (User-unchangeable)	
Contact output section		None	
Terminal screw size		M3.5×7	
Applicable wire size		0.75 to 2mm^2	
Applicable solderless terminal		RAV1.25 - 3.5, RAV2 - 3.5	
Applicable tightening torque		0.66 to 0.89N•m	
External dimensions		☞ Section 4.1	
Weight			

Table5.10 Power supply module specifications

Item		Performance Specifications		
		A1S61PN	A1S62PN	A1S63P
Mounting position		Power supply module mounting slot		
Applicable base unit		QA1S6□B		
Input power supply		100 to 240VAC $^{+10\%}_{-15\%}$ (85 to 264VAC)		24VDC $^{+30\%}_{-35\%}$ (15.6 to 31.2VDC)
Input frequency		50/60Hz ±5%		----
Input voltage distortion factor		Within 5% (☞ Section 5.2.4)		---
Max. input apparent power		105VA		----
Max. input power		----		41W
Inrush current		20A within 8ms*5		81A within 1ms
Rated output current	5VDC	5A	3A	5A
	24VDC	----	0.6A	----
Overcurrent protection*1	5VDC	5.5A or more	3.3A or more	5.5A or more
	24VDC	----	0.66A or more	----
Overvoltage protection*2	5VDC	5.5 to 6.5V		
	24VDC	----		
Efficiency		65% or more		
Allowable momentary power failure time*3		Within 20ms		Within 10ms (at 24VDC input)
Dielectric withstand voltage		Between inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000 m (6562 feet))		Between primary and 5VDC 500VAC
Insulation resistance		Between inputs and outputs (LG and FG separated), between inputs and LG/FG, between outputs and FG/LG 10MΩ or more by insulation resistance tester		5MΩ or more by insulation resistance tester
Noise durability		• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC 61000-4-4, 2KV		By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency
Operation indication		LED indication (Normal: On (green), Error: Off)		
Fuse		Built-in (User-unchangeable)		
Contact output section		None		
Terminal screw size		M3.5 screw		
Applicable wire size		0.75 to 2mm^2		
Applicable solderless terminal		RAV1.25 to 3.5, RAV2 to 3.5		
Applicable tightening torque		0.66 to 0.89N•m		
External dimensions	H	130mm (5.12 inches)		
	W	55mm (2.17 inches)		
	D	93.6mm (3.69 inches)		
Weight		0.60kg		0.50kg

Table5.11 Power supply module specifications

Item		Specifications			
		A61P	A61PN	A62P	A63P
Slot position		Power supply module mounting slot			
Applicable base unit		QA6□B			
Input power supply		100VAC to 120VAC $^{+10\%}_{-15\%}$ (85VAC to 132VAC)			24VDC $^{+30\%}_{-35\%}$ (15.6VDC to 31.2VDC)
		200VAC to 240VAC $^{+10\%}_{-15\%}$ (170VAC to 264VAC)			
Input frequency		50/60Hz±5%			–
Input voltage distortion		Within 5% (☞ Section 5.2.4)			–
Max. input apparent power		160VA		155VA	65W
Inrush current		20A, 8ms or less*5			100A, 1ms or less
Rated output current	5VDC	8A		5A	8A
	24VDC	–		0.8A	–
Overcurrent protection*1	5VDC	8.8A or more		5.5A or more	8.5A or more
	24VDC	–		1.2A or more	–
Overvoltage protection*2	5VDC	5.5 to 6.5V		5.5 to 6.5V	5.5 to 6.5V
	24VDC	–			
Efficiency		65% or more			
Dielectric withstand voltage		Between AC external terminals and ground, 1500V AC, 1 minute Between DC external terminals and ground, 500V AC, 1 minute			
Noise durability		By noise simulator of 1500Vp-p noise voltage, noise width 1 μs, and 25 to 60Hz noise frequency			By noise simulator of 500Vp-p noise voltage, noise width 1 μs, and 25 to 60Hz noise frequency
Insulation resistance		Between AC external terminals and ground, 5MΩ or higher by 500VDC insulation resistance tester			
Power indicator		LED indication of power supply			
Terminal screw size		M4×0.7×6			
Applicable wire size		0.75 to 2mm^2			
Applicable solderless terminal		R1.25-4, R2-4 RAV1.25, RAV2-4			
Applicable tightening torque		78 to 118 ▪ Ncm			
External dimensions	H	250mm(9.84 inches)			
	W	55mm(2.17 inches)			
	D	121mm(4.76 inches)			
Weight		0.98 kg	0.75 kg	0.94 kg	0.8 kg
Allowable momentary power failure time*3		20ms or less			1ms or less

Table5.12 Power supply module specifications

Item		Performance specifications	
		A61PEU	A62PEU
Slot position		Power supply module mounting slot	
Applicable base unit		QA6□B	
Input power supply		100 to 120/200 to 240VAC +10%/-15%	
Input frequency		50/60Hz±5%	
Input voltage distortion		Within 5% (☞ Section 5.2.4)	
Max. input apparent power		130VA	155VA
Inrush current		20A, 8ms or less*5	
Rated output current	5VDC	8A	5A
	24VDC	–	0.8A
Overcurrent protection*1	5VDC	8.8A or more	5.5A or more
	24VDC	–	1.2A or more
Overvoltage protection*2	5VDC	5.5 to 6.5V	–
	24VDC	–	
Efficiency		65% or more	
Dielectric withstand voltage	Between primary side and FG	2830V AC rms/3 cycles (altitude 2000m (6562 feet))	
Noise durability		By noise simulator of noise voltage IEC 801-4, 2KV, 1500Vp-p, noise width 1 μs, and noise frequency 25 to 60Hz	
Power indicator		LED indication of power supply	
Terminal screw size		M4×0.7×6	
Applicable wire size		0.75 to 2mm^2	
Applicable solderless terminal		RAV1.25-4, RAV2-4	
Applicable tightening torque		98 to 137N ▪ cm	
External dimensions	H	250mm(9.84 inches)	
	W	55mm(2.17 inches)	
	D	121mm(4.76 inches)	
Weight		0.8 kg	0.9 kg
Allowable momentary power failure time*3		20ms or less	

Point

*1: Overcurrent protection

The overcurrent protection device shuts off the 5 V, 24 VDC circuit and stops the system if the current flowing in the circuit exceeds the specified value.

The LED of the power supply module turns off or turns on in dim green when voltage is lowered. (As for the redundant power supply module, the LED turns off or turns on in red.) If this device is activated, switch the input power supply off and eliminate the cause such as insufficient current capacity or short. Then, a few minutes later, switch it on to restart the system.

The initial start for the system takes place when the current value becomes normal.

*2: Overvoltage protection

The overvoltage protection device shuts off the 5 VDC circuit and stops the system if a voltage of 5.5 VDC is applied to the circuit.

When this device is activated, the power supply module LED turns off.

If this happens, switch the input power off, then a few minutes later on. This causes the initial start for the system to take place. The power supply module must be changed if the system is not booted and the LED remains off (As for the redundant power supply module, the LED turns on in red).

*3: Allowable momentary power failure time

(a)For AC input power supply

- If the momentary power failure time is within 20ms, the system detects an AC down and suspends the operation processing. However, the system continues operations after the power comes back.
- If the momentary power failure time exceeds 20ms, the system either continues or initially starts operations depending on the power supply load. In case that the operation processing is continued, the system operates the same as when the momentary power failure time is within 20ms.

  Supplying the same amount of AC to both the power supply module and the input module (such as QX10) can prevent the sensor connected to the input module from being switched to the OFF status when the power supply turns off.

  Note, however, that if only the input module (such as QX10) is connected on the AC line, which is connected to the power supply, an AC down detection in the power supply module may be delayed due to the internal capacitor of the input module. To avoid this, connect a load of approx. 30mA per input module on the AC line.

  In the system operating with two redundant power supply modules, the system does not initially start operations when the momentary power failure exceeding 20ms occurs in only one of the input power supplies.

  The system, however, may initially start operations when the momentary power failure exceeding 20ms occurs simultaneously in both input power supplies.

(b)For DC input power supply

- If the momentary power failure time is within 10ms(*4), the system detects an 24VDC down and suspends the operation processing. However, the system continues operations after the power comes back.
- If the momentary power failure time exceeds 10ms(*4), the system either continues or initially starts operations depending on the power supply load. In case that the operation processing is continued, the system operates the same as when the momentary power failure time is within 10ms.

  (*4: This is the time when 24VDC is input. If the input is less than 24VDC, the time will be less than 10ms.)

*5: Inrush current

When power is switched on again immediately (within 5 seconds) after power-off, an inrush current of more than the specified value (2ms or less) may flow. Reapply power 5 or more seconds after power-off. When selecting a fuse and breaker in the external circuit, take account of the blowout, detection characteristics and above matters.

Table5.13 Power supply module specifications

Item		Performance Specifications
		A68P
Location		I/O module slot
Number of points occupied		2 slots occupied, 1 slot 16 points
Input voltage		100 to 120V AC $^{+10\%}_{-15\%}$ (85 to 132V AC)
		200 to 240V AC $^{+10\%}_{-15\%}$ (170 to 264V AC)
Input frequency		50/60Hz±5%
Max. input apparent power		95VA
Inrush current		20A, within 8ms
Rated output current	+15VDC	1.2A
	-15VDC	0.7A
Overcurrent protection[*8]	+15VDC	1.64A or more
	-15VDC	0.94A or more
Efficiency		65% or more
Power indicator		Power LED display (Normal: On (green), error: Off)
Power ON monitor output		Contact output
		Switched on if +15V DC output is +14.25V or higher or -15V DC output is -14.25V or lower.
		Min. contact switching load: 5V DC, 10mA Min. contact switching load: 264V AC (R load)
Terminal screw size		M3×0.5(0.02)×6(0.24)
Wire size		0.75 to 2mm^2 (18 to 14 AWG)
Soldreless terminal		V1.25 - 4, V2 - YS4A, V2 - S4, V2 - YS4A
External dimensions	H	250mm(9.84 inches)
	W	75.5mm(2.97 inches)
	D	121mm(4.76 inches)
Weight		0.9kg

*8: The overcurrent protection shuts off the +15VDC circuit if a current higher than the specified value flows in the circuit and:
- Both +15VDC and -15VDC are switched off if overcurrent has occurred at +15V; or
- -15VDC is switched off but +15V remains output if overcurrent has occuerred at -15V; and
- The power supply module LED is switched off or dimly lit due to 15VDC voltage drop.

If this device is activated, turn off the input power supply and eliminate the cause such as insufficient current capacity or short before restarting the system.

5.2.2 Selecting the power supply module

The power supply module is selected according to the total of current consumption of the base units, I/O modules, intelligent function module, special function module, and peripheral devices supplied by its power supply module.
For the internal current consumption of 5 VDC of the base unit, refer to CHAPTER 6.
For the internal current consumption of 5 VDC of the I/O modules, intelligent function module, special function module, and peripheral devices, refer to the Manuals of their respective modules.
For the devices obtained by a user, see the manual for the respective device.

(1) When the base unit is Q3□B, Q3□DB or Q6□B:

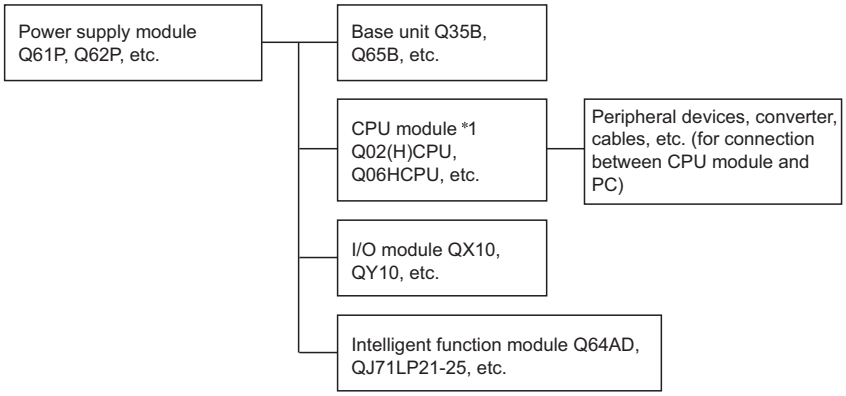


Figure 5.1 Modules and peripheral device that are powered by power supply module

*1: The CPU module is mounted on the main base unit.

Keep the current consumption of the base unit (Q3□B, Q3□DB, Q6□B) below the 5VDC rated output current of the Q series power supply module.

Table5.14 5VD rated output current

5VDC rated output current	Type
6.0A	Q61P-A1, Q61P-A2, Q61P, Q61P-D, Q63P
3.0A	Q62P
8.5A	Q64P, Q64PN

(a) Precaution on using the extension base unit (Q5□B)

When Q5□B is used, a power of 5VDC is supplied from the power supply module on the main base unit through an extension cable.

Pay attention to the following to use Q5□B.

- Select a power supply module of a proper 5VDC rated output current to be installed to the main base unit so that it will cover the current used by Q5□B.

  For example, if current consumption is 3.0A on the main base unit and 1.0A on Q5□B, any of the power supply modules shown in Table5.15 must be mounted on the main base unit.

Table5.15 5VD rated output current

5VDC rated output current	Type
6.0A	Q61P-A1, Q61P-A2, Q61P, Q61P-D, Q63P
8.5A	Q64P, Q64PN

- Because 5VDC is supplied to Q5□B through an extension cable, voltage is lowered in the extension cable.
  The power supply module and extension cable must be selected so that a voltage of 4.75VDC or more is supplied at the "IN" connector of Q5□B.
  For details of the voltage drop, refer to Section 6.1.5.

(b) Methods for reducing voltage drops

The following methods are effective to reduce voltage drops at the extension cables.

1) Changing the module loading positions

Load large current consumption modules on the main base unit.

Load small current consumption modules on the extension base unit (Q5□B).

2) Using short extension cables

The shorter the extension cable is, the smaller the resistance and voltage drops will be.

Use the shortest possible extension cables.

(2) When the base unit is Q3□SB:

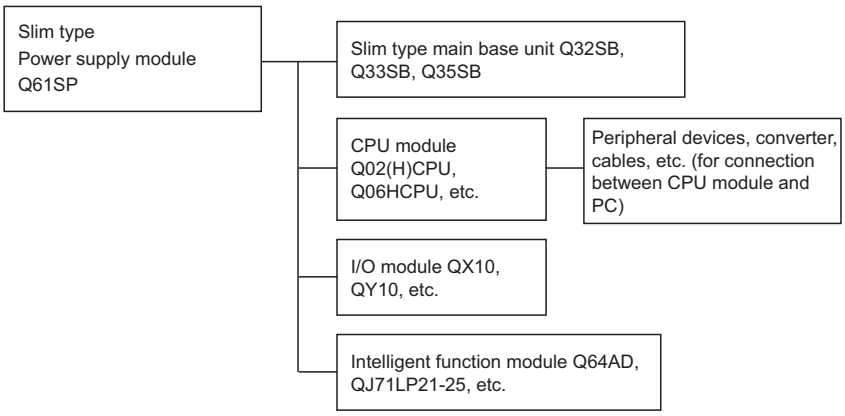


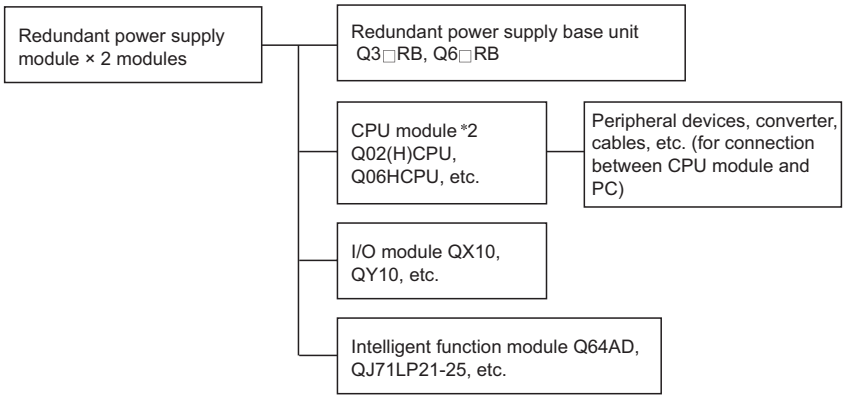
Figure 5.2 Modules and peripheral device that are powered by power supply module

Keep the current consumption of the slim type main base unit (Q3□SB) not exceeding the 5VDC rated output current of the slim type power supply module (Q61SP).

Table5.16 5VD rated output current

5VDC Rated output current	Type
2.0A	Q61SP

(3) When the base unit is Q3□RB or Q6□RB



*2: Mounted on the redundant main base unit (Q3□RB)

Figure 5.3 Modules and peripheral device that are powered by power supply module

Table5.17 5VD rated output current

5VDC rated output current	Type
8.5A	Q63RP Q64RP

Point

When a redundant power supply system is configured and one redundant power supply module has failed, the system is operated using the other redundant power supply module only during replacement of the failed redundant power supply module.

Therefore, keep the current consumption of the redundant power supply base unit (Q3☐RB/Q6☐RB/Q6☐WRB) within the 5VDC rated output current (8.5A) for one redundant power supply module.

(a) Cautions for using the extension base unit (Q5□B)

When Q5□B is used, a power of 5VDC is supplied from the redundant power supply module on the redundant power main base unit (Q3□RB) through an extension cable.

Pay attentions to the following to use Q5□B.

- Keep the sum of the current consumption on Q3□RB and Q5□B not exceeding the 5VDC rated output current for one redundant power supply module.
- Because 5VDC is supplied to Q5□B through an extension cable, voltage drop occurs in the extension cable.
  Select an appropriate extension cable so that a voltage of 4.75VDC or more is supplied at the "IN" connector of Q5□B.
  For details of the voltage drop, refer to Section 6.1.5.

(b) Methods for reducing voltage drops

The following methods are effective to reduce voltage drops at the extension cables.

1) Changing the module mounting positions

Mount a module with large current consumption on the redundant power main base unit (Q3□RB).

Mount small current consumption modules on the extension base unit (Q5□B).

2) Using short extension cables

The shorter the extension cable is, the smaller the resistance and voltage drops are.

Use the shortest possible extension cables.

(4) When the base unit is QA1S6□B:

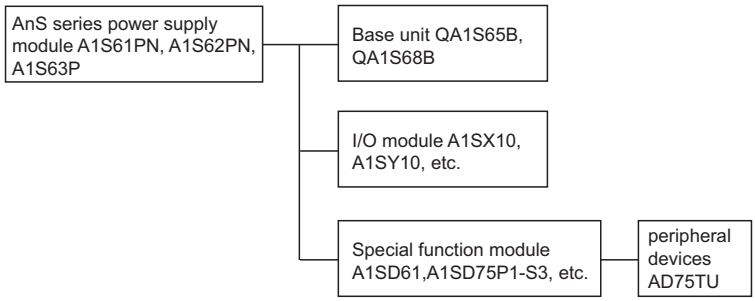


Figure 5.4 Modules and peripheral device that are powered by power supply module

Select the power supply module also in consideration of the current consumption of the peripheral devices connected to the special function module.

For example, when the AD75TU is connected to the AD75P1-S3, the current consumption of the AD75TU must also be taken into account.

(5) When the base unit is QA6□B:

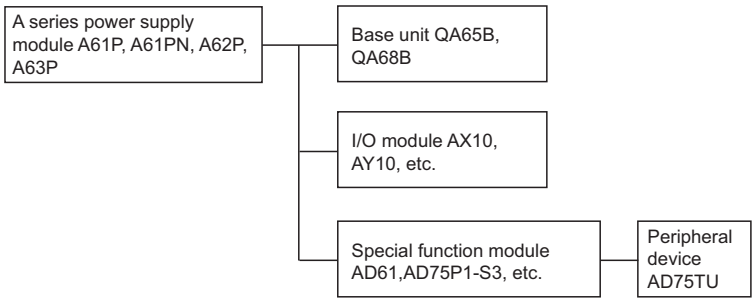


Figure 5.5 Modules and peripheral device that are powered by power supply module

Select the power supply module also in consideration of the current consumption of the peripheral devices connected to the special function module.
For example, when the AD75TU is connected to the AD75P1-S3, the current consumption of the AD75TU must also be taken into account.

5.2.3 Life detection power supply module

The Life detection power supply module estimates its remaining life internally and indicates the life. The remaining life of the module can be checked by the LIFE LED located on the front of the module and on/off of the $\overline{\text{LIFE OUT}}$ terminals.

(1) LED indication and module status during operation

Table5.18 indicates the LED indication and module status during operation.

Table5.18 LED indication and module status

LED		$\overline{\text{LIFE OUT}}$ terminal	Module
POWER	LIFE		
Off	Off	Off	• Power supply module failure • AC power is not input • Power failure (including momentary power failure for 20ms or more)
On (green)	On (green)	On	• Normal operation
On (green)	On (orange)		• Normal operation (Remaining life approx. 50%)*1
On (green)	Flash (orange) (On for 5 sec. and off for 1 sec.)	Off	• Normal operation (Remaining life approx. 1 year)*1 Replacement of the module is recommended
On (green)	Flash (orange) (At intervals of half a sec.)		• Normal operation (Remaining life approx. 6 months)*1
On (green)	Off		• Life expired
On (green)	On (red)	Turns off and on three times at intervals of 1 second and then off	• Ambient temperature is out of range (Ambient temperature is exceeding the specification)
On (green)	Flash (red)(At intervals of 1 sec.)		• Function failure (Normal processing is not available due to a failure of the life diagnostics circuit in the module)
On (green)	Off		• Ambient temperature is out of range (Ambient temperature is exceeding the specification and also the life detection function has stopped.)
On (orange)	Off	Off	• Watchdog timer error in the module

*1: The remaining life of the module varies depending on the ambient temperature.
(If the ambient temperature rose by 10°C, the remaining life of the module will be shortened by half.)

(2) Monitoring module life by using the $\overline{\text{LIFE OUT}}$ terminal

The module life can be monitored in either of the following way by using outputs of the $\overline{\text{LIFE OUT}}$ terminal

- Connecting the terminal to an external display device
- Obtaining the output status into an input module and monitoring it by GOT

(a) Connecting the terminal to an external display device

Connecting the $\overline{\text{LIFE OUT}}$ terminal allows indication of the remaining life of the module to an external display, device such as external LED, by turning it off when the life is one year or less.

When the external display device turned off, the remaining life can be checked by the LIFE LED of the Q61P-D located in the control panel.

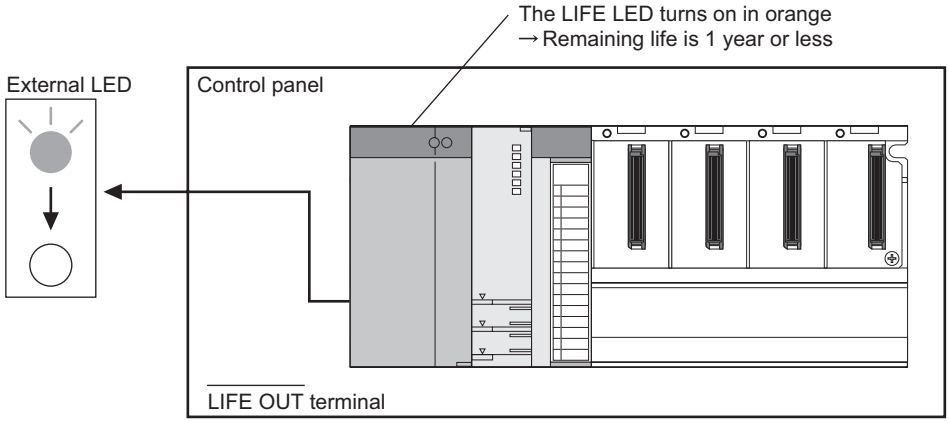


Figure 5.6 When connecting to an external display device

(b) Obtaining the output status into an input module and monitoring it by GOT

Obtaining the $\overline{\text{LIFE OUT}}$ terminal status into an input module allows monitoring of the module remaining life in a sequence program.

The following indicates how to monitor the remaining life of the power supply module in the sequence program by using GOT.

1) System configuration

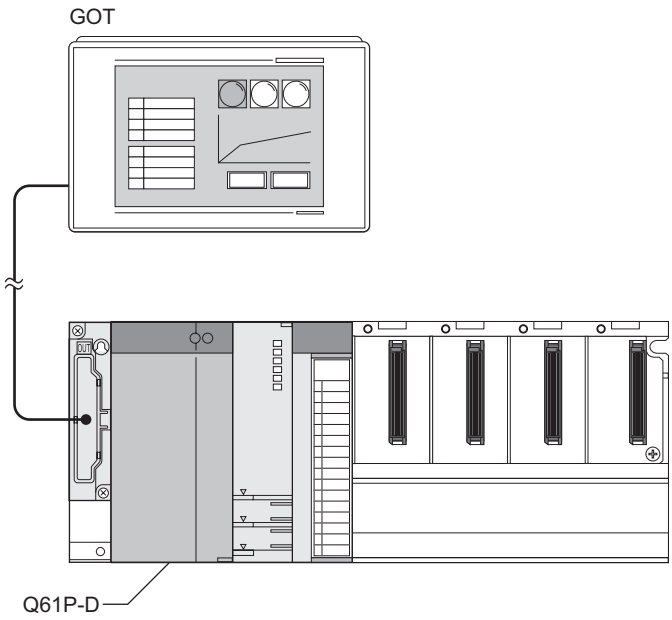


Figure 5.7 When obtaining into an input module

Table5.19 I/O assignment

Model name	Start XY
Q02CHPU	-
QX40	0000_H

2) Conditions of a program

Table5.20 and Table5.21 indicate devices used in a program for monitoring the module life.

Table5.20 Devices used by user

Sinal	Device	Function
Monitoring clear command	X0F	Resets the life monitoring processing
Life warning signal	M11	Turns on when the remaining life of the Q61P-D is one year or less
Error signal	M12	Turns on when the life detection function of the Q61P-D is faulty

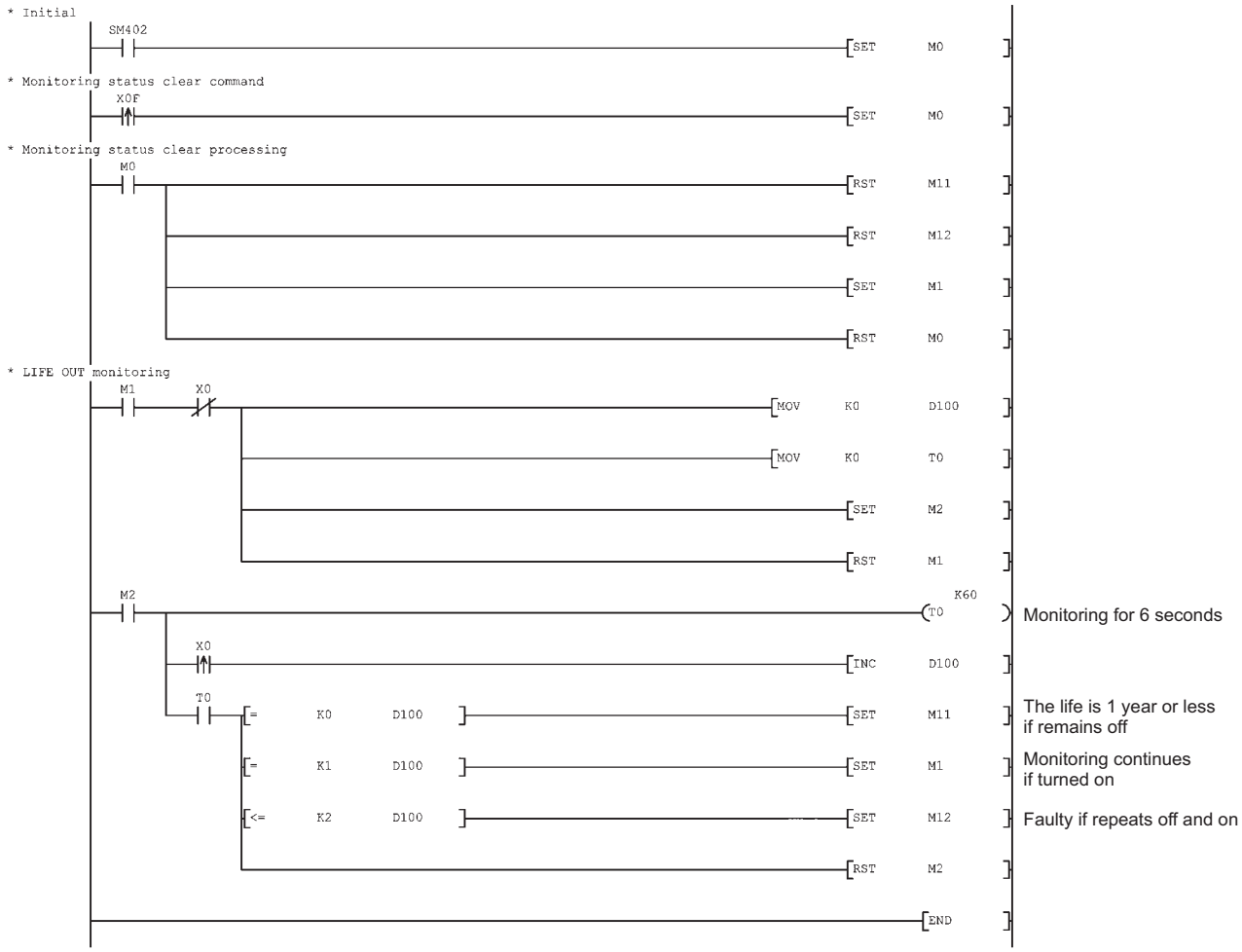
Table5.21 Devices used by program

Signal	Device	Function
LIFE OUT signal	X00	LIFE OUT terminal status of the Q61P-D
Monitoring clear request	M0	An internal signal for resetting the life monitoring processing
Monitoring start flag	M1	An internal signal for detecting offs of the LIFE OUT terminal
Time monitoring flag	M2	An internal signal for counting ons and offs of the LIFE OUT terminal
ON/OFF monitoring timer	T0	Ons and offs of the LIFE OUT terminal are counted while this timer is enabled (6 seconds)
ON/OFF counter	D100	Counts ons and offs of the LIFE OUT terminal

Point

When the life detection function of the Q61P-D is faulty, the LIFE OUT terminal repeats on and off for three times when the module is started.
Depending on the system, this behavior (ons and offs) of the LIFE OUT terminal may not be obtained to the input module due to delay of the sequence program start after the Q61P-D has started.
In this program example, M11 turns on even though the life detection function is faulty when powered on since the remaining life is regarded as one year.

3) Program example



5.2.4 Precaution when connecting the uninterruptive power supply

Be sure of the following terms when connecting the Q series CPU module system to the uninterruptive power supply (hereinafter referred to as UPS):

Use the online UPS or line interactive UPS with a voltage distortion rate of 5% or less.
For the off-line system UPS, use Mitsubishi Electric's F Series UPS (serial number P or later) (Ex.: FW-F10-0.3K/0.5K).
Do not use any off-line system UPS other than the F series mentioned above.

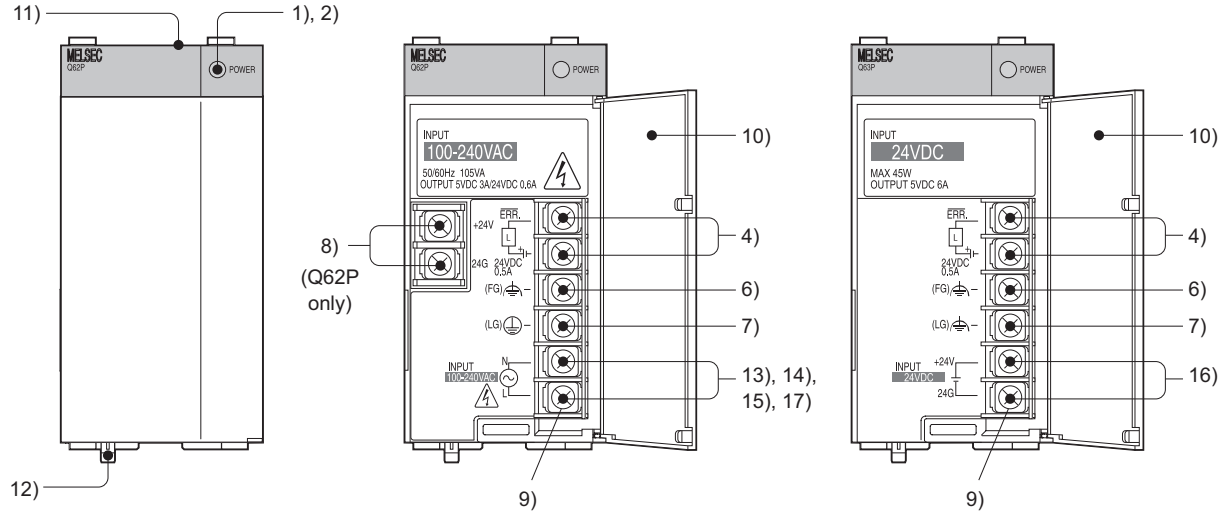
5.2.5 Precautions on power supply capacity

The Q64RP and Q64P automatically recognize the rated input voltage waveform to switch the input voltage between 100VAC and 200VAC.
Select the power supply for the Q64RP/Q64P power supply module, considering the power supply capacity.
(Reference: At least twice as much as the current consumption)
If the power supply of insufficient capacity is applied, the power supply module might fail when 200VAC power is supplied.

5.3 Part Names and Settings

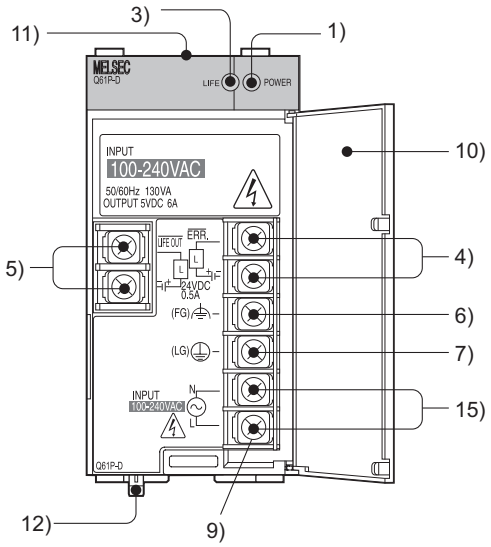
This section describs part names of each power supply module.

■ Q61P-A1 (100 to 120VAC input, 5VDC 6A output)
■ Q61P-A2 (200 to 240VAC input, 5VDC 6A output)
■ Q61P (100 to 240VAC input, 5VDC 6A output)
■ Q62P (100 to 240VAC input, 5VDC 3A/24VDC 0.6A output)
■ Q63P (24VDC input, 5VDC 6A output)
■ Q64P (100 to 120VAC/200 to 240VAC input, 5VDC 8.5A output)
■ Q64PN (100 to 240VAC input, 5VDC 8.5A output)



Q61P-A1, Q61P-A2, Q61P, Q62P, Q64P, Q64PN　　Q63P

■ Q61P-D (100 to 240VAC input, 5VDC 6A output)



■ Q61SP (100 to 240VAC input, 5VDC2A output)

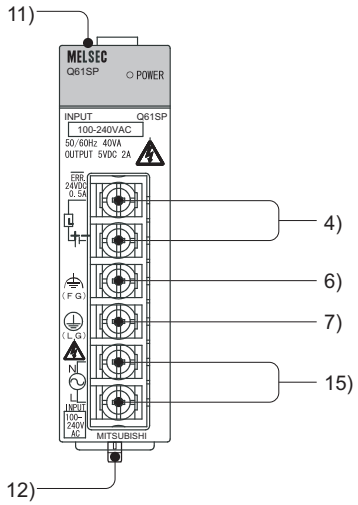


Figure 5.8 Power supply module

Table5.22 Part Names

No.	Name	Application
1)	POWER LED*2	On (green): Normal (5VDC output, momentary power failure within 20ms) Off: • AC power supply is on but the power supply module is out of order. (5VDC error, overload, internal circuit failure, or blown fuse) • AC power supply is not on. • Power failure (including an momentary power failure of 20ms or more)
2)	POWER LED	On (green): Normal (5VDC output, momentary power failure within 10ms) Off: • DC power supply is on but the power supply module is out of order. (5VDC error, overload, internal circuit failure, or blown fuse) • DC power supply is not on. • Power failure (including an momentary power failure of 10ms or more)
3)	LIFE LED	On (green) : When operation has started On (orange) : Remaining life of the module approx. 50% Flash(orange) : • On for 5 seconds and off for 1 second: Module remaining life is approx. 1 year • At intervals of 0.5 seconds: Module remaining life is approx. 6 months Off: • Module life expired. (Turns on red for 1 second after power-on) • Ambient temperature is out of range (Ambient temperature of the module is exceeding the specification and also the life detection function is stopped.) On (red) : Ambient temperature out of range (Ambient temperature of the module is exceeding the specification) Flash(red) : Function failure
4)	$\overline{\text{ERR.}}$ terminal	• Turns on when the entire system operates normally. • Turns off (opens) when the AC power is not supplied, a stop error (including reset) occurs in the CPU module, or the fuse is blown. • In a multiple CPU system, turns off when a stop error occurs in any of the CPU modules. Normally off when mounted on a extension base unit.
5)	$\overline{\text{LIFE OUT}}$ terminal	• Output signal of the terminal turns off (opens) when the life is detected. (Applicable only when the remaining life is 1 year or less.) • Flicker-OFF (opens) when the life diagnostics error (including detection error)is detected.*1 • Flicker-OFF (opens) when the ambient temperature is detected out of range.*1 • Output signal of the terminal turns off (opens) when the watchdog timer error is detected in the module. The above operations are available when the module is mounted on an extension base unit.
6)	FG terminal	Ground terminal connected to the shield pattern of the printed circuit board.
7)	LG terminal	Grounding for the power supply filter. For AC input, it has one-half the potential of the input voltage.
8)	+24V, 24G terminals	Used to supply 24VDC power to inside the output module (using external wiring).
9)	Terminal screw	M3.5×7 screw
10)	Terminal cover	Protective cover of the terminal block
11)	Module fixing screw hole	Used to secure the module to the base unit. M3×12 screw (user-prepared) (Tightening torque range : 0.36 to 0.48N•m)
12)	Module mounting lever	Used to mount the module onto the base unit.

*1: Flicker-OFF indicates that the output signal of the terminal turns off and on at intervals of one second for three times and then off (opens).

*2: When using the Q61P-D in the system configured with an extension base unit, the POWER LED of the Q61P-D on the extension base unit may turn on in dull red when the module is turned off. Note that this does not indicate an error.

Table5.22 Part Names

No.	Name	Application
13)	Power input terminals	Power input terminals for Q61P-A1 and connected to a 100VAC power supply.
14)	Power input terminals	Power input terminals for Q61P-A2 and connected to a 200VAC power supply.
15)	Power input terminals	Power input terminals for Q61P, Q61P-D, Q61SP, Q62P, Q64PN and connected to a power supply of 100VAC to 200VAC.
16)	Power input terminals	Power input terminals for Q63P and connected to a 24VDC power supply.
17)	Power input terminals	Power input terminals for Q64P and connected to a 100VAC/200VAC power supply.

Point

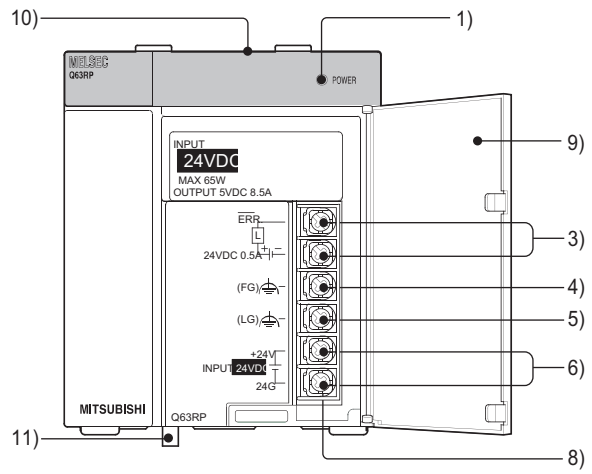
- The Q61P-A1 is dedicated for inputting a voltage of 100 VAC.
  Do not input a voltage of 200 VAC into it or trouble may occur on the Q61P-A1.

Table5.23 Precaution

Power module type	Supply power voltage	
	100VAC	200VAC
Q61P-A1	Operates normally.	Power supply module causes trouble.
Q61P-A2	Power supply module does not cause trouble. CPU module cannot be operated.	Operates normally.

- Q64P automatically switches the input range 100/200VAC.
  Therefore, it is not compatible with the intermediate voltage (133 to 169VAC).
  The CPU module may not work normally if the above intermediate voltage is applied.
- Ground the LG and FG terminals to the protective ground conductor.
- When the Q61P-A1, Q61P-A2, Q61P-D, Q61P, Q62P, Q63P, Q64P or Q64PN is mounted on the extension base unit, a system error cannot be detected by the $\overline{\text{ERR.}}$ terminal. (The $\overline{\text{ERR.}}$ terminal is always off.)
- Cables for the $\overline{\text{ERR.}}$ contact and $\overline{\text{LIFE OUT}}$ contact must be up to 30m (98.43 feet) and installed in the control panel.

■Q63RP



■Q64RP

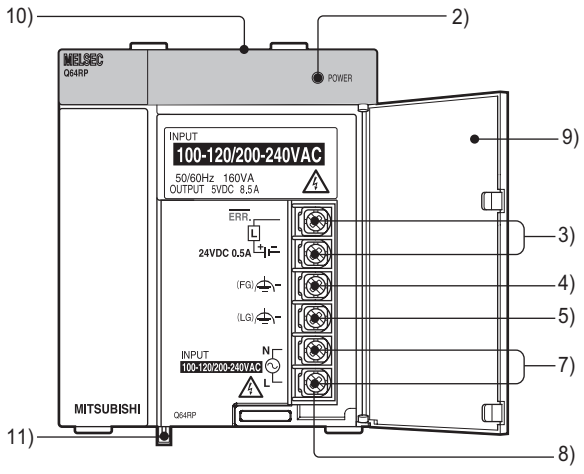


Figure 5.9 Power supply module

Table5.24 Part Names

No.	Name	Application
1)	POWER LED*1	On (green) : Normal operation (5V DC output, momentary power failure of 20ms or less) On (red)*1 : DC power is input but the Q63RP is faulty. (5V DC error, overload, or internal circuit failure) Off : DC power not input, blown fuse, power failure (including momentary power failure of 10ms or more)
2)	POWER LED*1	On (green) : Normal (5V DC output, momentary power failure within 20ms) On (red) : AC power supply is on but Q64RP is out of order. (5V DC error, overload, or internal circuit failure) Off : AC power supply is not on, blown fuse, power failure (including momentary power failure of 10ms or more)
3)	$\overline{\text{ERR.}}$ terminal	<When power supply is mounted on redundant power main base unit (Q3☐RB)> • Turns on when the system on the redundant power main base unit operates normally. • Turns off (open) when the Q63RP fails, the DC power supply is not input, a CPU module stop error (including a reset) occurs, or the fuse is blown. • Turns off (open) when a stop error occurs in any of the CPU modules in a multiple CPU system. <When power supply is mounted on redundant power extension base unit (Q6☐RB) or redundant type extension base unit (Q6☐WRB)> • Turns on when the Q63RP operates normally. • Turns off (open) when the Q63RP fails, the DC power supply is not input, or the fuse is blown.
4)	FG terminal	Ground terminal connected to the shield pattern of the printed circuit board.
5)	LG terminal	Grounding for the power supply filter. The potential of Q64RP terminal is 1/2 of the input voltage.
6)	Power input terminals	Connect direct current of 24 VDC with the power input terminal.
7)	Power input terminals	Power input terminals and connected to a 100VAC/200VAC power supply.
8)	Terminal screw	M3.5×7 screw

No.	Name	Application
9)	Terminal cover	Protective cover of the terminal block
10)	Module fixing screw hole	Screw hole for securing a module to the base unit. M3×12 screw (user-prepared) (Tightening torque : 0.36 to 0.48N•m)
11)	Module mounting lever	Used to mount a module on the base unit.

*1: Although the POWER LED turns on in red for a moment immediately after the power supply is turned on or off, redundant power supply modules is not faulty.

Point

- Q64RP automatically switches the input range 100/200VAC.
  Therefore, it is not compatible with the intermediate voltage (133 to 169VAC).
  The CPU module may not work normally if the above intermediate voltage is applied.
- Supply power to redundant power supply modules from separate power sources (a redundant power supply system).
- Ground the LG and FG terminals to the protective ground conductor.

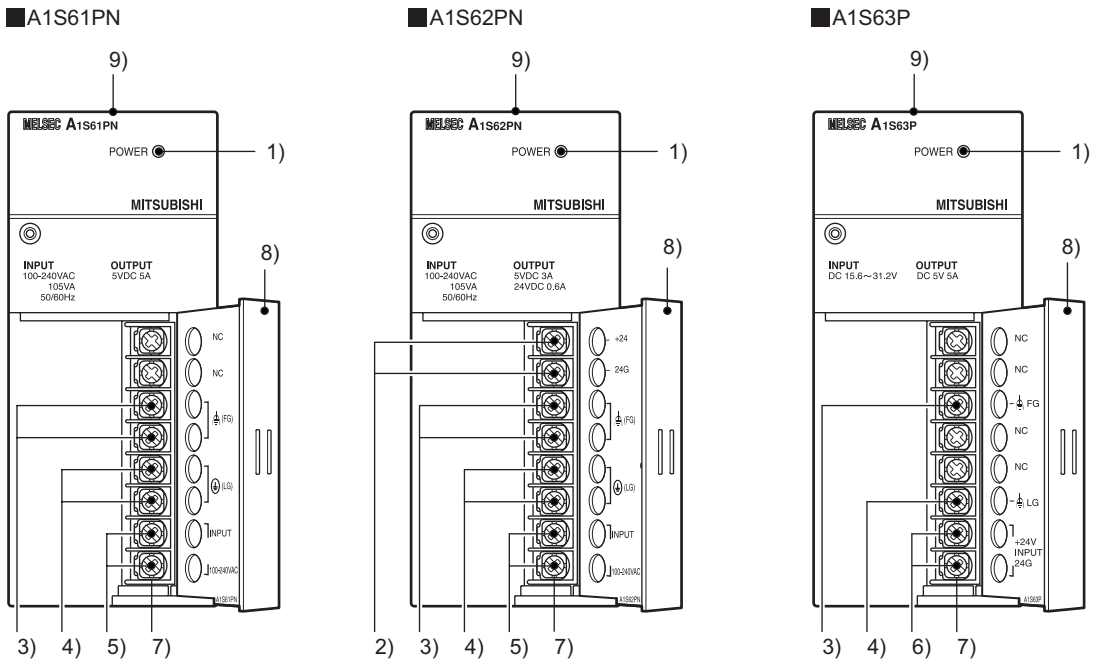


Figure 5.10 Power supply module

Table5.25 Part names

No.	Name	Application
1)	POWER LED	On (green): Normal (5VDC output, momentary power failure within 20ms) Off : • AC power supply is on but the power supply module is out of order. (5VDC error, overload, internal circuit failure, or fuse blown) • AC power supply is not on • Power failure (including an momentary power failure of 20ms or more)
2)	+24V, 24G terminals	Used to supply 24VDC power to inside the output module (using external wiring).
3)	FG terminals	Ground terminal connected to the shield pattern of the printed circuit board.
4)	LG terminals	Grounding for the power supply filter. The potential of A1S61PN or A1S62PN terminal is 1/2 of the input voltage.
5)	Power input terminals	Used to connect a 100VAC to 200VAC power supply.
6)	Power input terminals	Used to connect a 24VDC power supply.
7)	Terminal screw	M3.5×7 screw
8)	Terminal cover	Protective cover of the terminal block
9)	Module fixing screw hole	Used to secure the module to the base unit. (M4 screw, tightening torque : 0.66 to 0.89N•m)

Point

- Do not wire to those terminals for which NC is stamped on the terminal block.
- Ground the LG and FG terminals to the protective ground conductor.

CHAPTER6 BASE UNIT AND EXTENSION CABLE

This chapter describes the specifications of the extension cables for the base units (the main base unit, slim type main base unit, redundant power main base unit, extension base unit, redundant power extension base unit and redundant type extension base unit) used in the programmable controller system and the specification standards of the extension base unit.

6.1 Base Unit

6.1.1 Extension base units that can be combined with the main base unit

This section introduces extension base units that can be combined with the main base unit.

For details of the CPU module and power supply modules, refer to the following.

CPU module : ☞ CHAPTER 4

Power supply modules : ☞ CHAPTER 5

For the details of system configuration, refer to CHAPTER 2.

Table6.1 Extension base unit that can be combined with the main base unit

Main base unit	Extension base unit					
	Q52B Q55B	Q63B Q65B Q68B Q612B	Q68RB	Q65WRB*1	QA1S65B QA1S68B	QA65B QA68B*2
Q00JCPU Q00UJCPU	○	○	×	×	×	×
Q33B Q35B Q38B Q312B	○	○	×	○	○	○
Q32SB Q33SB Q35SB	×	×	×	×	×	×
Q38RB	○	×	○	○	×	×
Q38DB Q312DB	○	○	×	×	×	×

○: Combination available ×: Combination not available

*1: Applicable only in a redundant system.

*2: The same specifications are applied to the QA6ADP+A6□B.

Point

Slim type main base units do not have a connector for extension cable. Therefore, connection of extension base units and GOT by bus is not available.

6.1.2 Specification table

The base unit is a unit to which the CPU module, power supply module, I/O module and/or intelligent function module are installed.
Section 6.1.2 to Section 6.1.5 provide the specifications and other information on the base unit.

(1) Main base unit

Table6.2 Main base unit specifications

Item		Type			
		Q33B	Q35B	Q38B	Q312B
Number of I/O modules installed		3	5	8	12
Possibility of extension		Extendable			
Applicable module		Q series modules			
5 VDC internal current consumption		0.11A		0.12A	0.13A
Mounting hole size		M4 screw hole or ϕ4.5 hole (for M4 screw)			
External dimensions	H	98mm (3.86 inches)			
	W	189mm (7.44 inches)	245mm (9.65 inches)	328mm (12.92 inches)	439mm (17.28 inches)
	D	44.1mm (1.74 inches)			
Weight		0.21kg	0.27kg	0.36kg	0.47kg
Attachment		Mounting screw M4×14 4 pieces*1 (DIN rail mounting adapter is sold separately)			
DIN rail mounting adapter type		Q6DIN3	Q6DIN2	Q6DIN1	

*1: The 5 base mounting screws are included with the Q38B and Q312B that have 5 base mounting holes.

(2) Slim type main base unit

Table6.3 Slim type main base unit specifications

Item		Type		
		Q32SB	Q33SB	Q35SB
Number of I/O modules installed		2	3	5
Possibility of extension		Not extendable		
Applicable module		Q series modules		
5 VDC internal current consumption		0.09A		0.10A
Mounting hole size		M4 screw hole or ϕ4.5 hole (for M4 screw)		
External dimensions	H	98mm (3.86 inches)		
	W	114mm (4.49 inches)	142mm (5.59 inches)	197.5mm (7.78 inches)
	D	18.5mm (0.73 inches)		
Weight		0.12kg	0.15kg	0.21kg
Attachment		Mounting screw M4×12 4 pieces (DIN rail mounting adapter is sold separately)		
DIN rail mounting adapter type		Q6DIN3		

(3) Redundant power main base unit

Table6.4 Redundant power main base unit specifications

Item		Type
		Q38RB
Number of I/O modules installed		8
Possibility of extension		Extendable
Applicable module		Q series modules
5 VDC internal current consumption		0.12A
Mounting hole size		M4 screw hole or ϕ4.5 hole (for M4 screw)
External dimensions	H	98mm (3.86 inches)
	W	439mm (17.28 inches)
	D	44.1mm (1.74 inches)
Weight		0.47kg
Attachment		Mounting screw M4×14 5 pieces (DIN rail mounting adapter is sold separately)
DIN rail mounting adapter type		Q6DIN1

(4) Multiple CPU high speed main base unit

Table6.5 Multiple CPU high speed main base unit specifications

Item		Type	
		Q38DB	Q312DB
Number of I/O modules installed		8	12
Possibility of extension		Extendable	
Applicable module		Q series modules	
5 VDC internal current consumption		0.23A	0.24A
Mounting hole size		M4 screw hole or ϕ4.5 hole (for M4 screw)	
External dimensions	H	98mm (3.86 inches)	
	W	328mm (12.92 inches)	439mm(17.30 inches)
	D	44.1mm (1.74 inches)	
Weight		0.41kg	0.54kg
Attachment		Mounting screw M4× 14, 5 pieces (DIN rail mounting adapter is sold separately)	
DIN rail mounting adapter type		Q6DIN1	

(5) Extension base unit (Type not requiring power supply module)

Table6.6 Extension base unit (Type not requiring power supply module) specifications

Item		Type	
		Q52B	Q55B
Number of I/O modules installed		2	5
Possibility of extension		Extendable	
Applicable module		Q series modules	
5 VDC internal current consumption		0.08A	0.10A
Mounting hole size		M4 screw hole or ϕ4.5 hole (for M4 screw)	
External dimensions	H	98mm (3.86 inches)	
	W	106mm (4.17 inches)	189mm (7.44 inches)
	D	44.1mm (1.74 inches)	
Weight		0.14kg	0.23kg
Attachment		Mounting screw M4×14, 4 pieces (DIN rail mounting adapter is sold separately)	
DIN rail mounting adapter type		Q6DIN3	

(6) Extension base unit (Type requiring power supply module)

Table6.7 Extension base unit (Type requiring power supply module) specifications

Item		Type							
		Q63B	Q65B	Q68B	Q612B	QA1S65B	QA1S68B	QA65B	QA68B
Number of I/O modules installed		3	5	8	12	5	8	5	8
Possibility of extension		Extendable							
Applicable module		Q series modules				AnS series modules		A series module	
5 VDC internal current consumption		0.11A		0.12A	0.13A	0.12A			
Mounting hole size		M4 screw hole or ϕ4.5 hole (for M4 screw)				M5 screw hole or ϕ5.5 hole (for M5 screw)			
External dimensions	H	98mm (3.86 inches)				130mm (5.12 inches)		250mm (9.84 inches)	
	W	189mm (7.44 inches)	245mm (9.65 inches)	328mm (12.92 inches)	439mm (17.28 inches)	315mm (12.41 inches)	420mm (16.55 inches)	352mm (13.86 inches)	466mm (18.34 inches)
	D	44.1mm (1.74 inches)				51.2mm (2.02 inches)		46.6mm (1.83 inches)	
Weight		0.23kg	0.28kg	0.38kg	0.48kg	0.75kg	1.00kg	1.60kg	2.00kg
Attachment		Mounting screw M4×14 , 4 pieces *2 (DIN rail mounting adapter sold separately)				Mounting screw M5×25 4 pieces		----	
DIN rail mounting adapter type		Q6DIN3	Q6DIN2	Q6DIN1		----	----	----	----

*2: The 5 base mounting screws are included with the Q68B and Q612B that have 5 base mounting holes.

(7) Redundant power extension base unit

Table6.8 Redundant power extension base unit specifications

Item		Type
		Q68RB
Number of I/O modules installed		8
Possibility of extension		Extendable
Applicable module		Q series modules
5 VDC internal current consumption		0.12A
Mounting hole size		M4 screw hole or ϕ4.5 hole (for M4 screw)
External dimensions	H	98mm (3.86 inches)
	W	439mm (17.28 inches)
	D	44.1mm (1.74 inches)
Weight		0.49kg
Attachment		Mounting screw M4×14 , 5 pieces (DIN rail mounting adapter is sold separately)
DIN rail mounting adapter type		Q6DIN1

(8) Redundant extension base unit

Table6.9 Redundant extension base unit specifications

Item		Type
		Q65WRB
Number of I/O modules installed		5
Possibility of extension		Extendable
Applicable module		Q series modules
5 VDC internal current consumption		0.16A
Mounting hole size		M4 screw hole or ϕ4.5 hole (for M4 screw)
External dimensions	H	98mm (3.86 inches)
	W	439mm (17.28 inches)
	D	44.1mm (1.74 inches)
Weight		0.52kg
Attachment		Mounting screw M4×14 , 5 pieces (DIN rail mounting adapter is sold separately)
DIN rail mounting adapter type		Q6DIN1

6.1.3 Part names

The part names of the base unit are described below.

(1) Main base unit (Q33B, Q35B, Q38B, Q312B)

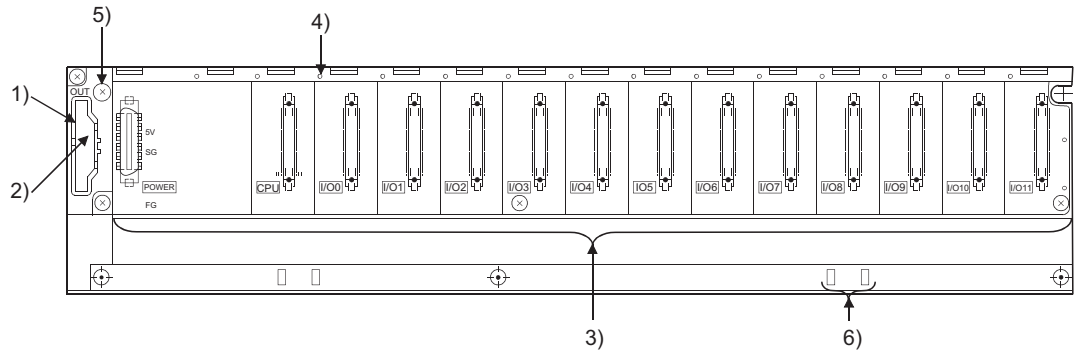


Figure 6.1 Main base unit (Q33B, Q35B, Q38B, Q312B)

Table6.10 Part names

No.	Name	Application
1)	Extension cable connector	Connector for connecting an extension cable (for signal communications with the extension base unit)
2)	Base cover	Protective cover of extension cable connector. Before an extension cable is connected, the area of the base cover surrounded by the groove under the word "OUT" on the base cover must be removed with a tool such as nippers.
3)	Module connector	Connector for installing the Q series power supply module, CPU module, I/O modules, and intelligent function module. To the connectors located in the spare space where these modules are not installed, attach the supplied connector cover or the blank cover module (QG60) to prevent entry of dirt.
4)	Module fixing screw hole	Screw hole for fixing the module to the base unit. Screw size: M3×12
5)	Base mounting hole	Hole for mounting this base unit onto the panel such as a control panel (for M4 screw)
6)	DIN rail adapter mounting hole	Hole for mounting DIN rail adapter

(2) Slim type main base unit (Q32SB, Q33SB, Q35SB)

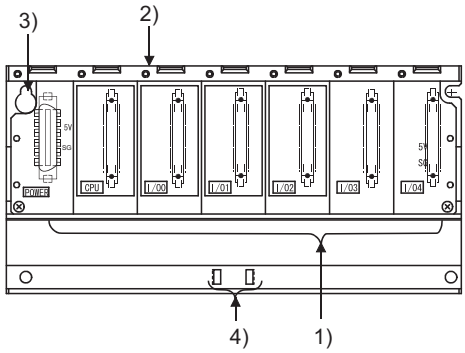


Figure 6.2 Slim type main base unit (Q32SB, Q33SB, Q35SB)

Table6.11 Part names

No.	Name	Application
1)	Module connector	Connector for installing the Q series power supply module, CPU module, I/O modules, and intelligent function module. To the connectors located in the spare space where these modules are not installed, attach the supplied connector cover or the blank cover module (QG60) to prevent entry of dirt.
2)	Module fixing screw hole	Screw hole for fixing the module to the base unit. Screw size: M3×12
3)	Base mounting hole	Hole for mounting this base unit onto the panel such as a control panel (for M4 screw)
4)	DIN rail adapter mounting hole	Hole for mounting DIN rail adapter

(3) Redundant power main base unit (Q38RB)

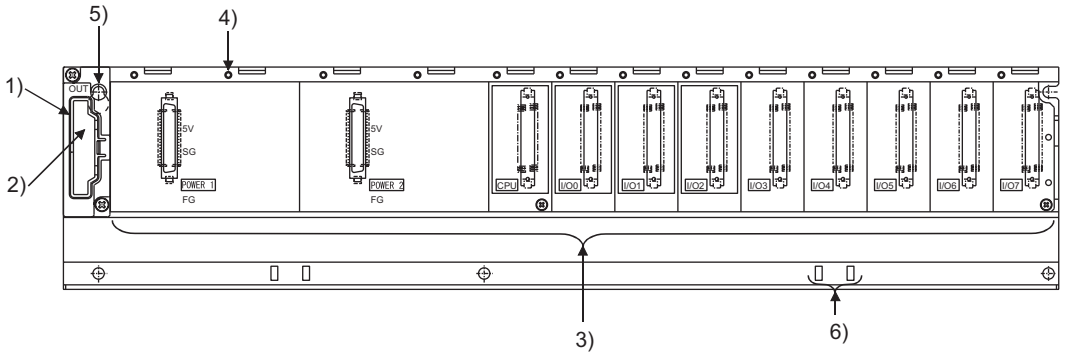


Figure 6.3 Redundant power main base unit (Q38RB)

Table6.12 Part names

No.	Name	Application
1)	Extension cable connector	Connector for connecting an extension cable (for signal communications with the extension base unit)
2)	Base cover	Protective cover of extension cable connector. Before an extension cable is connected, the area surrounded by the groove under the word "OUT" must be removed with a tool such as a flat head screwdriver.
3)	Module connector	Connector for connecting a redundant power supply module, CPU module, I/O module and intelligent function module To the connectors unused, attach the supplied connector cover or the blank cover module (QG60) to prevent entry of dirt.
4)	Module fixing screw hole	Screw hole for fixing the module to the base unit. Screw size: M3×12
5)	Base mounting hole	Hole for mounting this base unit onto the panel such as a control panel (for M4 screw)
6)	DIN rail adapter mounting hole	Hole for mounting DIN rail adapter

(4) Multiple CPU high speed main base unit (Q38DB, Q312DB)

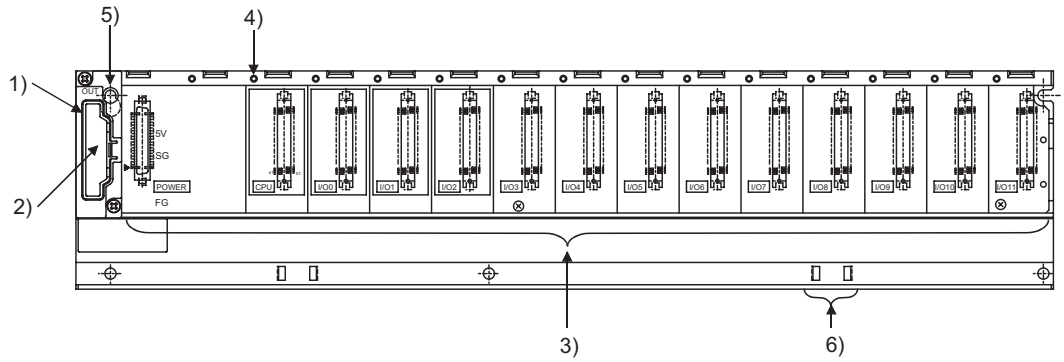


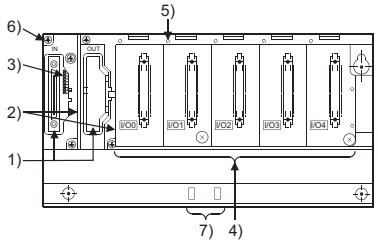
Figure 6.4 Multiple CPU high speed main base unit (Q38DB, Q312DB)

Table6.13 Part names

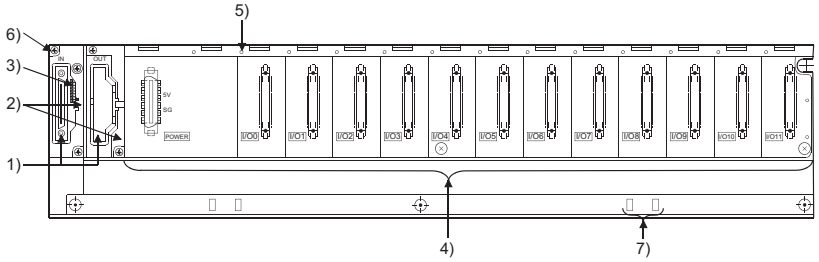
No.	Name	Application
1)	Extension cable connector	Connector for connecting an extension cable (for signal communications with the extension base unit)
2)	Base cover	Protective cover of extension cable connector. Before an extension cable is connected, the area of the base cover surrounded by the groove under the word "OUT" on the base cover must be removed with a tool such as nippers.
3)	Module connector	Connector for installing the Q series power supply module, CPU module, I/O modules, and intelligent function module. To the connectors located in the spare space where these modules are not installed, attach the supplied connector cover or the blank cover module (QG60) to prevent entry of dirt.
4)	Module fixing screw hole	Screw hole for fixing the module to the base unit. Screw size: M3×12
5)	Base mounting hole	Hole for mounting this base unit onto the panel such as a control panel (for M4 screw)
6)	DIN rail adapter mounting hole	Hole for mounting DIN rail adapter

(5) Extension base unit (Q5□B, Q6□B, QA1S6□B, QA6□B)

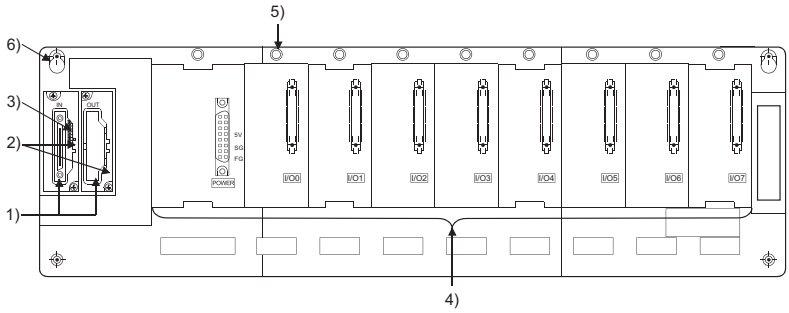
Q52B,Q55B



Q63B,Q65B,Q68B,Q612B



QA1S65B,QA1S68B



QA65B, QA68B

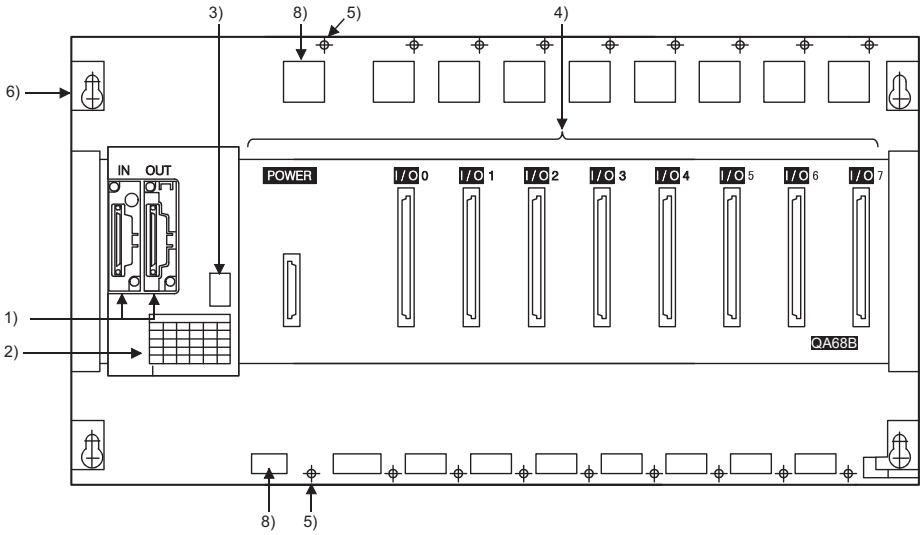


Figure 6.5 Extension base unit (Q5□B, Q6□B, QA1S6□B, QA6□B)

Table6.14 Part names

No.	Name	Application
1)	Extension cable connector	Connector for connecting an extension cable (for signal communications with the main base unit or other extension base unit)
2)	Base cover	Protective cover of extension cable connector. Before connecting an extension cable, the part under OUT on the base cover must be removed with a tool such as a flat blade screwdriver.
3)	Base No. setting connector	Connector for setting the number of bases of the extension base unit. (☞ Section 6.1.4)
4)	Module connector	Connectors for installing the power supply module, I/O modules, and intelligent function module/ special function module. To those connectors located in the spare space where these modules are not installed, apply the supplied connector cover or the blank cover module to prevent entry of dirt. Blank cover module applicable to Q52B, Q55B, Q63B,Q65B, Q68B and Q612B: QG60 Blank cover module applicable to QA1S65B and QA1S68B: A1SG60 Blank cover module applicable to QA6BB and QA68B:AG60
5)	Module fixing screw hole	Screw hole for fixing the module to the base unit. Q52B, Q55B, Q63B,Q65B,Q68B and Q612B.....Screw size: M3×12 QA1S6B, QA1S68B, QA65B and QA68B.....Screw size: M4×12
6)	Base mounting hole	Hole for mounting this base unit on the panel such as a control panel. Q52B, Q55B, Q65B,Q68B and Q612B .....For M4 screw QA1S6B, QA1S68B, QA65B and QA68B.....For M5 screw
7)	DIN rail adapter mounting hole	DIN rail adapter mounting hole.
8)	Module fixing hole	Cut out to accept projection and hook at rear of modules.

(6) Redundant power extension base unit (Q68RB)

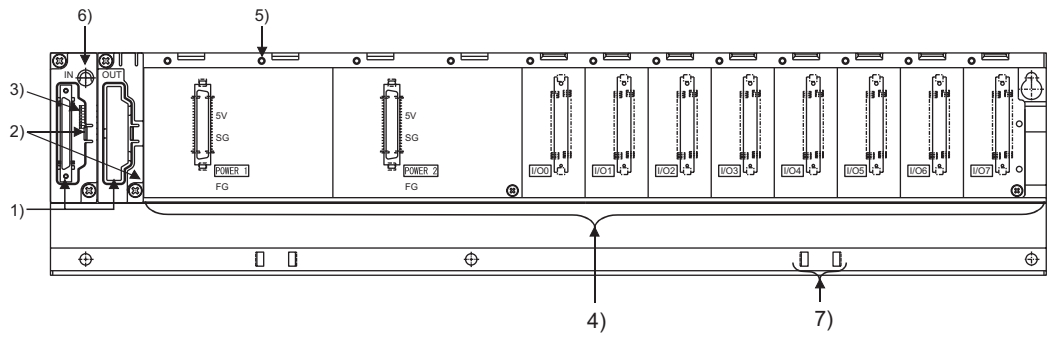


Figure 6.6 Redundant power extension base unit (Q68RB)

Table6.15 Part names

No.	Name	Application
1)	Extension cable connector	Connector for connecting an extension cable (for signal communications with the redundant power main base unit or other extension base unit)
2)	Base cover	Protective cover of extension cable connector. Before connecting an extension cable, the part under OUT on the base cover must be removed with a tool such as a flat blade screwdriver.
3)	Base No. setting connector	Connector for setting the number of bases of redundant power extension base units. (☞ Section 6.1.4)
4)	Module connector	Connector for installing a redundant power supply module, I/O module and intelligent function module. To the connectors unused, attach the supplied connector cover or the blank cover module (QG60) to prevent entry of dirt.
5)	Module fixing screw hole	Screw hole for fixing the module to the base unit. Screw size: M3×12
6)	Base mounting hole	Hole for mounting this base unit on the control panel. (For M4 screw)
7)	DIN rail adapter mounting hole	DIN rail adapter mounting hole.

(7) Redundant extension base unit (Q65WRB)

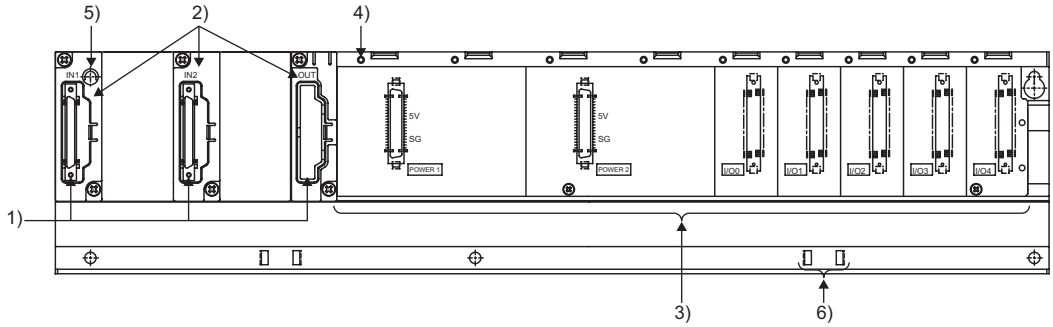


Figure 6.7 Redundant extension base unit (Q65WRB)

Table6.16 Part names

No.	Name	Application
1)	Extension cable connector	Connector for connecting an extension cable (for signal communications with the redundant system of the main base unit)
2)	Base cover	Protective cover of extension cable connector. Before connecting an extension cable, the part under OUT on the base cover must be removed with a tool such as a flat blade screwdriver.
3)	Module connector	Connector for installing a redundant power supply module, I/O module and intelligent function module. To the connectors unused, attach the supplied connector cover or the blank cover module (QG60) to prevent entry of dirt.
4)	Module fixing screw hole	Screw hole for fixing the module to the base unit. Screw size: M3×12
5)	Base mounting hole	Hole for mounting this base unit on the control panel. (For M4 screw)
6)	DIN rail adapter mounting hole	DIN rail adapter mounting hole.

6.1.4 Setting extension bases

The base number setting method of each extension base unit to be used is described below.

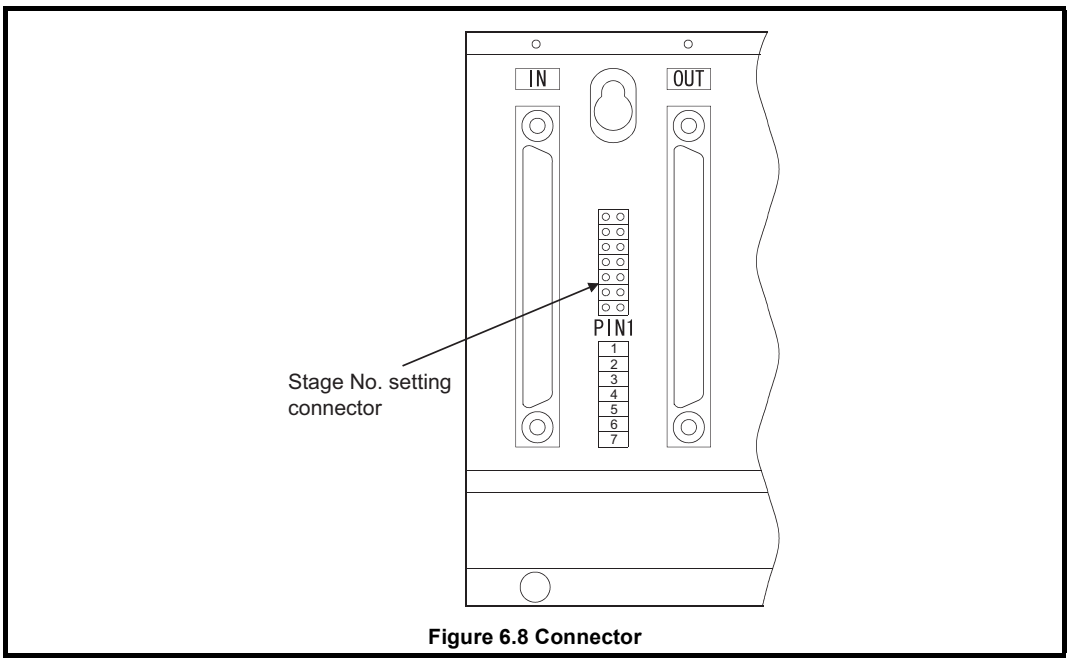
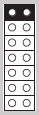
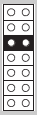


Figure 6.8 Connector

Table6.17 Setting of base number for extension base units

CPU module	Number setting for extension bases						
	Extension 1	Extension 2	Extension 3	Extension 4	Extension 5	Extension 6	Extension 7
							
Q02(H)CPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU, Q03UD(E)CPU, Q04UD(E)HCPU, Q06UD(E)HCPU, Q10UD(E)HCPU, Q13UD(E)HCPU, Q20UD(E)HCPU, Q26UD(E)HCPU	Setting available						
Q12PRHCPU*2, Q25PRHCPU*2	Setting not available *3	Setting available*4					
Q00JCPU, Q00UJCPU	Setting available		Setting prohibited *1				
Q00CPU, Q00UCPU, Q01CPU, Q01UCPU, Q02UCPU	Setting available				Setting prohibited *1		

*1: If these base numbers are set, "BASE LAY ERROR" (error code: 2010) occurs.

*2: The extension base unit can be connected only when the serial number (first five digits) of the Redundant CPU is "09012" or later and the redundant system is configured.
The extension base unit cannot be connected when the serial number (first five digits) of the Redundant CPU module is "09011" or earlier.

*3: Connect the Q6☐WRB to the first extension base. Since the Q6☐WRB is fixed to the first extension base, base number setting is not required.

*4: The Q6☐WRB cannot be connected to the second extension base or later bases. Use the Q6☐RB for the second extension base or later bases.

Point

- For the base number setting connector, set the number matched with the extension base number.
  Do not set the same base number at two or more positions or do not fail to set a number. A miss-input or miss-output may occur.
- In case of using the QA6ADP+A5☐B/A6☐B, set the same base number to both the base number setting connector of the A5☐B/A6☐B and that of the QA6ADP.

6.1.5 Guideline for extension base units

Since the extension base unit (Q5□B) is supplied with 5VDC from the power supply module on the main base unit, a voltage drop occurs at extension cables.
Improper I/O may be provided if the specified voltage (4.75VDC or higher) is not supplied to the "IN" connector of the Q5□B.
When using the Q5□B, make sure that the "IN" connector of the Q5□B is supplied with 4.75VDC or higher.
And it is recommend to connect it with the shortest possible extension cable right after connecting the main base unit, so as to minimize the effects of voltage drop.

(1) When only the Q5□B is connected to the extension base unit

(a) Selection condition

4.75VDC or higher should be supplied to the "IN" connector of the Q5□B in the final extension base.

(b) How to calculate voltage to "IN" connector

The 5VDC output voltage of the power supply module on the main base unit is set to at least 4.90VDC.
Therefore, the Q5□B can be used if the voltage drop is 0.15VDC or lower (4.9VDC - 4.75VDC = 0.15VDC).

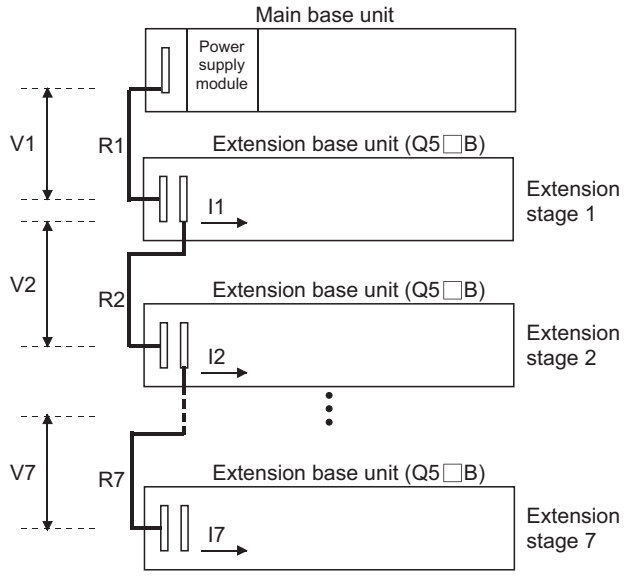


Figure 6.9 System configuration

Table6.18 Extension cable conductor resistance

Extension cable type	Extension cable conductor resistance
QC05B	0.044Ω
QC06B	0.051Ω
QC12B	0.082Ω
QC30B	0.172Ω
QC50B	0.273Ω
QC100B	0.530Ω

Table6.19 Symbol

Symbol	Description
V1	Voltage drop at the extension cable between the main base unit and extension base unit (Q5□B)
Vn	Voltage drop at the extension cable between the extension base unit (Q5□B) (extension base n-1) and extension base unit (Q5□B) (extension base n)
R1	Extension cable resistance between the main base unit and extension base unit (Q5□B)
Rn	Extension cable resistance between the extension base unit (Q5□B) (extension base n-1) and extension base unit (Q5□B) (extension base n)
I1 to I7	5VDC current consumption among extension base 1 to 7 *1

*1: Sum total of current consumed by Q5□B and currents consumed by the I/O, intelligent function modules loaded on the Q5□B.
The symbols including "I" (I1 to I7) vary with the modules loaded on the Q5□B. For details of the symbol, refer to the User's manuals of the module used.

Table6.20 List for calculating voltage drops occurring at extension cables in system consisting of extensions 1 to 7

Q5□B Installation position	Voltage drop at extension cable on corresponding extension unit							Sum total of voltage drops to "IN" connector of Q5□B (V)
	V1	V2	V3	V4	V5	V6	V7	
Extension 1	R1•I1	----	----	----	----	----	----	V=V1
Extension 2	R1 (I1+I2)	R2•I2	----	----	----	----	----	V= V1+V2
Extension 3	R1 (I1+I2+I3)	R2 (I2+I3)	R3•I3	----	----	----	----	V=V1+V2+V3
Extension 4	R1 (I1+I2+I3+ I4)	R2 (I2+I3+I4)	R3 (I3+I4)	R4•I4	----	----	----	V=V1+V2+V3+V4
Extension 5	R1 (I1+I2+I3+ I4+I5)	R2 (I2+I3+I4+ I5)	R3 (I3+I4+I5)	R4 (I4+I5)	R5•I5	----	----	V=V1+V2+V3+V4+ V5
Extension 6	R1 (I1+I2+I3+ I4+I5+I6)	R2 (I2+I3+I4+ I5+I6)	R3 (I3+I4+I5+ I6)	R4 (I4+I5+I6)	R5 (I5+I6)	R6•I6	----	V=V1+V2+V3+V4+ V5+V6
Extension 7	R1 (I1+I2+I3+ I4+I5+I6+ I7)	R2 (I2+I3+I4+ I5+I6+I7)	R3 (I3+I4+I5+ I6+I7)	R4 (I4+I5+I6+ I7)	R5 (I5+I6+I7)	R6 (I6+I7)	R7•I7	V=V1+V2+V3+V4+ V5+V6+V7

The voltage supplied to "IN" connector of the Q5□B in the final extension reaches 4.75 VDC or higher on the condition that the sum total of voltage drop to "IN" connector of Q5□B (V) is 0.15V or lower.

(2) When the Q6□B is connected between the main base unit and the Q5□B

(a) Selection condition

4.75VDC or higher should be supplied to the "IN" connector of the Q5□B in the final extension.

(b) How to calculate voltage to "IN" connector

The 5VDC output voltage of the power supply module on the main base unit is set to at least 4.90VDC.

Therefore, the Q5□B can be used if the voltage drop is 0.15VDC or lower (4.9VDC -4.75VDC = 0.15VDC).

[When the Q5□B is connected to Extension 2.]

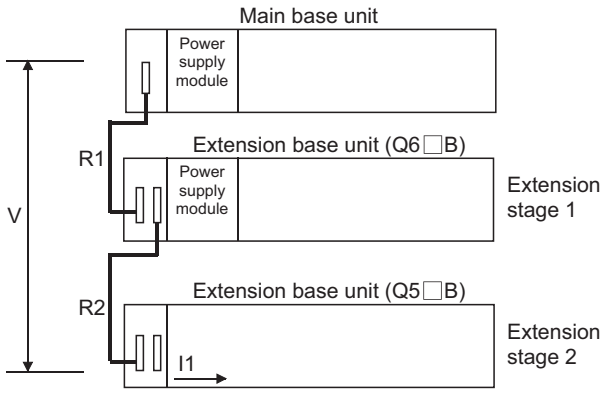


Figure 6.10 System configuration

Table6.21 Extension cable conductor resistance

Extension cable type	Extension cable conductor resistance
QC05B	0.044Ω
QC06B	0.051Ω
QC12B	0.082Ω
QC30B	0.172Ω
QC50B	0.273Ω
QC100B	0.530Ω

Table6.22 Symbol

Symbol	Description
V	Voltage drop at the extension cable between the main base unit and extension base unit (Q5□B)
In	5VDC current consumption when the extension base unit (Q5□B) is used as Extension n+1, n = 1 to 6, n: Extension number of extension base unit (Q6□B) connected (Sum total of current consumed by Q5□B and currents consumed by the I/O, intelligent function modules loaded on the Q5□B.)
Rn	Extension cable resistance between the main base unit and the extension base unit (Q6□B) or the extension base unit (Q6□B) and the extension base unit (Q6□B)
R_{n+1}	Extension cable resistance between the extension base unit (Q6□B) and extension base unit (Q5□B)

Table6.23 List for calculating voltage drops occurring at extension cables when connecting Q6□B between main base unit and Q5□B

Position of extension base unit		Voltage drop caused by extension cable from the main base unit to the Q5□B IN connector (V)
Q6□B	Q5□B	
Extension1	Extension 2	V=(R1+R2)I1
Extension 1, Extension 2	Extension 3	V=(R1+R2+R3)I2
Extension 1 to 3	Extension 4	V=(R1+R2+R3+R4)I3
Extension 1 to 4	Extension 5	V=(R1+R2+R3+R4+R5)I4
Extension 1 to 5	Extension 6	V=(R1+R2+R3+R4+R5+R6)I5
Extension 1 to 6	Extension 7	V=(R1+R2+R3+R4+R5+R6+R7)I6

The voltage supplied to the "IN" connector of the Q5□B reaches 4.75 VDC or later on the condition that the voltage drop (V) at the extension cable between the main base unit and Q5□B is 0.15 VDC or lower.

(3) When the GOT is bus-connected

(a) Selection condition

4.75VDC or later should be supplied to the "IN" connector of the Q5□B.

(b) How to calculate voltage to "IN" connector

The 5VDC output voltage of the power supply module on the main base unit is set to at least 4.90VDC.

Therefore, the Q5□B can be used if the voltage drop is 0.15VDC or lower (4.9VDC -4.75VDC = 0.15VDC).

Table6.24 Extension cable conductor resistance

Extension cable type	Extension cable conductor resistance
QC05B	0.044Ω
QC06B	0.051Ω
QC12B	0.082Ω
QC30B	0.172Ω
QC50B	0.273Ω
QC100B	0.530Ω

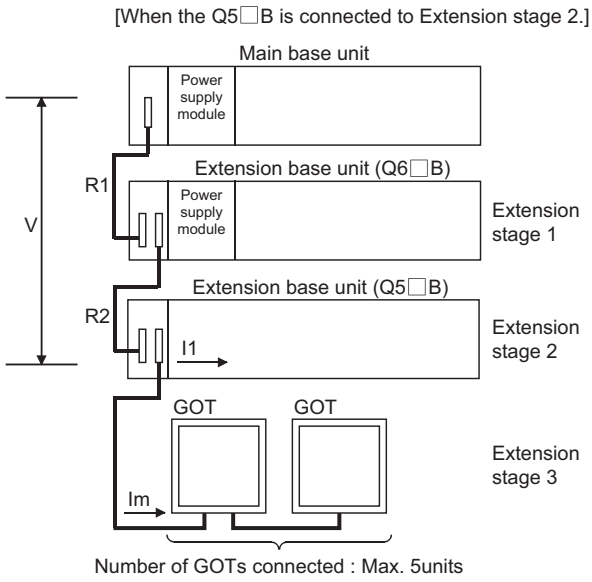


Figure 6.11 System configuration

Table6.25 Symbol

Symbol	Description
V	Voltage drop at the extension cable between the main base unit and extension base unit (Q5☐B)
In	5VDC current consumption when the extension base unit (Q5☐B) is used as Extension n+1, n = 1 to 5, n: Extension number of the extension base unit (Q6☐B) connected (Sum total of current consumed by Q5☐B and currents consumed by I/O, intelligent function modules loaded on the Q5☐B)
Im	5VDC current consumption of the GOT (current consumption per GOT is 255mA) • Im = 255×c (c: Number of GOTs connected (c: 1 to 5))
Rn	Extension cable resistance between the main base unit and extension base unit (Q6☐B) or the extension base unit (Q6☐B) and extension base unit (Q6☐B)
R_{n+1}	Extension cable resistance between the extension base unit (Q6☐B) and extension base unit (Q5☐B)

Table6.26 List of calculated voltage drop caused by the extension in bus connection of GOT

Position of extension base unit		Number of bases for GOT bus connection	Voltage drop caused by extension cable from the main base unit to the Q5☐B IN connector (V)
Q6☐B	Q5☐B		
Extension 1	Extension 2	Extension 3	V=(R1+R2)(I1+Im)
Extension 1, Extension 2	Extension 3	Extension 4	V=(R1+R2+R3)(I2+Im)
Extension 1 to 3	Extension 4	Extension 5	V=(R1+R2+R3+R4)(I3+Im)
Extension 1 to 4	Extension 5	Extension 6	V=(R1+R2+R3+R4+R5)(I4+Im)
Extension 1 to 5	Extension 6	Extension 7	V=(R1+R2+R3+R4+R5+R6)(I5+Im)

The voltage supplied to the "IN" connector of the Q5□B reaches 4.75 VDC or later on the condition that the voltage drop (V) at the extension cable between the main base unit and Q5□B is 0.15 VDC or lower.

Point

When connecting GOT by extension cable that is 13.2 m (43.31ft) or longer, the bus extension connector box A9GT-QCNB is required.
Since the A9GT-QCNB is supplied with 5VDC from the power supply module loaded on the main base unit, 30mA must be added to "Im" as the current consumption of the A9GT-QCNB.
For details of the method for GOT bus connection, refer to the following.

☞ GOT-A900 Series User's Manual (Connection)
☞ GOT1000 Series Connection Manual

6.2 Extension Cable

The extension cables are connected to transfer signals between a main base unit and an extension base unit or between extension base units.
For specifications of the extension cables, refer to Section 6.2.1.

6.2.1 Specification table

Table6.27 Extension cable specifications

Item	Type					
	QC05B	QC06B	QC12B	QC30B	QC50B	QC100B
Cable length	0.45m	0.6m	1.2m	3.0m	5.0m	10.0m
Conductor resistance value	0.044Ω	0.051Ω	0.082Ω	0.172Ω	0.273Ω	0.530Ω
Weight	0.15kg	0.16kg	0.22kg	0.40kg	0.60kg	1.11kg

Point

When the extension cables are used in combination, overall distance of the combined cable must be 13.2 m (43.28 feet) or less.

CHAPTER7 MEMORY CARD AND BATTERY

This chapter describes the specifications of the memory cards and the batteries for the Q Series CPU Module and how to handle them.

7.1 Memory Card

The memory card Note7.1 is used for storing programs and file registers as well as storing debugged data by the tracing function.
It is also used when handling a file register that exceeds the number of points storable in the standard RAM.
(☞ Section 4.1)

7.1.1 List of usable memory cards

Three types of memory cards(SRAM card, Flash card, and ATA card) are available. The memory cards usable for each CPU module are shown in Table7.1.

Table7.1 Memory cards and applicable CPU modules

Memory card *1		CPU module					
		Q00JCPU Q00CPU Q01CPU	Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	Q02PHCPU Q06PHCPU Q12PHCPU Q25PHCPU	Q12PRHCPU Q25PRHCPU	Q00UJCPU Q00UCPU Q01UCPU	Q02UCPU Q03UD(E)CPU Q04UD(E)HCPU Q06UD(E)HCPU Q10UD(E)HCPU Q13UD(E)HCPU Q20UD(E)HCPU Q26UD(E)HCPU
SRAM card	Q2MEM-1MBS	×	○	○	○	×	○
	Q2MEM-2MBS	×	○	○	○	×	○
	Q3MEM-4MBS	×	×	×	×	×	○
	Q3MEM-8MBS	×	×	×	×	×	○
Flash card	Q2MEM-2MBF	×	○	○	○	×	○
	Q2MEM-4MBF	×	○	○	○	×	○
ATA card	Q2MEM-8MBA	×	○	○	○	×	○
	Q2MEM-16MBA	×	○	○	○	×	○
	Q2MEM-32MBA	×	○	○	○	×	○

○: Usable ×: Not usable

*1: Only one memory card can be installed for each CPU module.

Point

Storable data vary depending on the type of memory card.
For the data that can be stored on memory cards, refer to the following.
☞ Manuals for the CPU module used (Function Explanation, Program Fundamentals)

Note7.1 Basic Universal
The Basic model QCPU, Q00U(J)CPU, Q01UCPU do not support memory cards.

7.1.2 Memory card specifications

The specifications of the memory card which can be used on the CPU module are compliant with those of the PCMCIA small PC card.

(1) SRAM card

Table7.2 SRAM card specifications

Item		Type			
		Q2MEM-1MBS	Q2MEM-2MBS	Q3MEM-4MBS	Q3MEM-8MBS
Memory size after format		1011.5K bytes	2034K bytes	4078K bytes	8172K bytes
Storable number of files		255	287	319	
Number of insertions and removals		5000 times			
External dimensions	H	45mm (1.77 inches)		74mm (2.91 inches)	
	W	42.8mm (1.69 inches)			
	D	3.3mm (0.13 inches)		8.1mm (0.32 inches)	
Weight		15g		30g	31g

(2) Flash card

Table7.3 Flash card specifications

Item		Type	
		Q2MEM-2MBF	Q2MEM-4MBF
Memory size		2035K bytes	4079K bytes
Storable number of files		288	
Number of insertions and removals		5000 times	
Number of writings		100000 times	
External dimensions	H	45mm (1.77 inches)	
	W	42.8mm (1.69 inches)	
	D	3.3mm (0.13 inches)	
Weight		15g	

(3) ATA card

Table7.4 ATA card specifications

Item		Type		
		Q2MEM-8MBA	Q2MEM-16MBA	Q2MEM-32MBA
Memory size after format		7982K bytes*1	15982K bytes*1	31854K bytes
Storable number of files		512		
Number of insertions and removals		5000 times		
Number of writings		1000000 times		
External dimensions	H	45mm (1.77 inches)		
	W	42.8mm (1.69 inches)		
	D	3.3mm (0.13 inches)		
Weight		15g		

*1: The size of ATA cards after formating will be as follows when the manufacuturer control number of the card is E or earlier.
Manufacturer control number E: Q2MEM-8MBA: 7948K bytes, Q2MEM-16MBA: 15948K bytes
Manufacturer control number D or earlier: Q2MEM-8MBA: 7940k bytes, Q2MEM-16MBA: 15932K bytes
For the manufacturer control number, refer to "POINT" in this section.

*2: Up to 511 files can be stored in the Universal model QCPU.

Point

When the ATA card is used, the value stored in the special register SD603 differs depending on the manufacturer control number and CPU module type.
When the CPU module is the Universal model QCPU, the ATA card size is stored in SD603 in units of K bytes.
When the module is not the Universal model QCPU, 8000, 16000, or 32000 is stored in SD603 and the value depends on the manufacturer control number and CPU module type

Table7.5 When the value stored in SD603 depending on manufacturer control number of the Q2MEM-8MBA

Manufacturer control No. and type of ATA card type		Value stored in special register SD603		
		Other than the Universal model QCPU		Universal model QCPU
		Serial No. (first 5 digits) is 09011 or earlier	Serial No. (first 5 digits) is 09012 or later	
"□□□" and "□□D□" or earlier	Q2MEM-8MBA	8000	8000	ATA card size (K bytes)
	Q2MEM-16MBA	16000	16000	
	Q2MEM-32MBA	32000	32000	
"□□E□"	Q2MEM-8MBA	16000	8000	
	Q2MEM-16MBA	16000	16000	
	Q2MEM-32MBA	32000	32000	
"□□F□" or later	Q2MEM-8MBA	32000	16000	
	Q2MEM-16MBA	32000	32000	
	Q2MEM-32MBA	32000	32000	

The manufacturer control number (the third digit from the left) of the ATA card is described in the label on the back of the ATA card. (Refer to Figure 7.1)
When character string including the manufacturer control number is 4digits, the third digit from the left is the manufacturer control number, and when it is 3 digits, the manufacturer control number is "B".

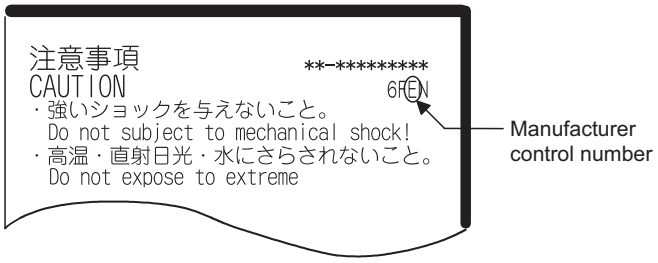


Figure 7.1 Label on the back of ATA card

7.1.3 Part names of the memory card

The part names of the memory card are described below.

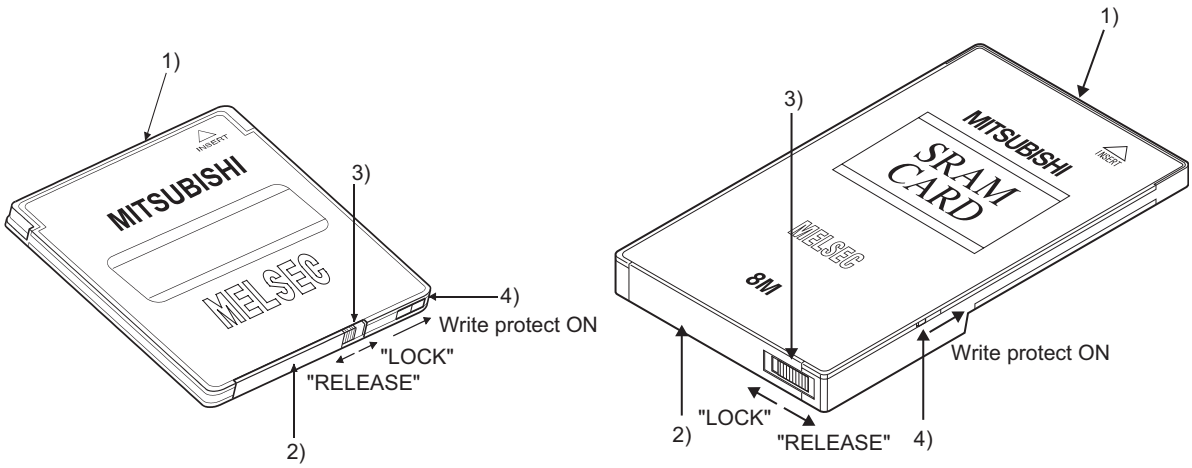


Figure 7.2 Memory card

Table7.6 Part names

No.	Name	Descriptions
1)	Connector area	Connector area connected to the CPU module
2)	Battery holder	Used to set the lithium battery for data backup of the SRAM memory (SRAM card only)
3)	Battery holder fixing switch *1	Switch for fixing the battery holder to the memory card. Locked at: LOCK position (write protect switch side) LOCK: Locked, RELEASE: Unlocked (SRAM card only)
4)	Write protect switch	Used to set write prohibit in the memory. Set to off by factory default. (SRAM card and Flash card only) On: Data write inhibited Off: Data write enabled

*1: The battery holder fixing switch is returned automatically from the RELEASE to LOCK position when the battery holder is disconnected.

7.1.4 Handling the memory card

(1) Formatting of memory card

Any SRAM or ATA card must have been formatted to use in the CPU module.

Since the SRAM or ATA card purchased is not yet formatted, format it using GX Developer before use.

(Formatting is not necessary for Flash cards.)

For formatting, refer to the following.

☞ GX Developer Operating Manual

Point

Do not format an ATA card other than by GX Developer.

(If formatted using format function of Microsoft® Windows® Operating System, the ATA card may not be usable in a CPU module.)

(2) Installation of SRAM card battery

A battery used to backup for power failure is supplied with the SRAM card.

Before using the SRAM card, install the battery.

Point

Note that the SRAM card memory is not backed up by the CPU module battery only.
Also, the program memory, standard RAM, and latch devices of the CPU module are not backed up by the battery installed on the SRAM card.

(3) Types of files which can be stored on memory card

For the types of the files that can be stored on each memory card, refer to the following.

☞ Manuals for the CPU module used (Function Explanation, Program Fundamentals)

7.1.5 Installing and removing a memory card

(1) For Q2MEM type memory card

(a) To install the memory card

Install the memory card into the CPU module, while paying attention to the orientation of the memory card. Insert the memory card securely into the connector until the height of the memory card reaches that of the memory card EJECT button.

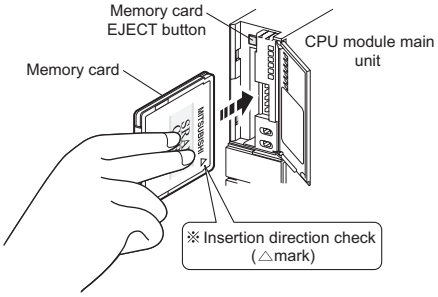


Figure 7.3 Install the memory card

(b) To remove the memory card

When removing the memory card from the CPU module, press the memory card EJECT button to pull out the memory card.

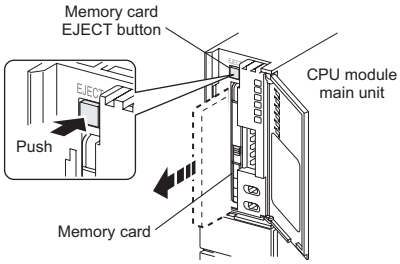


Figure 7.4 Remove the memory card

(2) For Q3MEM type memory card

(a) To install the memory card

When installing a memory card to the CPU module main body, install it according to the procedures in Figure 7.5, while paying attention to the direction of the memory card.

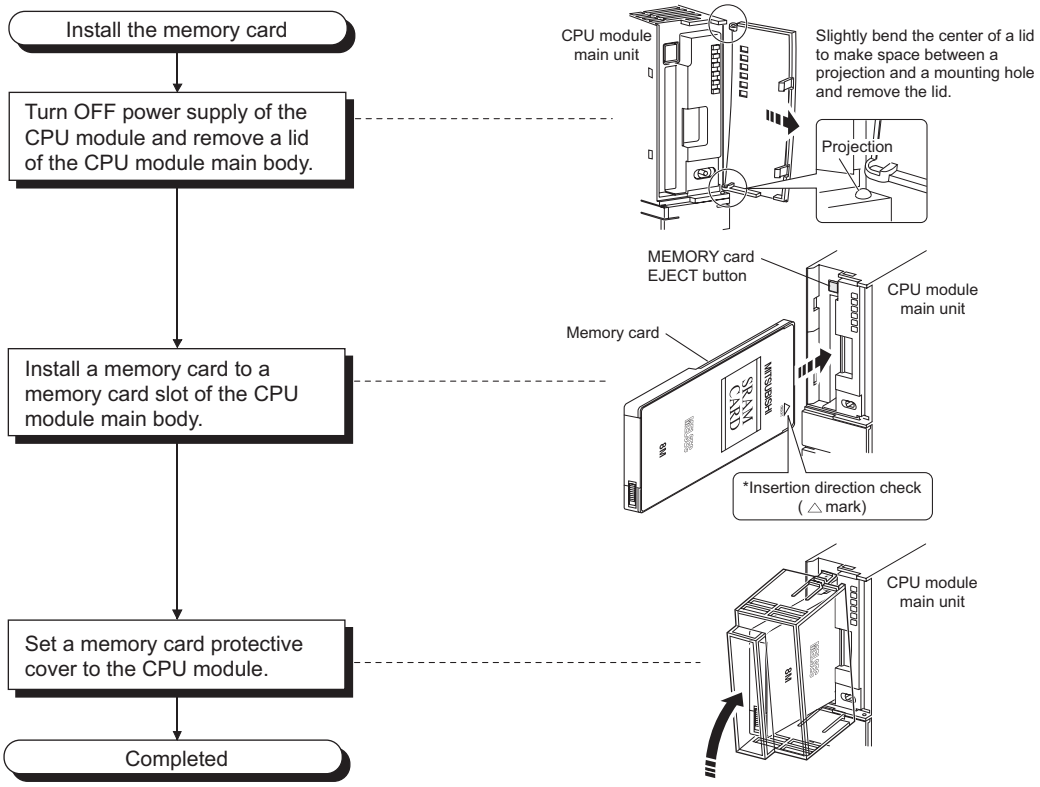


Figure 7.5 Installing a memory card

(b) To remove the memory card

When removing a memory card from the CPU module main body, remove a memory card protective cover and press the EJECT button to pull out the memory card.

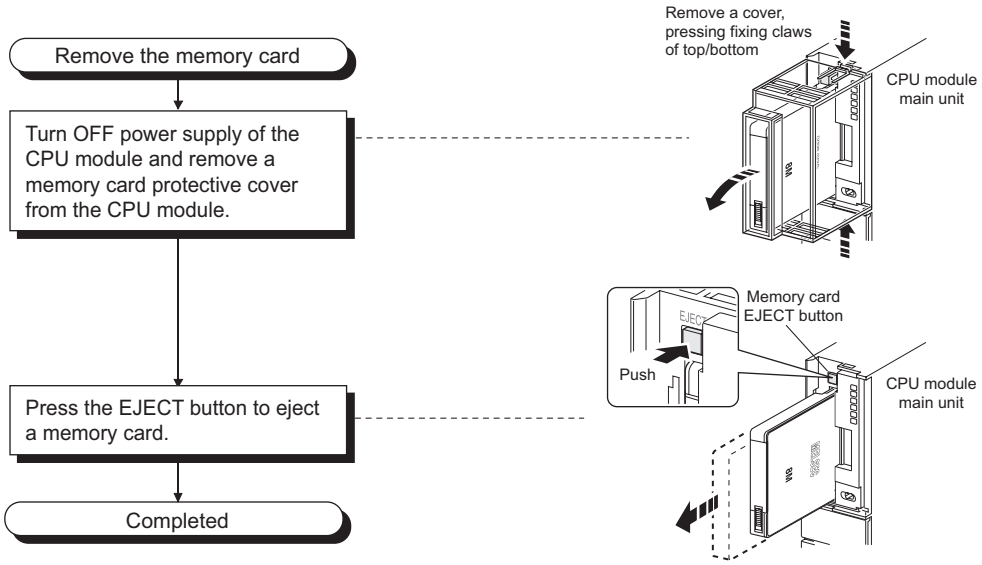


Figure 7.6 Removing a memory card

(3) To remove the memory card during power on

When removing the memory card, confirm that special relays "SM604" and "SM605" are off.

- The memory card cannot be removed while "SM604" is on because the CPU module is using the card.
- Turn off "SM605" if it is on.

When both "SM604" and "SM605" are off, remove the memory card according to the following procedure.

1) Turn on the special relay "SM609" using the sequence program or by the device test of GX Developer.
2) By monitoring GX Developer, check that the special relay "SM600" is turned off.
3) Remove the memory card.

SM600 (Memory card can be used)	:	The system is turned on when memory card is ready to be used.
SM604 (memory card is being used)	:	The system is turned on when the CPU module is using the memory card.
SM605 (memory card removal prohibited)	:	Turned on by the user to disable a removal of the memory card.

(4) To install the memory card while the power is on

1) Install the memory card.
2) Check that the special relay "SM600" is turned on by monitoring GX Developer etc., .

Point

The following precautions must be observed when inserting or removing the memory card while the power is on.

- Note that the data in the memory card may be damaged if the above mentioned procedures are not performed correctly.
  Also, if the CPU module operation for an error is set to "Stop" in the Parameters, the CPU module stops its operation upon the occurrence of “ICM.OPE.ERROR”.
- When the memory card is installed, the scanning time is increased by several 10ms max. 1 scan is only added, when the CPU module executes mount processing.
- Poor insertion of the memory card may result in “ICM.OPE.ERROR”.
- Using the tweezers below is effective when the memory card cannot be removed smoothly.

Table7.7 Tweezers for replacing memory card

Product	Model name
Plastic tweezers	NK-2539

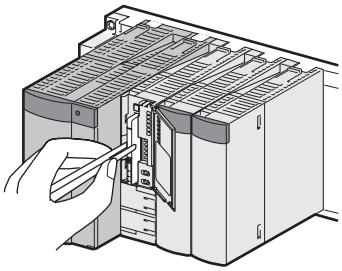


Figure 7.7 Memory card replacement using plastic tweezers

7.1.6 Specifications of the memory card battery

This section describes the specifications of the battery used for the memory card (SRAM card).

Table7.8 Specifications of the Battery for Memory Card

Item	Type	
	Q2MEM-BAT	Q3MEM-BAT
Classification	Graphite fluoride lithium primary battery	Manganese dioxide lithium primary battery
Initial voltage	3.0V	3.0V
Nominal current	48mAh	550mAh
Battery life when stored	Actually 5 years (room temperature)	
Battery life when used	☞ Section 11.3.4.	
Lithium content	0.014g	0.150g
Application	Power failure backup for SRAM card (for Q2MEM-1MBS/Q2MEM-2MBS)	Power failure backup for SRAM card (for Q3MEM-4MBS/Q3MEM-8MBS)

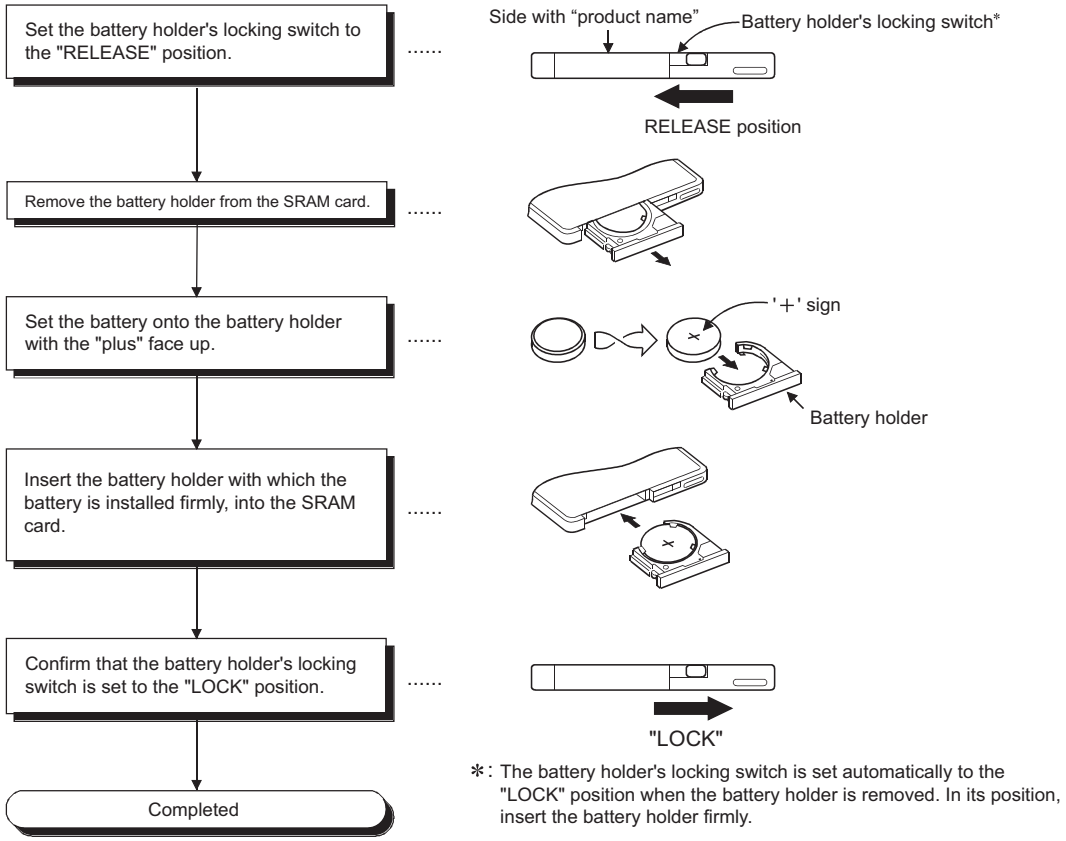
Remark

- For the life of the memory card battery, refer to Section 11.3.4.
- For the battery irective in EU member states, refer to Appendix 4.

7.1.7 Battery Installation into the memory card

Installation method of the battery for the memory card (SRAM card)
The battery for the SRAM card is removed from the battery holder when shipping.
Before installing the SRAM card into the CPU module, set the battery holder as shown in Figure 7.8.

(1) For Q2MEM-1MBS and Q2MEM-2MBS



*: The battery holder's locking switch is set automatically to the "LOCK" position when the battery holder is removed. In its position, insert the battery holder firmly.

Figure 7.8 Memory card battery setting procedure

Point

Insert or remove the battery in the horizontal direction along the battery holder fixing guide.
Failure to do so may damage the latches of the battery holder.

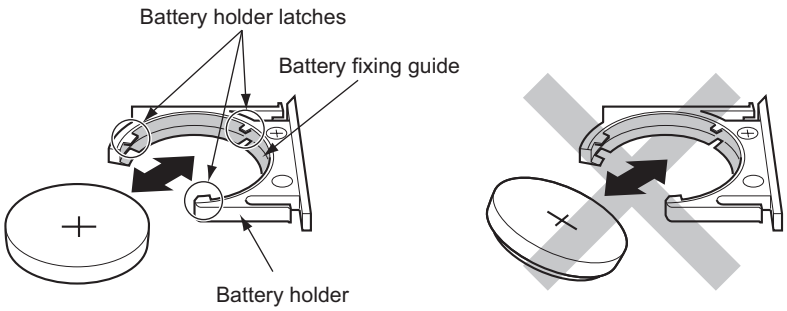


Figure 7.9 Battery setting direction

(2) For Q3MEM-4MBS and Q3MEM-8MBS

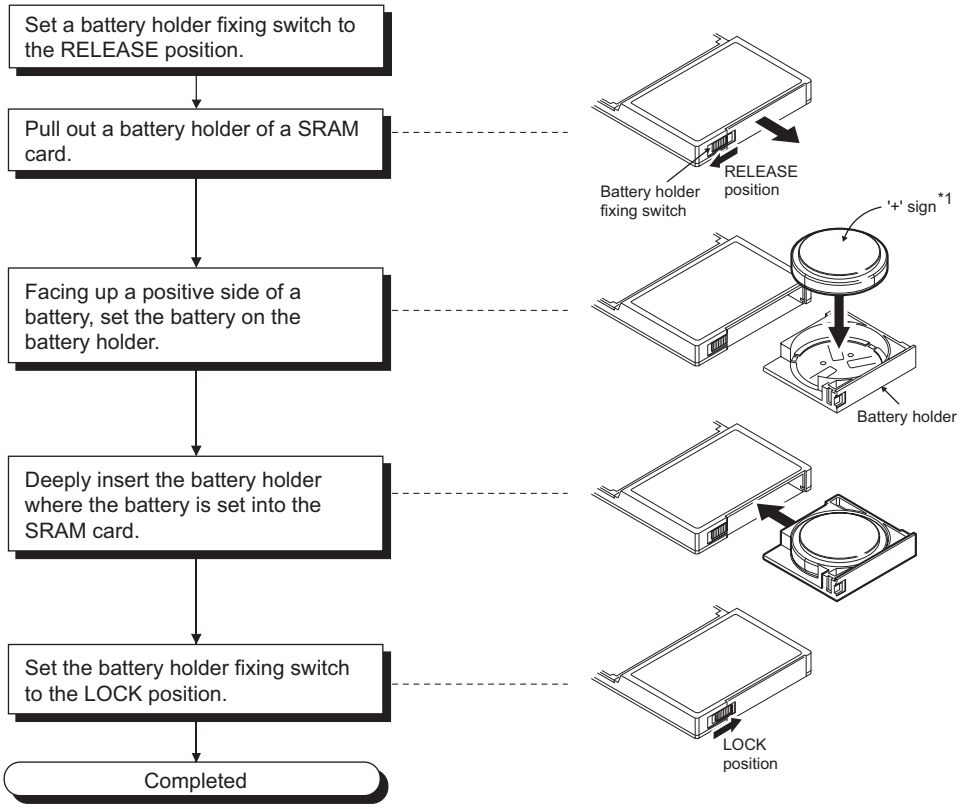


Figure 7.10 Memory card battery setting procedure

*1:The following shows the direction of a battery.

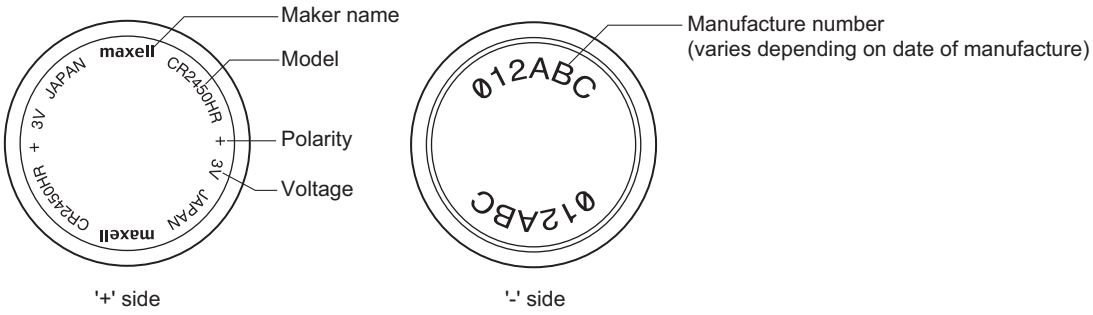


Figure 7.11 Direction of a battery

7.2 Battery (Q6BAT, Q7BAT, Q8BAT)

Batteries (Q6BAT, Q7BAT and Q8BAT) are installed in the CPU module to retain data of the program memory, standard RAM, and latch device in case of power failure.

7.2.1 Battery specifications

This section describes the specifications of the battery used for the CPU module.

Table7.9 Battery specifications

Item	Type		
	Q6BAT	**Q7BAT(-SET)** Note7.2	**Q8BAT(-SET)** Note7.2
Classification	Manganese dioxide lithium primary battery		Manganese dioxide lithium primary battery (assembled battery)
Initial voltage	3.0V		
Nominal current	1800mAh	5000mAh	1800mAh (1800mAh × 10 pieces)
Battery life when stored	Actually 5 years (room temperature)		
Battery life when used	☞ Section 11.3.2.		
Lithium content	0.49g	1.52g	4.9g
Application	For data retention of the program memory, standard RAM, and latch device during the power failure		
Accessory	----	Battery holder*1	Q8BAT connection cable*2

*1: Included only when the Q7BAT-SET is purchased.
*2: Included only when the Q8BAT-SET is purchased.

Remark

- For the battery life, refer to Section 11.3.2.
- For the battery directive in EU member states, refer to Appendix 4.

Note7.2 **Basic**

The Q7BAT and Q8BAT is not applicable to the Basic model QCPU.

7.2.2 Battery installation

(1) Q6BAT battery installation procedure

The battery connector of Q6BAT is disconnected when shipping. Connect the connector as follows.

For the service life of the battery and how to replace the battery, refer to Section 11.3.

(a) Basic model QCPU

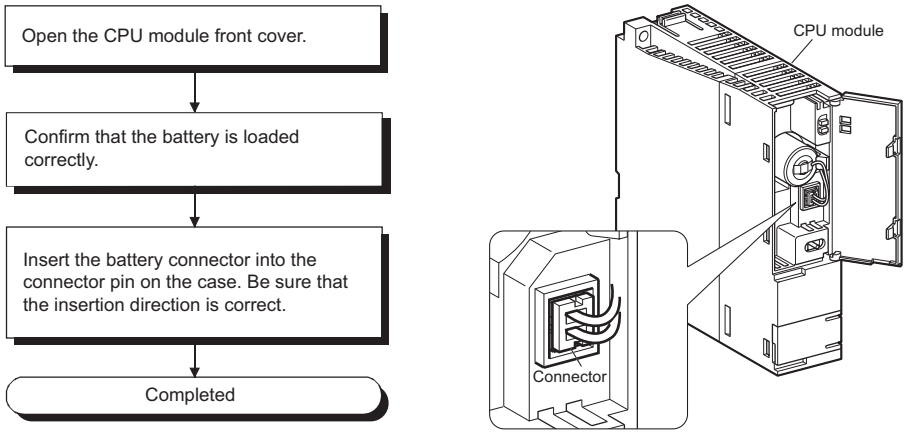


Figure 7.12 Q6BAT battery installation procedure

(b) High Performance model QCPU, Process CPU, Redundant CPU and Universal model QCPU

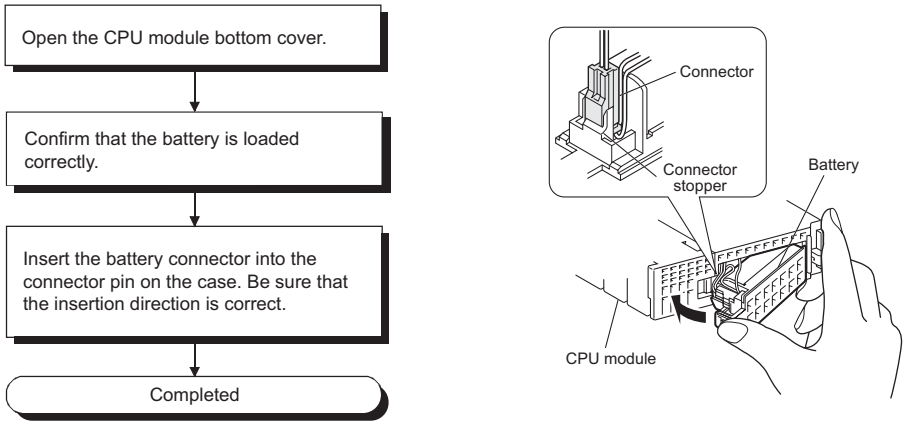


Figure 7.13 Q6BAT battery installation procedure

Point

Firmly push the connector all the way.

(2) Q7BAT-SET battery installation procedure

When changing the battery for the CPU module from the Q6BAT to the Q7BAT, set the battery and connect its connector in the following procedure.

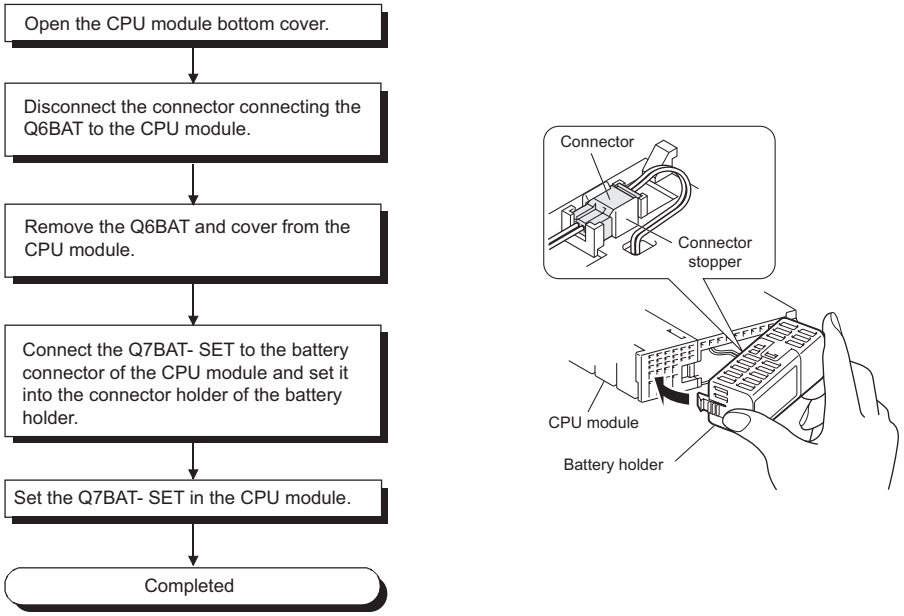


Figure 7.14 Q7BAT-SET battery installation procedure

Point

Firmly push the connector all the way.

(3) Q8BAT-SET battery installation procedure

When changing the battery of the CPU module from the Q6BAT to the Q8BAT, install the battery and connect its connector in the following procedure.

Open the cover of the CPU module's bottom.

↓

Disconnect the connector connecting the Q6BAT to the CPU module.

↓

Remove the Q6BAT and cover from the CPU module.

↓

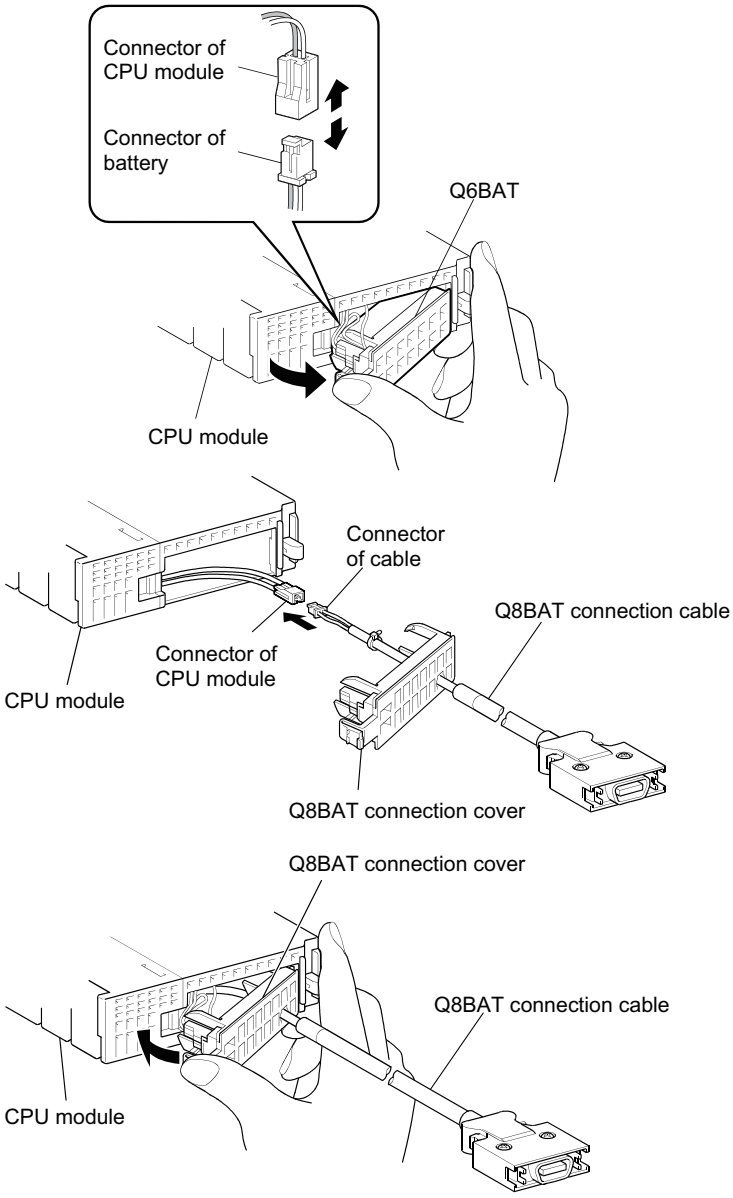
Insert the connector of Q8BAT connection cable (included in the Q8BAT-SET) into the connector of CPU module while confirming the orientation of each connector.

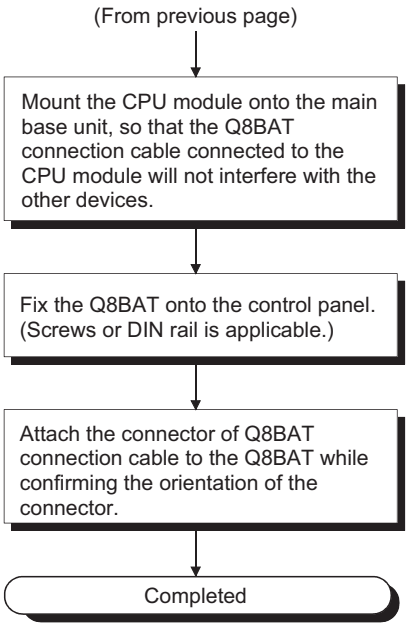
↓

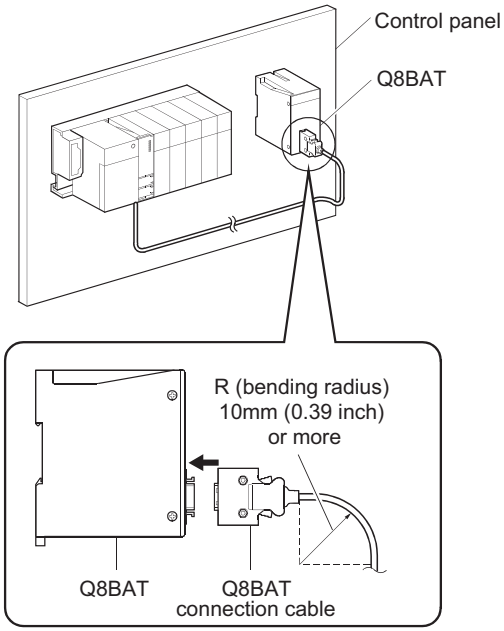
Attach the Q8BAT connection cover to the CPU module.

↓

(To next page)

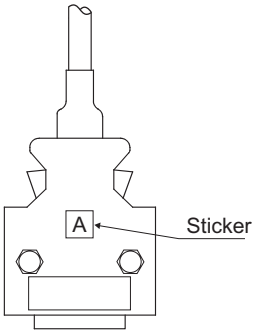






Point

- Clamp the Q8BAT connection cable.
  Failure to do so may damage the Q8BAT connection cover, connector, or the cable due to unintentional swinging and shifting or accidental pulling of the cable.
- Provide 10mm (0.39 inches) or more of the bending radius for the Q8BAT connection cable.
  If the bending radius is less than 10mm (0.39 inches), malfunction may occur due to characteristic deterioration and wire breakage.
- For details of the module mounting position, refer to the following.
  Section 10.3.2
- Firmly push the connector all the way.
- When installing the Q8BAT for the Universal model QCPU, use the connection cable with “A” printed.



CHAPTER8 CPU MODULE START-UP PROCEDURES

This chapter provide the start-up procedure for the Q Series CPU module on the assumption that programs and parameters have been created separately.

For the start-up procedures for a redundant system configured with a Redundant CPU, refer to the following.

☞ QnPRHCPU User's Manual (Redundant System)

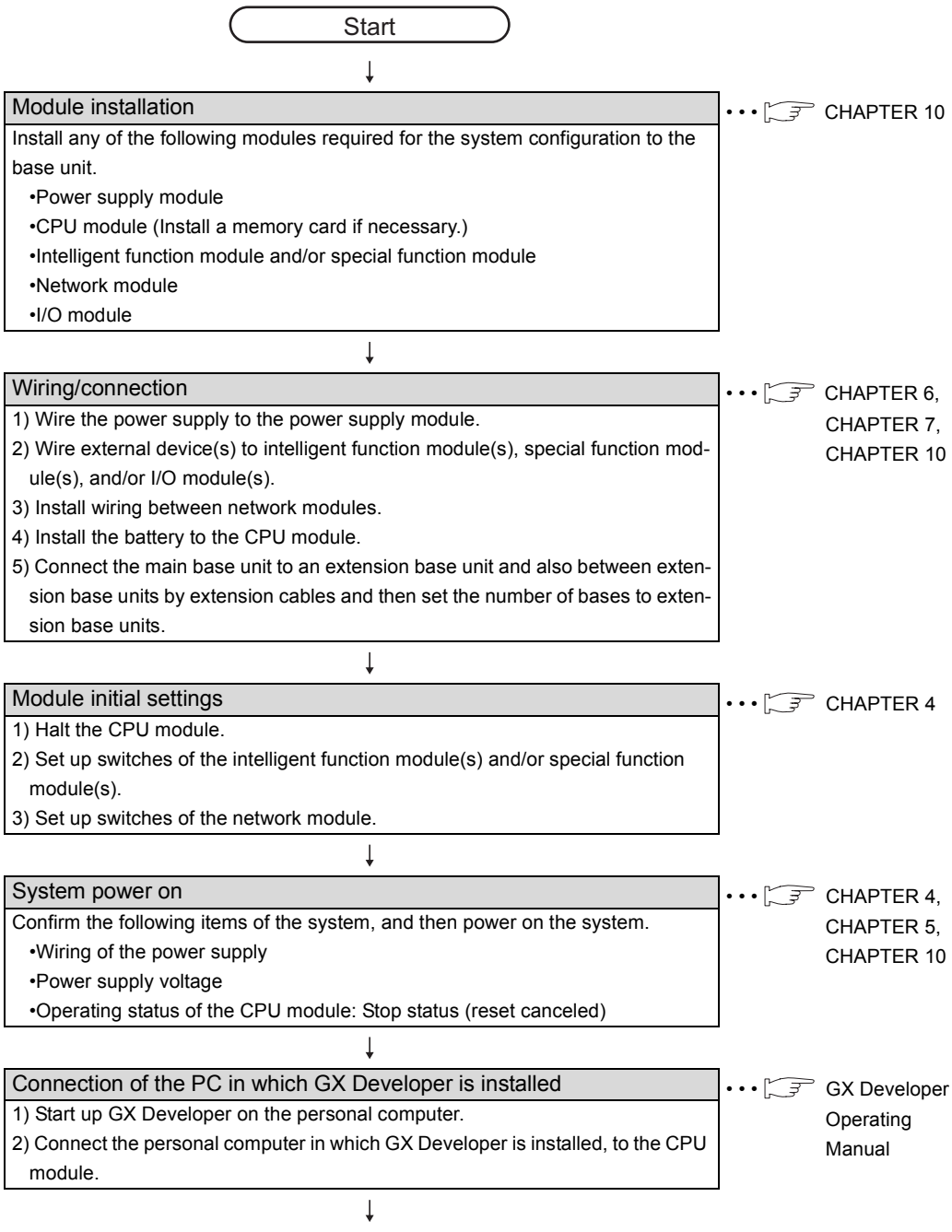


Figure 8.1 CPU module start-up procedures

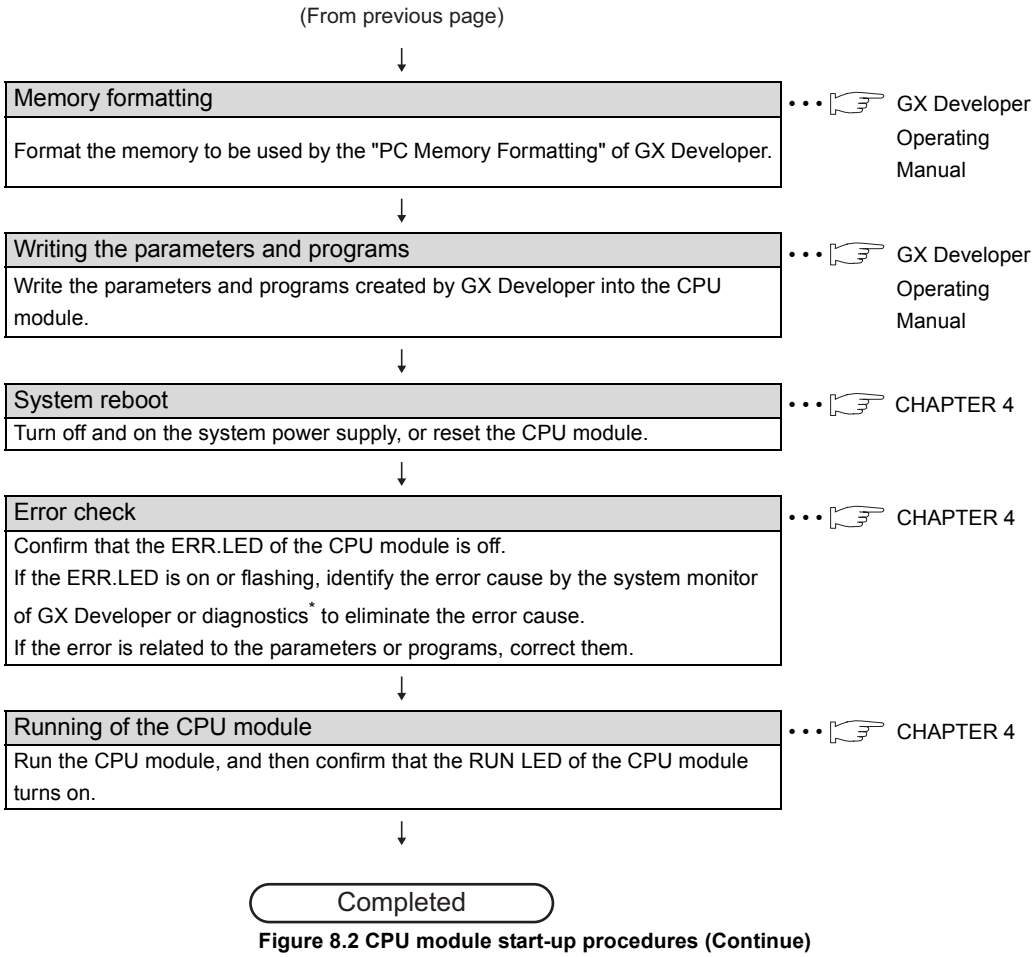


Figure 8.2 CPU module start-up procedures (Continue)

*: The following types of diagnostics are available.

- PC diagnostics
- Network diagnostics
- Ethernet diagnostics
- CC-Link and CC-Link/LT diagnostics

Point

For details of the wiring, connection, and initial settings of intelligent function modules, special function modules, and network modules, refer to relevant manuals for the network.

Memo

CHAPTER9 EMC AND LOW VOLTAGE DIRECTIVES

Compliance to the EMC Directive, which is one of the EU Directives, has been a legal obligation for the products sold in European countries since 1996 as well as the Low Voltage Directive since 1997.
Manufacturers who recognize their products are compliant to the EMC and Low Voltage Directives are required to declare that print a "CE mark" on their products.

(1) Authorized representative in Europe

Authorized representative in Europe is shown below.
Name : Mitsubishi Electric Europe BV
Address: Gothaer strase 8, 40880 Ratingen, Germany

9.1 Requirements for Compliance with the EMC Directive

The EMC Directive specifies that products placed on the market must be so constructed that they do not cause excessive electromagnetic interference (emissions) and are not unduly affected by electromagnetic interference (immunity)".
Section 9.1.1 through Section 9.1.6 summarize the precautions on compliance with the EMC Directive of the machinery constructed with the MELSEC-Q series programmable controllers.
These precautions are based on the requirements and the standards of the regulation, however, it does not guarantee that the entire machinery constructed according to the descriptions will comply with above-mentioned directive. The method and judgement for complying with the EMC Directive must be determined by the person who construct the entire machinery.

9.1.1 Standards relevant to the EMC Directive

The standards relevant to the EMC Directive are listed in Table9.1.

Table9.1 Standards relevant to the EMC Directive

Specification	Test item	Test details	Standard value
EN61131-2: 2003	EN61000-4-2 Electrostatic discharge immunity*2	Immunity test in which electrostatic is applied to the cabinet of the equipment.	8KV Air discharge 4KV Contact discharge
	EN61000-4-3 Radiated electromagnetic field immunity*2	Immunity test in which electric fields are irradiated to the product.	1.4GHz-2.0GHz, 80-1000MHz, 10V/m, 80%AM modulation@1KHz
	EN61000-4-4 Electrical fast transient/ burst immunity *2	Immunity test in which burst noise is applied to the power cable and signal line.	AC power cable: ± 2KV DC power cable: ± 2KV I/O power(DC): ± 1KV DC I/O, analog, communication line(shielded): ± 1KV
	EN61000-4-5 Surge immunity *2	Immunity test in which burst noise is applied to the power line and signal line.	AC power line: Common mode ± 2KV, differential mode ± 1KV DC power line: Common mode ± 1KV, differential mode ± 0.5KV I/O power(DC): Common mode ± 0.5KV, differential mode ± 0.5KV DC I/O, analog, communication (shielded): Common mode ± 1KV
	EN61000-4-6 Conducted disturbances immunity *2	Immunity test in which high frequency noise is applied to the power line and signal line.	0.15-80MHz, 80%AM modulation 1KHz, 3Vrms

*1: QP : Quasi-peak value, Mean : Average value

*2: Programmable controller is an open type device (a device designed to be housed inside other equipment) and must be installed inside a conductive control panel.
The corresponding test has been conducted with the programmable controller installed inside a control panel.
Besides, our programmable controller has been tested with the maximum rated input value of the power supply module to be used.

9.1.2 Installation instructions for EMC Directive

Programmable controller is an open type device and must be installed inside a control panel for use.*1
This not only ensures safety but also ensures effective shielding of programmable controller-generated electromagnetic noise.

*1: Also, each network remote station needs to be installed inside the control panel.
However, the waterproof type remote station can be installed outside the control panel.

(1) Control panel

- Use a conductive control panel.
- When attaching the control panel's top plate or base plate, mask painting and weld so that good surface contact can be made between the panel and plate.
- To ensure good electrical contact with the control panel, mask the paint on the installation bolts of the inner plate in the control panel so that contact between surfaces can be ensured over the widest possible area.
- Ground the control panel with a thick wire so that a low impedance connection to ground can be ensured even at high frequencies.
- Holes made in the control panel must be 10 cm (3.94 inches) diameter or less. If the holes are 10 cm (3.94 inches) or larger, radio frequency noise may be emitted.
  In addition, because radio waves leak through a clearance between the control panel door and the main unit, reduce the clearance as much as practicable.
  The leakage of radio waves can be suppressed by the direct application of an EMI gasket on the paint surface.

Our tests have been carried out on a panel having the damping characteristics of 37 dB max. and 30 dB mean (measured by 3 m method with 30 to 300 MHz).

(2) Connection of power line and ground wire

Ground wire and power supply cable for the programmable controller system must be connected as described below.

- Provide an grounding point near the power supply module. Ground the power supply's LG and FG terminals (LG : Line Ground, FG : Frame Ground) with the thickest and shortest wire possible. (The wire length must be 30 cm (11.81 inches) or shorter.) The LG and FG terminals function is to pass the noise generated in the programmable controller system to the ground, so an impedance that is as low as possible must be ensured. As the wires are used to relieve the noise, the wire itself carries a large noise content and thus short wiring means that the wire is prevented from acting as an antenna.
- The ground wire led from the grounding point must be twisted with the power supply wires. By twisting with the ground wire, noise flowing from the power supply wires can be relieved to the ground. However, if a filter is installed on the power supply wires, the wires and the ground wire may not need to be twisted.

9.1.3 Cables

The cables extracted from the control panel contain a high frequency noise component. On the outside of the control panel, therefore, they serve as antennas to emit noise. To prevent noise emission, use shielded cables for the cables which are connected to the I/O modules and intelligent function modules and may be extracted to the outside of the control panel.
The use of a shielded cable also increases noise resistance.
The signal lines (including common line) of the programmable controller, which are connected to I/O modules, intelligent function modules and/or extension cables, have noise durability in the condition of grounding their shields by using the shielded cables. If a shielded cable is not used or not grounded correctly, the noise resistance will not meet the specified requirements.

(1) Grounding of shield section of shield cable

- Ground the exposed shield section of the shielded cable close to the module. Confirm that the grounded cables are not induced to electromagnetic from the cables, which are not yet grounded.
- Ground the exposed shield section to spacious area on the control panel.A clamp can be used as shown in Figure 9.2.
  In this case, apply a cover on the painted inner wall surface of the control panel, which comes in contact with the clamp

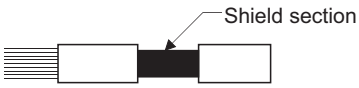


Figure 9.1 Part to be exposed

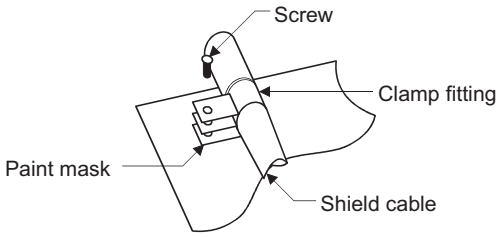


Figure 9.2 Shield grounding (Correct example)

Note) The method of grounding with a vinyl-coated wire soldered onto the shielded section of the shielded cable as in shown Figure 9.3 is not recommended. Doing so will raise the high-frequency impedance, resulting in loss of the shielding effect.

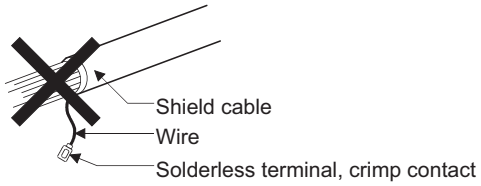


Figure 9.3 Shield grounding (Incorrect example)

(2) MELSECNET/H module

Always use a double-shielded coaxial cable (MITSUBISHI CABLE INDUSTRIES, LTD.: 5C-2V-CCY) for the coaxial cables MELSECNET/H module. Radiated noise in the range of 30HMz or higher can be suppressed by using double-shielded coaxial cables. Ground the double-shielded coaxial cable by connecting its outer shield to the ground.

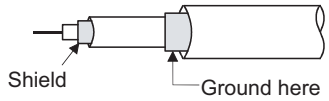


Figure 9.4 Double-shielded coaxial cable grounding

Refer to (1) for the grounding of the shield.

(3) Built-in Ethernet port QCPU module, Ethernet module, FL-net module, Web server module, MES interface module

Precautions for using AUI cables, twisted pair cables and coaxial cables are described below.

- Always ground the AUI cables[*1] connected to the 10BASE5 connectors. Because the AUI cable is a shielded type, strip part of the jacket as shown in Figure 9.5 and ground the exposed shield section to the ground as much as possible.

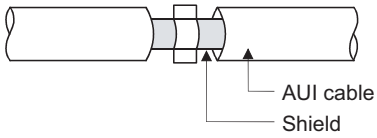


Figure 9.5 AUI cable grounding

Refer to (1) for the grounding of the shield.

*1: Make sure to install a ferrite core for the cable.
As a ferrite core, ZCAT2032 manufactured by TDK is recommended.

- Always use shielded twisted pair cables for connection to 10BASE-T and 100BASE-TX connectors.
- For the shielded twisted pair cable, remove a part of the jacket as shown in Figure 9.6 and ground the exposed shield section to the ground as much as possible.

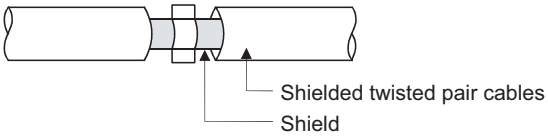


Figure 9.6 Shielded twisted pair cable grounding

Refer to (1) for the grounding of the shield.

- Always use double-shielded coaxial cables as the coaxial cables[*2] connected to the 10BASE2 connectors. Ground the double-shielded coaxial cable by connecting its outer shield to the ground.

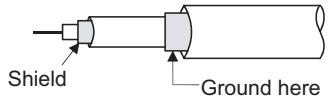


Figure 9.7 Double-shielded coaxial cable grounding

Refer to (1) for the grounding of the shield.

*2: Make sure to install a ferrite core for the cable.
As a ferrite core, ZCAT3035 manufactured by TDK is recommended.

(4) Positioning module, channel-isolated pulse input module

Use shielded cables for the external wiring, and ground the shields of the external wiring cables to the control box with the AD75CK cable clamp (Mitsubishi).
(Ground the shields 20 to 30cm away from the module.)

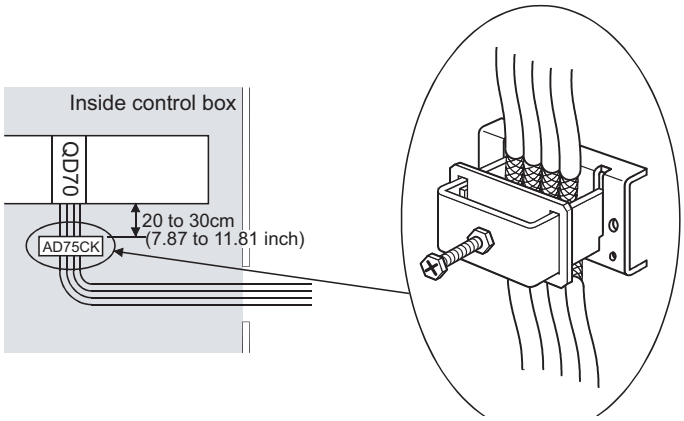


Figure 9.8 AD75CK cable clamp mounting position

The AD75CK allows up to four cables to be grounded if the outside diameter of the shielded cable is about 7mm.

(5) Temperature control module

Use shielded cables for the external wiring, and ground the shields of the external wiring cables to the control box with the AD75CK cable clamp (Mitsubishi).
(Ground the shields 20 to 30cm away from the module.)

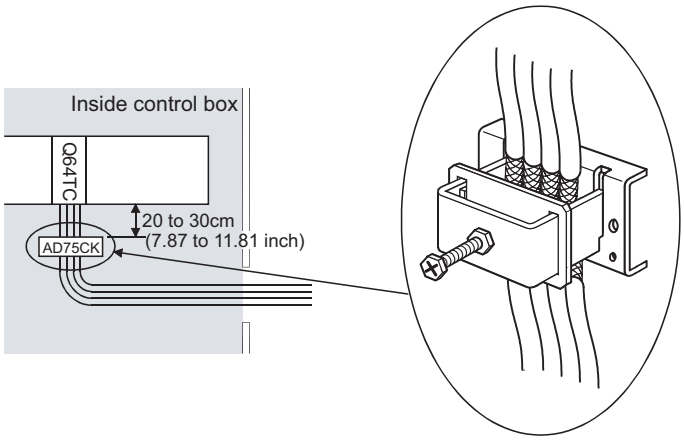


Figure 9.9 AD75CK cable clamp mounting position

The AD75CK allows up to four cables to be grounded if the outside diameter of the shielded cable is about 7mm. The required number of AD75CKs is indicated in Table9.2. (When cables of 7mm outside diameter are used for all wiring.)

Table9.2 Required number of AD75CK

Required Number of AD75CKs		Number of Used Channels			
		1	2	3	4
Number of used CT channel	0	1	1	2	2
	1	1	2	2	3
	2	1	2	2	3
	3	2	2	3	3
	4	2	2	3	3
	5	2	3	3	4
	6	2	3	3	4
	7	3	3	4	4
	8	3	3	4	4

(6) Redundant CPU

Be sure to use the QC☐TR for the tracking cable, and ground the shielded part of the cable to the panel with the AD75CK cable clamp (Mitsubishi).
(Ground the shield at a position 20 to 30cm (7.87 to 11.81 inches) away from the module.)

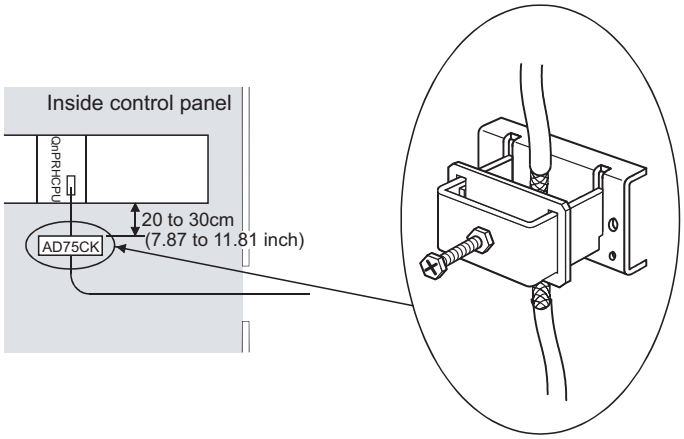


Figure 9.10 AD75CK cable clamp mounting position

(7) I/O signal lines and other communication cables

For the I/O signal lines (including common line) and other communication cables (RS-232, RS-422, CC-Link, etc.), always ground the shields of the shield cables as in (1) if they are pulled out of the control panel.

(8) Extension cable

For an extension cable, always ground the shields of the shield cables as in (1) if they are pulled out of the control panel.

(9) Power line for external power supply terminal

The power line connecting to the external power supply terminal of the analog module must be 30m (98.43 feet) or less.

(10)Power line of CC-Link remote module

Power line connecting to the external power supply terminal (compliant with I/O power port of CE standard) must be 30m (98.43 feet) or less. Power line connecting to module power supply terminal (compliant with I/O power port of CE standard) must be 10m or less.

9.1.4 Power supply part of the power supply module, Q00JCPU, and Q00UJCPU

Always ground the LG and FG terminals after short-circuiting them.

9.1.5 When using MELSEC-A series modules

The following describes the case where the MELSEC-A series module is used, using the QA1S6□B, QA6□B, and QA6ADP+A5□B/A6□B as the extension base unit.

(1) Cable

(a) Grounding the shield section of shielded cable

- Ground the exposed shield section of the shielded cable close to the module. Confirm that the grounded cables are not induced to electromagnetic from the cables, which are not yet grounded.
- Ground the exposed shield section to spacious area on the control panel.
- A clamp can be used as shown in Figure 9.12.
  In this case, apply a cover on the painted inner wall surface of the control panel, which comes in contact with the clamp.

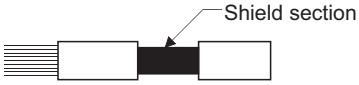


Figure 9.11 Part to be exposed

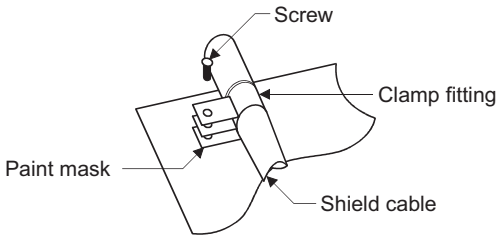


Figure 9.12 Shield grounding (Correct example)

Note) The method of grounding with a vinyl-coated wire soldered onto the shielded section of the shielded cable as in shown Figure 9.13 is not recommended. Doing so will raise the high-frequency impedance, resulting in loss of shielding effect.

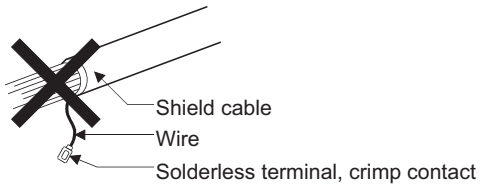


Figure 9.13 Shield grounding (Incorrect example)

(b) Positioning modules

Precautions for configuring the machinery compliant with the EMC Directives using the A1SD75P□-S3 (abbreviated as A1SD75 hereafter), AD75P□-S3 (abbreviated as AD75 hereafter) are described below.

1) When wiring cable of a 2 m (6.56 feet) or less

- Ground the shield of the external device connection cable with a cable clamp. (Ground the shield at the closest location to the A1SD75/AD75 external wiring connector.)
- Wire external device connection cables to drive modules and external devices by the shortest distance.
- Install the drive unit in the same panel.

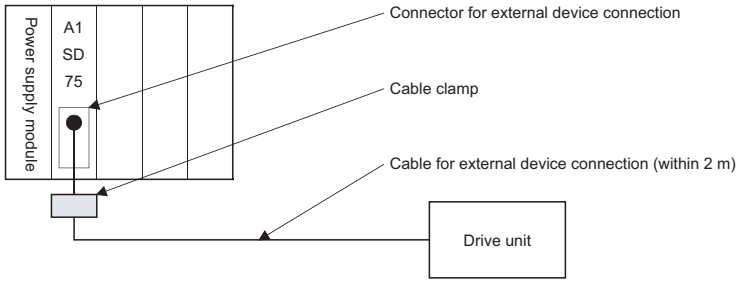


Figure 9.14 When wiring with a 2 m (6.56 feet) or less cable

2) When wiring with cable that exceeds 2 m (6.56 feet), but is 10 m (32.79 feet) or less

- Ground the shield of the external device connection cable with a cable clamp. (Ground the shield at the closest location to the A1SD75/AD75 external wiring connector.)
- Wire external device connection cables to drive modules and external devices by the shortest distance.
- Install a ferrite core.

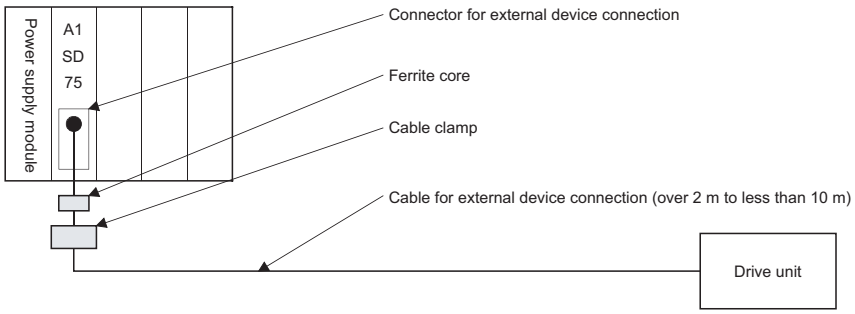


Figure 9.15 When wiring with cable that exceeds 2 m (6.56 feet), but is 10 m (32.79 feet) or less

3) Ferrite core and cable clamp types

- Cable clamp
  Type : AD75CK (Mitsubishi)
- Ferrite core
  Type : ZCAT3035-1330 (TDK ferrite core)

Table9.3 Number of required ferrite cores and cable clamps

Cable length	Prepared part	Required Qty		
		1 axis	2 axes	3 axes
Within 2 m (6.56 feet)	AD75CK	1	1	1
2 m (6.56 feet) to 10m (32.79feet)	AD75CK	1	1	1
	ZCAT3035-1330	1	2	3

4) Cable clamp mounting position

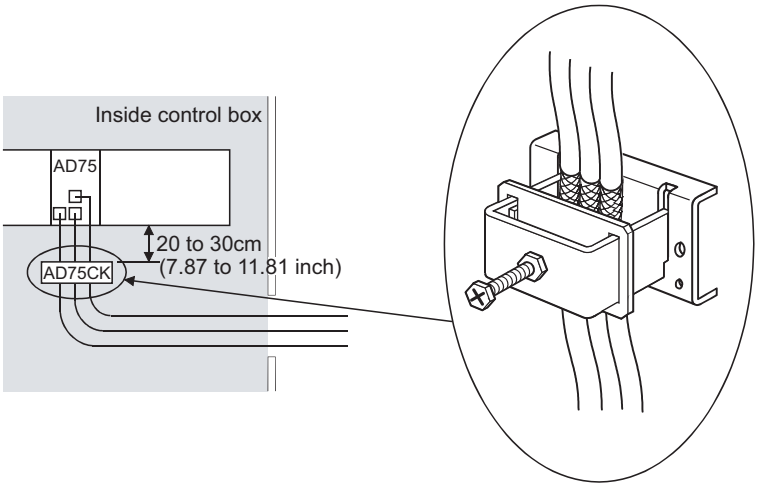


Figure 9.16 AD75CK cable clamp mounting position

(c) CC-Link module

- Be sure to ground the cable shield that is connected to the CC-Link module close to the exit of control panel or to any of the CC-Link stations within 30 cm (11.81 inches) from the module or stations.
  The CC-Link dedicated cable is a shielded cable. Remove a part of the jacket as shown in Figure 9.17 and ground the exposed shield section to the ground as much as possible.

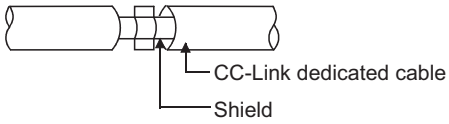


Figure 9.17 CC-Link dedicated cable grounding

- Always use the specified CC-Link dedicated cable.
- The CC-Link module, the CC-Link stations and the FG line inside the control panel must be connected at the FG terminal as shown in Figure 9.18.

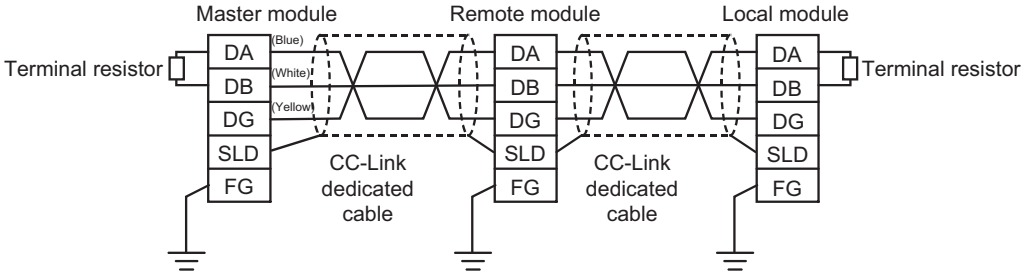


Figure 9.18 Connection between CC-Link module/CC-Link station and FG line inside the control panel. (Simplified figure)

- Use the external power supply that is CE compliant. Ground FG terminals.

Table9.4 External power supply

Power supply model name		DLP75-24-1	DLP100-24-1	DLP120-24-1	DLP180-24-1	DLP240-24-1
Rated input voltage		100 to 240VAC				
Rated output	Voltage	24VDC				
	Current	3.1A	4.1A	5.0A	7.5A	10.0A

- Power line connecting to the external power supply terminal (compliant with I/O power port of CE standard) must be 30m (98.43 feet) or less. Power line connecting to module power supply terminal (compliant with I/O power port of CE standard) must be 10m (32.81 feet) or less.
- The signal line connecting to the analog input of the following modules must be 30m or less.

  AJ65BT-64RD3
  AJ65BT-64RD4
  AJ65BT-68TD

(d) I/O signal lines

For the I/O signal lines (including common line), if extracted to the outside of the control panel, also ensure to ground the shield section of these lines and cables in the same manner as in item (1) above.

(e) Extension cable

For an extension cable, always ground the shield section of the shield cables as in (1) if they are pulled out of the control panel.

(2) Power supply module

The precautions required for each power supply module are described in Table9.5. Always observe the items noted as precautions.

Table9.5 Precautions when using a power supply module

Model	Precautions
A1S61P A1S62P A61P A62P	Not usable
A1S63P *1 A163P	Use the CE marked 24VDC panel power equipment.
A1S61PEU A1S62PEU A1S61PN A1S62PN A61PN A61PEU A62PEU A68P	Always ground the LG and FG terminals after short-circuiting them.

*1: If sufficient filter circuitry is built into the 24VDC external power supply module, the noise generated by A1S63P will be absorbed by that filter circuit, so a line filter may not be required.
Filtering circuitry of version F or later of A1S63P is improved so that a external line filter is not required.

9.1.6 Others

(1) Ferrite core

A ferrite core has the effect of reducing radiated noise in the 30MHz to 100MHz band.
It is not required to fit ferrite cores to cables, but it is recommended to fit ferrite cores if shield cables pulled out of the enclosure do not provide sufficient shielding effects.
Note that the ferrite cores must be fitted to the cables in the position immediately before they are pulled out of the enclosure. If the fitting position is improper, the ferrite will not produce any effect.

(2) Noise filter (power supply line filter)

A noise filter is a component which has an effect on conducted noise.
It is not required to attach the noise filter to the power supply line except the A61PEU, A62PEU power supply modules and some models, however, attaching it can suppress more noise.
(The noise filter has the effect of reducing conducted noise of 10 MHz or less.)

The precautions required when installing a noise filter are described below.

- Do not bundle the wires on the input side and output side of the noise filter. When bundled, the output side noise will be induced into the input side wires from which the noise was filtered.

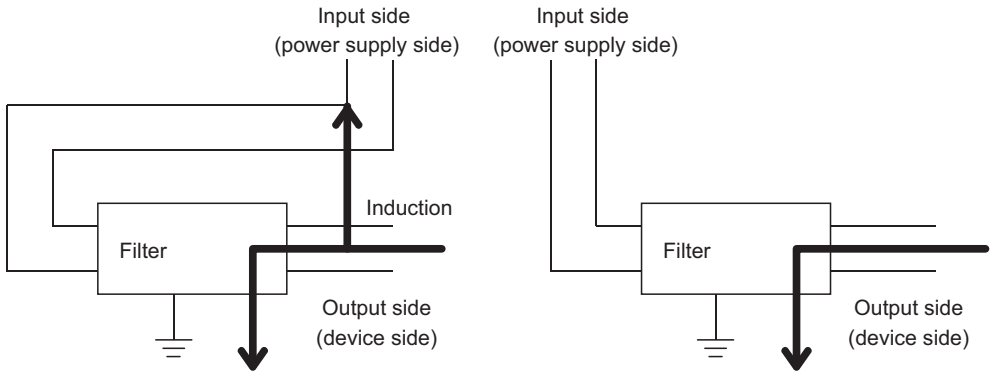


Figure 9.19 Precautions on noise filter

- Ground the noise filter grounding terminal to the control cabinet with the shortest wire possible (approx. 10 cm (3.94 inches)).

Remark

Table9.6 Noise filter specifications

Noise filter model name	FN343-3/01	FN660-6/06	ZHC2203-11
Manufacturer	SCHAFFNER	SCHAFFNER	TDK
Rated current	3A	6A	3A
Rated voltage	250V		

(3) Isolation transformer

An isolation transformer has an effect on reducing conducted noise (especially, lightning surge). Lightning surge may cause a malfunction of the programmable controller.

As a measure against lightning surge, connect an isolation transformer as shown in Figure 9.20. The use of an isolation transformer reduces an impact of lightning.

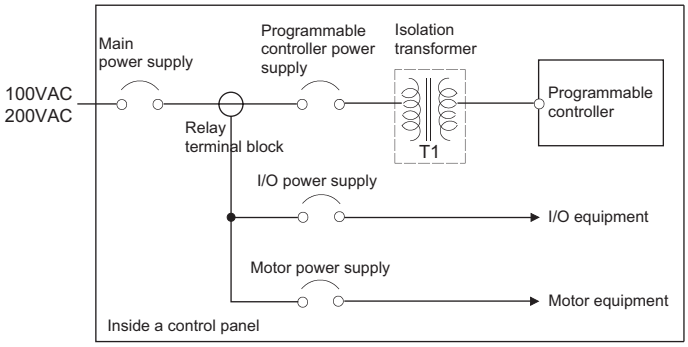


Figure 9.20 Power supply wiring figure

9.2 Requirement to Compliance with the Low Voltage Directive

The Low Voltage Directive requires each device that operates with the power supply ranging from 50 to 1000VAC and 75 to 1500VDC to satisfy the safety requirements.
In Section 9.2.1 to Section 9.2.6, cautions on installation and wiring of the MELSEC-Q series programmable controller to comply with the Low Voltage Directive are described.
These descriptions are based on the requirements and standards of the regulation, however, it does not guarantee that the entire machinery manufactured based on the descriptions complies with the above-mentioned directive. The method and judgment for the low voltage directive must be left to the manufacturer's own discretion.

9.2.1 Standard applied for MELSEC-Q series programmable controller

The standard applied for MELSEC-Q series programmable controller is EN61131-2 safety of devices used in measurement rooms, control rooms, or laboratories.

The MELSEC-Q series programmable controller which operate at the rated voltage of 50VAC/75VDC or above are also developed to conform to the above standard.
The modules which operate at the rated voltage of less than 50VAC/75VDC are out of the Low Voltage Directive application range.
For products with the CE mark, refer to the "Standard Compliance" menu of the MELFANSweb homepage.

9.2.2 MELSEC-Q series programmable controller selection

(1) Power supply module

There are dangerous voltages (voltages higher than 42.4V peak) inside the power supply modules of the 100/200VAC rated I/O voltages. Therefore, the CE marked models are enhanced in insulation internally between the primary and secondary.

(2) I/O module

There are dangerous voltages (voltages higher than 42.4V peak) inside the I/O modules of the 100/200VAC rated I/O voltages. Therefore, the CE marked models are enhanced in insulation internally between the primary and secondary.
The I/O modules of 24VDC or less rating are out of the Low Voltage Directive application range.

(3) CPU module, memory card, base unit

Using 5VDC circuits inside, the above modules are out of the Low Voltage Directive application range.

(4) Intelligent function modules (special function modules)

The intelligent function modules such as analog-digital converter modules, digital-analog converter modules, network modules, and positioning modules (special function modules) are out of the scope of the low voltage directive because the rated voltage is 24VDC or less.

(5) Display device

Use the CE marked display device.

9.2.3 Power supply

The insulation specification of the power supply module was designed assuming installation category II. Be sure to use the installation category II power supply to the programmable controller.
The installation category indicates the durability level against surge voltage generated by a thunderbolt. Category I has the lowest durability; category IV has the highest durability.

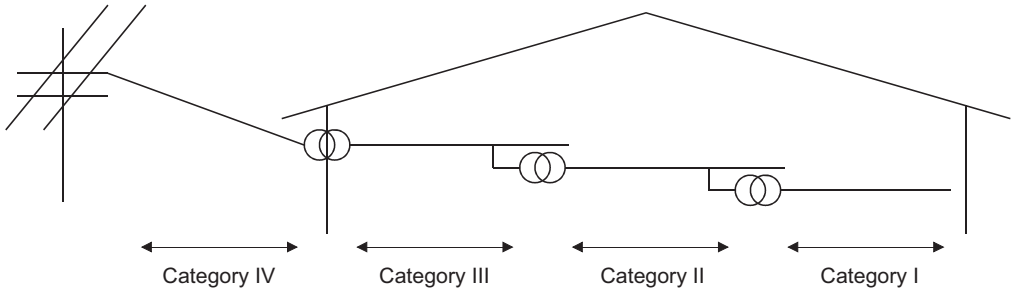


Figure 9.21 Installation category for power supply module

Category II indicates a power supply whose voltage has been reduced by two or more levels of isolating transformers from the public power distribution.

9.2.4 Control panel

Programmable controller is an open type device (a device designed to be housed inside other equipment) and must be installed inside a control panel for use.*1

*1: Also, each network remote station needs to be installed inside the control panel.
However, the waterproof type remote station can be installed outside the control panel.

(1) Electrical shock prevention

The control panel must be handled as shown below to protect a person who does not have adequate knowledge of electricity from an electric shock.

- Lock the control panel so that only those who are trained and have acquired enough knowledge of electric facilities can open the control panel.
- The control panel must have a structure which automatically stops the power supply when the box is opened.
- For electric shock protection, use IP20 or greater control panel.

(2) Dustproof and waterproof features

The control panel also has the dustproof and waterproof functions. Insufficient dustproof and waterproof features lower the insulation withstand voltage, resulting in insulation destruction.
The insulation in our programmable controller is designed to cope with the pollution level 2, so use in an environment with pollution level 2 or below.

Pollution level 1 : An environment where the air is dry and conductive dust does not exist.
Pollution level 2 : An environment where conductive dust
does not usually exist, but occasional temporary conductivity occurs due to the accumulated dust. Generally, this is the level for inside the control box equivalent to IP54 in a control room or on the floor of a typical factory.
Pollution level 3 : An environment where conductive dust exits and conductivity may be generated due to the accumulated dust.
An environment for a typical factory floor.
Pollution level 4 : Continuous conductivity may occur due to rain, snow, etc. An outdoor environment.

As shown above, the programmable controller can realize the pollution level 2 when stored in a control panel equivalent to IP54.

9.2.5 Grounding

There are the following two different ground terminals.
Use either ground terminal in an grounding status.

Protective grounding ⏚: Maintains the safety of the programmable controller and improves the noise resistance.

Functional grounding ⏚: Improves the noise resistance.

9.2.6 External wiring

(1) Module power supply and external power supply

For the remote module which requires 24VDC as module power supply, the 5/12/24/48VDC I/O module, and the intelligent function module (special function module) which requires the external power supply, use the 5/12/24/48VDC circuit which is doubly insulated from the hazardous voltage circuit or use the power supply whose insulation is reinforced.

(2) External devices

When a device with a hazardous voltage circuit is externally connected to the programmable controller, use a model whose circuit section of the interface to the programmable controller is intensively insulated from the hazardous voltage circuit.

(3) Intensive insulation

The intensive insulation covers the withstand voltages shown in Table9.7.

Table9.7 Intensive Insulation Withstand Voltage (Installation Category II, source : IEC 664)

Rated voltage of hazardous voltage area	Surge withstand voltage (1.2/50 μs)
150VAC or below	2500V
300VAC or below	4000V

CHAPTER10 LOADING AND INSTALLATION

In order to increase the reliability of the system and exploit the maximum performance of its functions, this chapter describes the methods and precautions for the mounting and installation of the system.

10.1 General Safety Requirements

DANGER

- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.
  (1) Configure external safety circuits, such as an emergency stop circuit, protection circuit, and protective interlock circuit for forward/ reverse operation or upper/lower limit positioning.
  (2) When the programmable controller CPU stops its operation upon detection of the following status, and the output status of the system will be as shown below.

	Q series module	AnS/A series module
(a) Overcurrent or overvoltage protection of the power supply module is activated.	All outputs are turned off.	All outputs are turned off.
(b) The CPU module detects an error such as a watchdog timer error by the self-diagnostic function.	All outputs are held or turned off according to the parameter setting.	All outputs are turned off.

  All outputs may turn on when an error occurs in the part, such as I/O control part, where the programmable controller CPU cannot detect any error. To ensure the safety operation in such a case, provide a safety mechanism or a fail-safe circuit external to the programmable controller.
  (3) Outputs may remain on or off due to a failure of an output module relay or transistor. Configure an external circuit for monitoring output signals that could cause a serious accident.
- In an output module, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.
- Configure a circuit so that the programmable controller is turned on first and then the external power supply.
  If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.
- For the operating status of each station after a communication failure, refer to the relevant manuals for the network.
  Incorrect output or malfunction due to a communication failure amy result in an accident.

DANGER

- When changing data of the running programmable controller from a peripheral connected to the CPU module or from a personal computer connected to an intelligent function module, configure an interlock circuit in the sequence program to ensure that the entire system will always operate safely.
  For program modification and operating status change, read relevant manuals carefully and ensure the safety before operation.
  Especially, in the case of a control from an external device to a remote programmable controller, immediate action cannot be taken for a problem on the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the sequence program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.

CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables.
  Keep a distance of 100mm (3.94 inches) or more between them.
  Failure to do so may result in malfunction due to noise.
- When a device such as a lamp, heater, or solenoid valve is controlled through an output module, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on.
  Take measures such as replacing the module with one having a sufficient current rating.

When the programmable controller is powered on and off, normal control output may not be done momentarily due to a delay or a start-up time difference between the programmable controller power supply and the external power supply (DC in particular) for the control target.

For example, if the external power supply for the controlled object is switched on in a DC output module and then the programmable controller power supply is switched on, the DC output module may provide false output instantaneously at power-on of the programmable controller. Therefore, it is necessary to make up a circuit that can switch on the programmable controller power supply first.

Also, malfunction may occour if an external power supply or the programmable controller is faulty.

To prevent any malfunction which may affect the whole system and in a fail-safe viewpoint, provide a external circuit to the areas which can result in machine breakdown and accidents (e.g. emergency stop, protective and interlock circuits) must be constructed outside the programmable controller.

The following page gives examples of system designing in the above viewpoint.

(1) System design circuit example (when not using $\overline{\text{ERR.}}$ terminal of power supply module, or using Q00JCPU)

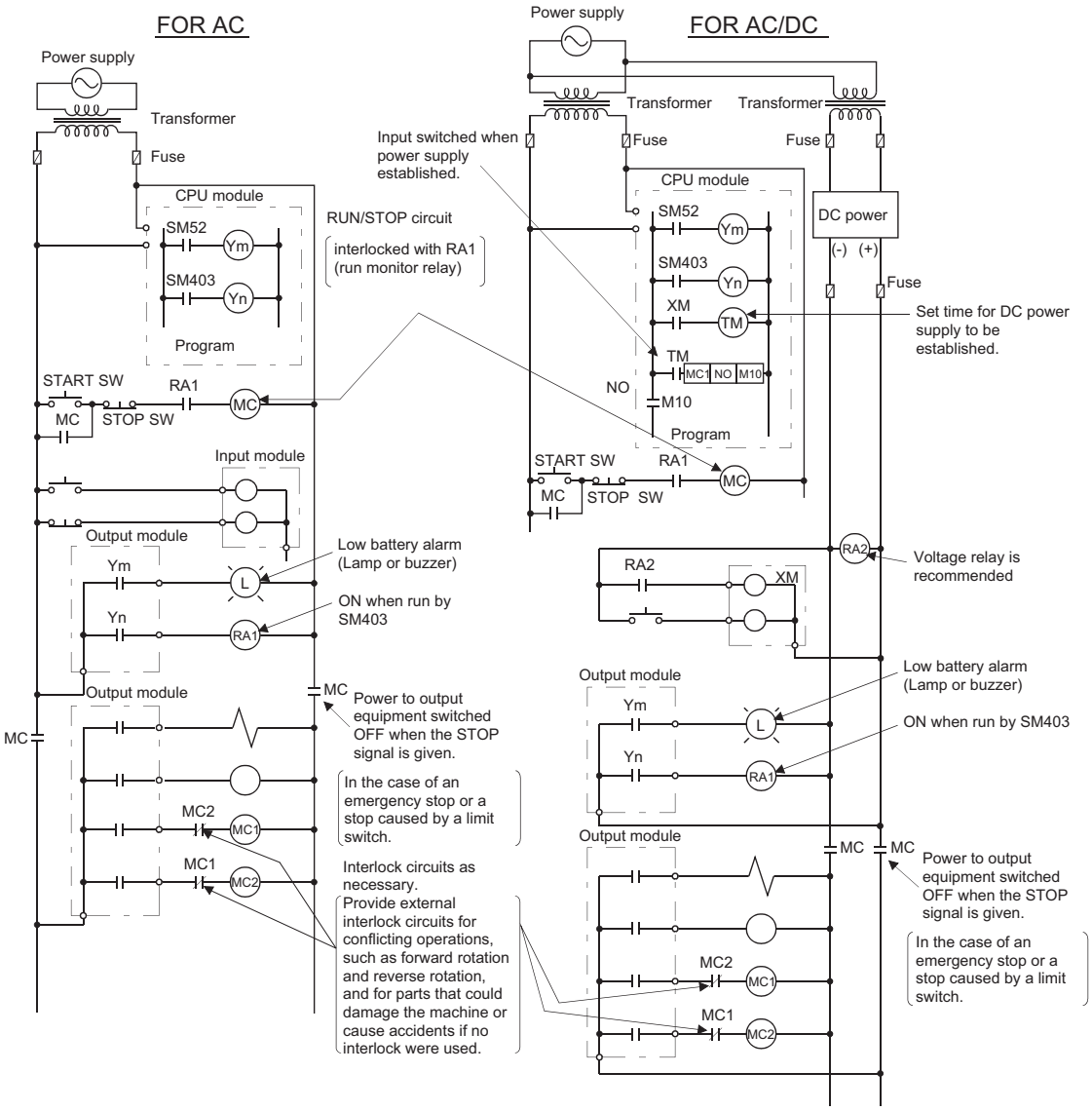


Figure 10.1 System design circuit example

The power-on procedure is as follows:

For AC

1) Turn the power on.
2) Set CPU to RUN.
3) Turn on the start switch.
4) When the magnetic contactor (MC) comes on, the output equipment is powered and may be driven by the program.

For AC/DC

1) Turn power on.
2) Set CPU to RUN.
3) When DC power is established, RA2 goes ON.
4) Timer (TM) times out after the DC power reaches 100%. (The TM set value must be the period of time from when RA2 goes on to the establishment of 100% DC voltage. Set this value to approximately 0.5 seconds.)
5) Turn on the start switch.
6) When the magnetic contactor (MC) comes on, the output equipment is powered and may be driven by the program. (If a voltage relay is used at RA2, no timer (TM) is required in the program.)

(2) System design circuit example (when using $\overline{\text{ERR}}$. terminal of power supply module)

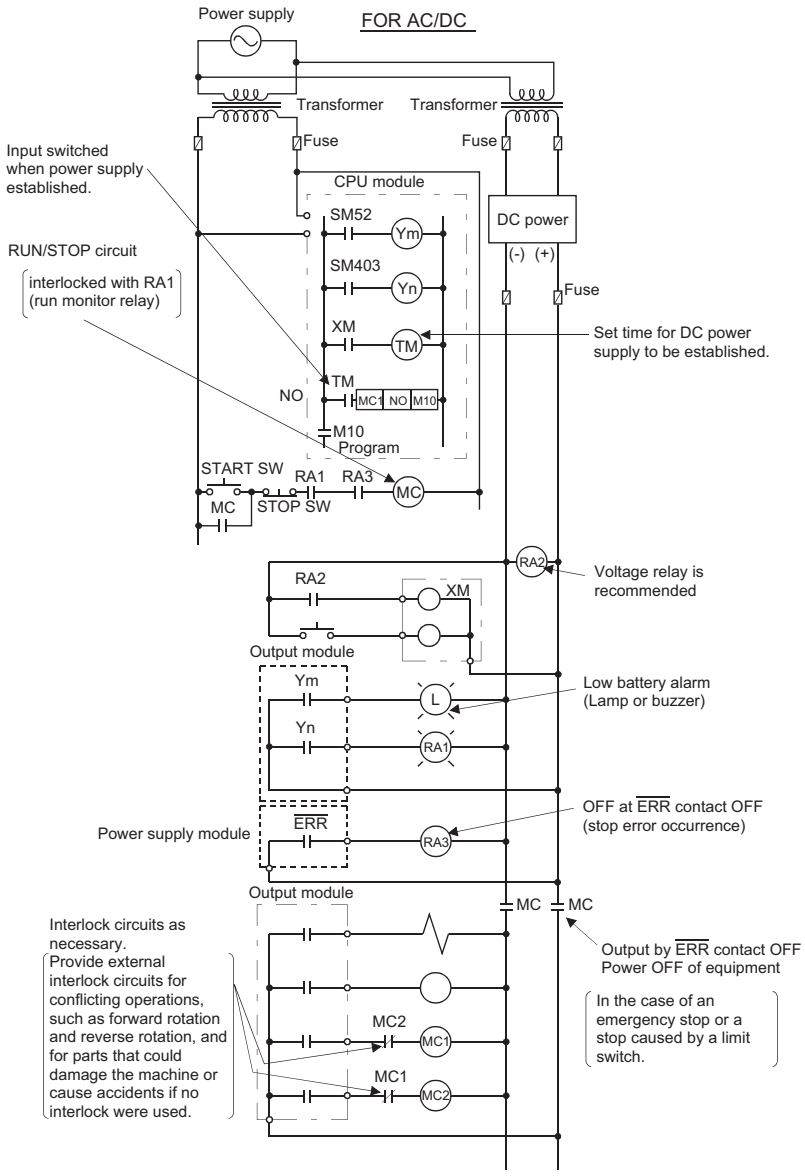


Figure 10.2 System design circuit example

The power-ON procedure is as follows:

For AC/DC

1) Turn power ON.
2) Set CPU to RUN.
3) When DC power is established, RA2 goes on.
4) Timer (TM) times out after the DC power reaches 100%. (The TM set value must be the period of time from when RA2 goes ON to the establishment of 100% DC voltage. Set this value to approximately 0.5s.)
5) Turn on the start switch.
6) When the magnetic contactor (MC) comes on, the output equipment is powered and may be driven by the program. (If a voltage relay is used at RA2, no timer (TM) is required in the program.)

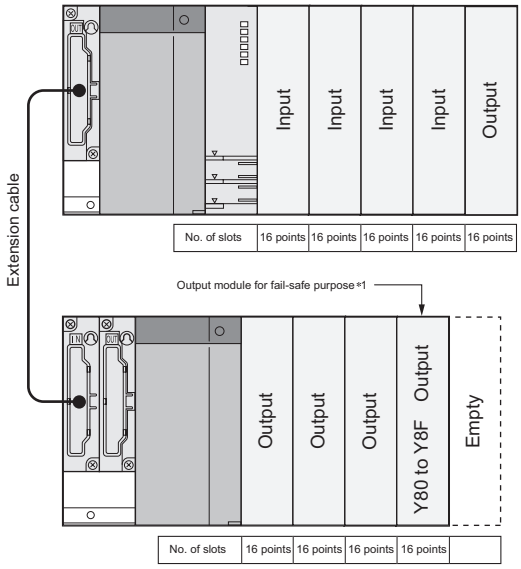
(3) Fail-safe measures against failure of the programmable controller

Failure of a CPU module or memory can be detected by the self-diagnosis function. However, failure of I/O control area may not be detected by the CPU module.

In such cases, all I/O points turn on or off depending on a condition of problem, and normal operating conditions and operating safety cannot sometimes be maintained.

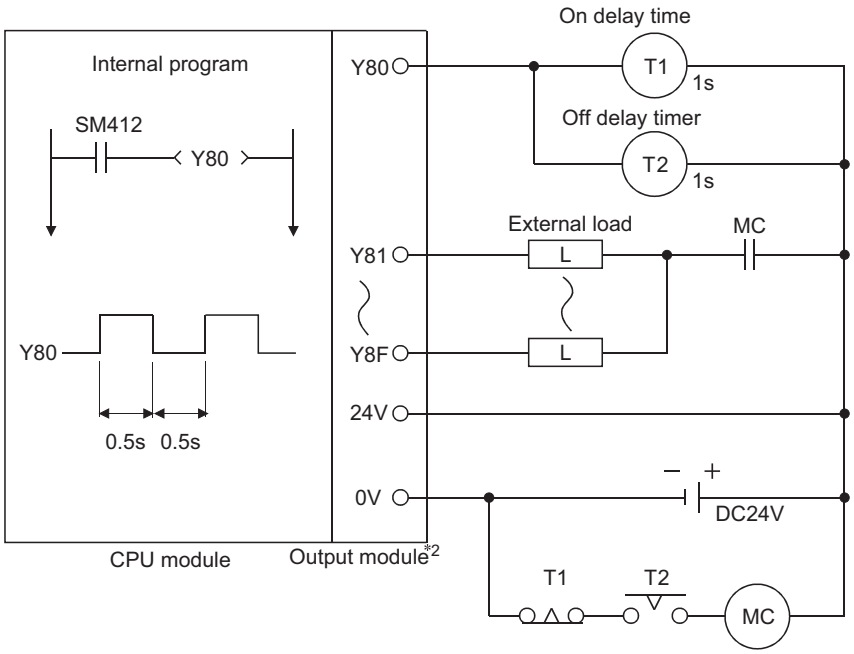
Though Mitsubishi programmable controllers are manufactured under strict quality control, they may cause failure or abnormal operations due to unspecific reasons. To prevent the abnormal operation of the whole system, machine breakdown, and accidents, fail-safe circuitry against failure of the programmable controller must be constructed outside the programmable controller.

Figure 10.3 and Figure 10.4 are a system example and its fail-safe circuit example.



*1: The output module for fail-safe purpose must be mounted in the last slot of the system. (Y80 to Y8F in the above system.)

Figure 10.3 System example



*2: Y80 repeats turning on and then off at 0.5s intervals.
Use a no-contact output module (transistor in the example shown above).

Figure 10.4 <Fail-safe circuit example>

10.2 Calculating Heat Generation of Programmable Controller

The ambient temperature inside the panel storing the programmable controller must be suppressed to an ambient temperature of 55℃ or less, which is specified for the programmable controller.
For the design of a heat releasing panel, it is necessary to know the average power consumption (heating value) of the devices and instruments stored inside.
Here the method of obtaining the average power consumption of the programmable controller system is described.
From the power consumption, calculate a rise in ambient temperature inside the panel.

How to calculate average power consumption

The power consuming parts of the programmable controller are roughly classified into six blocks as shown below.

(1) Power consumption of power supply module

The power conversion efficiency of the power supply module is approx. 70 %, while 30 % of the output power is consumed as heat. As a result, 3/7 of the output power is the power consumption.
Therefore the calculation formula is as follows.

$$W_{PW} = \frac{3}{7} \times \{(I_{5V} \times 5) + (I_{15V} \times 15) + (I_{24V} \times 24)\} \text{ (W)}$$

I_{5V}: Current consumption of logic 5 VDC circuit of each module
I_{15V}: Current consumption of 15VDC external power supply part of intelligent function module
I_{24V}: Average current consumption of 24VDC power supply for internal consumption of the output module

Point

In a redundant power supply system configuration, the same calculation method is applied.
(When 2 redundant power supply modules are placed in parallel, they run sharing the load current half-and-half.)

(2) Total power consumption for 5VDC logic circuits of all modules (including CPU module)

The power consumption of the 5 VDC output circuit section of the power supply module is the power consumption of each module*1 (including the current consumption of the base unit).

$W_{5V} = I_{5V} \times 5$ (W)

*1: For the power consumption of the motion CPU and PC CPU module, refer to the instruction manuals of the corresponding modules.

(3) A total of 24 VDC average power consumption of the output module (power consumption for simultaneous ON points)

The average power of the external 24 VDC power is the total power consumption of each module.

$W_{24V} = I_{24V} \times 24 \times$ Simultaneous ON rate (W)

(4) Average power consumption due to voltage drop in the output section of the output module (Power consumption for simultaneous ON points)

$W_{OUT} = I_{OUT} \times$ Vdrop $\times$ Number of outputs $\times$ Simultaneous ON rate (W)

I_{OUT} : Output current (Current in actual use) (A)

Vdrop : Voltage drop in each output module (V)

(5) Average power consumption of the input section of the input module (Power consumption for simultaneous ON points)

$W_{IN} = I_{IN} \times E \times$ Number of input points $\times$ Simultaneous ON rate (W)

I_{IN} : Input current (Effective value for AC) (A)

E : Input voltage (Voltage in actual use) (V)

(6) Power consumption of the external power supply section of the intelligent function module

$W_S = I_{+15V} \times 15 + I_{-15V} \times 15 + I_{24V} \times 24$ (W)

The total of the power consumption values calculated for each block becomes the power consumption of the overall sequencer system.

$$W = W_{PW}+W_{5V}+W_{24V}+W_{OUT}+W_{IN}+W_S \text{ (W)}$$

From this overall power consumption (W), calculate the heating value and a rise in ambient temperature inside the panel.

The outline of the calculation formula for a rise in ambient temperature inside the panel is shown below.

$$T = \frac{W}{UA} (^{\circ}C)$$

W : Power consumption of overall sequencer system (value obtained above)

A : Surface area inside the panel

U : When the ambient temperature inside the panel is uniformed by a fan.....6

When air inside the panel is not circulated.....4

Point

If the temperature inside the panel has exceeded the specified range, it is recommended to install a heat exchanger to the panel to lower the temperature.

If a normal ventilating fan is used, dust will be sucked into the programmable controller together with the external air, and it may affect the performance of the programmable controller.

(7) Example of calculation of average power consumption

(a) System configuration

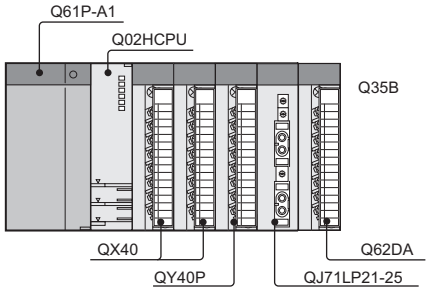


Figure 10.5 System configuration

(b) 5VDC/24VDC current consumption of each module

Table10.1 5VDC/24VDC current consumption

module name	5VDC	24VDC
Q02HCPU	0.64A	----
QX40	0.05A	----
QY40P	0.065A	0.01A
QJ71LP-25	0.55A	----
Q62DA	0.33A	0.12A
Q35B	0.11A	----

(c) Power consumption of power supply module

W_{PW} = 3/7×(0.64 + 0.05 + 0.05 + 0.065 + 0.55 + 0.33 + 0.11)×5 = 3.85(W)

(d) Total power consumption for 5 VDC logic circuits of all module

W_{5V} = (0.64 + 0.05 + 0.05 + 0.065 + 0.55+ 0.33 + 0.11)×5 = 8.98(W)

(e) Total 24 VDC average power consumption of the output module

W_{24V} = 0.01×24×1 = 0.24(W)

(f) Average power consumption due to voltage drop in the output section of the output module

W_{OUT} = 0.1×0.2×16×1 = 0.32(W)

(g) Average power consumption of the input section of the input module

W_{IN} = 0.004×24×32×1 = 3.07(W)

(h) Power consumption of the external power supply section of the intelligent function module

W_S = 0.12×24=2.88(W)

(i) Power consumption of overall system

W = 3.85 + 8.98 + 0.24 + 0.32 + 3.07 + 2.88 = 19.34(W)

Point

The value of the heat generated in a redundant system configuration (when the Redundant CPU is used) is the sum of the two values for the control and standby systems, each of which is calculated by the same method as that for the single system.

10.3 Module Installation

10.3.1 Precaution on installation

CAUTION

- Use the programmable controller in an environment that meets the general specifications in this manual.
  Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- To mount the module, while pressing the module mounting lever located in the lower part of the module, fully insert the module fixing projection(s) into the hole(s) in the base unit and press the module until it snaps into place.
  Incorrect mounting may cause malfunction, failure or drop of the module.
  When using the programmable controller in an environment of frequent vibrations, fix the module with a screw.
  Tighten the screw within the specified torque range.
  Undertightening can cause drop of the screw, short circuit or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- When installing more cables, be sure that the base unit and the module connectors are installed correctly.
  After installation, check them for looseness.
  Poor connections could cause an input or output failure.
- When using a memory card, fully insert it into the memory card slot.
  Check that it is inserted completely.
  Poor contact may cause malfunction.
- Shut off the external power supply for the system in all phases before mounting or removing the module. Failure to do so may result in damage to the product.
  A module can be replaced online (while power is on) on any MELSECNET/H remote I/O station or in the system where a CPU module supporting the online module change function is used.
  Note that there are restrictions on the modules that can be replaced online, and each module has its predetermined replacement procedure.
  (☞ 12.4.1).
- After the first use of the product, do not mount or remove the module to or from the base unit, and the terminal block to or from the module more than 50 times (IEC 61131-2 compliant) respectively.
  Exceeding the limit of 50 times may cause malfunction.

CAUTION

- Do not directly touch any conductive part of the module.
  Doing so can cause malfunction of failure of the module.
- When using the Motion CPU module or motion module, check that the combination of modules is correct before power-on.
  The product may be damaged if the combination is incorrect.
  For details, refer to the User's manual for the Motion CPU module.

Point

In case of using the QA1S6□B, when installing the base unit to DIN rail in an environment of frequent vibration, use a vibration-proofing bracket (A1S-PLT-D). Mounting the vibration-proofing bracket (A1S-PLT-D) enhances the resistance to vibration.
Depending on the environment to install the base unit, it is also recommended to secure the base unit directly to the control panel.

This section gives instructions for handling the CPU, I/O, intelligent function and power supply modules, base units and so on.

- Module enclosure, terminal block connectors and pin connectors are made of resin; do not drop them or subject them to strong impact.
- Do not remove module's printed circuit boards from the enclosure in order to avoid changes in operation.
- Tighten the module fixing screws and terminal block screws within the tightening torque range specified shown in Table10.2.

Table10.2 Tightening torque range

Location of Screw	Tightening Torque Range
Module fixing screw (M3×12 screw)	0.36 to 0.48N•m
I/O module terminal block screw (M3 screw)	0.42 to 0.58N•m
I/O module terminal block fixing screw (M3.5 screw)	0.66 to 0.89N•m
Power supply module terminal screw (M3.5 screw)	0.66 to 0.89N•m

- Be sure to install a power supply module in the power supply installation slot of Q3□B, Q3□SB, Q3□RB, Q3□DB, Q6□B, Q6□RB, Q6□WRB, QA1S6□B or QA6□B.
  Even if the power supply module is not installed, when the I/O modules and intelligent function module installed on the base units are of light load type, the modules may be operated.
  In this case, because a voltage becomes unstable, we cannot guarantee the operation.
- When using an extension cable or a tracking cable, keep it away from the main circuit cable (high voltage and large current).
  Keep a distance of 100mm (3.94 inches) or more from the main circuit.
- The following are precautions on use in combination with a module whose depth is 130mm or more (Q66DA-G).

1) A module that is less than 130mm in depth cannot be mounted between modules that are 130mm or more in depth.
2) A module that is less than 130mm in depth cannot be mounted on the right side of a module that is 130mm or more in depth.
3) If a module that is 130mm or more in depth is mounted in slot 0 with the Q64P(N) used as power supply, operations such as installing or removing a CPU memory card may be difficult.

Although there is no problem with the operation behavior, if it is inconvenient, mount a module that is less than 130mm in depth in slot 0 or leave the slot empty.

Install a main base unit, Q00JCPU, and Q00UJCPU (by screwing) in the following procedure.

4) Fit the two base unit top mounting screws into the enclosure.

Figure 10.6 Installing a main base unit,Q00JCPU, and Q00UJCPU

5) Place the right-hand side notch of the base unit onto the right-hand side screw.

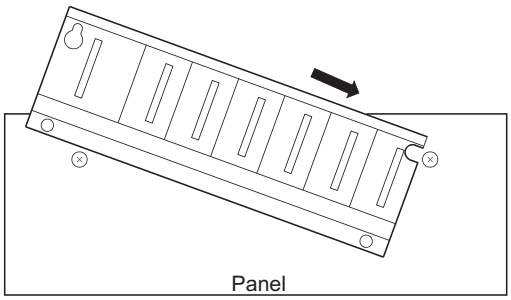


Figure 10.7 Installing a main base unit, Q00JCPU, and Q00UJCPU

6) Place the left-hand side pear-shaped hole onto the left-hand side screw.

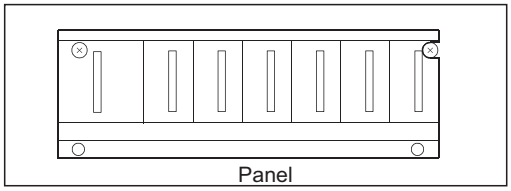


Figure 10.8 Install a main base unit, Q00JCPU, and Q00UJCPU

7) Fit the mounting screws into the holes at the bottom of the base unit, and then retighten the all mounting screws.

Point

- Install the main base unit, Q00JCPU, and Q00UJCPU on the panel while no module is mounted in the right-end slot on the base.
  When removing the base from the panel, remove the module mounted on the right-end slot first and then the base unit.
- The mounting screws that provided with the slim type main base unit differ from those provided with other types of the base unit.
  For mounting screws for the slim type main base unit, order "cross recessed head bind screw M4 x 12 (black)."

Note the following when mounting a DIN rail.

Mounting a DIN rail needs special adaptors (optional), which are user-prepared.

(a) Applicable adaptor types

For Q38B,Q312B,Q68B,Q612B,Q38RB,Q68RB,
Q65WRB,Q38DB,Q312DB : Q6DIN1

For Q35B,Q65B,Q00JCPU, Q00UJCPU : Q6DIN2

For Q33B,Q52B,Q55B,Q63B,Q32SB,Q33SB,Q35SB : Q6DIN3

Table10.3 Parts included with DIN rail mounting adaptors

DIN rail mounting adaptors	Quantity of included parts				
	Adaptor(Large)	Adaptor(small)	Mounting screw (M5×10)	Square washer	Stopper
Q6DIN1	2	4	3	3	2
Q6DIN2	2	3	2	2	2
Q6DIN3	1	2	2	2	2

(b) Adaptor installation method

The way to install the adaptors for mounting a DIN rail to the base unit is given in Figure 10.9.

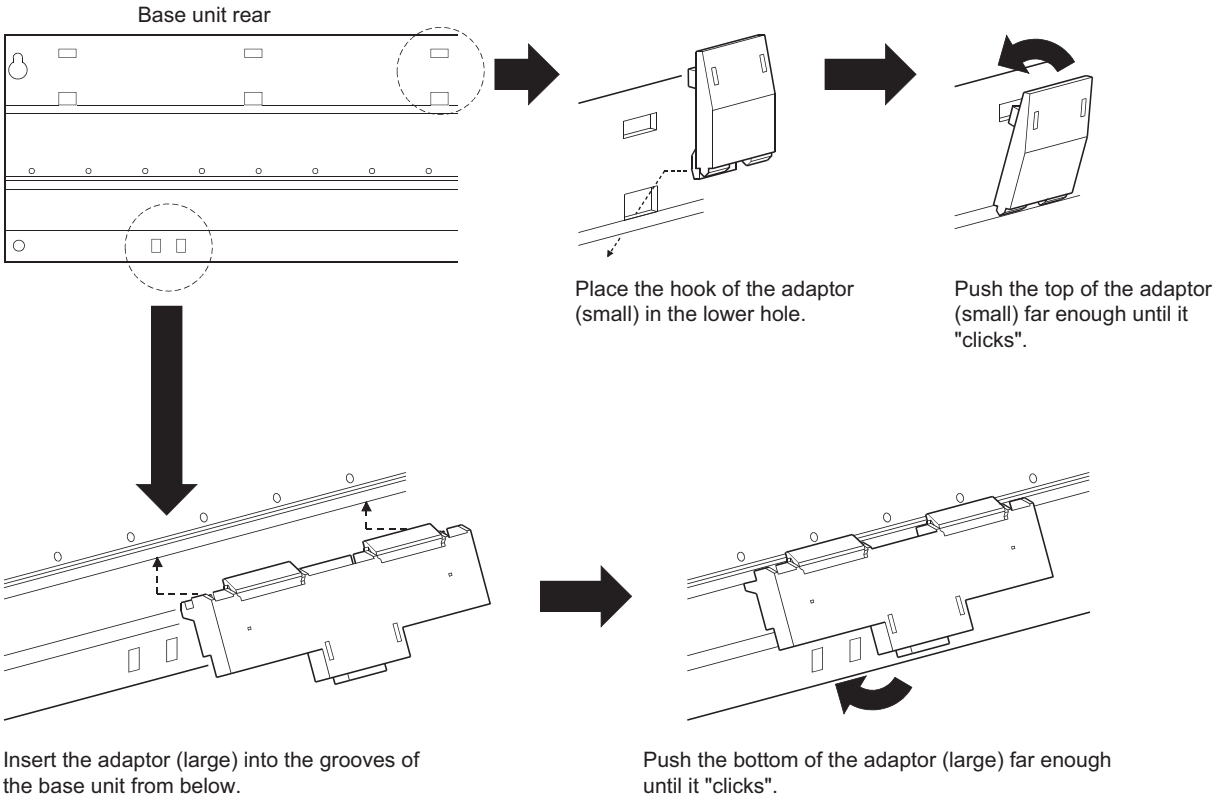


Figure 10.9 Adaptor installation method

(c) Applicable DIN rail types (IEC 60715)

TH35-7.5Fe

TH35-7.5Al

TH35-15Fe

(d) Distance between DIN rail mounting screws

When using DIN rail, DIN rail mounting screws must be inserted in 200 mm (7.88 inches) distances or less in order to ensure that the rail has sufficient strength.

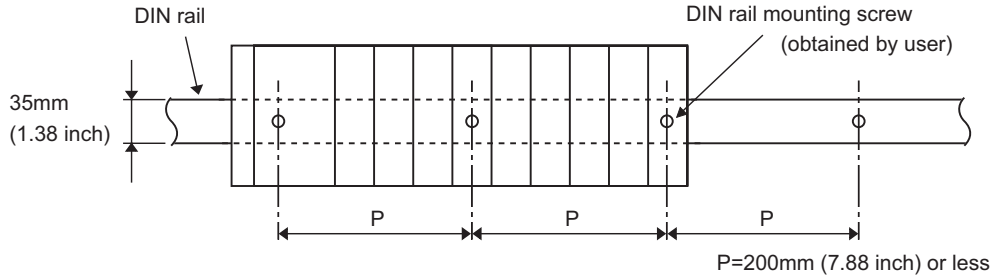


Figure 10.10 Distance between DIN rail mounting screws

When installing the DIN rail in a frequent vibration and/or shock prone environment, insert the mounting screws in 200mm interrals or less by the following method show below.

<For Q38B, Q312B, Q68B, Q612B, Q38RB, Q68RB, Q65WRB, Q38DB or Q312DB type>

Screw the DIN rail in three places using the mounting screws and square washers included with the DIN rail mounting adaptors (hereafter referred to as the adaptors) in 'Position A' (bottom of base unit).

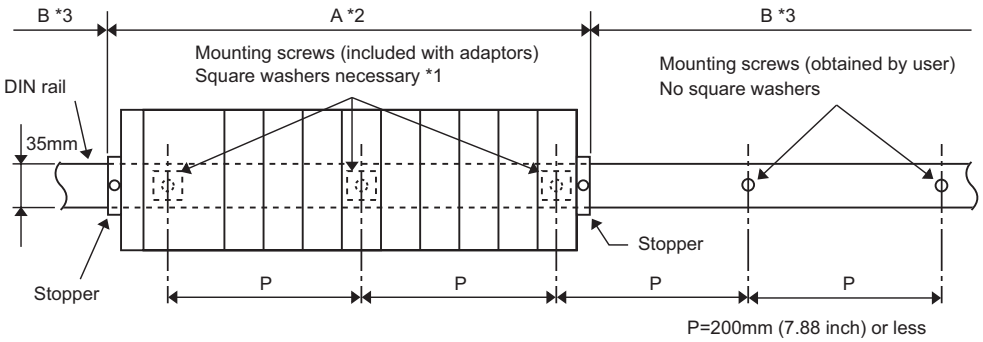


Figure 10.11 Distance between DIN rail mounting screws

<For Q00JCPU, Q00UJCPU, Q33B, Q35B, Q65B, Q52B, Q55B, Q63B, Q32SB, Q33SB or Q35SB type>
Screw the DIN rail in two places using the mounting screws and square washers included with the adaptors in 'Position A' (bottom of base unit).

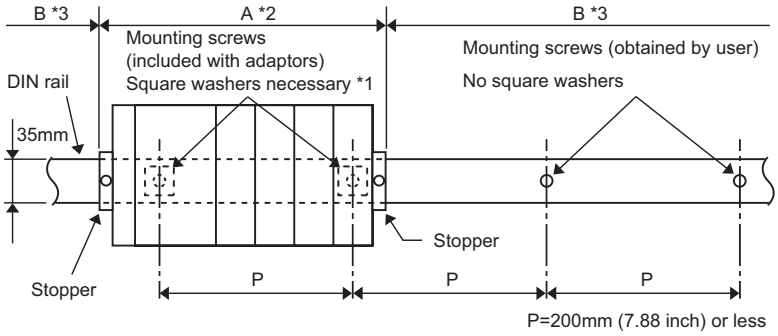


Figure 10.12 Distance between DIN rail mounting screws

*1: The following shows where to position the square washers.

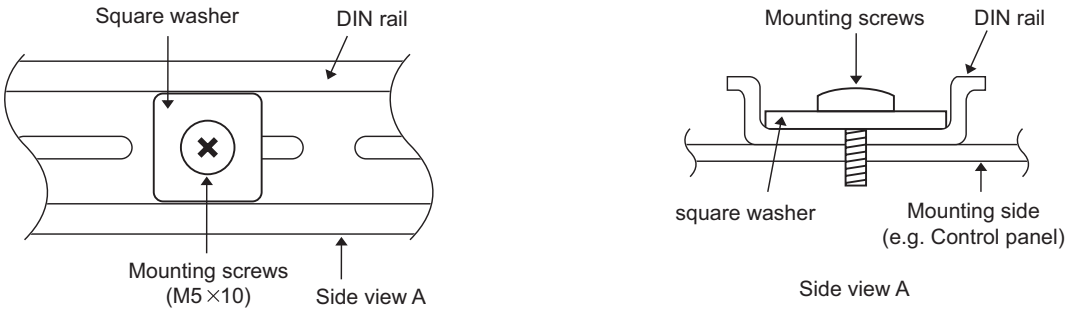


Figure 10.13 Square washer

*2: Screw the DIN rail to a control panel using the mounting screws and square washers included with the adaptors in 'Position A' (bottom of base unit).

*3: Screw the DIN rail with mounting screws(obtained by user) in 'Position B' (Where the base unit is not installed). In this method the supplied mounting screws and square washers are not used.

Point

- Use only one washer for each mounting screw. Use only the square washers supplied with the adaptors. If two or more washers are used together for one mounting screw, the screw may interfere with the base unit.
- Make sure to align the square washer sides with the DIN rail.

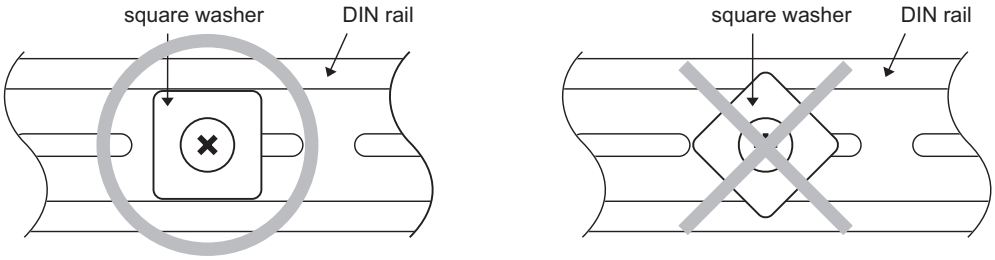


Figure 10.14 Precautions when mounting a square washer

- Use the DIN rail that is compatible with M5 size screws.

(e) Stopper mounting

When using the DIN rail in the environment with frequent vibration, use stoppers included with the DIN rail mounting adaptor shown in (a).

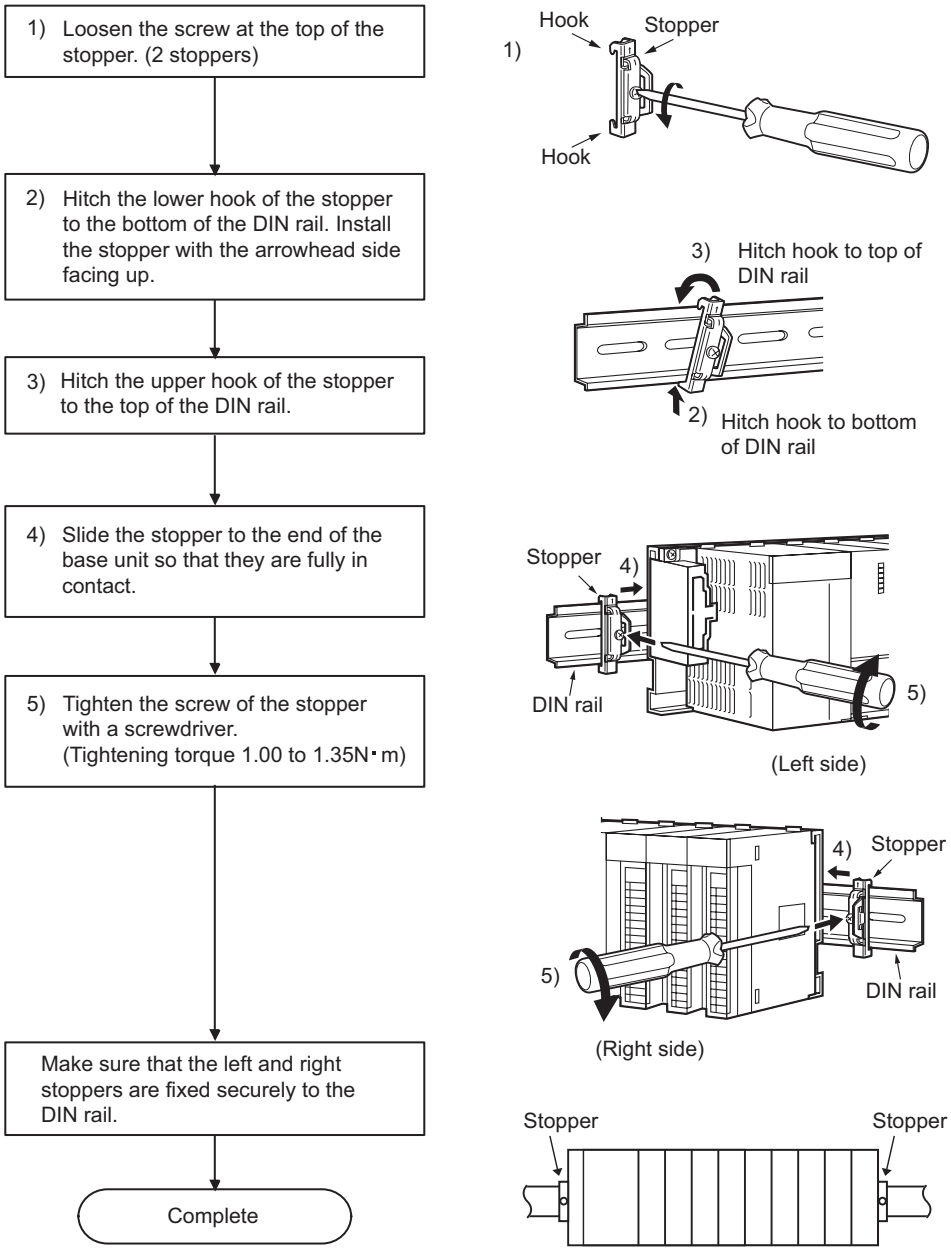


Figure 10.15 Fixture mounting procedure

In addition, when three or more modules with 130mm or more in depth (such as Q66DA-G etc.) are mounted, or when the base unit is used in the environment with extremely frequent vibration, use the Q6DIN1A Q-type base DIN rail mounting adaptor (vibration-proofing bracket kit) where the large mounting bracket is included. The large mounting bracket enables to enhance the resistance to vibration. Depending on the environment, it is recommended to mount the base unit directly on the control panel.

1) Q6DIN1A applicable models

Q00JCPU, Q00UJCPU, Q33B, Q35B, Q38B, Q312B, Q32SB, Q33SB, Q35SB, Q38RB, Q38DB, Q312DB, Q52B, Q55B, Q63B, Q65B, Q68B, Q612B, Q68RB, Q65WRB

Table10.4 Q-type base DIN rail mounting adaptor (Vibration-proofing bracket kit) included parts

DIN rail mounting adaptor (Vibration-proofing bracket kit)	Quantity of included parts							
	Adaptor (Large)	Adaptor (small)	Module mounting screw (M4×10)	Square washer	Stopper	Mounting bracket L	Mounting bracket R	Mounting screw (M5×10)
Q6DIN1A	2	4	4	3	2	1	1	3

Point

When stoppers are used, the dimension of stoppers need to be considered in the unit installation dimensions. Refer to a CPU user's manual for the base unit dimensions (W).

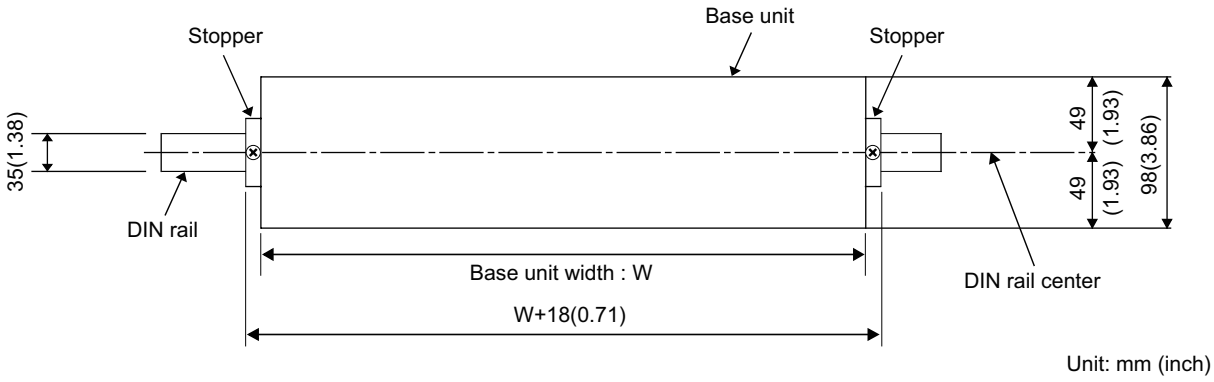
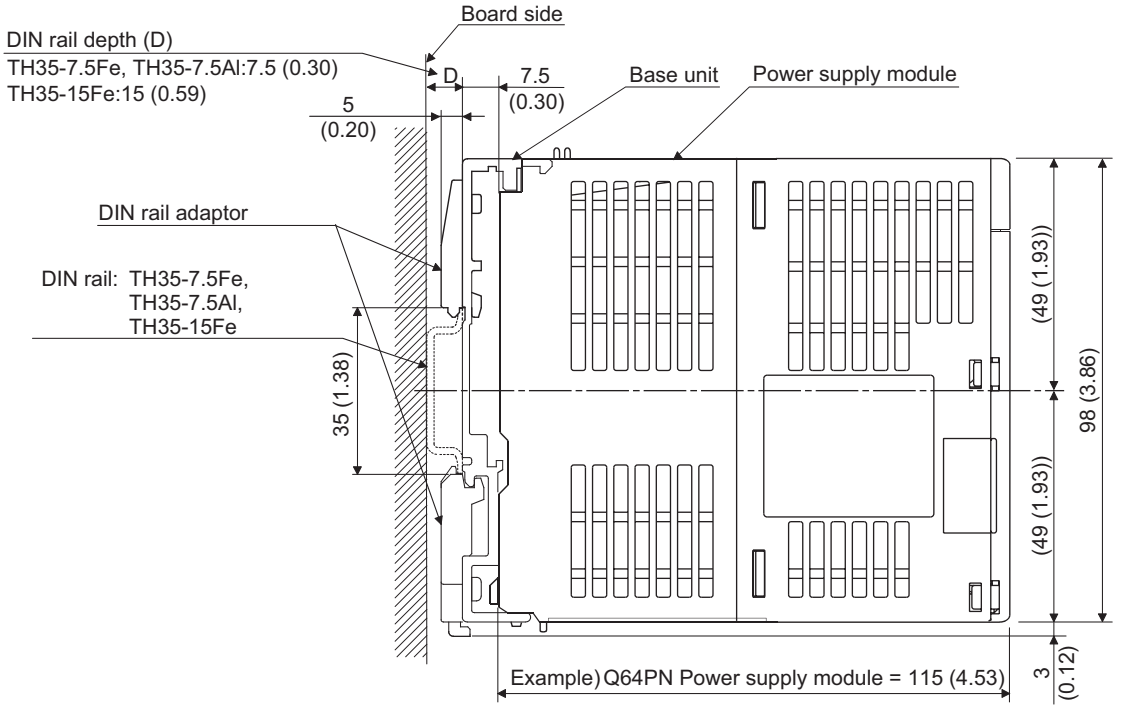


Figure 10.16 Base unit external dimensions (Front face)

(f) Dimensions when DIN rail is attached (Side view).



Unit: mm (inch)

Figure 10.17 External dimensions (Side face)

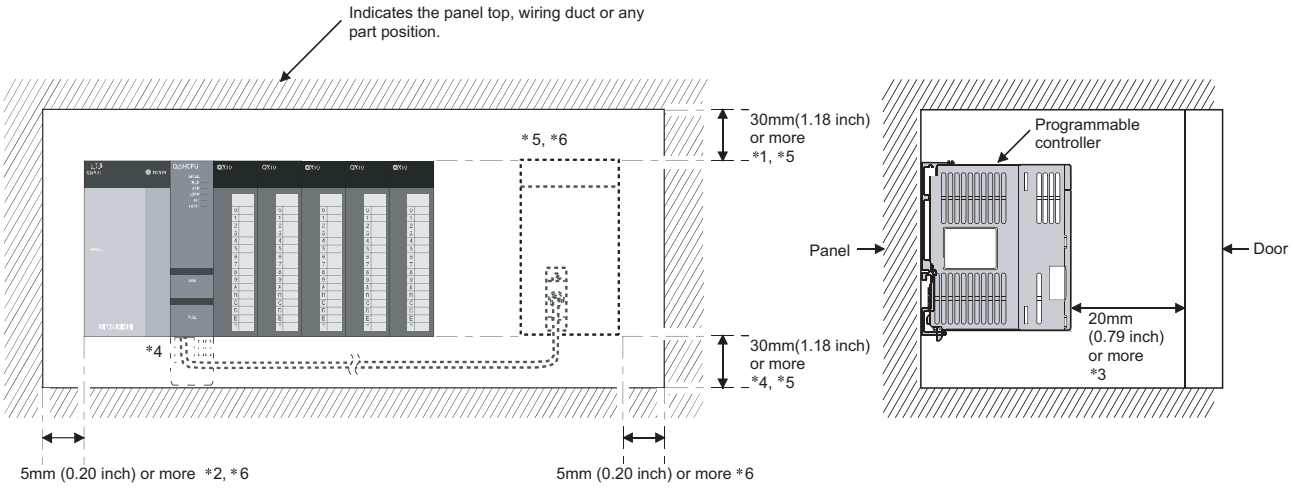
10.3.2 Instructions for mounting the base unit

When mounting the programmable controller to an enclosure or similar, fully consider its operability, maintainability and environmental resistance.

(1) Module mounting position

Keep the clearances shown in Figure 10.18 or Figure 10.19 between the top/bottom faces of the module and other structures or parts to ensure good ventilation and facilitate module replacement.

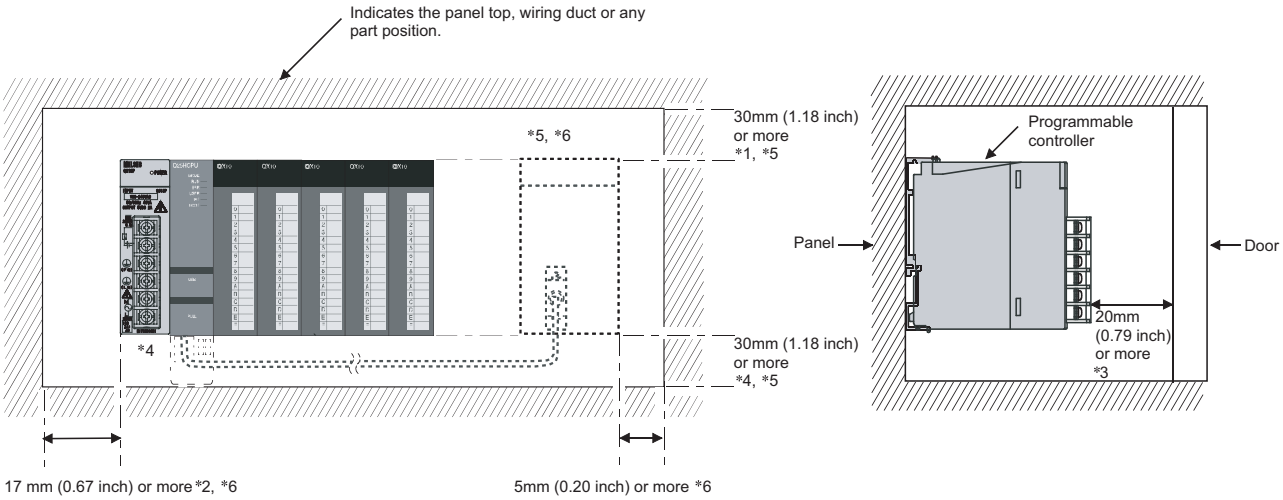
(a) In case of main base unit or extension base unit



*1: For wiring duct with 50mm (1.97 inches) or less height.
40mm (1.58 inches) or more for other cases.
*2: 20mm (0.79 inches) or more when the adjacent module is not removed and the extension cable is connected.
*3: 80mm (3.15 inches) or more for the connector type. 140mm (5.51 inches) or more for installing a tracking cable when using a Redundant CPU. 80mm (3.15 inches) or more for installing the Q8BAT cable when using the Q8BAT.
*4: 45mm (1.77 inches) or more when the Q7BAT is mounted.
*5: 30mm (1.18 inches) or more from the top and bottom of the Q8BAT when the Q8BAT is mounted.
*6: 5mm (0.20 inches) or more from the right and left of the Q8BAT when the Q8BAT is mounted.

Figure 10.18 Module mounting position

(b) In case of slim type main base unit



*1: For wiring duct with 50mm (1.97 inches) or less height.
40mm (1.58 inches) or more for other cases.

*2: The cable of the power supply module of the slim type main base unit protrudes out of the left end of the module. Install the module while reserving 17mm (0.67 inches) or more wiring space.
If the cable sheath is susceptible to damage caused by a structural object or part on the left side of the module, take a protective measure with spiral tube or a similar insulator.

*3: 80mm (3.15 inches) or more for the connector type. 80mm (3.15 inches) or more for installing the Q8BAT cable when using the Q8BAT.

*4: 45mm (1.77 inches) or more when the Q7BAT is mounted.

*5: 30mm (1.18 inches) or more from the top and bottom of the Q8BAT when the Q8BAT is mounted.

*6: 5mm (0.20 inches) or more from the right and left of the Q8BAT when the Q8BAT is mounted.

Figure 10.19 Module mounting position

(2) Module mounting orientation

- Install the programmable controller in the orientation in Figure 10.20 to ensure good ventilation for heat release.

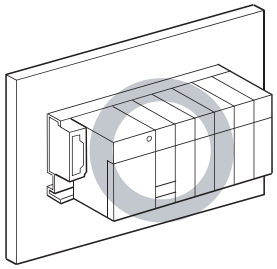


Figure 10.20 Orientation in which modules can be mounted

- Do not mount it in either of the orientations shown in Figure 10.21.

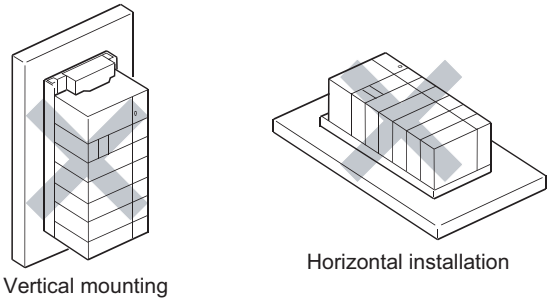


Figure 10.21 Orientation in which modules cannot be mounted

(3) Installation surface

Mount the base unit on a flat surface. If the mounting surface is not even, this may strain the printed circuit boards and cause malfunctions.

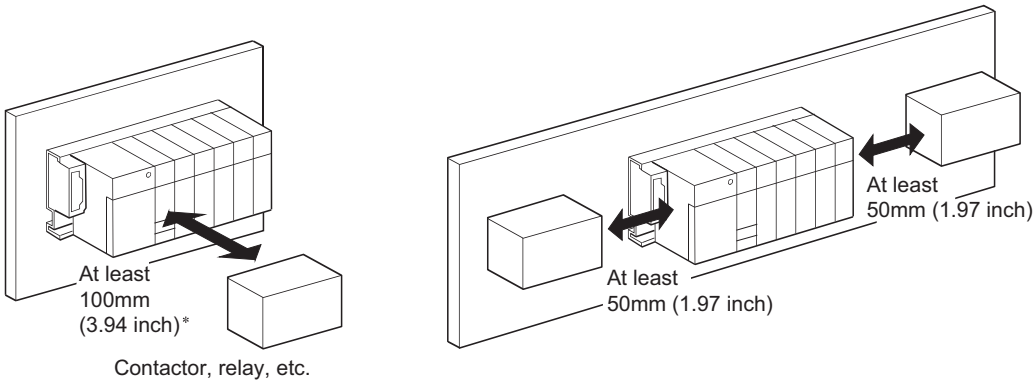
(4) Installation of unit in an area where the other devices are installed

Avoid mounting base unit in proximity to vibration sources such as large magnetic contractors and no-fuse circuit breakers; mount these on a separate panel or at a distance.

(5) Distances from the other devices

In order to avoid the effects of radiated noise and heat, provide the clearances indicated below between the programmable controller and devices that generate noise or heat (contactors and relays).

- Required clearance in front of programmable controller : at least 100 mm (3.94 inches)*
- Required clearance on the right and left of programmable controller : at least 50 mm (1.97 inches)



*: When using a Redundant CPU, keep a distance of 100mm (3.94 inches) or more between the programmable controller and the tracking cable.

Figure 10.22 Distances from the other devices

10.3.3 Installation and removal of module

This section explains how to install and remove a power supply, CPU, I/O, intelligent function or another module to and from the base unit.

(1) Installation and removal of the module from Q3□B, Q3□SB, Q3□RB, Q3□DB, Q5□B, Q6□B, Q6□RB and Q6□WRB

(a) Installation of module on Q3□B, Q3□SB, Q3□RB, Q3□DB, Q5□B, Q6□B, Q6□RB and Q6□WRB

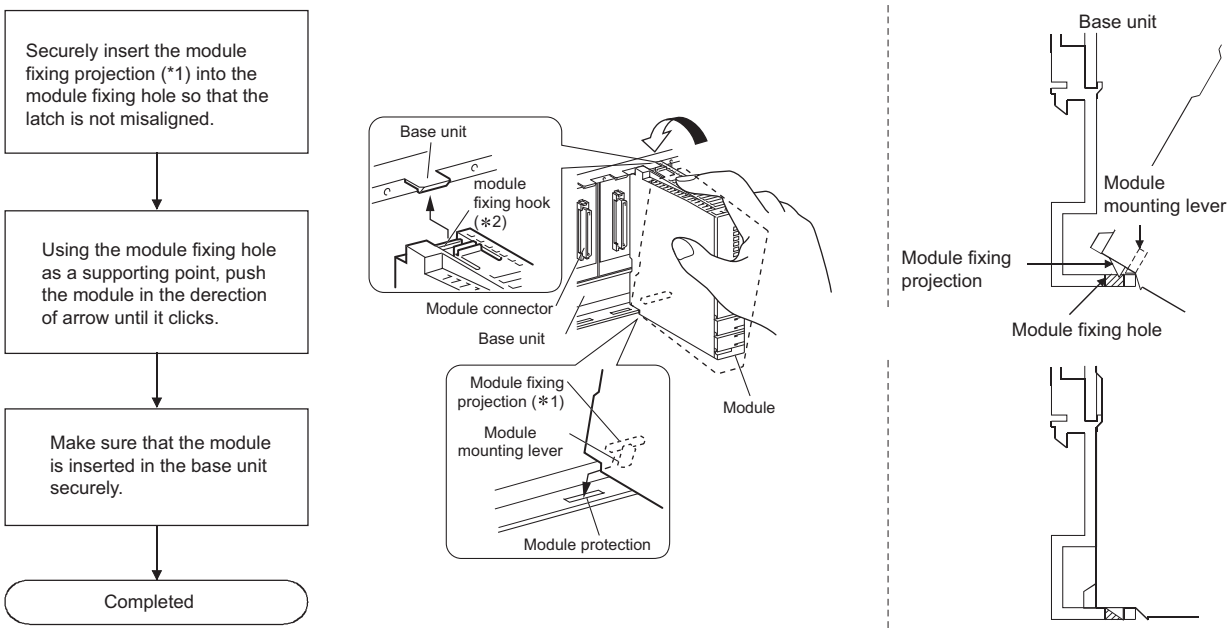


Figure 10.23 Module mounting procedure

*1: If the module has two module fixing projections, insert the two module fixing projections on the right and left into the module fixing holes so that they are not misaligned.

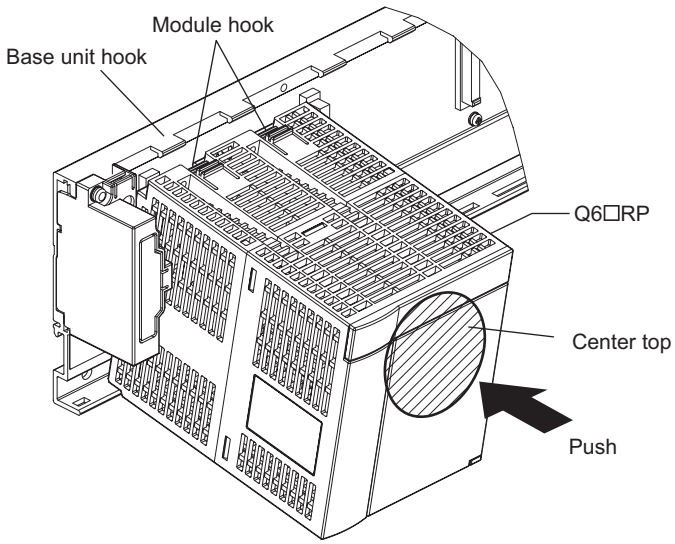


Figure 10.24 Mounting the Q6□RP

*2: If the module has two module fixing projections on its top, push the center top of the module so that the two module fixing hooks on the right and left are securely engaged with the base unit hooks.

Point

- When mounting the module, always insert the module fixing projection into the module fixing hole of the base unit. At that time, securely insert the module fixing projection so that it does not come off from the module fixing hole. Failure to do so may damage the module connector and module.
- When using the programmable controller in an environment of frequent vibration or impact, secure the CPU module to the base unit using screws.
  Module fixing screw : M3 X 12 (user-prepared)
- After first use of the product, do not mount or remove the module onto or from the base unit and the terminal block to or from the module more than 50 times (IEC 61131-2 compliant) respectively. Exceeding the limit of 50 times may cause malfunction.

(b) Removal from Q3□B, Q3□SB, Q3□RB, Q3□DB, Q5□B, Q6□B, Q6□RB, and Q6□WRB

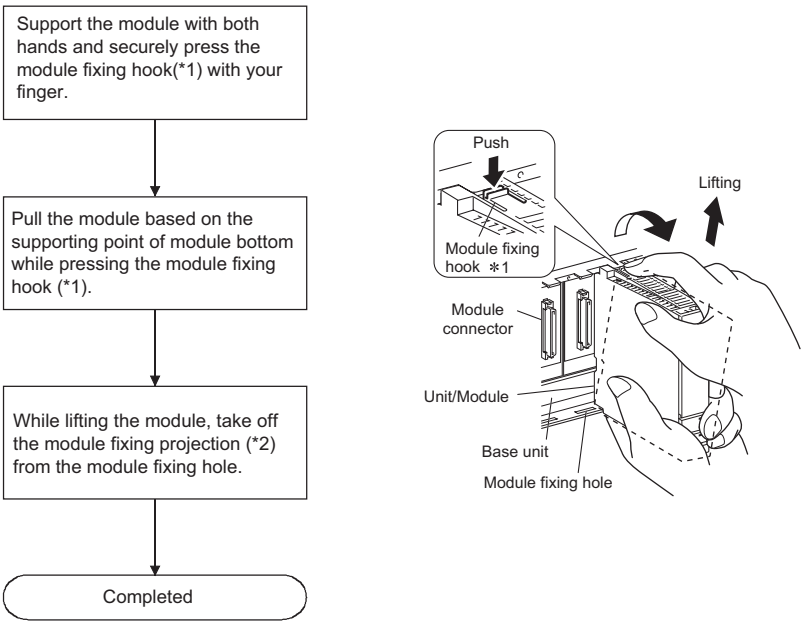


Figure 10.25 Module removal procedure

*1: If the module has two module fixing hooks on its top, push the two modules fixing projections on the right and left of the module top simultaneously with your fingers until they stop.

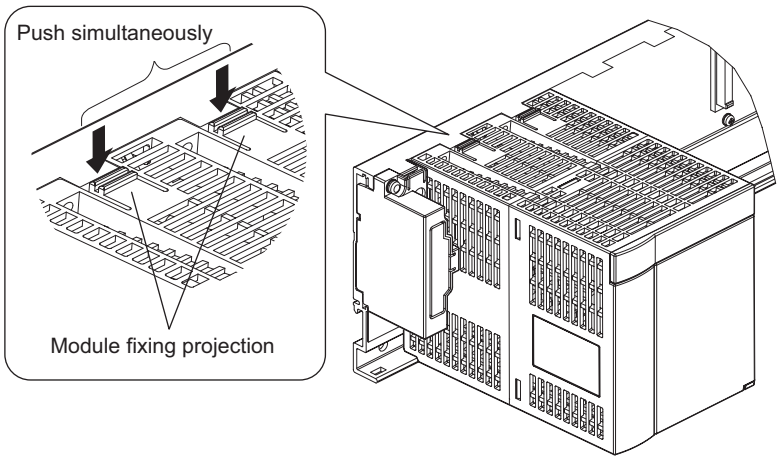


Figure 10.26 Q6□RP removal procedure

*2: If the module has two fixing projections, remove the two module fixing projections on the right and left of the module bottom from the module fixing holes.

Point

When removing the module which is secured by module fixing screw, remove the module fixing screw first and then module fixing projection off the module fixing hole of the base unit.
Failure to do so may damage the module fixing projection.

(2) Installation and removal of the module from QA1S6□B

(a) Installation of module on QA1S6□B

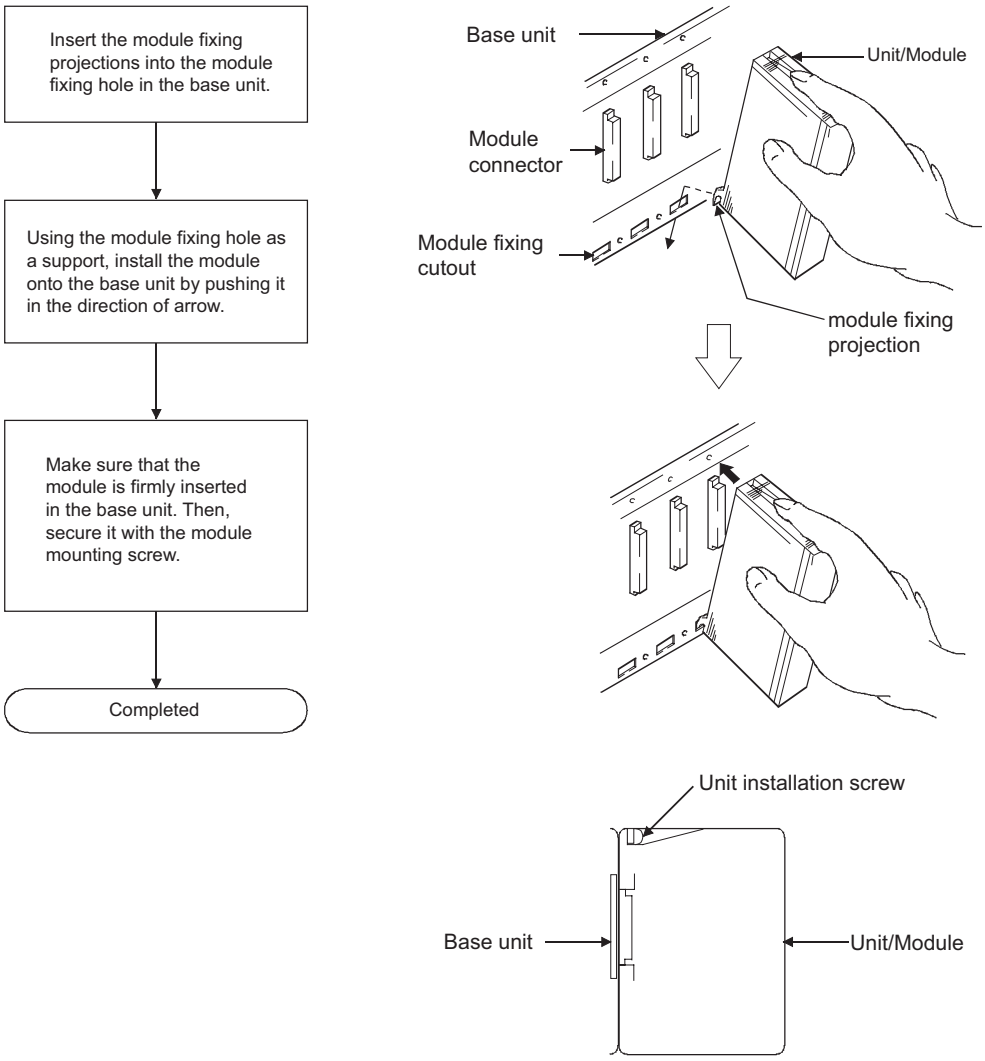


Figure 10.27 Module mounting procedure

Point

Make sure to mount the module with the module fixing projection inserted into the module fixing hole, using the module fixing screws.
Failure to do so may damage the module connector and module.

(b) Removal from QA1S6□B

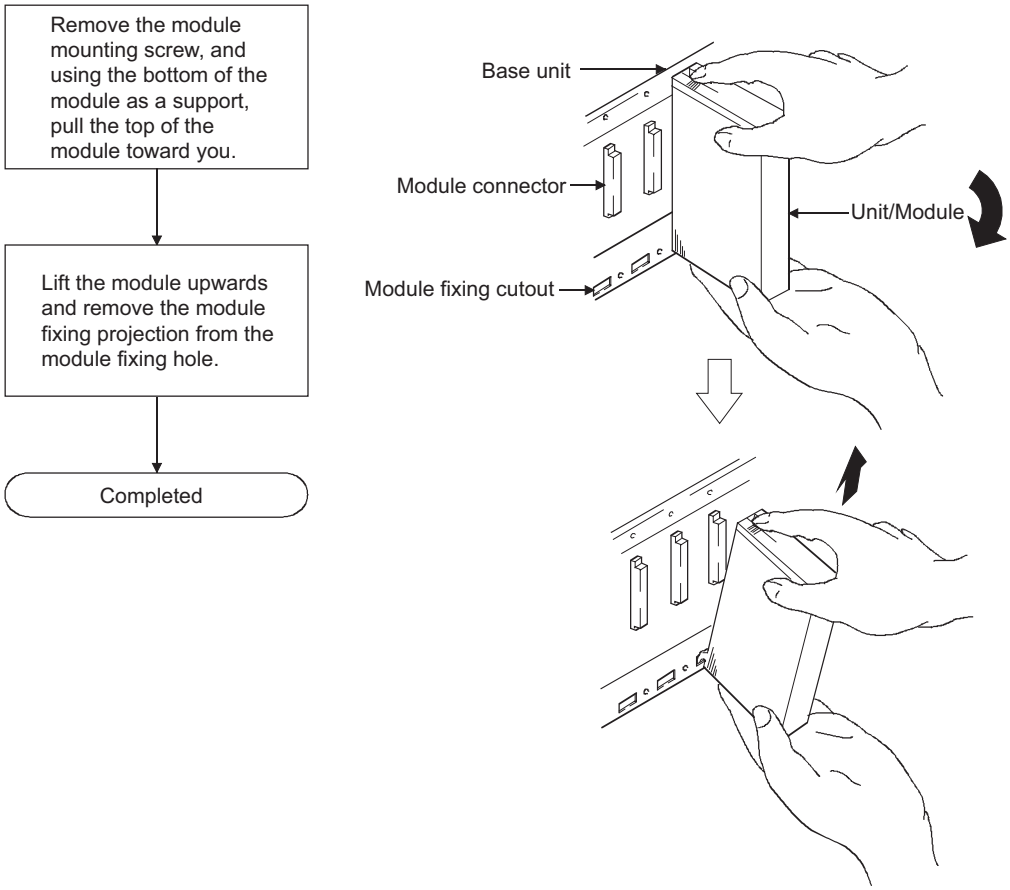


Figure 10.28 Module removal procedure

Point

When removing the module which is secured by module fixing screw, remove the module fixing screw first and then module fixing projection off the module fixing hole of the base unit.
Failure to do so may damage the module fixing projection.

(3) Installation and removal of modules

(a) Installation of module on QA6□B

Insert the two module fixing projections into the module fixing hole (B) in the base unit.

↓

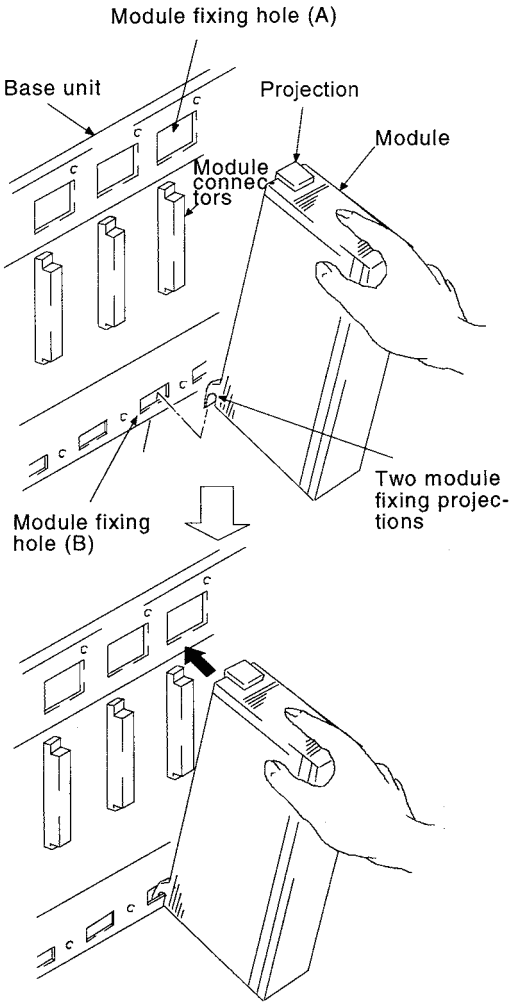
Load the module into the base unit by pushing it in the direction of the arrow.

↓

Check if the projection of module is securely inserted in the module fixing hole (A) in the base unit.

↓

Completed



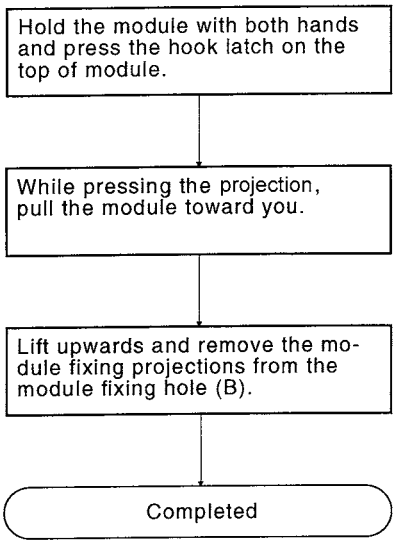
Point

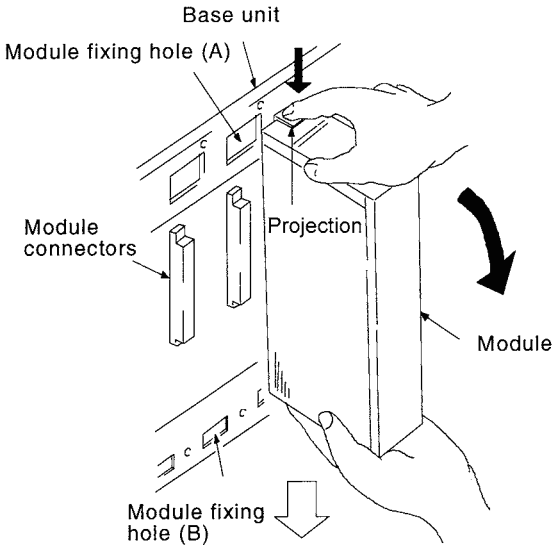
For use in an environment with particularly frequent vibrations and/or shock, secure the module to the base with screws. The applicable screw size is M4(0.16)×0.7(0.03)×12mm (0.47 inches). Refer to the figure on the right.

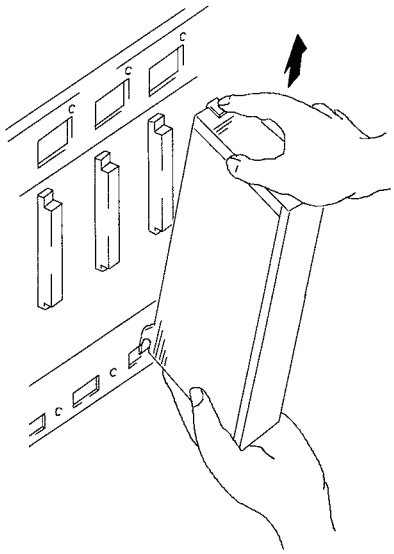
CAUTION

- To mount a module, Insert the module fixing projection(s) into the fixing hole(s) in the base unit and press the module until it snaps into place.
  Incorrect mounting may cause malfunction, failure, or a drop of the module.
  When using in an environment of frequent vibrations, secure the module with a screw.
  Tighten the screw within the specified torque range.
  Undertightning can cause drop of the screw, circuit or malfunction.
  Overtightning can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

(b) Removal from QA6□B







Point

Disengage the hook from the module fixing hole (A) and then remove the module fixing projection from the module fixing hole (B). Attempting to remove the module forcibly may damage the hook or module fixing projection.

10.4 How to set the Base Number for the Extension Base Unit

When using two or more extension base units, the base number must be set with their base number setting connectors.*1
(The number of extension bases is set to 1 by factory default.)

*1: Since the Q6□WRB is fixed to the extension 1, extension base No. setting is not required.

(1) Setting the extension base number

Set the extension base number in the following procedure.

1) The base number setting connector of the extension base unit is located under the IN side base cover.
(Setting of the extension number setting connector (☞ Section 6.1.4))
First, loosen the upper and lower screws in the IN side base cover and remove the base cover from the extension base unit.

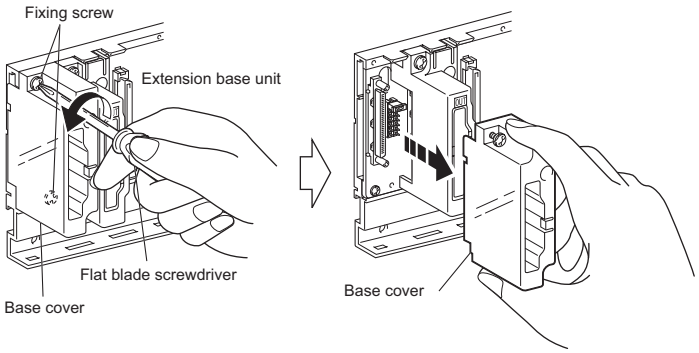


Figure 10.29 Removing a base cover

2) Insert the connector pin in the required base number location of the connector (PIN1) existing between the IN and OUT sides of the extension cable connector.

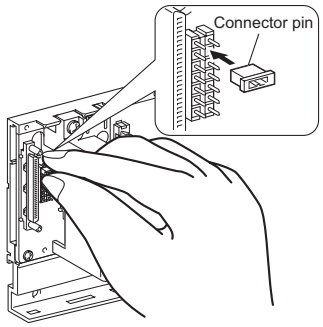


Figure 10.30 Setting the number of extension bases

3) Install the base cover to the extension base unit and tighten the base cover screw.
(Tightening torque: 0.36 to 0.48N•m)

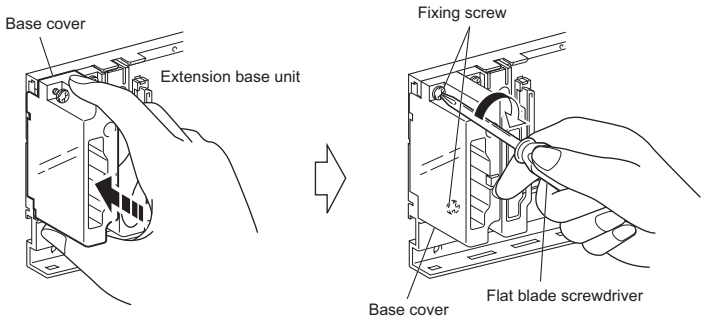


Figure 10.31 Base cover removal procedure

Point

Set the numbers for extension base units in the order of connecting, starting from the one connected to the main base unit.

(2) Precautions for setting the extension base numbers

(a) Setting order

Set the extension base number consecutively.

In Auto mode, when any extension base number is skipped, no slots will be allocated to an empty extension base so that the slots cannot be reserved.

For details of the base mode, refer to the follwoing.

☞ Manuals for the CPU module used (Function Explanation, Program Fundamentals)

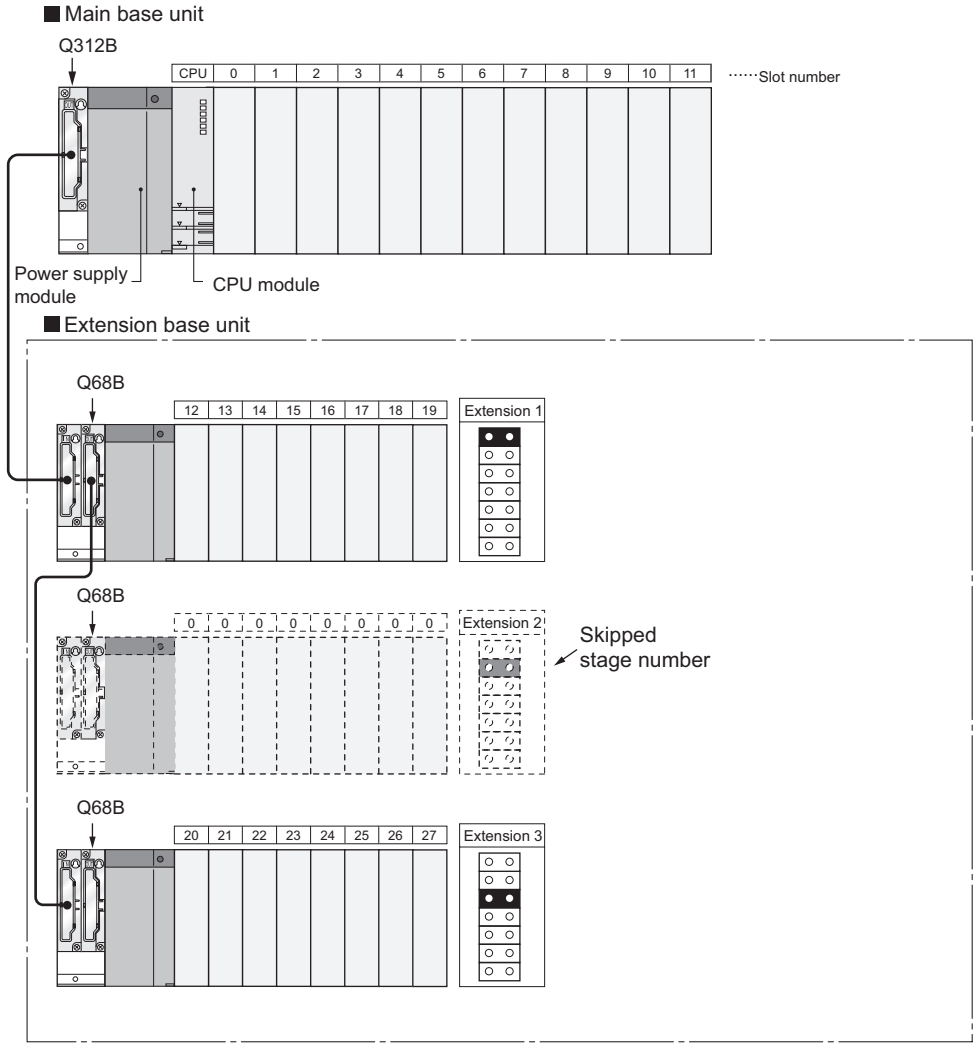


Figure 10.32 The number of slots when a extension base number is skipped

(b) When the same number is set

The same extension number cannot be set.

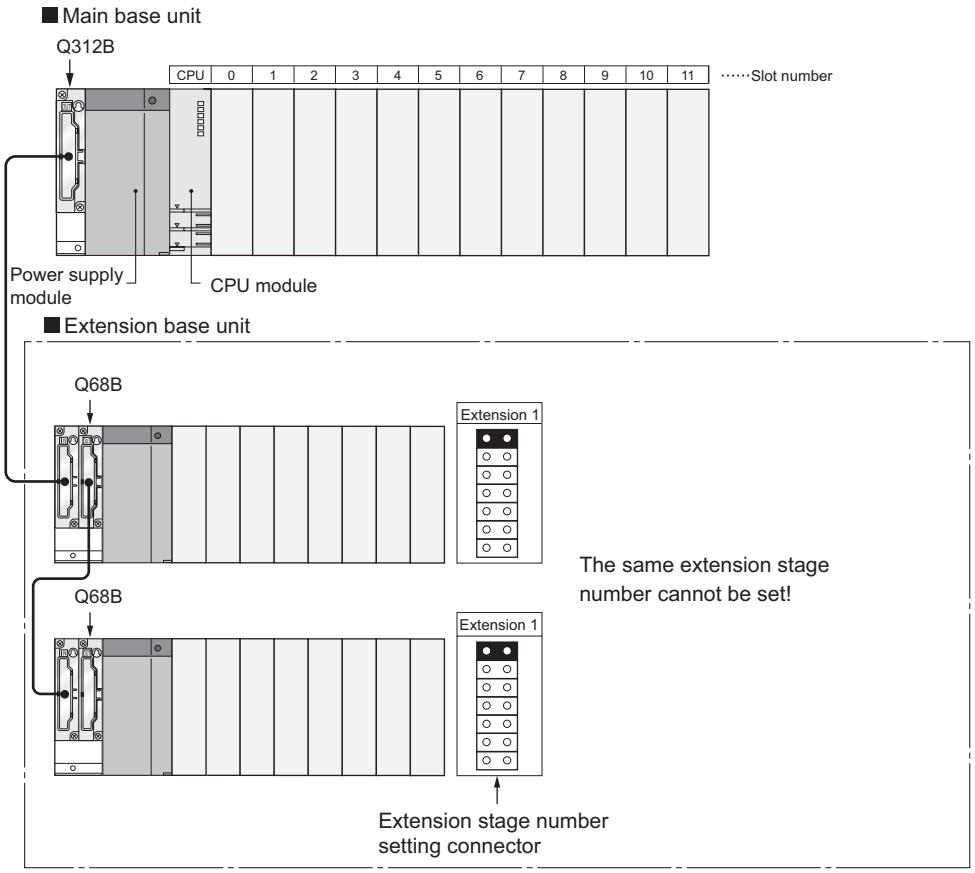


Figure 10.33 When the same extension number is set

(c) When connector pins are connectd in more than 2 positions, or no pin is used

The extension base unit cannot be used when connector pins for base number setting are inserted in more than two positions and when not using any connector pin.

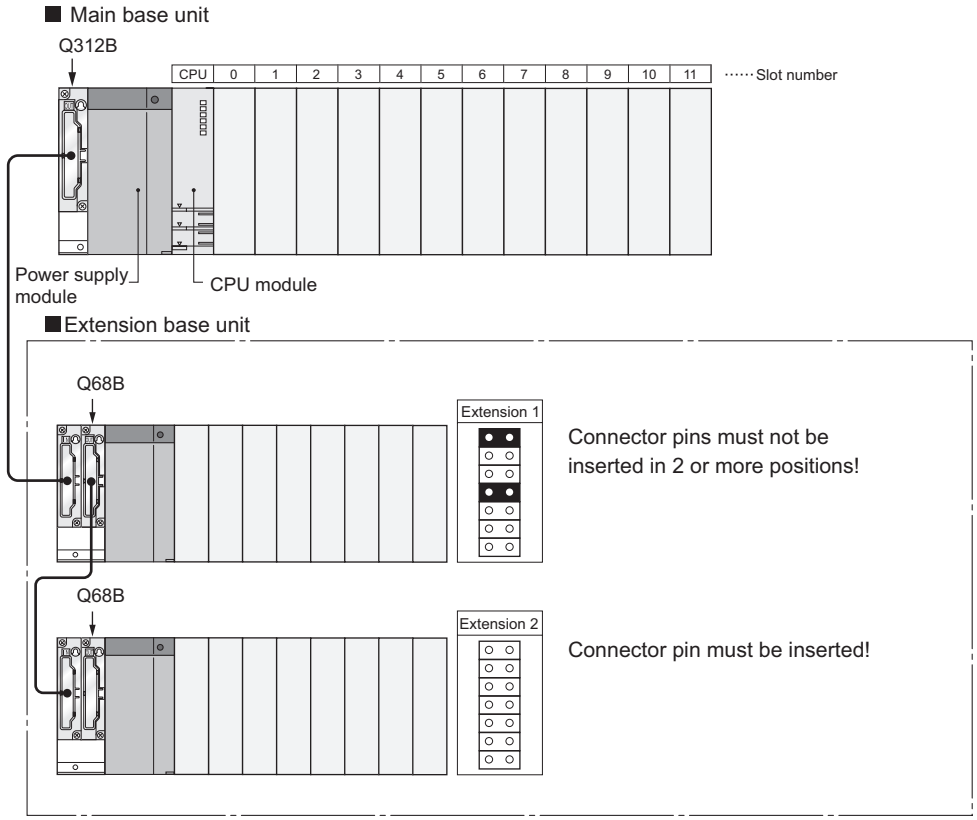


Figure 10.34 Connector pins are used in 2 positions, and not using any connector pin

(d) Extension base positioning for AnS/A series-compatible extension base units (QA1S6□B, QA6□B, and QA6ADP+A5□B/A6□B)

When using AnS/A series-compatible extension base units in combination, connect Q5□B/Q6□B closest to the main base unit, and then QA1S6□B, QA6□B, and then QA6ADP+A5□B/A6□B.

Note that the QA1S6□B and QA6ADP+A5□B/A6□B cannot be used in combination.

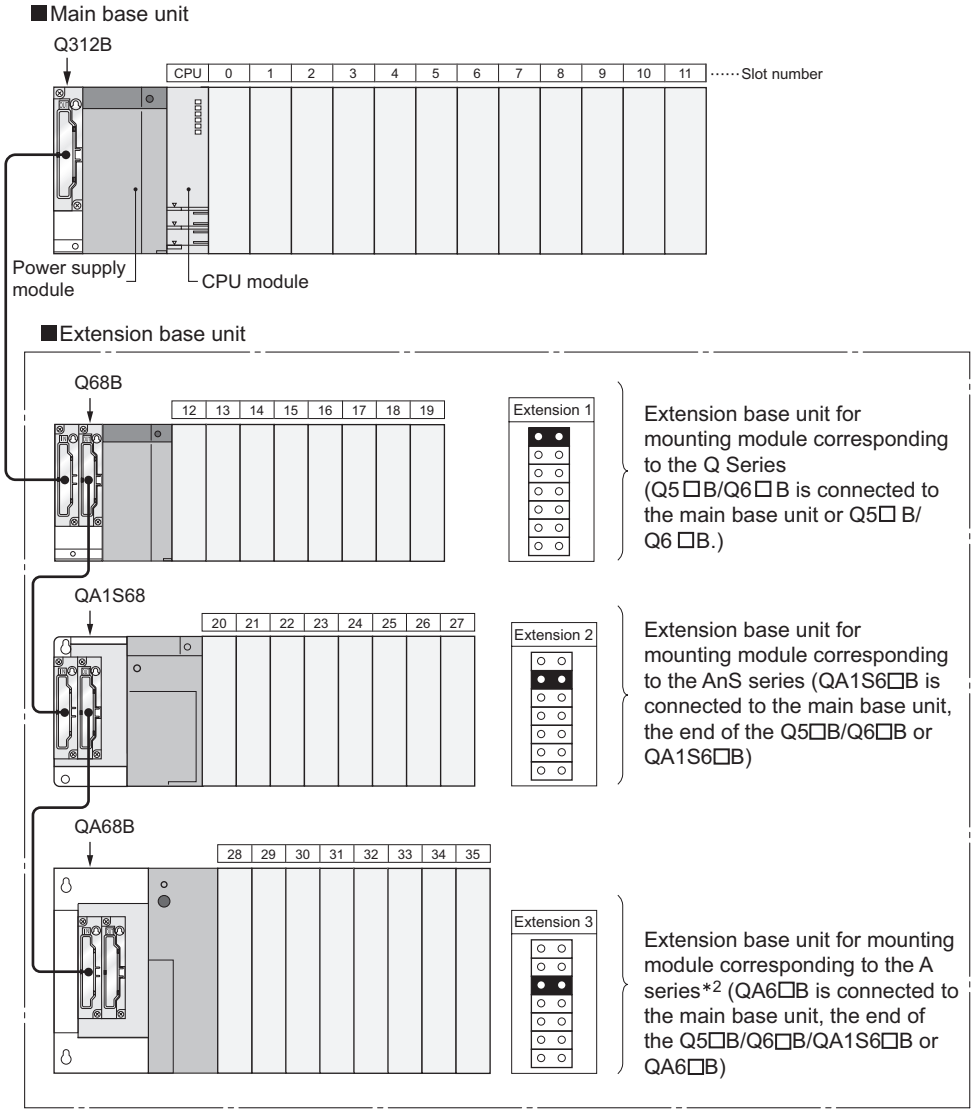


Figure 10.35 Extension base positioning for the AnS/A series-compatible extension base units

*1: When using the QA6ADP+A5□B/A6□B, connect it below the QA6□B.

10.5 Connection and Disconnection of Extension Cable

(1) Instructions for handling an extension cable

- Do not step on an extension cable.
- Connect the extension cable to the base unit with the base cover installed to the base unit.
  (After you have set the extension number to the extension base unit, reinstall and screw the base cover.)
- When laying an extension cable, secure 55mm (2.17 inches) or more as the minimum cable bending radius. If it is less than 55mm (2.17 inches), a malfunction may occur due to characteristic deterioration, cable disconnection or the like.
- The overall length of extension cables must be up to 13.2m (43.31 feet).
- Do not install extension cables with the main circuit (high voltage and large current) line.
- When connecting or disconnecting an extension cable, do not hold the ferrite cores mounted at both ends of the cable.
  Hold the connector part of the cable for connection or disconnection.

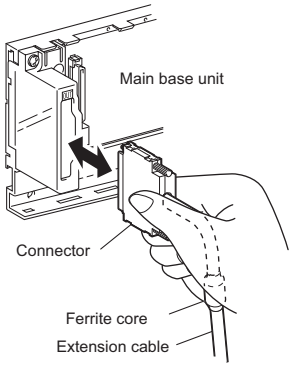


Figure 10.36 Connection and Disconnection of Extension Cable

Holding the ferrite core may cause the cable disconnection in the connector.
Also, if the ferrite core position is shifted, the characteristic will change. When handling the cable, do not to shift the ferrite core position.

(2) Connection of extension cable

Point

When connecting an extension base unit to the main base unit with an extension cable, plug the OUT side connector of the main base unit and the IN side connector of the extension base unit with an extension cable. The system will not operate properly if the extension cable is connected in the form of IN to IN, OUT to OUT or IN to OUT.
When connecting two or more extension base units, plug the OUT side connector of the first extension base unit and the IN side connector of the second extension base unit with an extension cable.

- To connect an extension cable to the main base unit, remove the portion under the OUT characters on the base cover with a tool such as a flat blade screwdriver (5.5×75, 6×100).
  This also applies to a case where an extension cable is connected to the OUT side connector of the extension base unit.
  When connecting an extension cable to the Q00JCPU and Q00UJCPU, remove the base cover manually.
  To remove the base cover, insert the tip of a screwdriver into a clearance below the base cover and pry it up.
  Be careful not to damage the connector when inserting the screw driver since a connector is located inside the base cover.

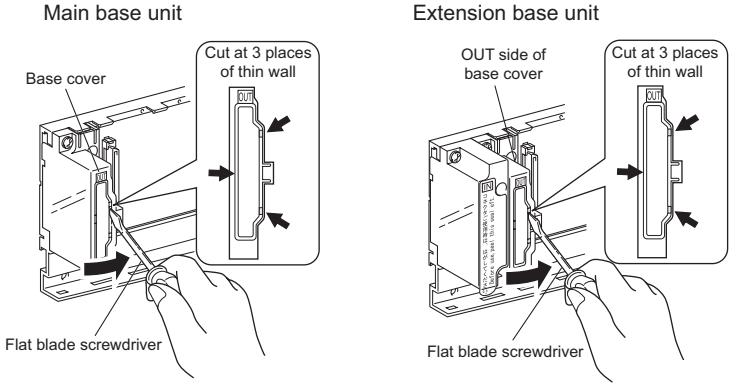


Figure 10.37 Connection of extension cable

• To connect the extension cable to the next extension base unit, remove the sticker put under the IN characters on the base cover.

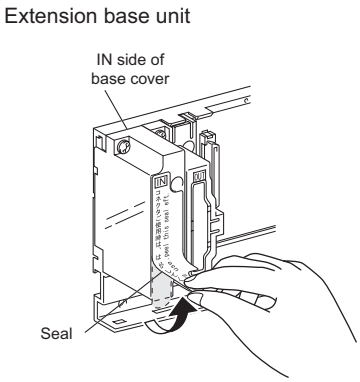


Figure 10.38 Connection of extension cable

• When plugging the extension cable to any base unit, hold the connector part of the extension cable.

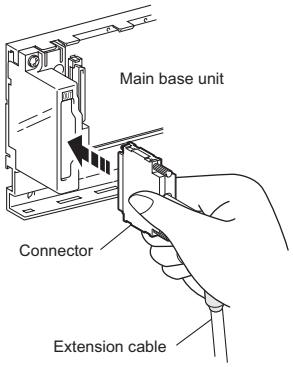


Figure 10.39 Connection of extension cable

• After fitting the extension cable, always tighten the extension cable connector fixing screws. (Tightening torque: 0.20N•m)

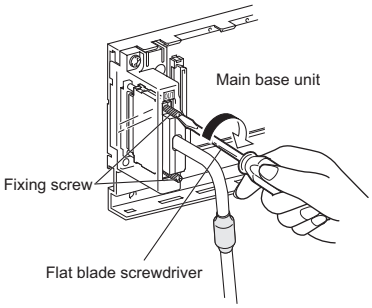


Figure 10.40 Connection of extension cable

(3) Disconnection of extension cable

When disconnectiong the extension cable, hold and pull the connector part of the extension cable after confirming that the fixing screws have been completely removed.

10.6 Wiring

10.6.1 Wiring precautions

DANGER

- Shut off the external power supply for the system in all phases before wiring.
  Failure to do so may result in electric shock or damage to the product.
- After wiring, attach the included terminal cover to the module before turning it on for operation.
  Failure to do so may result in electric shock.

CAUTION

- Ground the FG and LG terminals to the protective ground conductor dedicated to the programmable controller.
  Failure to do so may result in electric shock or malfunction.
- Check the rated voltage and terminal layout before wiring to the module, and connect the cables correctly.
  Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Connectors for external connection must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered.
  Incomplete connections could result in short circuit, fire, or malfunction.
- Tighten the terminal screws within the specified torque range.
  Undertightning can cause short circuit, fire, or malfunction.
  Overtightening can cause damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Prevent foreign matter such as dust or wire chips from entering the module.
  Such foreign matter can cause a fire, failure, or malfunction.
- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring.
  Do not remove the film during wiring.
  Remove it for heat dissipation before system operation.
- Mitsubishi programmable controller must be installed in a control panels.
  Connect the main power supply to the power supply module in the control panel through a relay terminal block.
  Wiring and replacement of a power supply module must be performed by a maintenance personnel who is familiar with protection against electricshock.
  (For the wiring methods, refer to Section 10.6.2.)

This section describes the precautions for wiring power supply lines.

(1) Wiring power supply lines

- Wire the power supply lines for programmable controller, I/O devices, and motor equipment separately as shown in Figure 10.41.
- If there is much noise, such as lightning surge, connect an isolation transformer.
  For details on the isolation transformer, refer to the following.
  ☞ Section 9.1.6(3) Isolation transformer
- Taking rated current or inrush current into consideration when wiring the power supply, connect a breaker or an external fuse that have proper blown and detection.
  When using a single programmable controller, a 10A breaker or an external fuse are recommended for wiring protection.

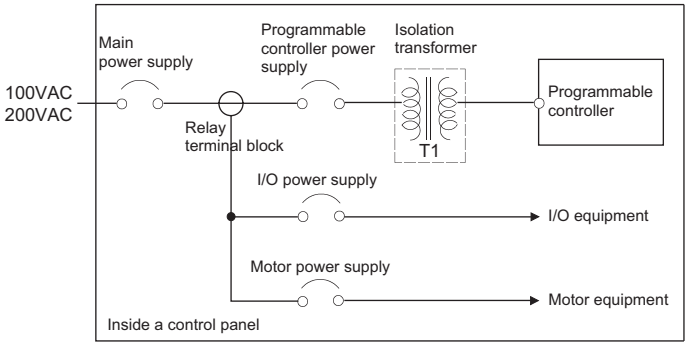


Figure 10.41 Power supply wiring

- Do not connect the 24VDC outputs of two or more power supply modules in parallel to supply power to one I/O module. Parallel connection will damage the power supply modules.

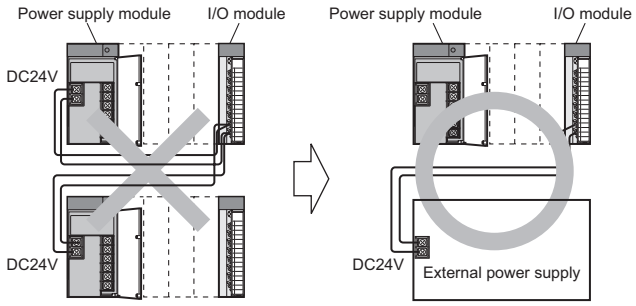


Figure 10.42 Cautions when connecting a power supply module

- 100VAC, 200VAC and 24VDC wires must be twisted as dense as possible.
  Connect the modules with the shortest distance.
  Also, to reduce the voltage drop to the minimum, use the thickest wires possible (maximum 2mm^2).
- Do not bundle the 100VAC and 24VDC wires with, or run them close to, the main circuit (high voltage, large current) and I/O signal lines (including common line). Reserve a distance of at least 100 mm from adjacent wires.

• Momentary power failure may be detected or the CPU module may be reset due to serge caused by lightening.
As measures against serge caused by lightening, connect a surge absorber for lightening as shown in Figure 10.43.
Using the surge absorber for lightening can reduce the influence of lightening.

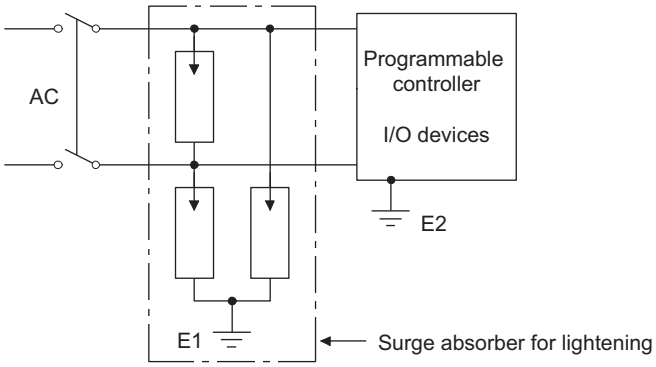


Figure 10.43 Connecting a lightning surge absorber

Point

- Separate the ground of the surge absorber for lightening (E1) from that of the programmable controller (E2).
- Select a surge absorber for lightening whose power supply voltage does no exceed the maximum allowable circuit voltage even at the time of maximum power supply voltage elevation.

(2) Wiring of I/O equipment

- Insulation-sleeved crimping terminals cannot be used with the terminal block.
  It is recommended to cover the wire connections of the crimping terminals with mark or insulation tubes.
- The wires used for connection to the terminal block must be 0.3 to 0.75mm^2 in core and 2.8mm (0.11 inches) max. in outside diameter.
- Run the input and output lines away from each other.
- When the lines cannot be run away from the main circuit and power lines, use a batch-shielded cable and ground it on the programmable controller side.
  In some cases, ground it in the opposite side.

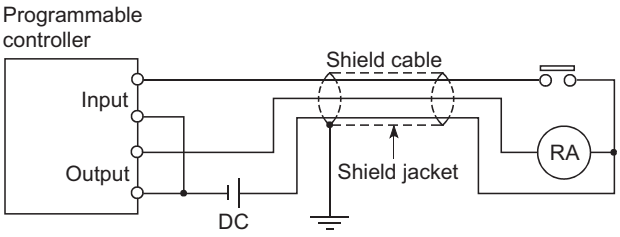


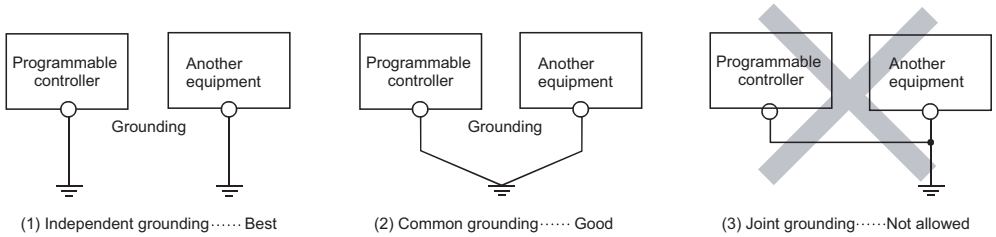
Figure 10.44 Wiring of I/O equipment

- Where wiring runs through piping, ground the piping.
- Run the 24VDC input line away from the 100VAC and 200VAC lines.
- Wiring of 200m (686.67 feet) or longer will raises current leakage due to the line capacity, resulting in a fault.
- To prevent electric shock or malfunction, provide the external power supply for the module to be changed online with means that can turn the power supply off individually, e.g. a switch. (☞ Section 12.4)
  For details, refer to Section 12.5.
- As a countermeasure against the power surge due to lightning, separate the AC wiring and DC wiring and connect a surge absorber for lightning as shown in (1) of item (10.6.1).
  Failure to do so increases the risk of I/O device failure due to lightning.

(3) Grounding

For grounding, perform the following:

- Use a dedicated grounding wire as far as possible. (Grounding resistance of 100Ω or less.)
- When a dedicated grounding cannot be provided, use (2) Common grounding shown below.



(1) Independent grounding····· Best (2) Common grounding····· Good (3) Joint grounding·····Not allowed

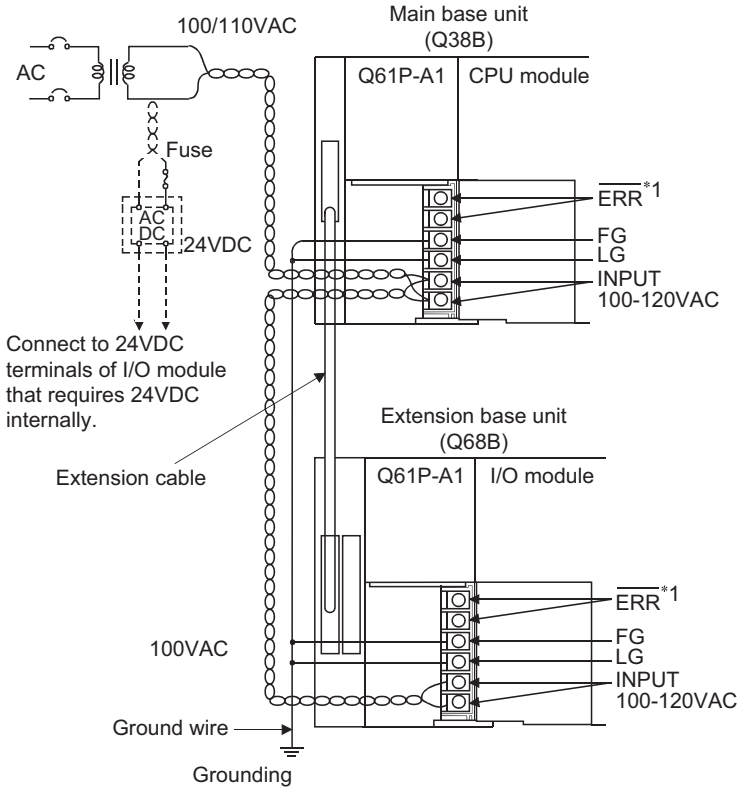
Figure 10.45 Grounding procedures

- For grounding a cable, use the cable of 2 mm^2 or more.
  Position the ground-contact point close to the programmable controller as much as possible so that the length of the grounding cable will be shorten.

10.6.2 Connecting to the power supply module

The following figure shows the wiring example of lines such as power lines and grounding lines to the main base unit and extension base units.

(1) Singular power supply system

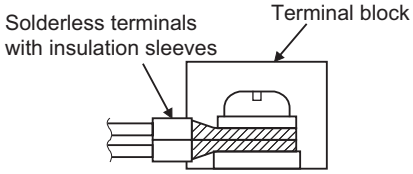


*1: The operation of the $\overline{\text{ERR}}$ terminal is as fllows.
<When the power supply module is mounted on the main base unit>
The terminal turns off (opens) when the AC power is not input, a CPU module stop error (including a reset) occurs, or the fuse of the power supply module is blown.
<When the power supply module is mounted on the extension base unit>
The terminal is always off (opened).

Figure 10.46 Single power supply system wiring example

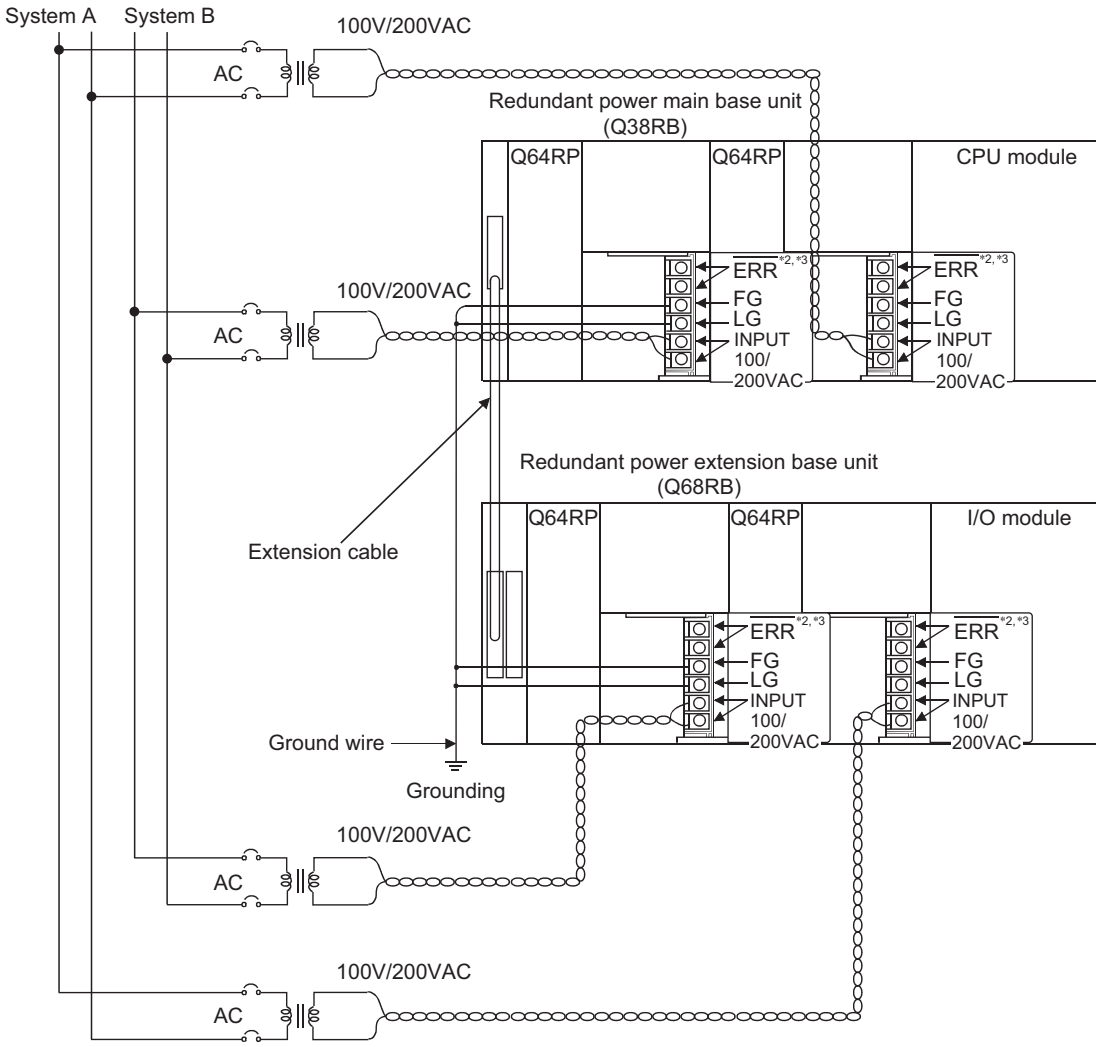
Point

- Use the thickest possible (max. 2 mm^2 (14 AWG)) wires for the 100/200VAC and 24VDC power cables. Twist these wires starting at the connection terminals. Use a solderless terminal for wiring a terminal block. To prevent short-circuit due to loosening screws, use the solderless terminals with insulation sleeves of 0.8 mm (0.03 inches) or less.
  Note that up to two solderless terminals can be connected per terminal block.



- When LG and FG terminals are connected, ground the wires.
  If not, the programmable controller may become susceptible to noise.
  Since the LG terminal has a half of the input voltage, touching this terminal may result in electric shock.
- No system error can be detected by the $\overline{\text{ERR}}$ terminal of an extension base unit. (The $\overline{\text{ERR}}$ terminal is always set to off.)

(2) Redundant power supply system



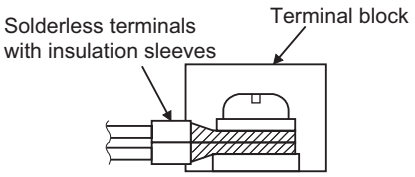
*2: The operation of the $\overline{\text{ERR}}$ terminal is as fllows.
<When the redundant power supply module is mounted on the redundant power main base unit>
The terminal turns off (opens) when the AC power is not input, a CPU module stop error (including a reset) occurs, the redundant power supply module fails, or the fuse of the redundant power supply module is blown.
<When the redundant power supply module is mounted on the redundant power extension base unit>
The terminal turns off (opens) when the redundant power supply module fails.

*3 When input power is supplied to the redundant power supply module mounted on the redundant power main base unit and the redundant power supply module mounted on the redundant power extension base unit simultaneously, the ON (short) timing of the $\overline{\text{ERR}}$ terminal on the redundant power main base unit is later than that of the $\overline{\text{ERR}}$ terminal on the redundant power extension base unit by the initial processing time of the CPU module.

Figure 10.47 Redundant power supply system wiring example

Point

- Use the thickest possible (max. 2 mm^2 (14 AWG)) wires for the 100/200VAC and 24VDC power cables. Twist these wires starting at the connection terminals. Use a solderless terminal for wiring a terminal block. To prevent short-circuit due to loosening screws, use the solderless terminals with insulation sleeves of 0.8 mm (0.03 inches) or less.
  Note that up to two solderless terminals can be connected per terminal block.



- Supply power to two redundant power supply modules individually (redundant power supply system).
- When two redundant power supply modules (Q64RP) are placed together and operated as a redundant power supply system, it is recommended to use one of them as an AC power input and connect the other to an uninterruptible power supply to the other.
- When the LG and FG terminals are connected, ground the wires.
  If not, the programmable controller may become susceptible to noise.
  Since the LG terminal has a half of the input voltage, touching this termial may result in electric shock.

CHAPTER11 MAINTENANCE AND INSPECTION

DANGER

- Do not touch the terminals while power is on.
  Doing so will cause electric shock.
- Correctly connect the battery connector.
  Do not charge, disassemble, heat, short-circuit, solder, or throw the battery into the fire.
  Doing so will cause the battery to produce heat, explode, or ignite, resulting in injury and fire.
- Shut off the external power supply for the system in all phases before cleaning the module or retightening the terminal screws or module fixing screws.
  Failure to do so may result in electric shock.
  Undertightening the terminal screws can cause short circuit or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

CAUTION

- Before performing online operations (especially, program modification, forced output, and operation status change) for the running CPU module from the peripheral connected, read relevant manuals carefully and ensure the safety.
- Do not disassemble of modify the modules.
  Doing so may cause failure, malfunction, injury or a fire.
- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm (9.85 inches) away in all directions from the programmable controller.
  Failure to do so may cause malfunction.
- Shut off the external power supply for the system in all phases before mounting or removing the module. Failure to do so may cause the module to fail or malfunction.
  A module can be replaced online (while power is on) on any MELSECNET/H remote I/O station or in the system where a CPU module supporting the online module change function is used.
  Note that there are restrictions on the modules that can be replaced online, and each module has its predetermined replacement procedure.
  (☞ Section 12.4.1).
- After the first use of the product, do not mount/remove the module to/from the base unit, and the terminal block to/from the module more than 50 times (IEC 61131-2 compliant) respectively.
  Exceeding the limit of 50 times may cause malfunction.
- Do not drop or apply shock to the battery to be installed in the module.
  Doing so may damage the battery, causing the battery fluid to leak inside the battery.
  If the battery is dropped or any shock is applied to it, dispose of it without using.
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.
  Failure to do so may cause the module to fail or malfunction.

In order to use the programmable controller in normal and optimal condition at all times, this section describes items that must be maintained or inspected daily or at regular intervals.

11.1 Daily Inspection

The items that must be inspected daily are listed in Table11.1.

Table11.1 Daily inspection

Item	Inspection Item		Inspection	Judgment Criteria	Measures
1	Installation of base unit		Check that fixing screws are not loose and the cover is not dislocated.	The screws and cover must be installed securely	Retighten the screws.
2	Installation of I/O module		Check that the module is not dislocated and the unit fixing hook is engaged securely.	The module fixing hook must be engaged and installed securely.	Securely engaged the module fixing hook.
3	Connecting conditions		Check for loose terminal screws.	Screws must not be loose.	Retighten the terminal screws.
			Check for distance between solderless terminals.	The proper clearance must be provided between solderless terminals.	Correct.
			Check that the cable connector is not loose.	Connections must no be loose.	Retighten the connector fixing screws.
4	Module indication LED	Power supply module POWER LED*1	Check that the LED is on.	The LED must be on (green). (Error if the LED is off or on (red)).	☞ Section 12.2.
		Power supply module LIFE LED*2	Check that the LED is on.	The LED must be on (green or orange) or flashing (orange). (Error if the LED is off, on (red), or flashing (red))	
		CPU module MODE LED*3	Check that the LED is on.	The LED must be on (green). (Error if the LED is off or flashing.)	
		CPU module RUN LED	Check that the LED is on in the RUN status.	The LED must be on. (Error if the LED is off.)	
		CPU module ERR. LED	Check that the LED is off.	The LED must be off. (Error if the LED is on or flashing.)	
		CPU module BAT. LED*4	Check that the LED is off.	The LED must be off. (Error if the LED is on.)	
		Input module Input LED	Check that the LED turns on and off.	The LED must be on when the input power is turned on. The LED must be off when the input power is turned off. (Error if the LED does not turn on or turn off as indicated above.)	
		Output module Output LED	Check that the LED turns on and off.	The LED turns on when the output power is turned on. The LED must be off when the output power is turned off. (Error if the LED does not turn on or turn off as indicated above.)	

*1: For the Q00JCPU and Q00UJCPU, check the POWER LED on the CPU module side.
*2: When the Life detection power supply module is used, check the LIFE LED.
*3: The Basic model QCPU does not have the MODE LED.
*4: The Basic model QCPU does not have the BAT. LED.

11.2 Periodic Inspection

The items that must be inspected one or two times every 6 months to 1 year are listed below.
When the equipment has been relocated or modified, or wiring layout has been changed, perform this inspection.

Periodic Inspection

Table11.2 Periodic Inspection

Item	Inspection Item		Inspection	Judgment Criteria	Measures
1	Ambient environment	Ambient temperature	Measure with a thermometer and a hygrometer. Measure corrosive gas.	0 to 55°C	When the sequencer is used in the board, the ambient temperature in the board becomes the ambient temperature.
		Ambient humidity		5 to 95 %RH *1	
		Atmosphere		Corrosive gas must not be present.	
2	Power voltage		Measure a voltage between the terminals of 100/200VAC and 24VDC.	85 to 132VAC	Change the power supply.
				170 to 264VAC	
				15.6 to 31.2VDC	
3	Installation	Looseness, rattling	Move the module to check for looseness and rattling.	The module must be installed securely.	Retighten the screws. If the CPU, I/O, or power supply module is loose, fix it with screws.
		Adhesion of dirt and foreign matter	Check visually.	Dirt and foreign matter must not be present.	Remove and clean.
4	Connection	Looseness of terminal screws	Try to further tighten screws with a screwdriver.	Screws must not be loose.	Retighten the terminal screws.
		Proximity of solderless terminals to each other	Check visually.	Solderless terminals must be positioned at proper intervals.	Correct.
		Looseness of connectors	Check visually.	Connectors must not be loose.	Retighten the connector fixing screws.
5	Battery		Check the BAT. LED at the front side of the CPU module.	The LED must be off.	Replace the battery when the BAT. LED is on.
			Check the length of term after purchasing the battery.	Must not be used more than 5 years.	Replace the battery if it has been used more than 5 years.
			Check that SM51 or SM52 is turned off using GX Developer in monitor mode.	Must be turned off.	Replace the battery when SM51 or SM52 is on.
6	PLC diagnostics		Check the Error log.	The Error log must not be updated.	Section 12.3.3
7	Maximum scan time		Check the values of SD526 and SD527 using GX Developer in the monitor mode.	Maximum scan time must be within the allowable range given in the specification of the system.	Specify factors that increase the scan time. (Check the operation status of the trigger signal that passes through a loop if loop positions exist in the sequence program.)

*1: When AnS/A Series module is included in the system, the judgement criteria will be from 10 to 90 % RH.

11.3 Battery Life and Replacement Procedure

The batteries installed in the CPU module and SRAM card are used for data retention of the program memory, standard RAM, and latch device during the power failure. Special relays SM51 and SM52 turn on due to the battery voltage drop. Even if the special relays turn on, the program and retained data are not deleted immediately.
After relay SM51 turns on, replace the battery quickly within the backup power time for (3 minutes).

Point

SM51 turns on when the battery voltage drops below the specified value, and remains on even after the voltage is recovered to the normal value.
SM52 turns on when the battery voltage drops below the specified value, and turns off when the voltage is recovered to the normal value.
After SM51 and/or SM52 turns on, replace the battery quickly.

SM51 and SM52 turn on when the battery voltage of the CPU module or SRAM card is lowered.
To identify the specific battery of the memory of which voltage is lowered, check the contents of the special resisters SD51 and SD52.

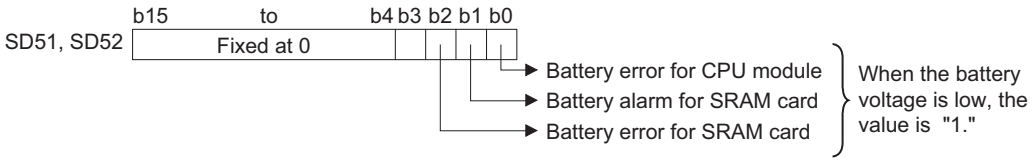


Figure 11.1 Bit pattern

For details of SD51 and SD52, refer to Section 12.8.

Point

The cases for memory retention by the CPU module battery and the SRAM card battery are described below.
The important points are:

- The CPU module battery cannot retain the SRAM card memory.
- The SRAM card battery cannot retain the CPU module memory.

Table11.3 Cases for memory retention by the CPU module battery and the SRAM card battery.

Power supply module	Battery of CPU module	SRAM card battery	Memory of CPU module	Memory of SRAM card
On	Connected	Installed	○	○
		Not installed	○	○
	Not connected	Installed	○	○
		Not installed	○	○
Off	Connected	Installed	○	○
		Not installed	○	×
	Not connected	Installed	×	○
		Not installed	×	×

○: Retained, ×: Not retained

11.3.1 Display of battery consumption and reduction measures of the consumption

(1) Battery consumption

The battery consumption represents consumption of the CPU module battery energy.*1

The larger value of the battery consumption in the table, the more battery per time unit is consumed.

The battery consumption depends on the factors of (a) to (c) as follows.

The following table shows the relationship of the factors and the battery consumption.

Table11.4 Battery consumption and causes for determining the consumption

Factors of battery consumption			Battery consumption
(a) Battery life-prolonging function*2	(b) Module error log function*3	(c) Size of file register file in standard RAM (SR) <Unit: word>	
Set	----	----	1
Not set	Not set	No file registers or 0K < SR ≦ 128K	2
		128K < SR ≦ 384K	3
		384K < SR	4
	Set	Refer to Table11.5.	

When the standard RAM is set as a storage location for module error log data, battery consumption will be as shown in Table11.5.

Table11.5 Battery consumption when module error log data are stored to the standard RAM

(c) Size of file register file in standard RAM (SR) <Unit: word>	Battery consumption		
	Q00U/01U/02U/ Q03UD(E)/ Q04UD(E)HCPU	Q6UD(E)HCPU	Q10UD(E)H/ Q13UD(E)H/ Q20UD(E)H/ Q26UD(E)HCPU
0K ≦ SR ≦ 128K	2	3	3
128K < SR ≦ 384K	----	3	4
384K < SR	----	----	4

*1: Applicable to the Q02UCPU, Q03UDCPU, Q04UDHCPU, and Q06UDHCPU if the serial numbers (first five digits) are "10012" or later.

The current consumption level can be checked by referring to SD118 where the battery consumption value is stored.

*2: For details of the battery life-prolonging function, refer to the following.

(☞ QnUCPU User's Manual (Function Explanation, Program Fundamentals)

*3: For details of the module error log function, refer to the following.

(☞ QnUCPU User's Manual (Function Explanation, Program Fundamentals)

Note11.1 Basic Redundant High performance Process

The battery consumption value is displayed only for the Universal model QCPU.

(2) Reduction measures of battery consumption

The following describes measures for reducing battery consumption.

- Enable the battery life-prolonging function.
- When storing a file register in standard the RAM, minimize the file register file.
- By performing the latch data backup function (to standard ROM), the battery life-prolonging function will be enabled independent of the parameter setting.*4
  If not powering on the programmable controller for a long period of time for shipment or other reason, back up the data to the standard ROM.

*4: Except when the battery life-prolonging function has already been enabled.

11.3.2 Battery lives of CPU modules

(1) Battery (Q6BAT) lives of Basic model QCPUs

Table11.6 Battery life

CPU module model	Power-on time ratio*1	Battery life		
		Guaranteed value *2	Actual service value (Reference value)*3	After SM52 turned on. (Backup power time after an alarm*4)
Q00JCPU	0%	26,000 hours 2.96 years	43,800 hours 5.00 years	710 hours 30 days
	30%	37,142 hours 4.23 years	43,800 hours 5.00 years	710 hours 30 days
	50%	43,800 hours 5.00 years	43,800 hours 5.00 years	710 hours 30 days
	70%	43,800 hours 5.00 years	43,800 hours 5.00 years	710 hours 30 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	710 hours 30 days
Q00CPU	0%	26,000 hours 2.96 years	43,800 hours 5.00 years	710 hours 30 days
	30%	37,142 hours 4.23 years	43,800 hours 5.00 years	710 hours 30 days
	50%	43,800 hours 5.00 years	43,800 hours 5.00 years	710 hours 30 days
	70%	43,800 hours 5.00 years	43,800 hours 5.00 years	710 hours 30 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	710 hours 30 days
Q01CPU	0%	5,600 hours 0.63 years	25,175 hours 2.87 years	420 hours 18 days
	30%	8,000 hours 0.91 years	35,964 hours 4.10 years	420 hours 18 days
	50%	11,200 hours 1.27 years	43,800 hours 5.00 years	420 hours 18 days
	70%	18,666 hours 2.13 years	43,800 hours 5.00 years	420 hours 18 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	420 hours 18 days

*1: The power-on time ratio indicates the ratio of programmable controller power-on time to one day (24 hours).
(When the total power-on time is 12 hours and the total power-off time is 12 hours, the power-on time ratio is 50%.)

*2: The guaranteed value represents a battery life at 70℃, which is calculated based on the characteristic values of manufacturere-supplied memories (SRAM) and on the assumption of storage within the ambient temperature range of -25 to 75℃ (operating ambient temperature of 0 to 55℃).

*3: The actual service value (reference value) represents a battery life that is calculated based on the values measured at storage ambient temperature of 40℃. This value is intended for reference only, as it varies with characteristics of the memory.

*4: In the following status, the backup time after power off is 3 minutes.
•The battery connector is disconnected.
•The lead wire of the battery is broken.

Point

- Do not use the battery exceeding the guaranteed value of the battery life.
- When the battery may be used exceeding the guaranteed value of the battery life, take the following measures.
  - Perform ROM operation to protect a program even if the battery dies at the programmable controller power-off.
  - Back up programs and data after SM52 turned on (within the backup power time after an alarm).
- When the battery (Q6BAT) is not connected to the CPU module, its service life is five years.
- When the battery-low special relay SM52 turns on, immediately change the battery.
  Even if an alarm has not yet occurred, it is recommended to replace the battery periodically according to the operating condition.
- The battery (Q7BAT and Q8BAT) is not available for the Basic model QCPU.

(2) Battery (Q6BAT, Q7BAT and Q8BAT) lives of High Performance model QCPU, Process CPU, and Redundant CPU

Table11.7 Battery life

CPU module model	Power-on time ratio[*1]	Battery life[*5]					
		Q6BAT			Q7BAT		
		Guaranteed value[*2]	Actual service value (Reference value)[*3]	After SM52 turned on. (Backup power time after an alarm[*4])	Guaranteed value[*2]	Actual service value (Reference value)[*3]	After SM52 turned on. (Backup power time after an alarm[*4])
Q02CPU	0%	30,000 hours 3.42 years	43,800 hours 5.00 years	120 hours 5 days	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
	30%	42,857 hours 4.89 years	43,800hours 5.00 years	120 hours 5 days	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
	50%	43,800 hours 5.00 years	43,800 hours 5.00 years	120 hours 5 days	43,800 hours 5.00 years	43,800hours 5.00 years	240 hours 10 days
	70%	43,800 hours 5.00 years	43,800 hours 5.00 years	120 hours 5 days	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	120 hours 5 days	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
Q02HCPU Q06HCPU	0%	2,341 hours 0.26 years	18,364 hours 2.09 years	120 hours 5 days	5,000 hours 0.57 years	43,800 hours 5.00 years	240 hours 10 days
	30%	3,344 hours 0.38 years	26,234 hours 2.99 years	120 hours 5 days	7,142 hours 0.81 years	43,800 hours 5.00 years	240 hours 10 days
	50%	4,682 hours 0.53 years	36,728 hours 4.19 years	120 hours 5 days	10,000 hours 1.14 years	43,800 hours 5.00 years	240 hours 10 days
	70%	7,803 hours 0.89 years	43,800 hours 5.00 years	120 hours 5 days	16,666 hours 1.90 years	43,800 hours 5.00 years	240 hours 10 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	120 hours 5 days	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
Q02PHCPU Q06PHCPU	0%	1,897 hours 0.21 years	14,229 hours 1.62 years	96hours 4 days	4,051 hours 0.46 years	38,727 hours 4.42 years	192 hours 8 days
	30%	2,710 hours 0.30 years	20,327 hours 2.32 years	96hours 4 days	5,787 hours 0.66 years	43,800 hours 5.00 years	192 hours 8 days
	50%	3,794 hours 0.43 years	28,458 hours 3.25 years	96 hours 4 days	8,102 hours 0.92 years	43,800 hours 5.00 years	192 hours 8 days
	70%	6,323 hours 0.72 years	43,800 hours 5.00 years	96 hours 4 days	13,503 hours 1.54 years	43,800 hours 5.00 years	192 hours 8 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	9 hours 4 days	43,800 hours 5.00 years	43,800 hours 5.00 years	192 hours 8 days
Q12HCPU Q25HCPU Q12PHCPU Q25PHCPU Q12PRHCPU Q25PRHCPU	0%	1,260 hours 0.14 years	7,755 hours 0.88 years	48 hours 2 days	2,900 hours 0.33 years	21,107 hours 2.40 years	96 hours 4 days
	30%	1,800 hours 0.20 years	11,079 hours 1.26 years	48 hours 2 days	4,142 hours 0.47 years	30,153 hours 3.44 years	96 hours 4 days
	50%	2,520 hours 0.28 years	15,510 hours 1.77 years	48 hours 2 days	5,800 hours 0.66 years	42,214 hours 4.81 years	96 hours 4 days
	70%	4,200 hours 0.47 years	25,850 hours 2.95 years	48 hours 2 days	9,666 hours 1.10 years	43,800 hours 5.00 years	96 hours 4 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	48 hours 2 days	43,800 hours 5.00 years	43,800 hours 5.00 years	96 hours 4 days

CPU module model	Power-on time ratio[*1]	Battery life[*5]		
		Q8BAT		
		Guaranteed value[*2]	Actual service value (Reference value)[*3]	After SM52 turned on. (Backup power time after an alarm[*4])
Q02CPU	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
	30%	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
	50%	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
	70%	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
Q02HCPU Q06HCPU	0%	20,498 hours 2.34 years	43,800 hours 5.00 years	240 hours 10 days
	30%	29,959 hours 3.42 years	43,800 hours 5.00 years	240 hours 10 days
	50%	41,785 hours 4.77 years	43,800 hours 5.00 years	240 hours 10 days
	70%	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
Q02PHCPU Q06PHCPU	0%	16,609 hours 1.89 years	43,800 hours 5.00 years	192 hours 8 days
	30%	23,727 hours 2.70 years	43,800 hours 5.00 years	192 hours 8 days
	50%	33,218 hours 3.79 years	43,800 hours 5.00 years	192 hours 8 days
	70%	43,800 hours 5.00 years	43,800 hours 5.00 years	192 hours 8 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	192 hours 8 days
Q12HCPU Q25HCPU Q12PHCPU Q25PHCPU Q12PRHCPU Q25PRHCPU	0%	11,038 hours 1.26 years	29,609 hours 3.38 years	96 hours 4 days
	30%	16,200 hours 1.80 years	42,311 hours 4.83 years	96 hours 4 days
	50%	22,075 hours 2.52 years	43,800 hours 5.00 years	96 hours 4 days
	70%	37,055 hours 4.23 years	43,800 hours 5.00 years	96 hours 4 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	96 hours 4 days

*1: The power-on time ratio indicates the ratio of programmable controller power-on time to one day (24 hours).
(When the total power-on time is 12 hours and the total power-off time is 12 hours, the power-on time ratio is 50%.)

*2: The guaranteed value represents a battery life at 70℃, which is calculated based on the characteristic values of manufacturer-supplied memories (SRAM) and on the assumption of storage ambient temperature range of -25 to 75℃ (operating ambient temperature of 0 to 55℃).

*3: The actual service value (reference value) represents a battery life that is calculated based on the values measured at storage ambient temperature of 40℃. This value is intended for reference only, as it varies with characteristics of the memory.

*4: In the following status, the backup time after power off is 3 minutes.
• The battery connector is disconnected.
• The lead wire of the battery is broken.

*5: For the High Performance model QCPU, these values are applicable when the serial number (first five digits) of the CPU module is "05011" or later.
For the battery life of the CPU module with a serial number (first five digits) is "05010" or earlier, refer to Appendix 2.3.

Point

- Do not use the battery exceeding the guaranteed value of the battery life.
- When the battery may be used exceeding the guaranteed value of the battery life, take the following measures.
  - Perform ROM operation to protect a program even if the battery dies at the programmable controller power-off.
  - Back up programs and data after SM52 turned on (within the backup power time after an alarm).
- When the battery (Q6BAT, Q7BAT and Q8BAT) is not connected to the CPU module, its service life is five years.
- When the battery-low special relay SM52 turns on, immediately change the battery.
  Even if an alarm has not yet occurred, it is recommended to replace the battery periodically according to the operating condition.

(3) Battery (Q6BAT, Q7BAT and Q8BAT) lives of the Universal model QCPU

Table11.8 Battery life

CPU module model	Battery consumption[*1]	Power-on time ratio[*2]	Battery life		
			Q6BAT		
			Guaranteed value[*3]	Actual service value (Reference Value)[*4]	After SM52 turned on. (Backup power time after an alarm[*5])
Q00U(J)CPU Q01UCPU Q02UCPU Q03UD(E)CPU	1	0%	30,100 hours 3.44 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,000 hours 4.91 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	2	0%	25,300 hours 2.89 years	43,800 hours 5.00 years	600 hours 25 days
		30%	36,100 hours 4.12 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
Q04UD(E)HCPU	1	0%	30,100 hours 3.44 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,000 hours 4.91 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	2	0%	4,300 hours 0.49 years	32,100 hours 3.66 years	384hours 16 days
		30%	6,100 hours 0.70 years	43,800 hours 5.00 years	384hours 16 days
		50%	8,600 hours 0.98 years	43,800 hours 5.00 years	384hours 16 days
		70%	14,300 hours 1.63 years	43,800 hours 5.00 years	384hours 16 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	384hours 16 days

Table11.8 Battery life

CPU module model	Battery consumption[*1]	Power-on time ratio[*2]	Battery life		
			Q6BAT		
			Guaranteed value[*3]	Actual service value (Reference Value)[*4]	After SM52 turned on. (Backup power time after an alarm[*5])
Q06UD(E)HCPU	1	0%	25,300 hours 2.89 years	43,800 hours 5.00 years	600 hours 25 days
		30%	36,100 hours 4.12 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	2	0%	4,200 hours 0.48 years	32,100 hours 3.66 years	384 hours 16 days
		30%	6,000 hours 0.68 years	43,800 hours 5.00 years	384 hours 16 days
		50%	8,400 hours 0.96 years	43,800 hours 5.00 years	384 hours 16 days
		70%	14,000 hours 1.60 years	43,800 hours 5.00 years	384 hours 16 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	384 hours 16 days
	3	0%	2,300 hours 0.26 years	19,200 hours 2.19 years	192 hours 8 days
		30%	3,200 hours 0.37 years	27,400 hours 3.13 years	192 hours 8 days
		50%	4,600 hours 0.53 years	38,400 hours 4.38 years	192 hours 8 days
		70%	7,600 hours 0.87years	43,800 hours 5.00 years	192 hours 8 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	192 hours 8 days

Table11.8 Battery life

CPU module model	Battery consumption[*1]	Power-on time ratio[*2]	Battery life		
			Q6BAT		
			Guaranteed value[*3]	Actual service value (Reference Value)[*4]	After SM52 turned on. (Backup power time after an alarm[*5])
Q10UD(E)HCPU Q13UD(E)HCPU Q20UD(E)HCPU Q26UD(E)HCPU	1	0%	22,600 hours 2.58 years	43,800 hours 5.00 years	600 hours 25 days
		30%	32,200 hours 3.68 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	2	0%	4,100 hours 0.47 years	26,200 hours 2.99 years	384 hours 16 days
		30%	5,800 hours 0.66 years	37,400 hours 4.27 years	384 hours 16 days
		50%	8,200 hours 0.94 years	43,800 hours 5.00 years	384 hours 16 days
		70%	13,600 hours 1.55 years	43,800 hours 5.00 years	384 hours 16 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	384 hours 16 days
	3	0%	2,300 hours 0.26 years	18,600 hours 2.12 years	192 hours 8 days
		30%	3,200 hours 0.37 years	26,500 hours 3.03 years	192 hours 8 days
		50%	4,600 hours 0.53 years	37,200 hours 4.25 years	192 hours 8 days
		70%	7,600 hours 0.87 years	43,800 hours 5.00 years	192 hours 8 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	192 hours 8 days
	4	0%	1,500 hours 0.17 years	13,800 hours 1.58 years	144 hours 6 days
		30%	2,100 hours 0.24 years	19,700 hours 2.25 years	144 hours 6 days
		50%	3,000 hours 0.34 years	27,600 hours 3.15 years	144 hours 6 days
		70%	5,000 hours 0.57 years	43,800 hours 5.00 years	144 hours 6 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	144 hours 6 days

Table11.8 Battery life

CPU module model	Battery consumption[*1]	Power-on time ratio[*2]	Battery life		
			Q7BAT		
			Guaranteed value[*3]	Actual service value (Reference Value)[*4]	After SM52 turned on. (Backup power time after an alarm[*5])
Q00U(J)CPU Q01UCPU Q02UCPU Q03UD(E)CPU	1	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	2	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
Q04UD(E)HCPU	1	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	2	0%	11,700 hours 1.34 years	43,800 hours 5.00 years	600 hours 25 days
		30%	16,700 hours 1.91 years	43,800 hours 5.00 years	600 hours 25 days
		50%	23,400 hours 2.67 years	43,800 hours 5.00 years	600 hours 25 days
		70%	39,000 hours 4.45 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days

Table11.8 Battery life

CPU module model	Battery consumption[*1]	Power-on time ratio[*2]	Battery life		
			Q7BAT		
			Guaranteed value[*3]	Actual service value (Reference Value)[*4]	After SM52 turned on. (Backup power time after an alarm[*5])
Q06UD(E)HCPU	1	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	2	0%	11,400 hours 1.30 years	43,800 hours 5.00 years	600 hours 25 days
		30%	16,200 hours 1.85 years	43,800 hours 5.00 years	600 hours 25 days
		50%	22,800 hours 2.60 years	43,800 hours 5.00 years	600 hours 25 days
		70%	38,000 hours 4.34 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	3	0%	5,000 hours 0.57 years	43,800 hours 5.00 years	600 hours 25 days
		30%	7,100 hours 0.81 years	43,800 hours 5.00 years	600 hours 25 days
		50%	10,000 hours 1.14 years	43,800 hours 5.00 years	600 hours 25 days
		70%	16,600 hours 1.89 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days

Table11.8 Battery life

CPU module model	Battery consumption[*1]	Power-on time ratio[*2]	Battery life		
			Q7BAT		
			Guaranteed value[*3]	Actual service value (Reference Value)[*4]	After SM52 turned on. (Backup power time after an alarm[*5])
Q10UD(E)HCPU Q13UD(E)HCPU Q20UD(E)HCPU Q26UD(E)HCPU	1	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	2	0%	11,100 hours 1.27 years	43,800 hours 5.00 years	600 hours 25 days
		30%	15,800 hours 1.80 years	43,800 hours 5.00 years	600 hours 25 days
		50%	22,200 hours 2.53 years	43,800 hours 5.00 years	600 hours 25 days
		70%	37,000 hours 4.22 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	3	0%	5,000 hours 0.57 years	43,800 hours 5.00 years	600 hours 25 days
		30%	7,100 hours 0.81 years	43,800 hours 5.00 years	600 hours 25 days
		50%	10,000 hours 1.14 years	43,800 hours 5.00 years	600 hours 25 days
		70%	16,600 hours 1.89 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	4	0%	3,700 hours 0.42 years	36,100 hours 4.12 years	432 hours 18 days
		30%	5,200 hours 0.59 years	43,800 hours 5.00 years	432 hours 18 days
		50%	7,400 hours 0.84 years	43,800 hours 5.00 years	432 hours 18 days
		70%	12,300 hours 1.40 years	43,800 hours 5.00 years	432 hours 18 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	432 hours 18 days

Table11.8 Battery life

CPU module model	Battery consumption[*1]	Power-on time ratio[*2]	Battery life		
			Q8BAT		
			Guaranteed value[*3]	Actual service value (Reference Value)[*4]	After SM52 turned on. (Backup power time after an alarm[*5])
Q00U(J)CPU Q01UCPU Q02UCPU Q03UD(E)CPU	1	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	2	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
Q04UD(E)HCPU	1	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	2	0%	38,800 hours 4.43 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days

Table11.8 Battery life

CPU module model	Battery consumption[*1]	Power-on time ratio[*2]	Battery life		
			Q8BAT		
			Guaranteed value[*3]	Actual service value (Reference Value)[*4]	After SM52 turned on. (Backup power time after an alarm[*5])
Q06UD(E)HCPU	1	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	2	0%	37,900 hours 4.33 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	3	0%	20,500 hours 2.34 years	43,800 hours 5.00 years	600 hours 25 days
		30%	29,200 hours 3.33 years	43,800 hours 5.00 years	600 hours 25 days
		50%	41,000 hours 4.68 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days

Table11.8 Battery life

CPU module model	Battery consumption[*1]	Power-on time ratio[*2]	Battery life		
			Q8BAT		
			Guaranteed value[*3]	Actual service value (Reference Value)[*4]	After SM52 turned on. (Backup power time after an alarm[*5])
Q10UD(E)HCPU Q13UD(E)HCPU Q20UD(E)HCPU Q26UD(E)HCPU	1	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25days
	2	0%	37,000 hours 4.22 years	43,800 hours 5.00 years	600 hours 25 days
		30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		50%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	3	0%	20,200 hours 2.31 years	43,800 hours 5.00 years	600 hours 25 days
		30%	28,800 hours 3.29 years	43,800 hours 5.00 years	600 hours 25 days
		50%	40,400 hours 4.61 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	4	0%	14,000 hours 1.60 years	43,800 hours 5.00 years	600 hours 25 days
		30%	20,000 hours 2.28 years	43,800 hours 5.00 years	600 hours 25 days
		50%	28,000 hours 3.20 years	43,800 hours 5.00 years	600 hours 25 days
		70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
		100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days

*1: For the battery consumption ☞ Section 11.3.1.

*2: The power-on time ratio indicates the ratio of programmable controller power-on time to one day (24 hours).
(When the total power-on time is 12 hours and the total power-off time is 12 hours, the power-on time ratio is 50%.)

*3: The guaranteed value represents a battery life at 70℃, which is calculated based on the characteristic values of manufacturer-supplied memories (SRAM) and on the assumption of storage ambient temperature range of -25 to 75℃ (operating ambient temperature of 0 to 55℃).

*4: The actual service value (reference value) represents a battery life that is calculated based on the values measured at storage ambient temperature of 40℃. This value is intended for reference only, as it varies with characteristics of the memory.

*5: In the following status, the backup time after power off is 3 minutes.
• The battery connector is disconnected.
• The lead wire of the battery is broken.

Point

- Do not use the battery exceeding the guaranteed value of the battery life.
- When the battery may be used exceeding the guaranteed value of the battery life, take the following measures.
  - Perform ROM operation to protect a program even if the battery dies at the programmable controller power-off.
  - Back up programs and data After SM52 turned on (within the backup power time after an alarm).
- When the battery (Q6BAT, Q7BAT and Q8BAT) is not connected to the CPU module, its service life is five years.
- When the battery-low special relay SM52 turned on, immediately change the battery.
  Even if an alarm has not yet occurred, it is recommended to replace the battery periodically according to the operating condition.

11.3.3 Replacement procedure of the CPU module battery

Replace the battery of the CPU module by the following procedures when it comes to the end of its life.
The programmable controller power must be on for 10 minutes or longer before dismounting the battery.
Data in the memory are backed up for a while by a capacitor even after the battery is removed. However, since data in the memory may be erased if the time for replacement exceeds the backup time shown in Table11.9 to Table11.12, replace the battery quickly.

(1) Replacement procedure for the Basic model QCPU's Q6BAT battery

Table11.9 Backup time

Backup time
3 minutes

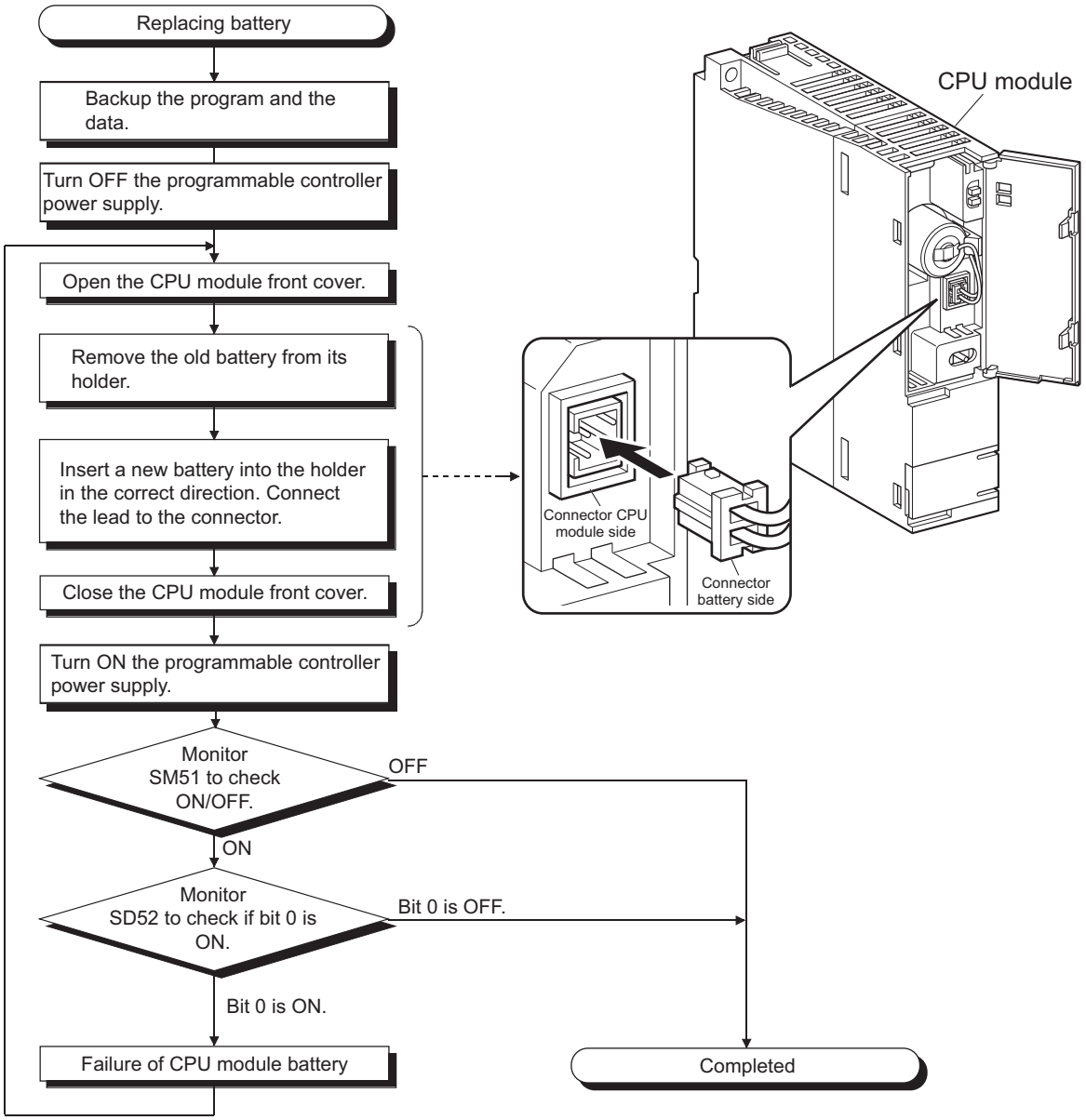


Figure 11.2 Replacement procedure for the Q6BAT battery

(2) Replacement procedure of the Q6BAT battery for the High Performance model QCPU, Process CPU, Redundant CPU and Universal model QCPU

Table11.10 Backup time

Backup time
3 minutes

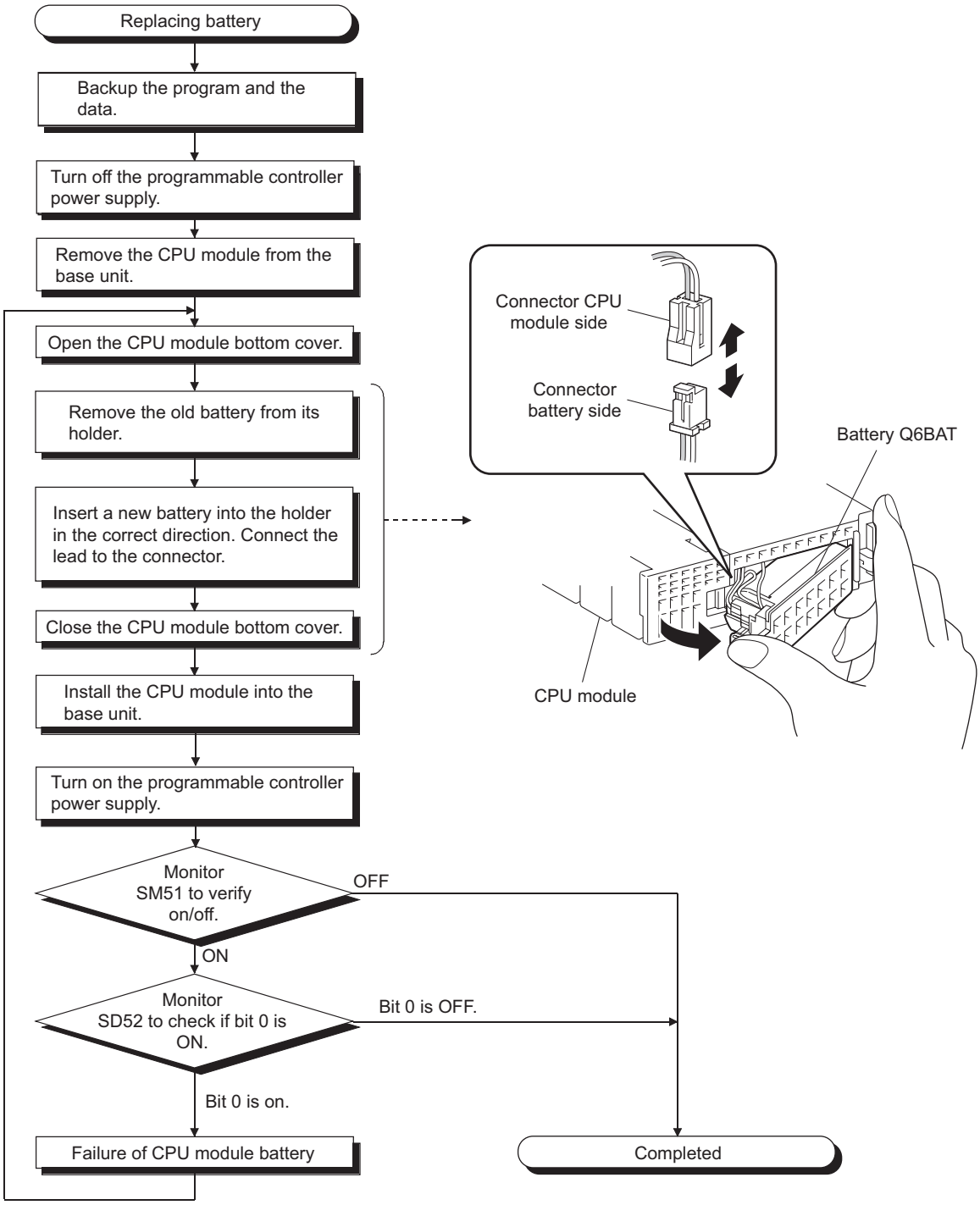


Figure 11.3 Replacement procedure for the Q6BAT battery

(3) Replacement procedure of the Q7BAT battery

Table11.11 Backup time

Backup time
3 minutes

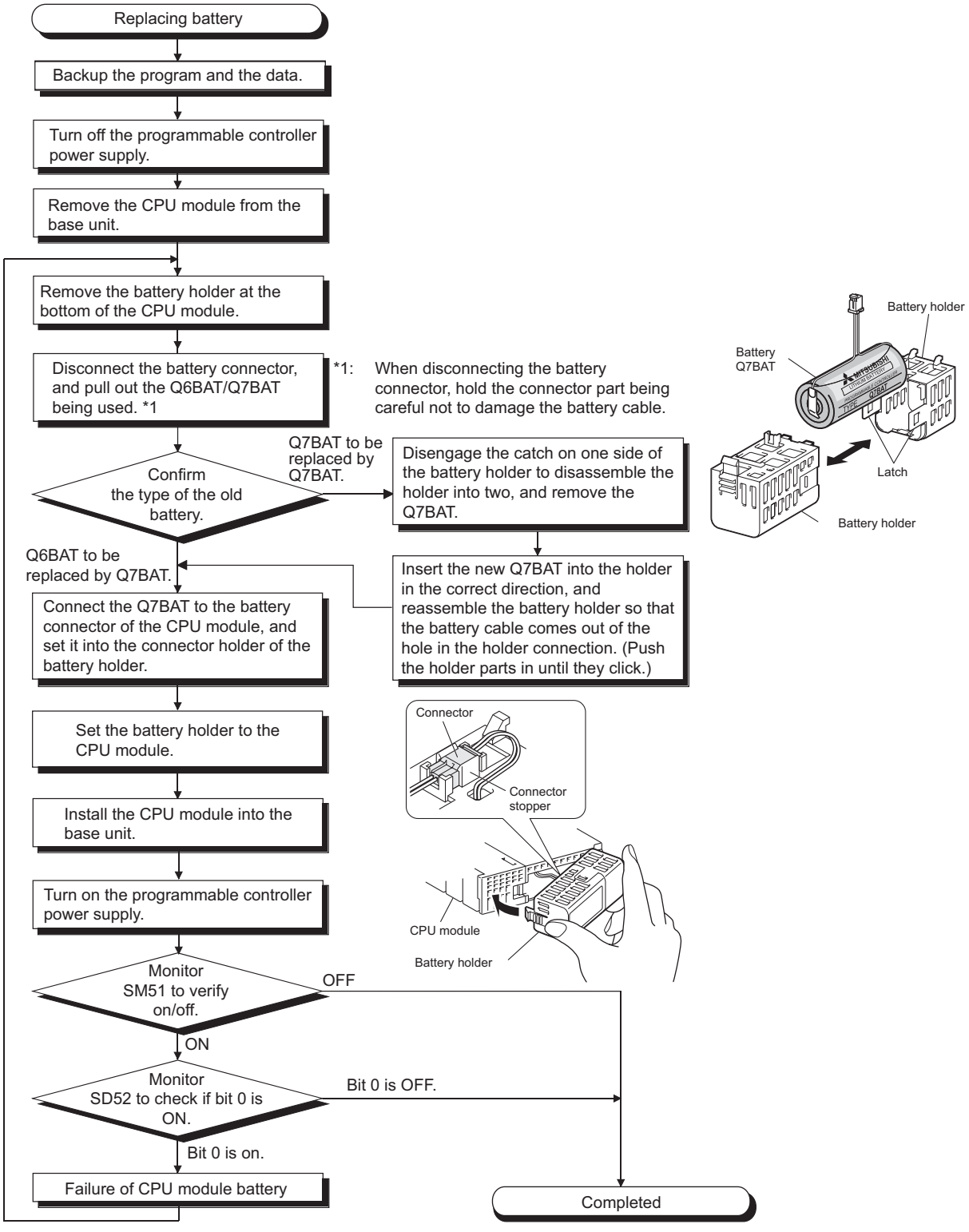
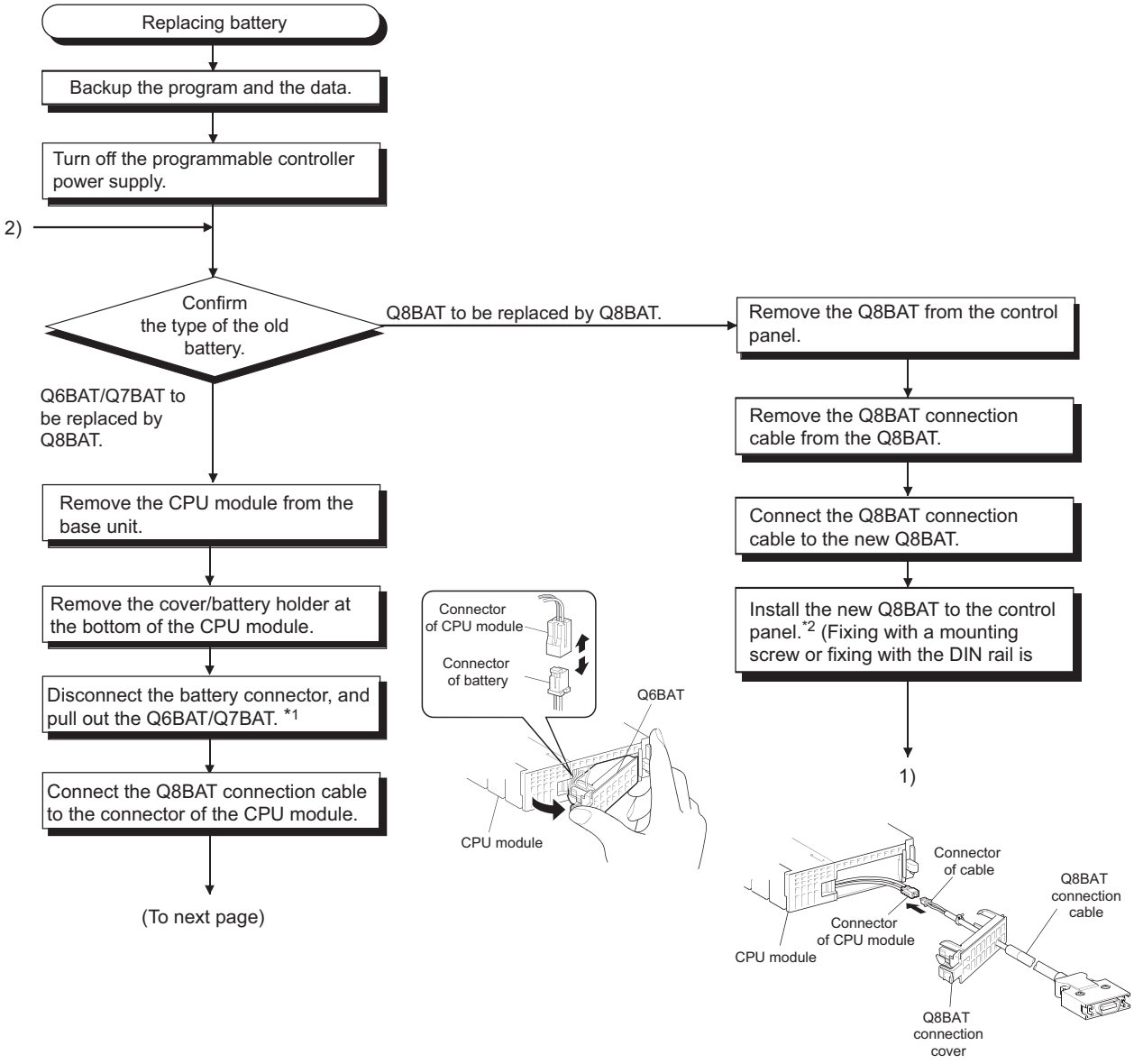


Figure 11.4 Replacement procedure for the Q7BAT battery

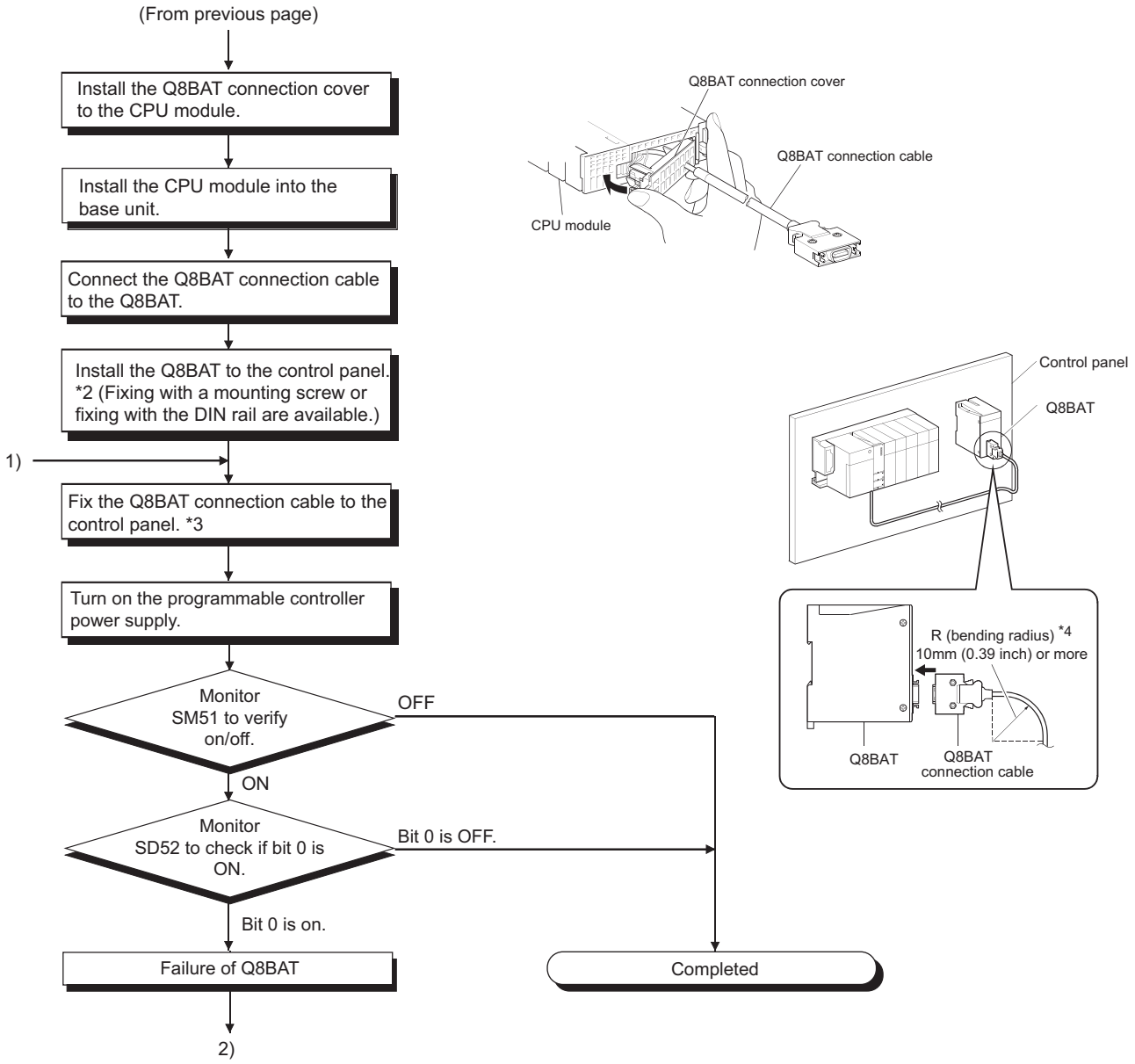
(4) Replacement procedure of the Q8BAT battery

Table11.12 Backup time

Backup time
3 minutes



*1: Remove the battery connector with holding the connector part so that the battery cable may not be damaged.



*2: For the module mounting position, refer to the following .

☞ Section 10.3.2

*3: Clamp the Q8BAT connection cable. If not being clamped, the Q8BAT connection cover, connector, and cable, may be damaged by a loose cable connection, shifting, or pulling due to carelessness, etc.

*4: Secure 10mm or more as the minimum cable bend radius.
If it is less than 10mm, malfunction may occur due to characteristic deterioration, open cable or the like.

Figure 11.5 Replacement procedure for the Q8BAT battery

Point

- After replacing a battery, write the date for next battery replacement on the sticker on the back side of the front cover. Write the proper date by checking the battery life. (☞ Section 11.3.2)

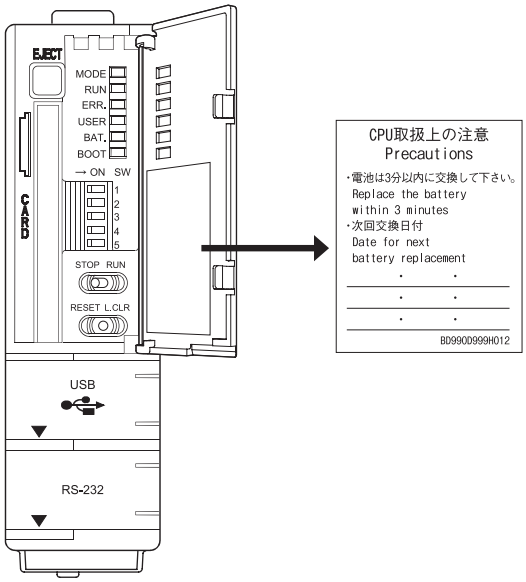


Figure 11.6 Back side of the front cover

- When replacing the battery of a CPU module, pay attention to the following:
  - Back up the data in the CPU module by GX Developer before starting replacement.
  - When replacing a battery of a Redundant CPU, back up the memory data such as programs by the memory copy from the control system to the standby system, and then replace the battery of the CPU module that was changed into the standby status by the system switching function.
    For the memory copy from control system to standby system and system switching function, refer to the manual below.
    ☞ QnPRHCPU User's Manual (Redundant System)
  - When the MELSEC-Q series is used as a UL-certified product, the Q7BAT and Q8BAT battery must be replaced by service personnel.
    The service personnel are defined as experienced technicians who have been sufficiently educated and trained, and are capable of perceiving and avoiding operational hazard.

11.3.4 SRAM card battery life

Table11.13 SRAM card battery life

SRAM card	Power-on time ratio *1	Battery life *3		
		Guaranteed value (MIN)	Actual service value (Reference value)*4	After SM52 turned on. (Backup power time after an alarm)
Q2MEM-1MBS Manufacturing control number "☐☐A" *2	0%	690 hours 0.07 years	6,336 hours 0.72 years	8 hours
	100%	11,784 hours 1.34 years	13,872 hours 1.58 years	8 hours
Q2MEM-1MBS Manufacturing control number "☐☐B" *2 or "☐☐B☐" *2 (On and after B)	0%	2,400 hours 0.27 years	23,660 hours 2.7 years	20 hours
	30%	2,880 hours 0.32 years	31,540 hours 3.6 years	20 hours
	50%	4,320 hours 0.49 years	39,420 hours 4.5 years	20 hours
	70%	6,480 hours 0.73 years	43,800 hours 5.0 years	20 hours
	100%	43,800 hours 5.0 years	43,800 hours 5.0 years	50 hours
Q2MEM-2MBS	0%	2,400 hours 0.27 years	23,660 hours 2.7 years	20 hours
	30%	2,880 hours 0.32 years	31,540 hours 3.6 years	20 hours
	50%	4,320 hours 0.49 years	39,420 hours 4.5 years	20 hours
	70%	6,480 hours 0.73 years	43,800 hours 5.0 years	20 hours
	100%	43,800 hours 5.0 years	43,800 hours 5.0 years	50 hours
Q3MEM-4MBS	0%	43,800 hours 5.0 years	43,800 hours 5.0 years	50 hours
	30%	43,800 hours 5.0 years	43,800 hours 5.0 years	50 hours
	50%	43,800 hours 5.0 years	43,800 hours 5.0y ears	50 hours
	70%	43,800 hours 5.0 years	43,800 hours 5.0 years	50 hours
	100%	43,800 hours 5.0 years	43,800 hours 5.0 years	50 hours

SRAM card	Power-on time ratio *1	Battery life *3		
		Guaranteed value (MIN)	Actual service value (Reference value)*4	After SM52 turned on. (Backup power time after an alarm)
Q3MEM-8MBS	0%	36,300hours 4.1 years	43,800hours 5.0 years	50 hours
	30%	43,800hours 5.0 years	43,800hours 5.0 years	50 hours
	50%	43,800hours 5.0 years	43,800hours 5.0 years	50 hours
	70%	43,800hours 5.0years	43,800hours 5.0 years	50 hours
	100%	43,800hours 5.0 years	43,800hours 5.0 years	50 hours

*1: The power-on time ratio indicates the ratio of programmable controller power-on time to one day (24 hours).
(When the total power-on and power-off times are 12 hours for each, the power-on time ratio is 50%).

*2: The manufacturing control number (the third digit from the leftmost) is written on the label on the back of the SRAM card (as shown in Figure 11.7).

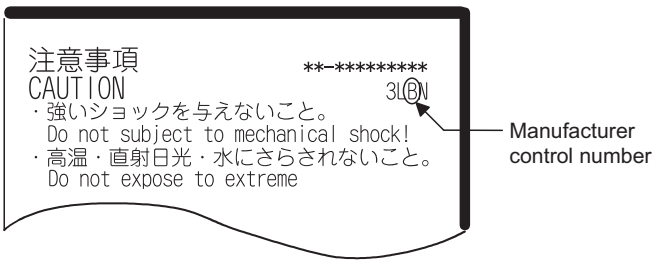


Figure 11.7 Label on the back of SRAM card

*3: Indicates the battery life when the SRAM card is installed in the High Performance model QCPU with the serial number (first five digits) is "04012" or later.
For the battery life for those of "04011" or lower, refer to Appendix 2.

*4: The actual value may vary depending on ambient temperature.

Point

- Do not use the battery exceeding the guaranteed value of the battery life.
- When the battery may be used exceeding the guaranteed value of the battery life, take the following measures.
  - Perform ROM operation to protect a program even if the battery dies at the programmable controller power-off.
  - Back up programs and data after SM52 turned on (within the backup time after an alarm).
- Note that the SRAM card battery is consumed even while the programmable controller is powered ON with the CPU module battery connected.
- When the special relay showing battery low, SM52 turned on, immediately change the battery.
  Even if an alarm has not yet occurred, it is recommended to replace the battery periodically according to the conditions of use.
- The SRAM card is not available for the Basic model QCPU.

11.3.5 SRAM card CPU module battery replacement procedure

Replace the SRAM card battery in the following procedure.

(1) Replacing Q2MEM-1MBS and Q2MEM-2MBS

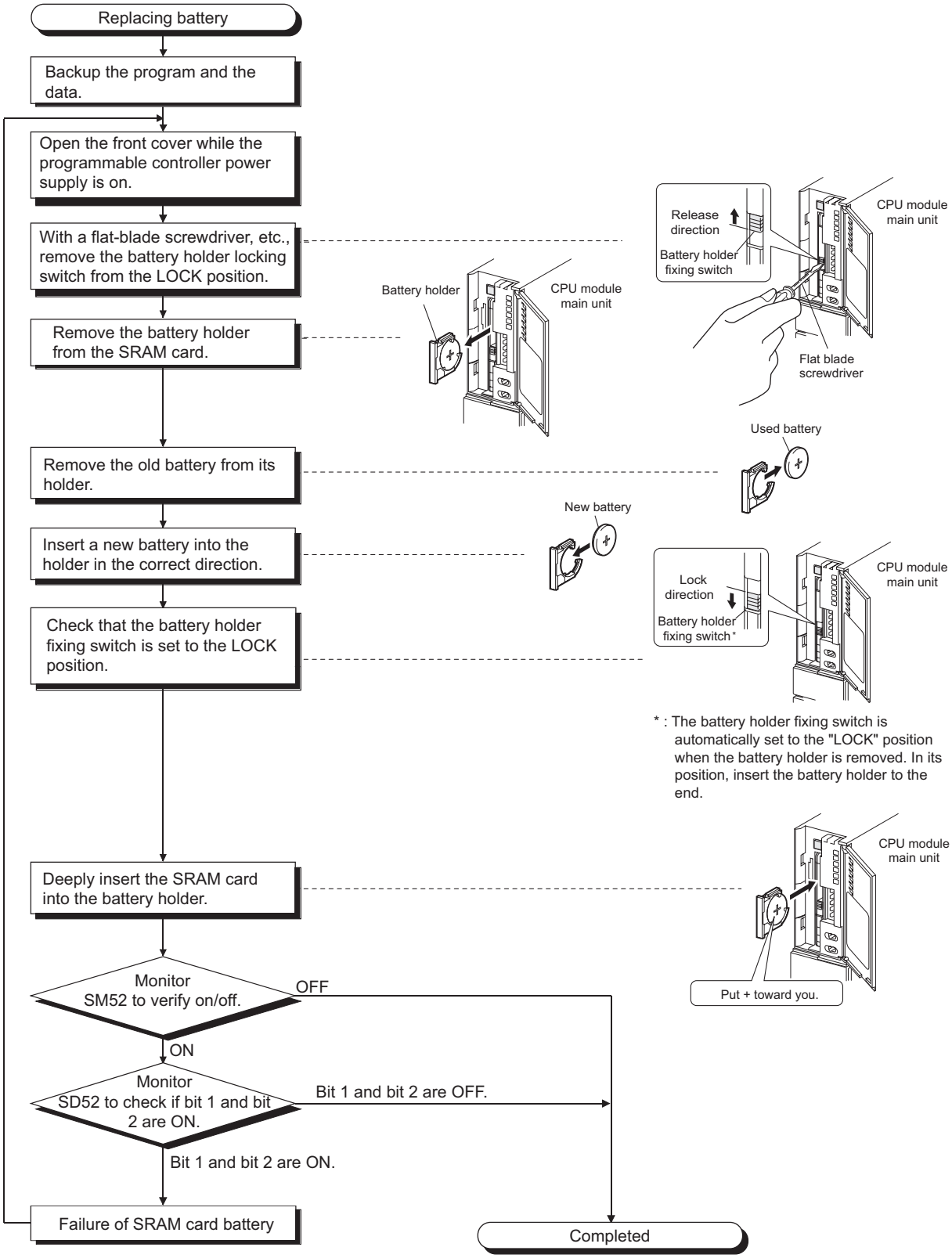


Figure 11.8 Replacing Q2MEM-BAT

(2) Replacing Q3MEM-4MBS and Q3MEM-8MBS

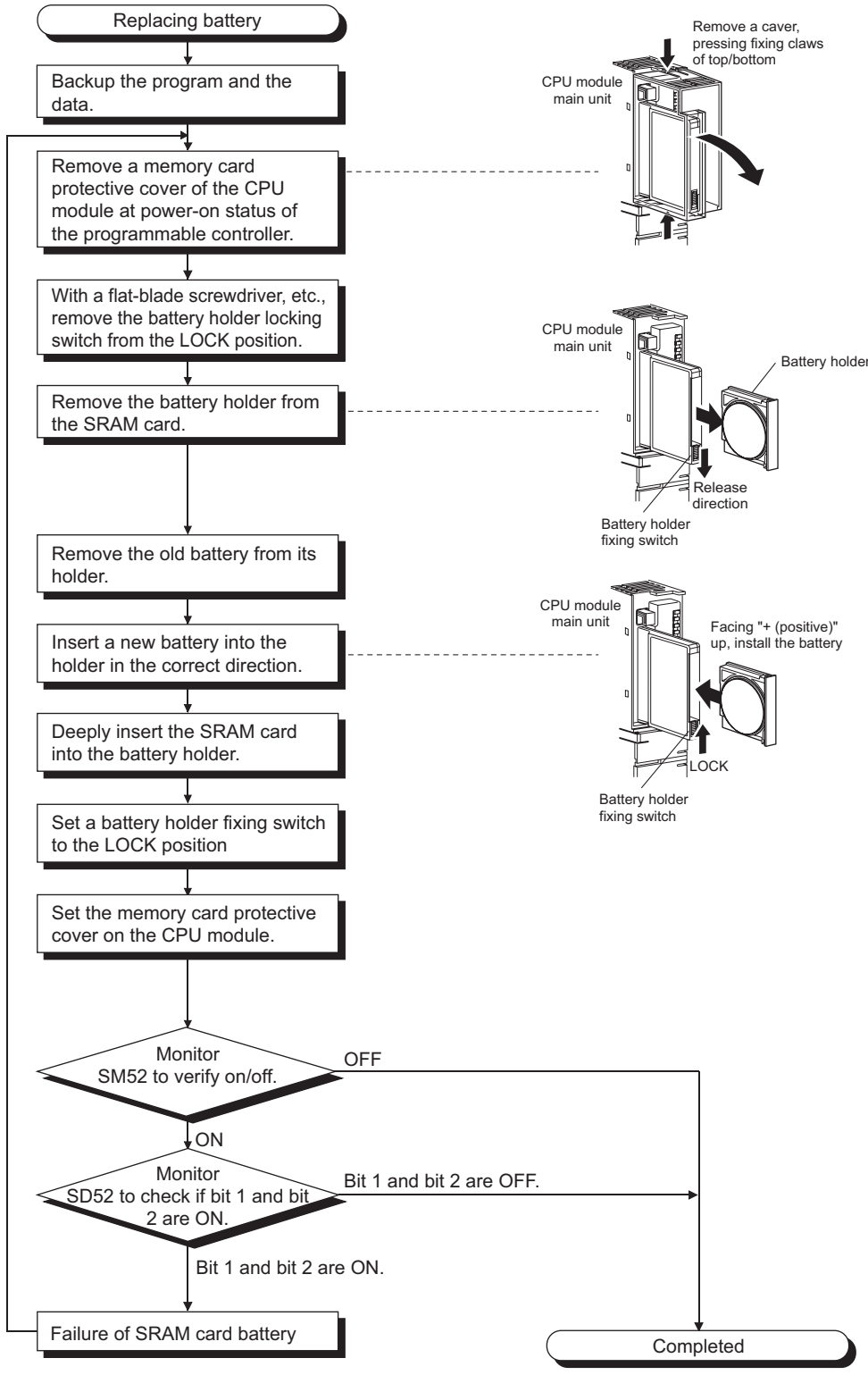


Figure 11.9 Replacing Q3MEM-8BAT

Point

Be careful about the following to replace the SRAM card battery.

- To back up the data, replace the SRAM card battery with the programmable controller power supply on and the SRAM card installed.
- Start replacement after backing up the CPU module data using GX Developer.
- Since replacement is made with the programmable controller power supply ON, take extreme care not to get an electric shock.
- When dismounting or mounting the battery holder on the SRAM card, take care so that the battery does not come out of the battery holder.
- When replacing the battery with the programmable controller power supply off, always back up the data before starting replacement.
  [Battery replacement procedure]
  1) Back up the SRAM card data using GX Developer.
  2) Replace the battery.
  3) Write the backed up data from GX Developer to the memory card.

  Insert or remove the battery in the horizontal direction along the battery holder fixing guide.
  Failure to do so may damage the latches of the battery holder.

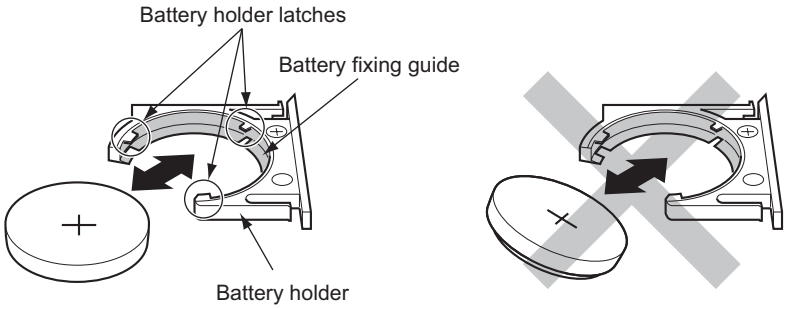


Figure 11.10 Battery setting direction

- If a battery of the SRAM card is hard to replace, use of the following tweezers is recommended.

Table11.14 Tweezers for replacing battery

Product	Model name
Plastic tweezers	NK-2539

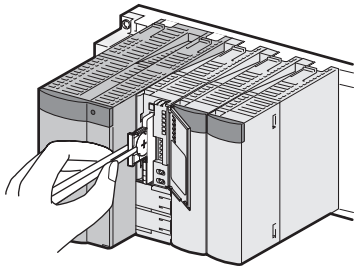


Figure 11.11 Replacement of battery using plastic tweezers

11.4 When Programmable Controller Has Been Stored Without Battery

When resuming operation of the programmable controller after having been stored without battery installed, the data in the CPU module and the memory card may be corrupted.
Before restarting operation, format the CPU module memory and SRAM card using GX Developer.
After formatting the memories, write backed up data to each memory.
To format a program memory during boot operation, select the "Clear program memory" checkbox in the Boot file tab of the PLC parameter dialog box.

Remark

For the Universal model QCPU, when the latch data backup function (to standard ROM) is used, data will not be disappeared even if storing data without a battery, since latch data such as device data of the CPU module or error history can be backed up without using a battery.

The relationships between battery and battery-backed memorie are shown in Table11.15.

Table11.15 Relationships between the battery and battery-backed memories

Memory		Battery	
		Battery of QCPU Module*1	Battery Built in Memory Card
CPU module	Program memory	○*2	×
	Standard RAM	○	×
	Standard ROM	---- (Battery backup not needed)	
Memory card*3	SRAM card	×	○
	Flash card	---- (Battery backup not needed)	
	ATA card	---- (Battery backup not needed)	

○ : Battery backed up, × : Not battery backed up

*1: Q6BAT, Q7BAT and Q8BAT are available.
*2: The Universal model QCPU needs no battery backup.
*3: Not applicable the Basic model QCPU.

Before restarting the operation, format the battery-backed memories shown in Table11.15 using GX Developer.

For formatiing memories, refer to the following.

☞ GX Developer Operating Manual

Point

- Before storing the programmable controller, back up all the data stored in the memories.
- When the programmable controller is powered on or the CPU module is reset, the CPU module initializes all of the following data if an error is detected.
  - Program memory data
  - Standard RAM data
  - Error history
  - Latch data (latch relay (L), devices in latch setting range set in the parameter, special relay SM900 to SM999, special register SD900 to SD900)
  - Sampling trace data

11.5 When Battery Has Gone Flat During Storage of Programmable Controller

When using the programmable controller after the guaranteed battery life had expired during storing, the data in the CPU module and the memory card may had been corrupted.
Before restarting operation, format the CPU module memory and SRAM card using GX Developer.
After formatting the memories, write backed up data to each memory.
To format a program memory during boot operation, select the "Clear program memory" checkbox in the Boot file tab of the PLC parameter dialog box.

Remark

For the Universal model QCPU, when the latch data backup function (to standard ROM) is used, data will not be disappeared even if a battery life ends, since latch data such as device data of the CPU module or error history can be backed up without using a battery.

The relationships between battery and battery-backed memorie are shown in Table11.16.

Table11.16 Relationships between the battery and battery-backed memories

Memory		Battery	
		Battery of QCPU Module*1	Battery Built in Memory Card
CPU module	Program memory	○*2	×
	Standard RAM	○	×
	Standard ROM	---- (Battery backup not needed)	
Memory card*3	SRAM card	×	○
	Flash card	---- (Battery backup not needed)	
	ATA card	---- (Battery backup not needed)	

○ : Battery backed up, × : Not battery backed up

*1: Q6BAT, Q7BAT and Q8BAT are available.
*2: The Universal model QCPU needs no battery backup.
*3: Not applicable to the Basic model QCPU.

Before restarting the operation, format the battery-backed up memories shown in Table11.16 using GX Developer.

For formatting memories, refer to the following.

☞ GX Developer Operating Manual

Point

- Before storing the programmable controller, back up all the data stored in the memories.
- When the programmable controller is powered on or the CPU module is reset, the CPU module initializes all of the following data if an error is detected.
  - Program memory data
  - Standard RAM data
  - Error history
  - Latch data (latch relay (L), devices in latch setting range set in the parameter, special relay SM900 to SM999, special register SD900 to SD900)
  - Sampling trace data

CHAPTER12 TROUBLESHOOTING

This chapter describes errors that may occur during system operation, how to locate the errors, and measures against the errors.

For a redundant system (when the Redundant CPU is used), refer to the following. ☞QnPRHCPU User's Manual (Redundant System)

12.1 Troubleshooting Basics

In order to increase the reliability of the system, resuming the system operation promptly after correcting a problem is one of the important factors as well as using reliable device.

To promptly start up the system, the trouble cause must be located and eliminated correctly.

The basic three points to be followed in the troubleshooting are as follows.

(1) Visual inspection

Visually check the following.

1) Behavior of the programmable controller and other connected devices
2) Applicability of the power supply
3) States of input and output devices
4) Installation states of the power supply module, CPU module, I/O module, intelligent function module, and extension cables
5) Wiring (Cables including input and output cables)
6) Display status of all indicators such as "POWER", "RUN", "ERR.", and "I/O" LEDs.
7) Setting status of all switches such as the number of extension base units and data retention time during power failure.

After checking 1) through 7), connect GX Developer and monitor the operating status and programs of the programmable controller.

(2) Error checking

Check how the error status changes by operating the following to the programmable controller.

1) Set the RUN/STOP switch Note12.1 to STOP.
2) Reset the trouble with the RESET/L.CLR switch. Note12.1 (☞ CHAPTER 4)*1
3) Power on and off.*1

*1: Resetting and powering off clears the error codes stored in the completion status area for the dedicated instruction and the buffer memory states of intelligent function modules.
Before resetting or powering off, backup the error codes and buffer memory states that are relevant to the error.

Note12.1 Basic Universal

For the Basic model QCPU or Universal model QCPU use the "RUN/STOP/RESET switch" for the operation.

(3) Narrowing down the scope for identifying trouble cause.

Estimate the troubled part in accordance with items (1) and (2) above.

1) Programmable controller or external devices
2) I/O module or others
3) Sequence program

12.2 Troubleshooting

This section describes how to identify errors, details of errors, and measures to eliminate the errors.

12.2.1 Troubleshooting flowchart

The following shows the contents of the troubles according to the types of events.

Note12.2 **Basic**

The Basic model QCPU does not have the following LEDs.
MODE LED
USER LED
BAT. LED
BOOT LED

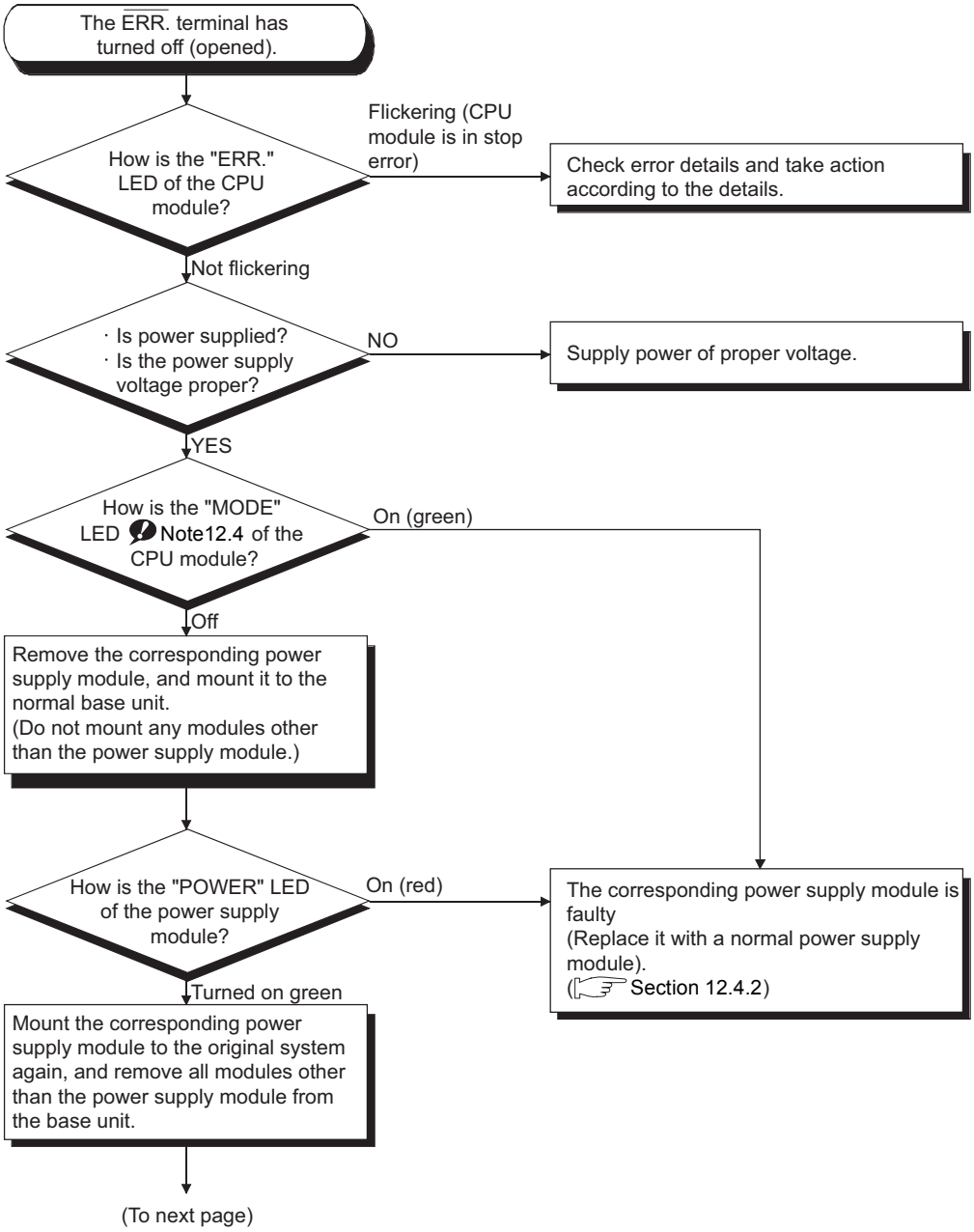
Figure 12.1 Troubleshooting flowchart

Note12.3 **Basic**

The Basic model QCPU cannot use the memory card.

12.2.2 When the $\overline{\text{ERR.}}$ terminal (negative logic) has turned off (opened)

Refer to the following flowchart when the $\overline{\text{ERR.}}$ terminal has turned off (opened) at power-on or during operation of the programmable controller.



Note12.4 **Basic**

The Basic model QCPU does not have the "MODE" LED. In the flowchart, proceed to "Off".

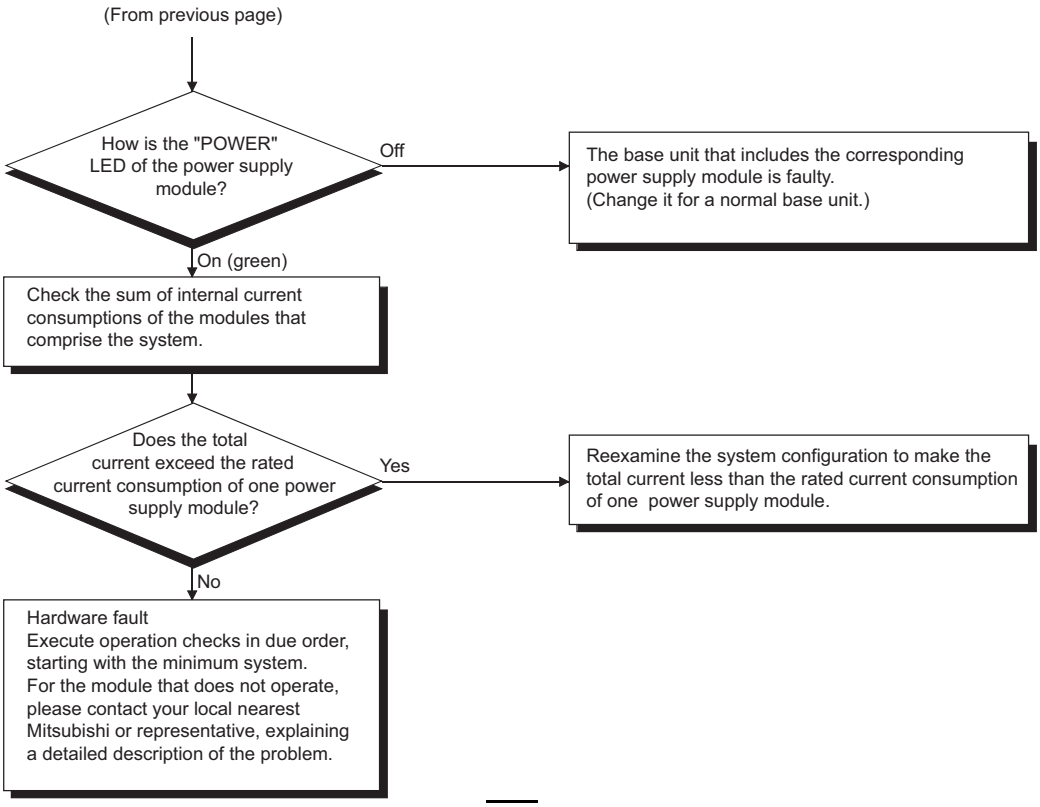


Figure 12.2 When the $\overline{\text{ERR.}}$ terminal has turned off

Point

If a CPU module stop error occurs during use of two redundant power supply modules, the error is output from the $\overline{\text{ERR.}}$ terminals of the two redundant power supply modules.
Refer to the following for details of the $\overline{\text{ERR.}}$ terminal.

Section 5.2.1 Power supply module specification list
Section 10.6.2 Wring of power supply module

Errors that can be detected by the $\overline{\text{ERR.}}$ terminal

The following shows the errors that can be detected by the $\overline{\text{ERR.}}$ terminal of the power supply module in a singular power supply system/redundant power supply system.

<Singular power supply system>.....One Q series power supply module is used.

Table12.1 Errors that can be detected by the $\overline{\text{ERR.}}$ terminal of a power supply module

Base unit	CPU module	
	Basic model QCPU*, High Performance model QCPU, Process CPU, Universal model QCPU	Redundant CPU
Main base unit (Q3□B)	AC power not input, power supply module fuse blown and CPU module stop error (including reset) can be detected.	
Multiple CPU high speed main base unit (Q3□DB)		
Extension base unit (Q6□B)	Errors cannot be detected (always off).	(Cannot be added)

*: Excluding the Q00JCPU and Q00UJCPU (without $\overline{\text{ERR.}}$ terminal).

<Singular power supply system>.....One slim type power supply module is used.

Table12.2 Errors that can be detected by the $\overline{\text{ERR.}}$ terminal of a power supply module

Base unit	CPU module	
	Basic model QCPU*, High Performance model QCPU, Universal model QCPU	Process CPU, Redundant CPU
Slim type main base unit (Q3□SB)	AC power not input, power supply module fuse blown and CPU module stop error (including reset) can be detected.	(Cannot be combined)

*: Excluding the Q00JCPU and Q00UJCPU (without $\overline{\text{ERR.}}$ terminal).

<Redundant power supply system>..... Two redundant power supply modules are used.

Table12.3 Errors that can be detected by the $\overline{\text{ERR.}}$ terminal of a power supply module

Base unit	CPU module	
	Basic model QCPU*, High Performance model QCPU, Process CPU, Universal model QCPU	Redundant CPU
Redundant power main base unit (Q3□RB)	AC power not input, redundant power supply module fuse blown, CPU module stop error (including reset), and redundant power supply module failure can be detected.	
Redundant power extension base unit (Q6□RB)	AC power not input, redundant power supply module fuse blown, and redundant power supply module failure can be detected.	(Cannot be added)

*: Excluding the Q00JCPU and Q00UJCPU (without $\overline{\text{ERR.}}$ terminal).

Remark

In the redundant power supply system, the failure of the redundant power supply module can also be detected by using GX Developer (Version 8.18U or later). Note12.5, Note12.6

- Detection by PLC diagnostics
- Detection by system monitor

For details of PLC diagnostics and system monitor, refer to the following.

☞ GX Developer Operating Manual

Note12.5 **Basic**

Failure of redundant power supply cannot be detected by the Basic model QCPU.

Note12.6 **High performance** **Process**

When using the High Performance QCPU or the Process CPU, check the versions of CPU module and GX Developer.

(☞ Appendix 2)

12.2.3 When the $\overline{\text{LIFE OUT}}$ terminal (negative logic) has turned off (opened)

Refer to the following flowchart when the $\overline{\text{LIFE OUT}}$ terminal of the Life detection power supply module has turned off (opened) at power-on or during operation of the programmable controller.

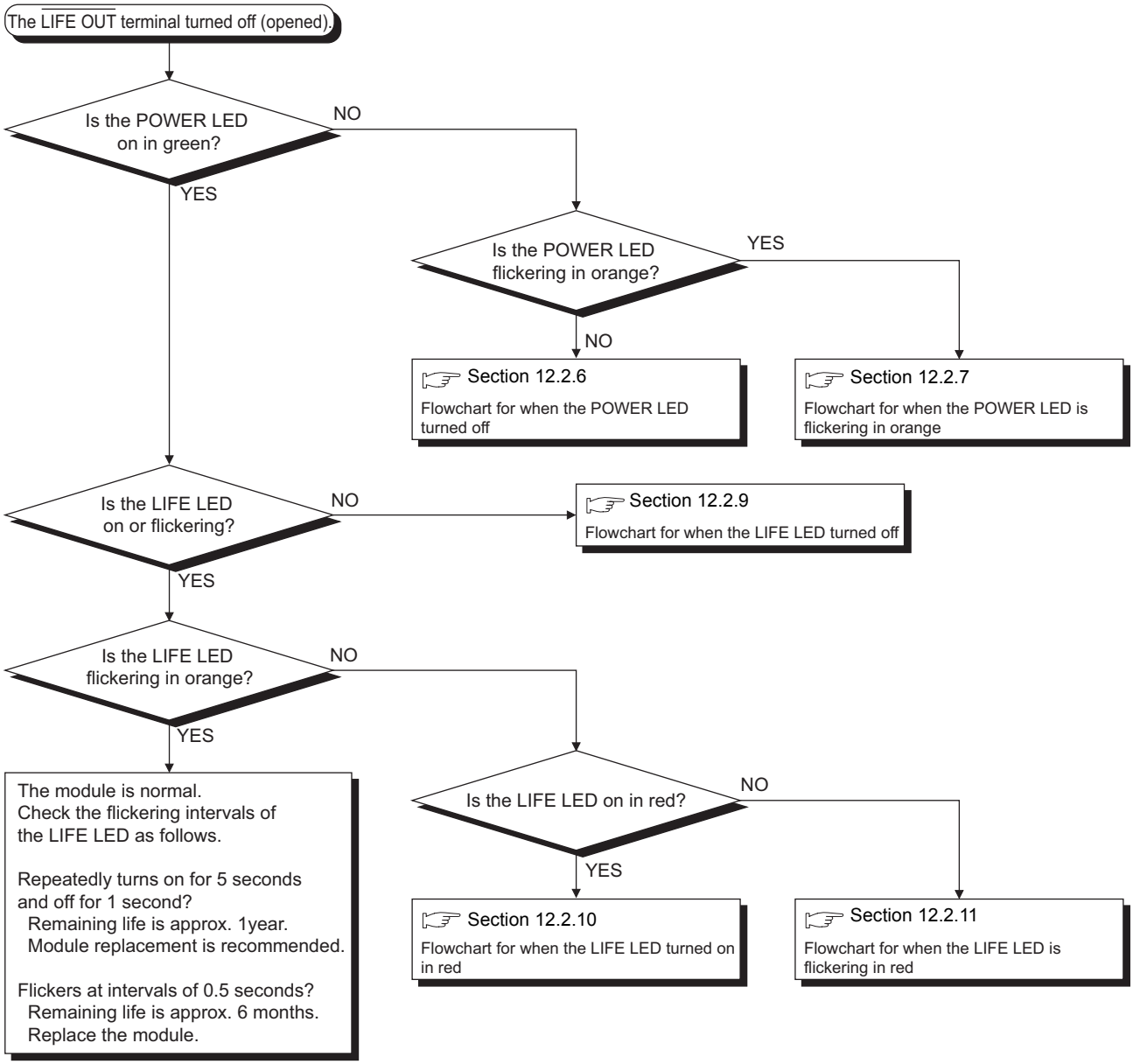
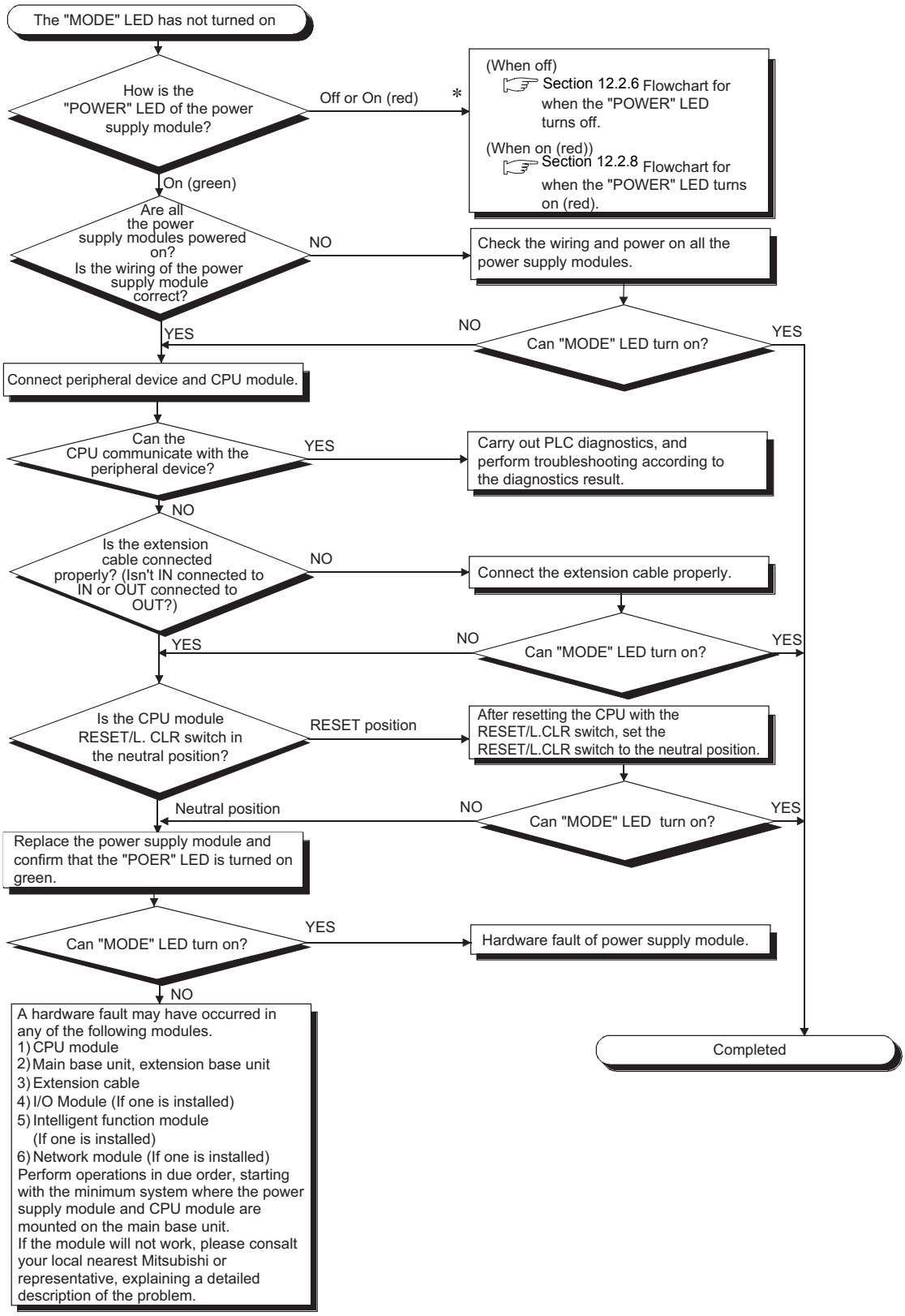


Figure 12.3 When the $\overline{\text{LIFE OUT}}$ terminal has turned off

12.2.4 When the MODE LED does not turn on

Refer to the following flowchart when the MODE LED of the CPU module does not turn on at programmable controller power-on.



*: This applies to the redundant power supply module.

Figure 12.4 When the MODE LED does not turn on

12.2.5 When the MODE LED is flickering

Refer to the following flowchart when the MODE LED of the CPU module flickers at programmable controller power-on, at operation start or during operation.

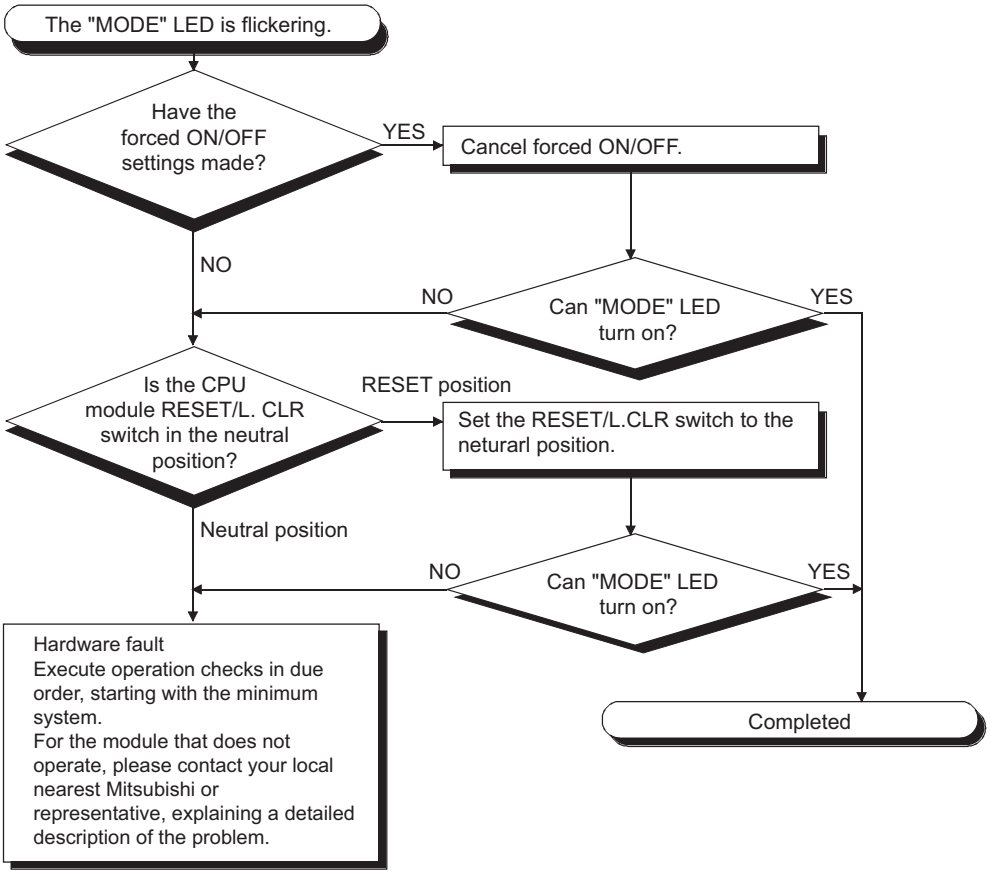
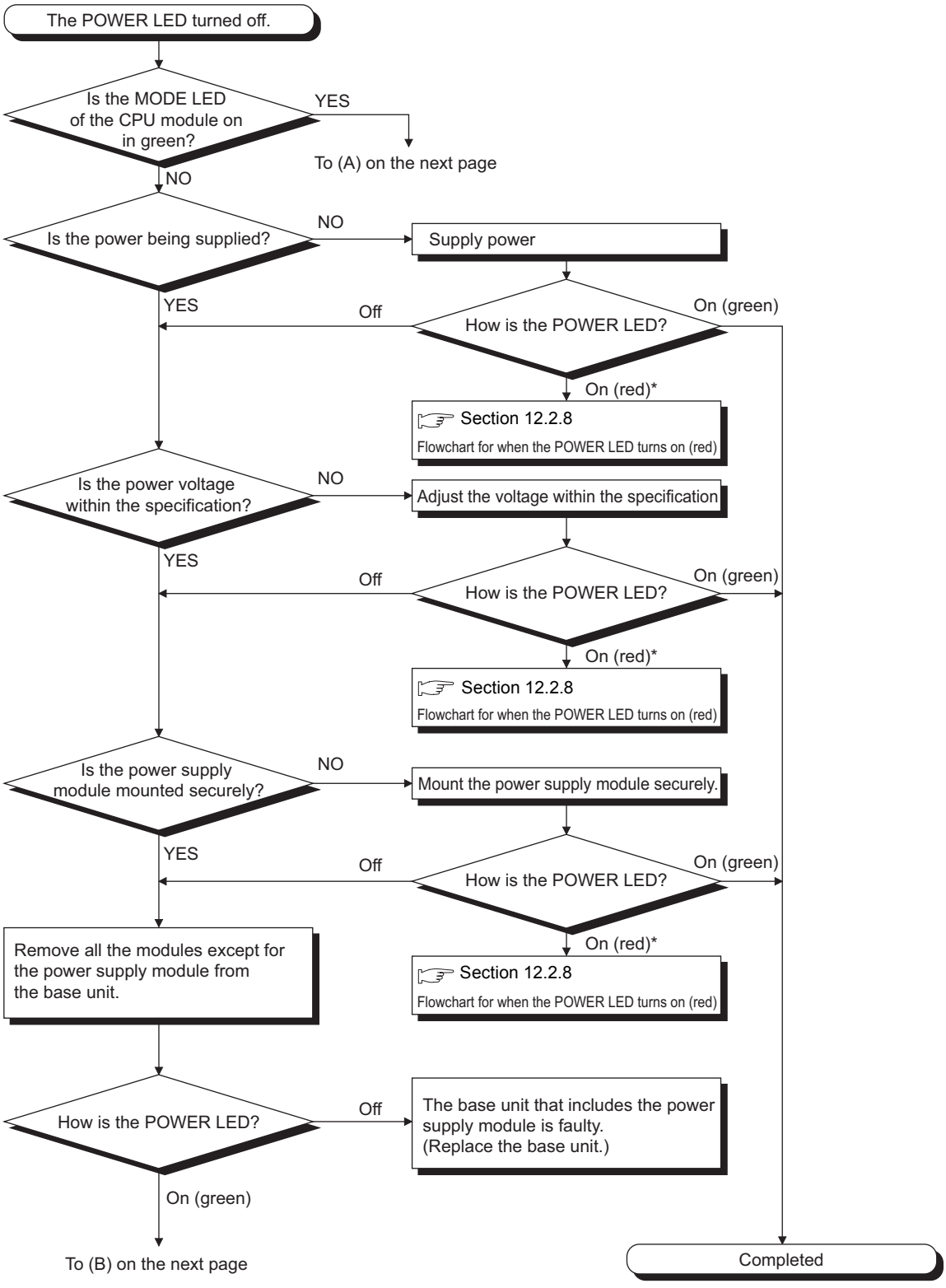


Figure 12.5 When the MODE LED is flickering

12.2.6 When the POWER LED has turned off

Refer to the following flowchart when the POWER LED of the power supply module has turned off at programmable controller power-on or during operation.



*: Applicable only to the redundant power supply module.

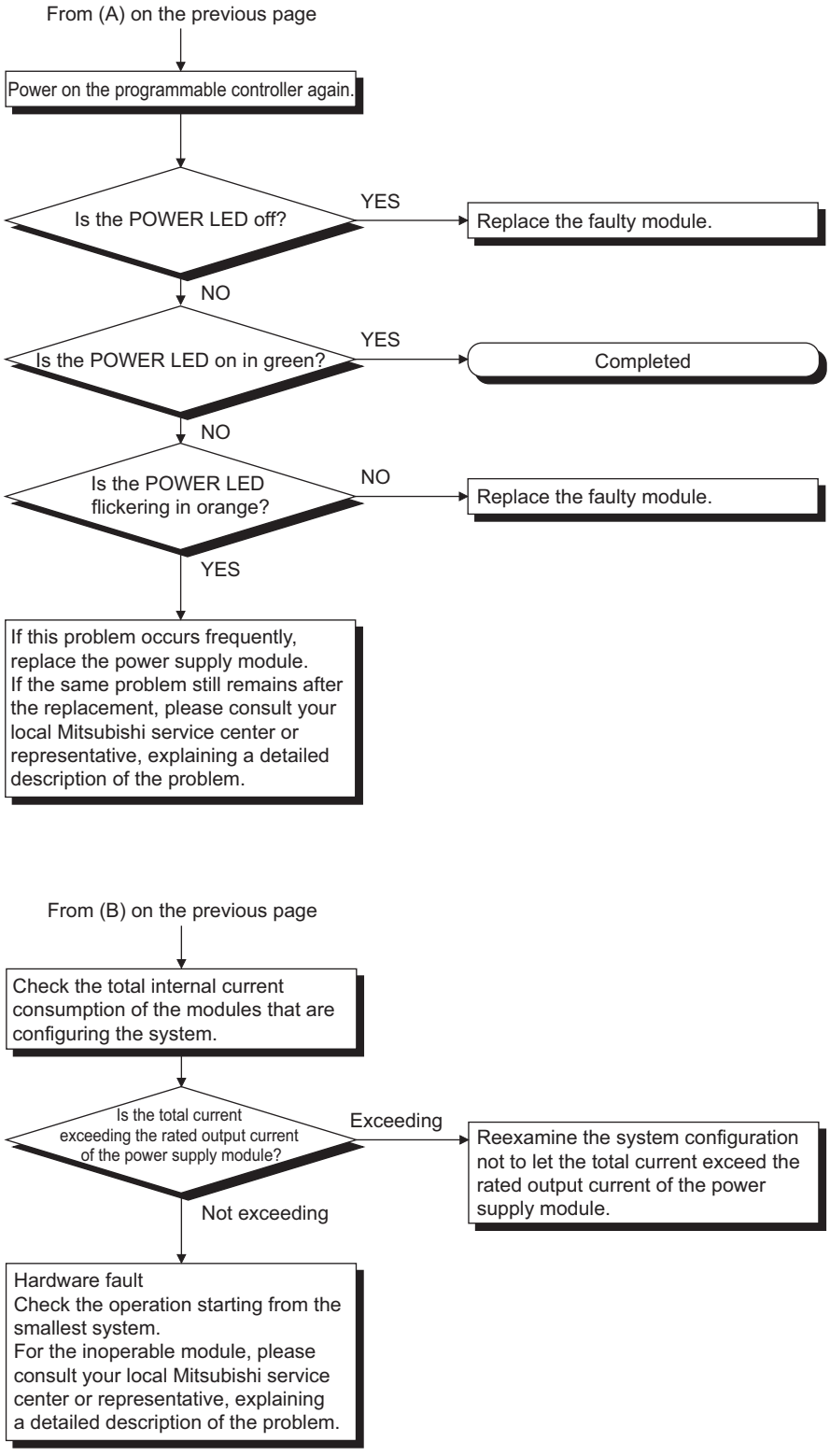


Figure 12.6 When the POWER LED has turned off

12.2.7 When the POWER LED is flickering in orange

Refer to the following flowchart when the POWER LED of the Life detection power supply module flickers in orange at power-on or during operation of the programmable controller.

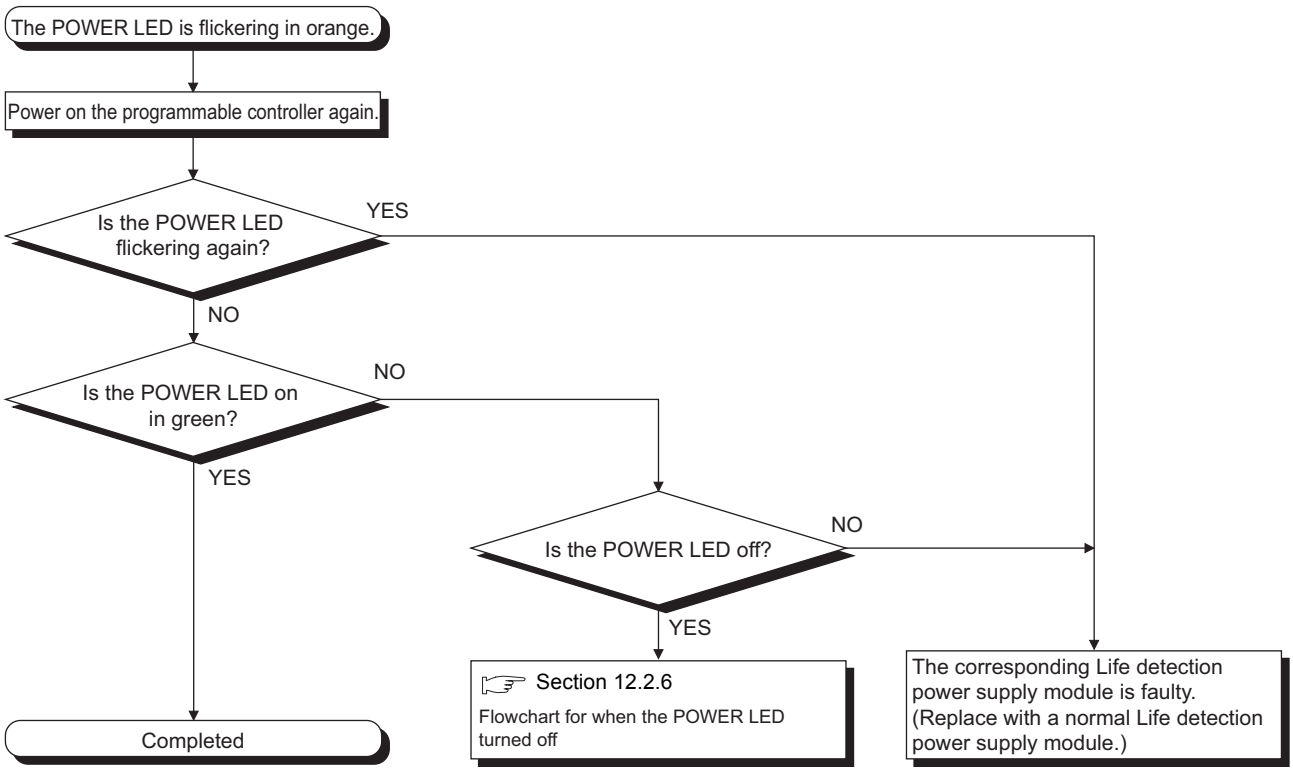


Figure 12.7 When the POWER LED is flickering in orange

12.2.8 When the POWER LED has turned on in red

Refer to the following flowchart when the POWER LED of the redundant power supply module has turned on in red at power-on or during operation of the programmable controller.

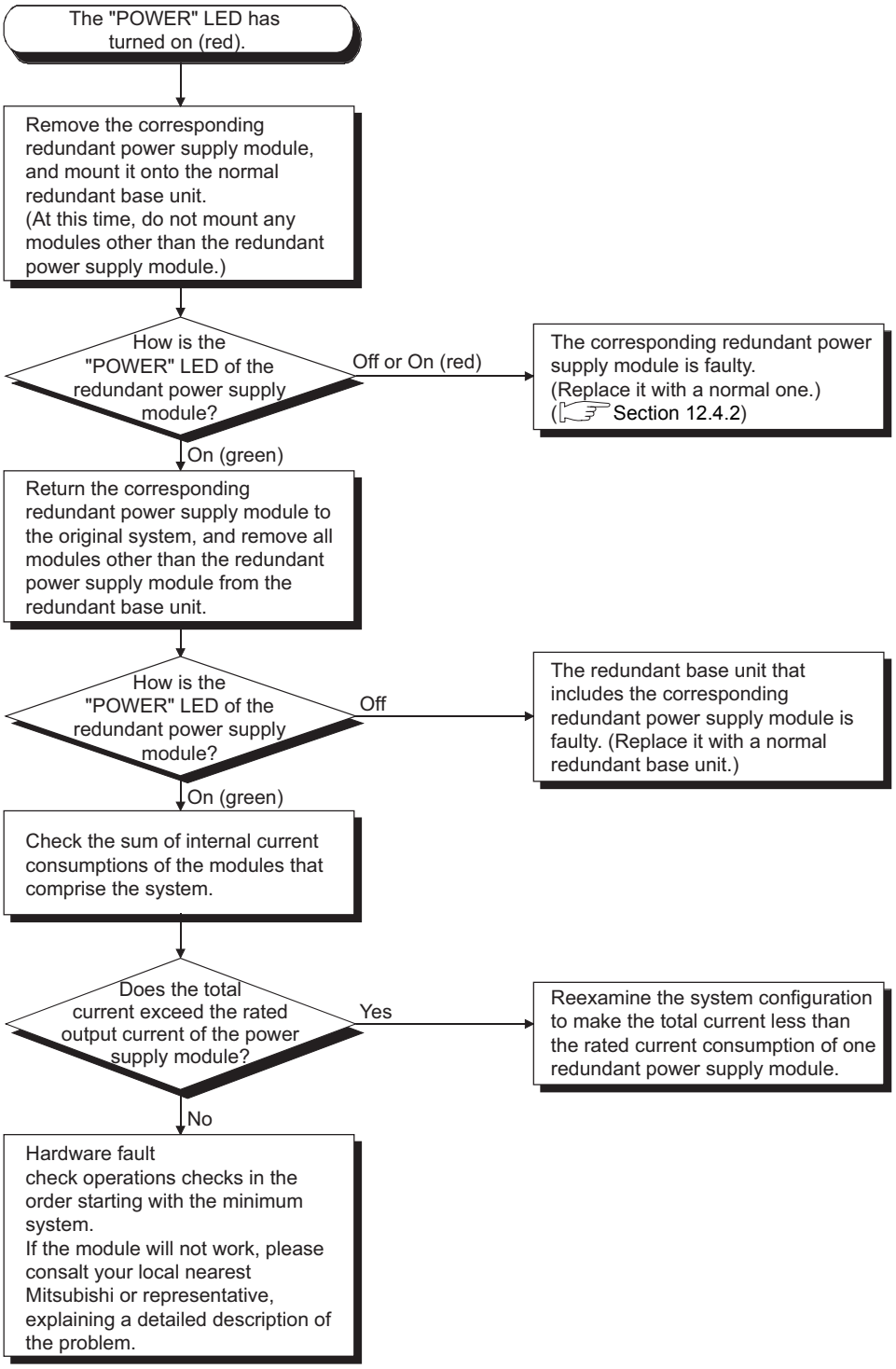


Figure 12.8 When the POWER LED has turned on in red

12.2.9 When the LIFE LED has turned off

Refer to the following flowchart when the LIFE LED of the Life detection power supply module turned off at power-on or during operation of the programmable controller.

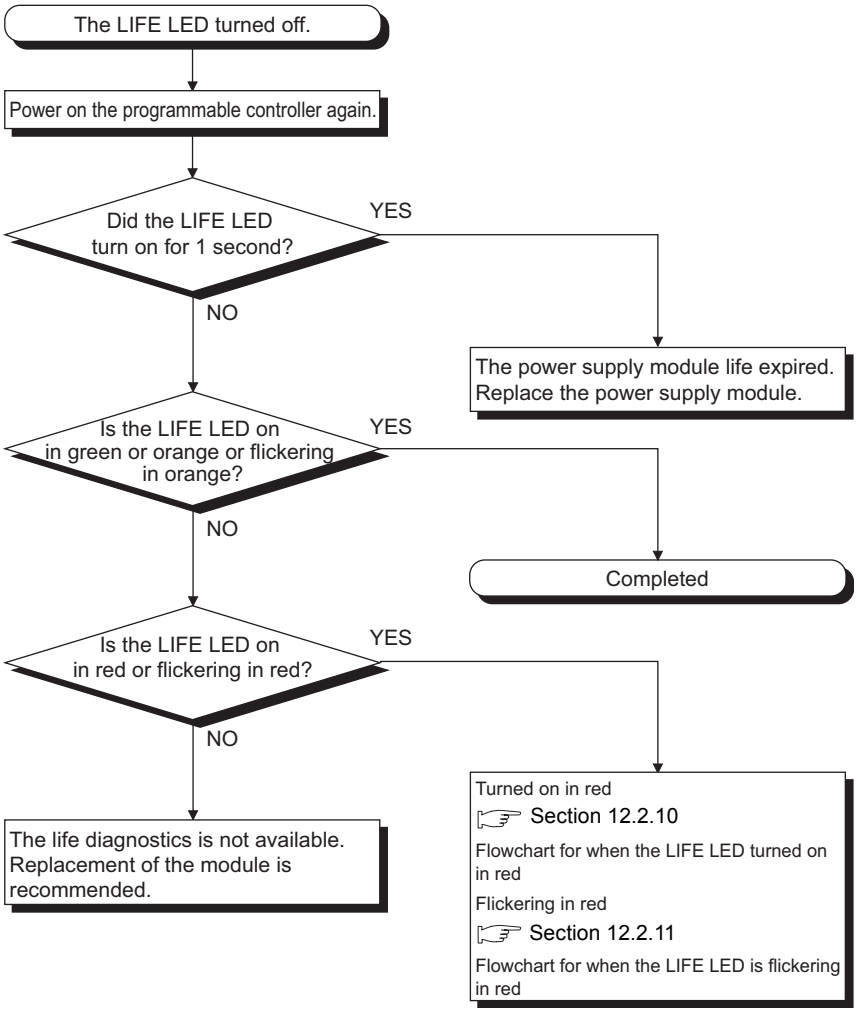


Figure 12.9 When the LIFE LED of the Life detection module has turned off

12.2.10 When the LIFE LED has turned on in red

Refer to the following flowchart when the LIFE LED of the Life detection power supply module has turned on in red at power-on or during operation of the programmable controller.

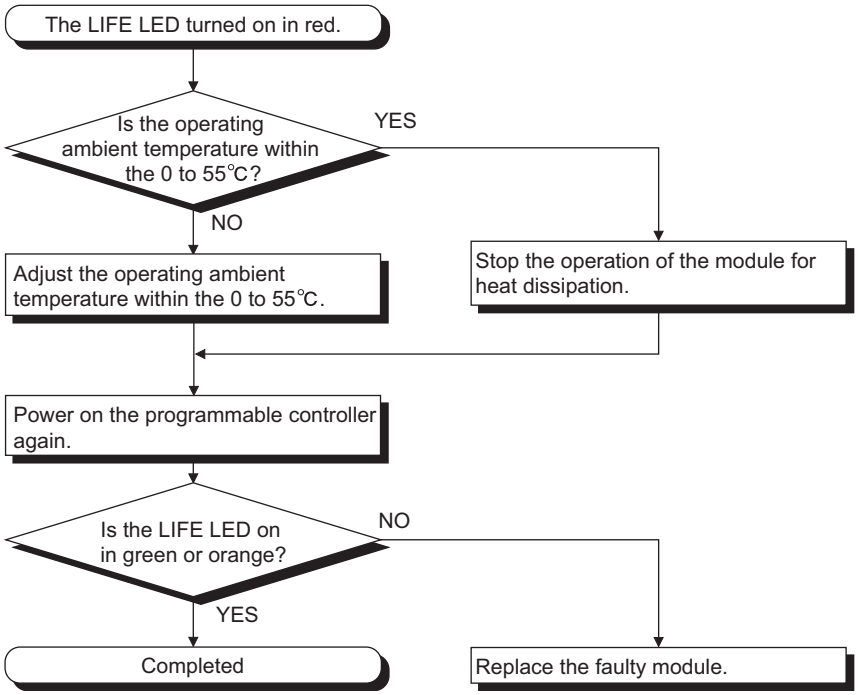


Figure 12.10 When the LIFE LED turn on in red

12.2.11 When the LIFE LED is flickering in red

Refer to the following flowchart when the LIFE LED of the Life detection power supply module flickers in red at power-on or during operation of the programmable controller.

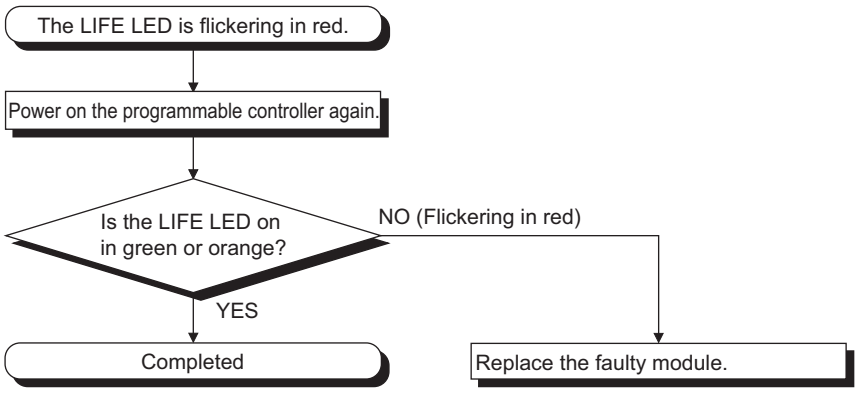


Figure 12.11 When the LIFE LED is flickering in red

12.2.12 When the RUN LED has turned off

Refer to the following flowchart when the RUN LED of the CPU module has turned off during operation of the programmable controller.

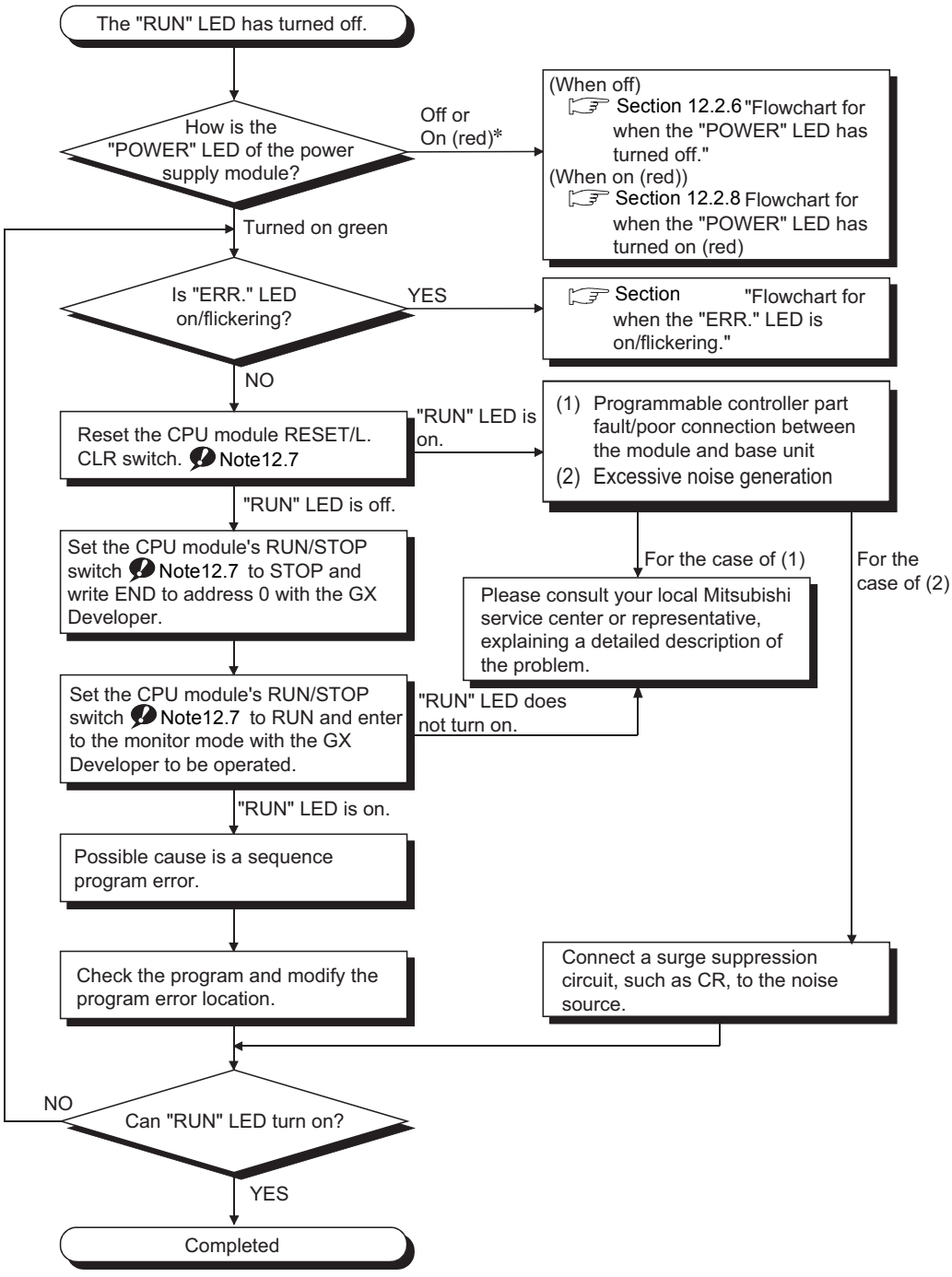


Figure 12.12 When the RUN LED has turned off

*: This applies to the redundant power supply module.

Note12.7 **Basic**

For the Basic model QCPU, use the RUN/STOP/RESET switch for operation.

12.2.13 When the RUN LED is flickering

If the RUN LED flickering, follow the procedure below.

When the programs or parameters are written into the CPU module during the STOP status and then the RUN/STOP switch Note12.8 is set from STOP to RUN, the RUN LED of the CPU module flickers.
Although this status does not mean the CPU module error, the CPU module stops the operation. To set the CPU module to the RUN status, reset the CPU module using the RESET/L.CLR switch Note12.8 or set the RUN/STOP switch Note12.8 from STOP to RUN position again.
With this setting, the RUN LED turns on.

12.2.14 When the ERR. LED has turned on or is flickering

Refer to the following flowchart when the ERR. LED of the CPU module turns on or flickers at programmable controller power-on, at operation start or during operation.

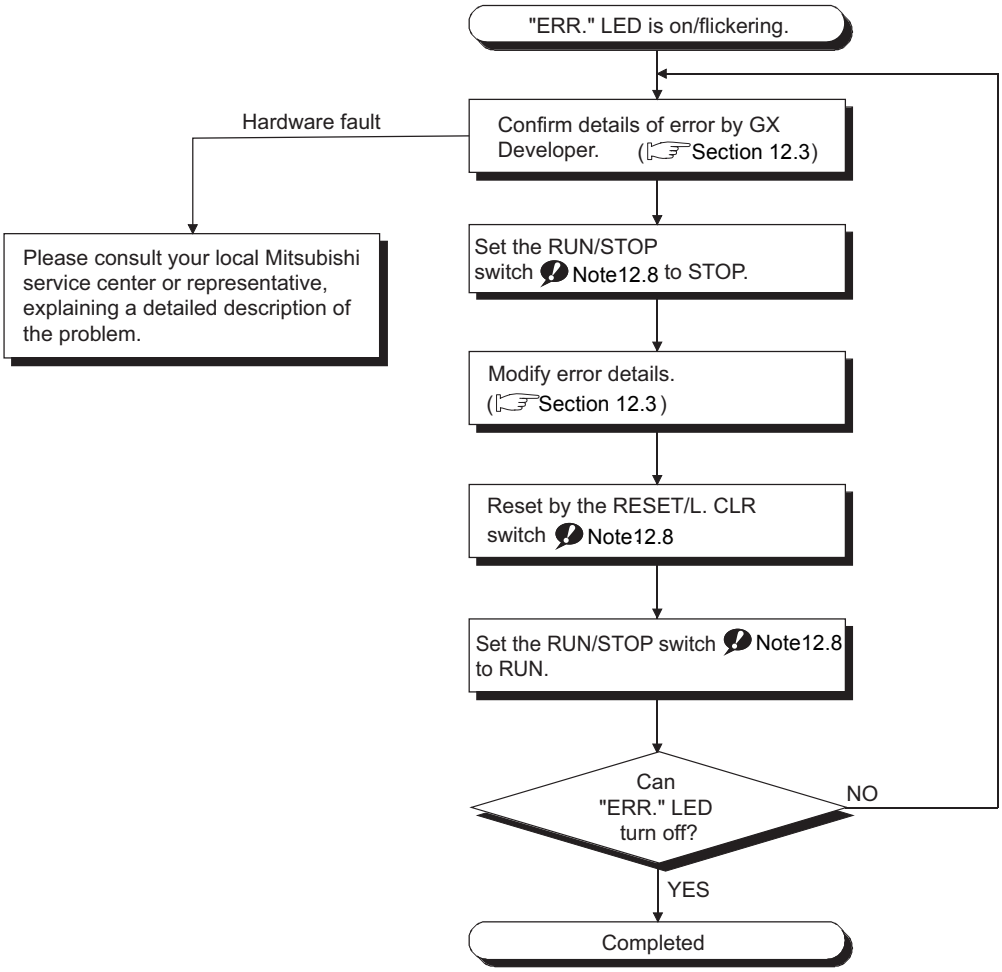


Figure 12.13 When the ERR. LED is on or flickers

Note12.8 **Basic**
For the Basic model QCPU, use the RUN/STOP/RESET switch for operation.

12.2.15 When the USER LED has turned on

If the USER LED turned on, follow the procedure described below.

The USER LED turns on when an error is detected by the CHK instruction or the annunciator (F) turns on.
If the USER LED is on, monitor the special relays SM62 and SM80 in the monitor mode of GX Developer.

- When M62 has turned on
  The annunciator (F) is on.Check the error cause using SD62 to SD79.
- When SM80 has turned on
  The USER LED turns on by the execution of the CHK instruction. Check the error cause using SD80.

Eliminate the error cause after checking.

The USER LED can be turned off by:

- Resetting with the RESET/L.CLR switch or
- Executing the LEDR instruction in the sequence program.

Point

When the RESET/L. CLR switch is tilted to L.CLR several times for latch clear operation, the USER LED flickers to indicate that the latch clear processing is in process.
When the RESET/L. CLR switch is further tilted to L.CLR while the USER LED flickering, the USER LED turns off and terminates the latch clear processing.

12.2.16 When the BAT. LED has turned on or is flickering

When the BAT. LED has turned on or is flickering, follow the procedure described below.

The BAT. LED turns on or flickers when a low battery capacity is detected.
If the BAT. LED is on, monitor the special relays and special registers in the monitor mode of GX Developer to check which of the CPU module and SRAM card batteries was lowered in capacity. (SM51 to SM52, SD51 to SD52)
After checking, replace the battery with a new one, and reset the CPU module with the RESET/L.CLR switch Note12.9 or run the LEDR instruction, and the BAT. LED will turn off.

Note12.9 Universal
For the Universal model QCPU, use the RUN/STOP/RESET switch for operation.

12.2.17 When the BOOT LED is flickering

Refer to the following flowchart when the BOOT LED of the CPU module flickers at programmable controller power-on, at operation start, or during operation.

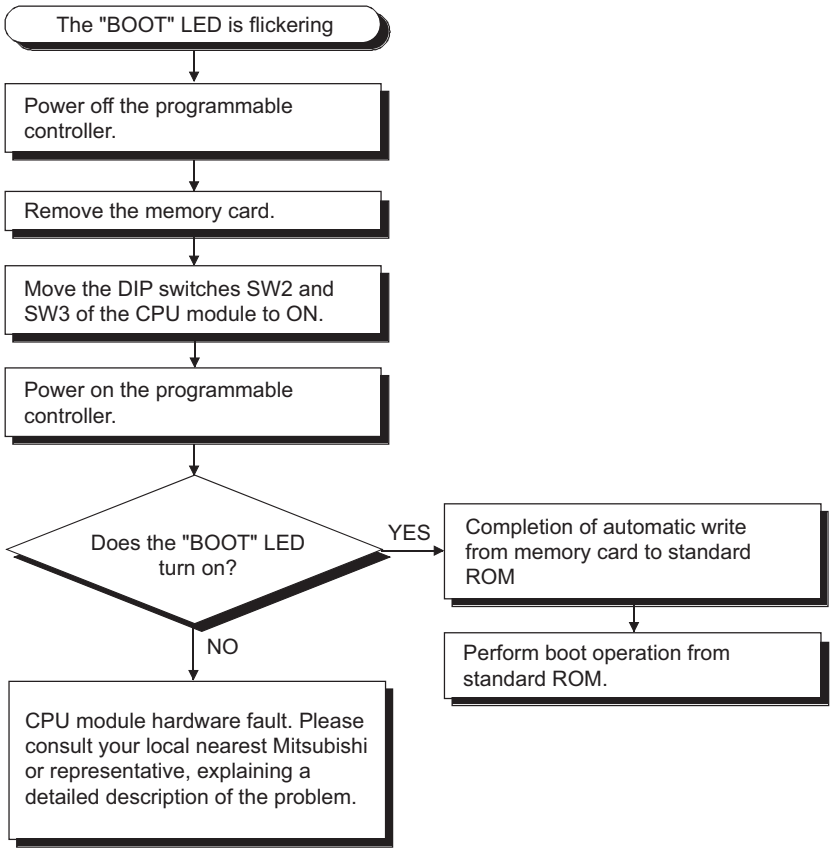


Figure 12.14 When the BOOT LED is flickering

12.2.18 When the LEDs of the output module do not turn on

Refer to the following flowchart when the LEDs of the output module do not turn on during programmable controller operation.

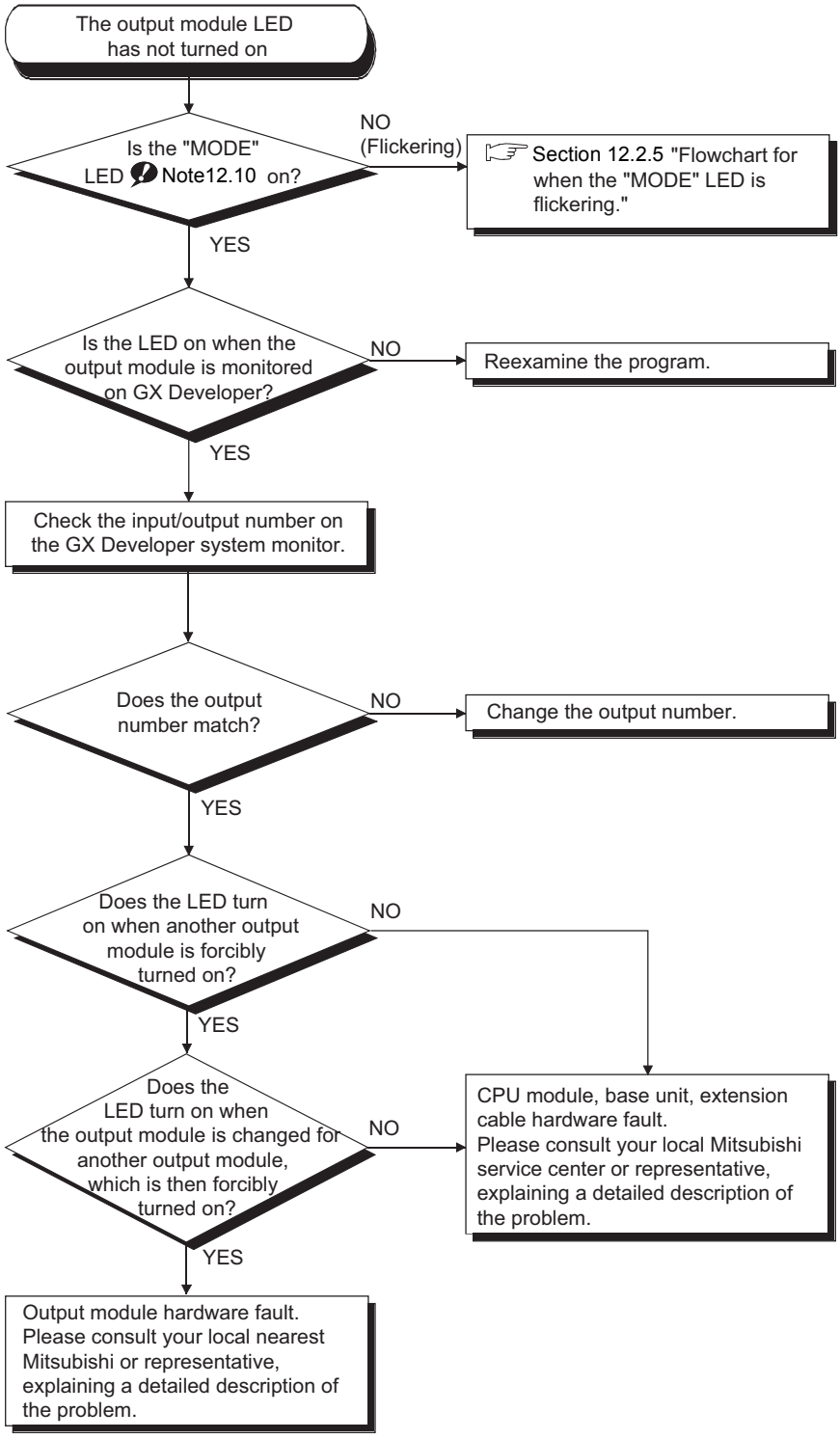


Figure 12.15 When the LEDs of the output module do not turn on

Note12.10 **Basic**

The Basic model QCPU does not have the MODE LED. In the flowchart, proceed to "YES".

12.2.19 When output load of the output module does not turn on

Refer to the following flowchart when the output load of the output module does not turn on during programmable controller operation.

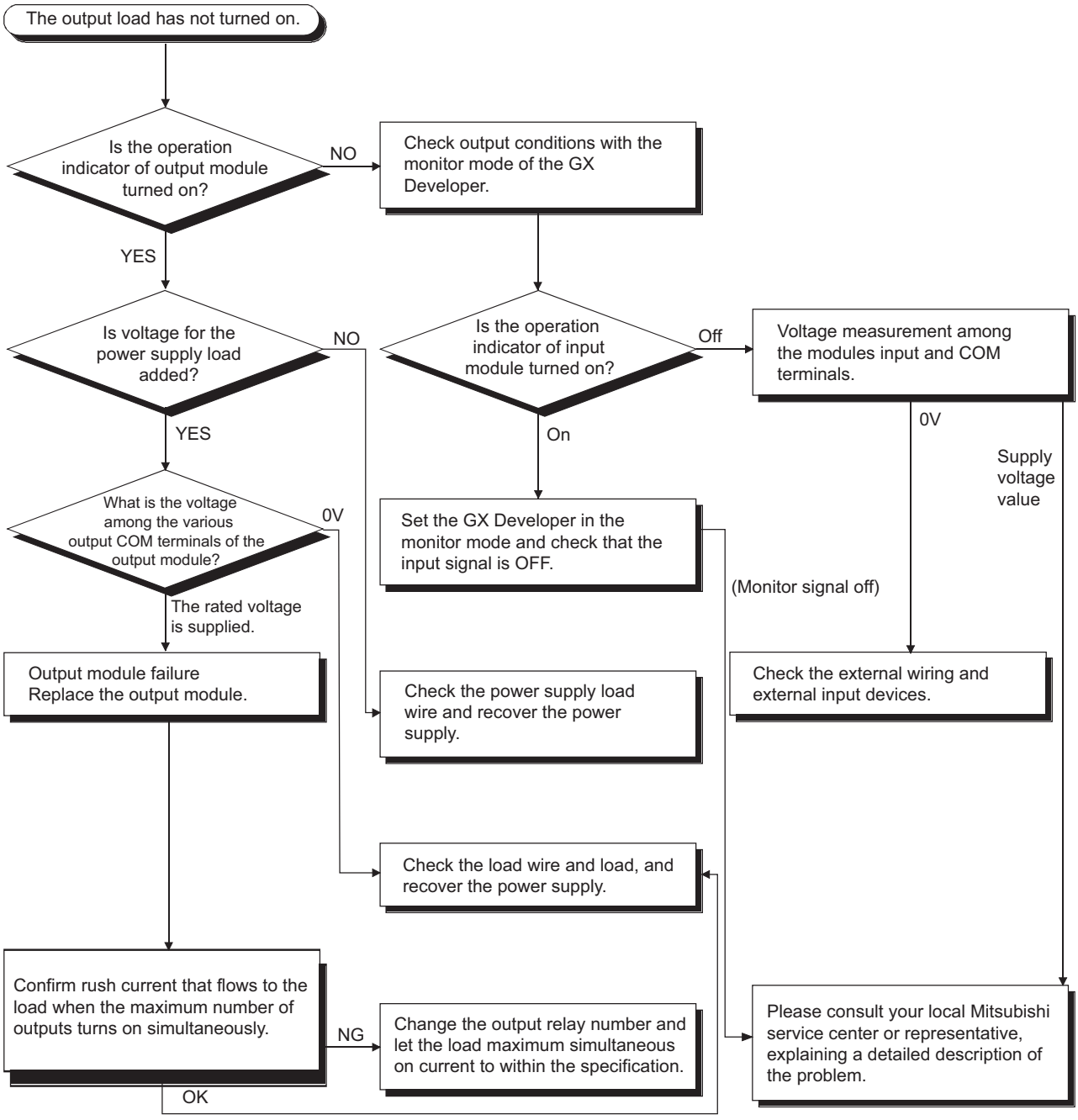


Figure 12.16 When the output load of the output module does not turn on

Point

For the trouble in which input signal to the input module does not turn off, troubleshoot referring to Section 12.5, Examples of I/O Modules Troubleshooting.

12.2.20 When unable to read a program

Refer to the following flowchart when a program cannot be read out from the CPU module.

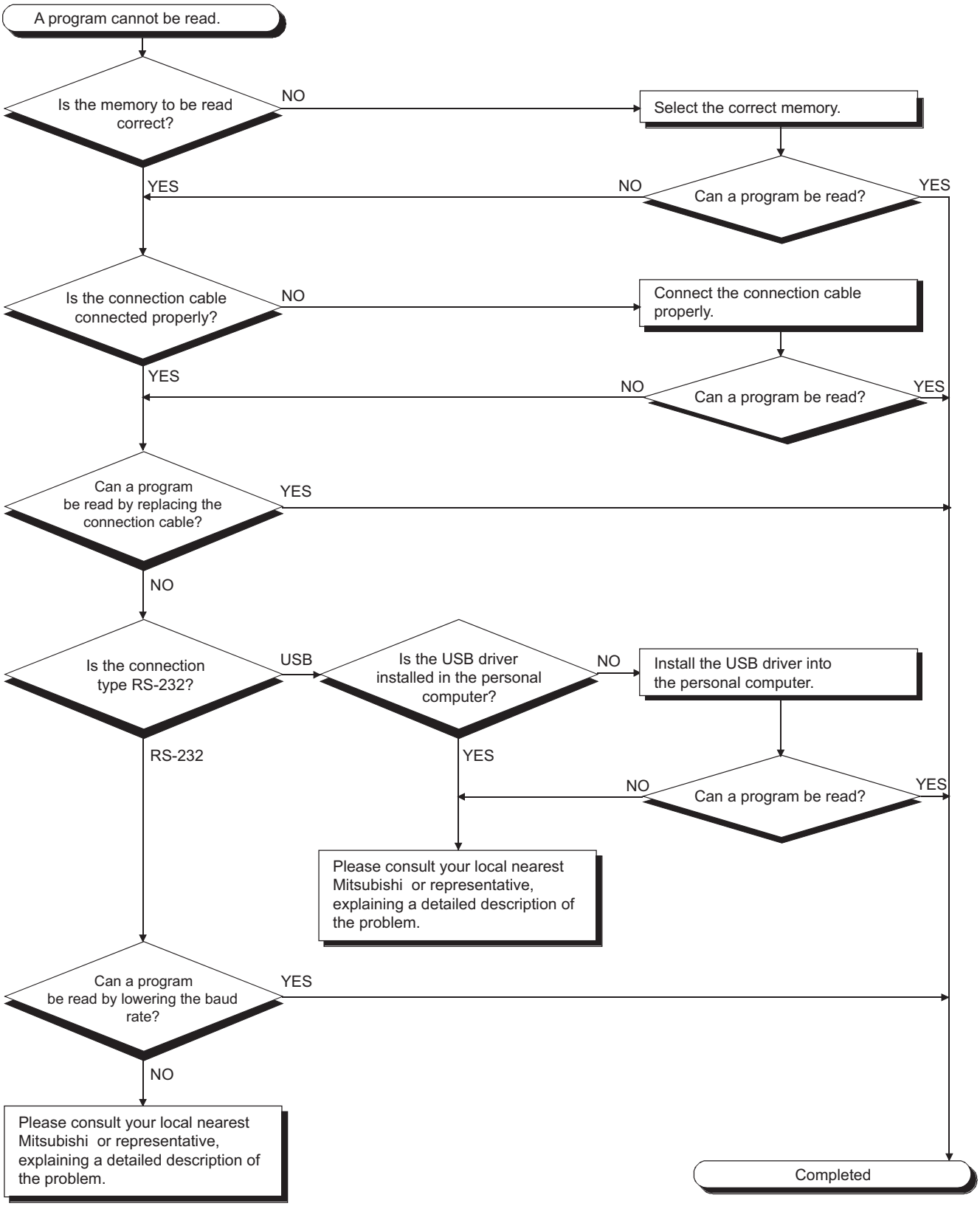


Figure 12.17 When a program cannot be read out

12.2.21 When unable to write a program

Refer to the following flowchart when a program cannot be written in the CPU module.

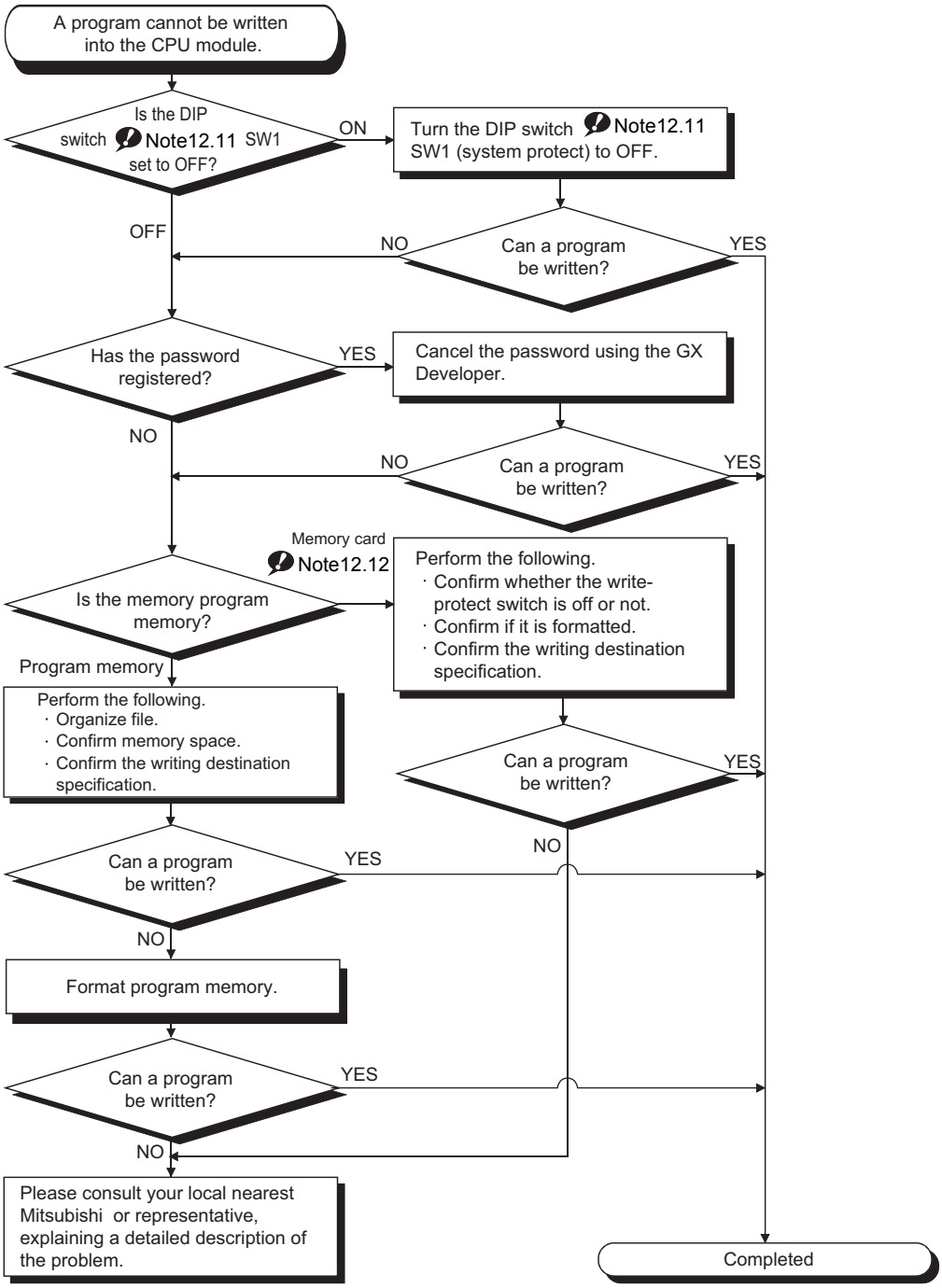


Figure 12.18 When a program cannot be written

Note12.11 **Basic** **Universal**

The Basic model QCPU and Universal model QCPU do not have the DIP switches.
In the flowchart, proceed to "OFF".

Note12.12 **Basic**

The Basic model QCPU does not support the memory card.

12.2.22 When program is rewritten unintentionally

Refer to the following flowchart when a program is unintentionally rewritten at power-on or reset of the programmable controller.

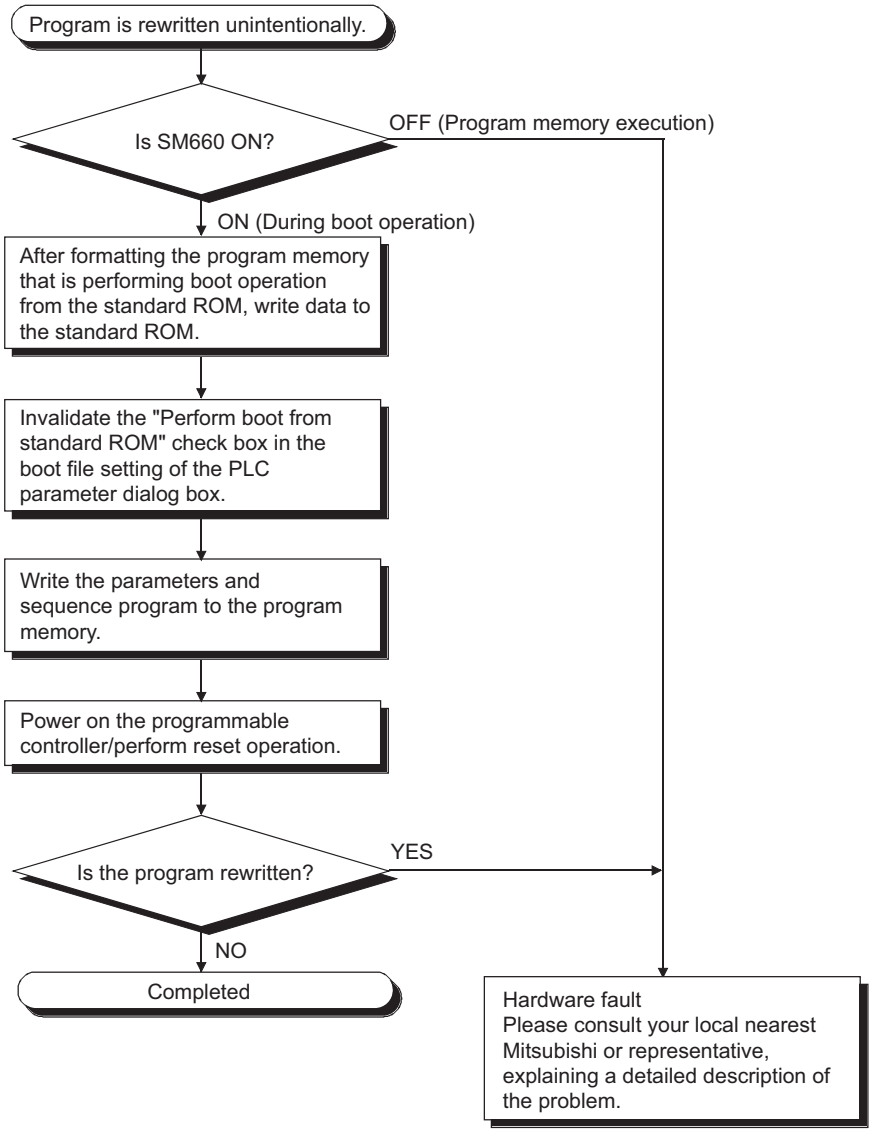
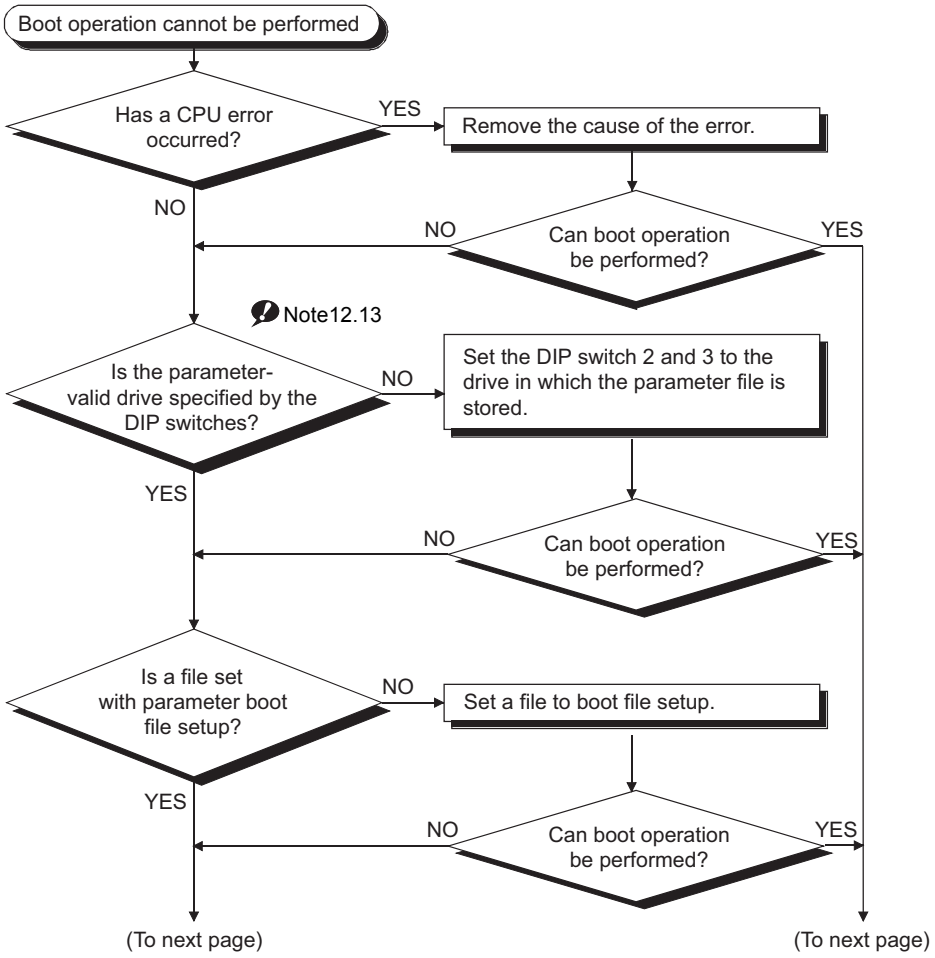


Figure 12.19 When program is rewritten unintentionally

12.2.23 When unable to perform boot operation from the memory card

Refer to the following flowchart when the boot operation of the CPU module cannot be performed using the memory card.



Note12.13 **Basic** **Universal**

The Basic model QCPU and Universal model QCPU do not have the DIP switches.
In the flowchart, proceed to "YES".

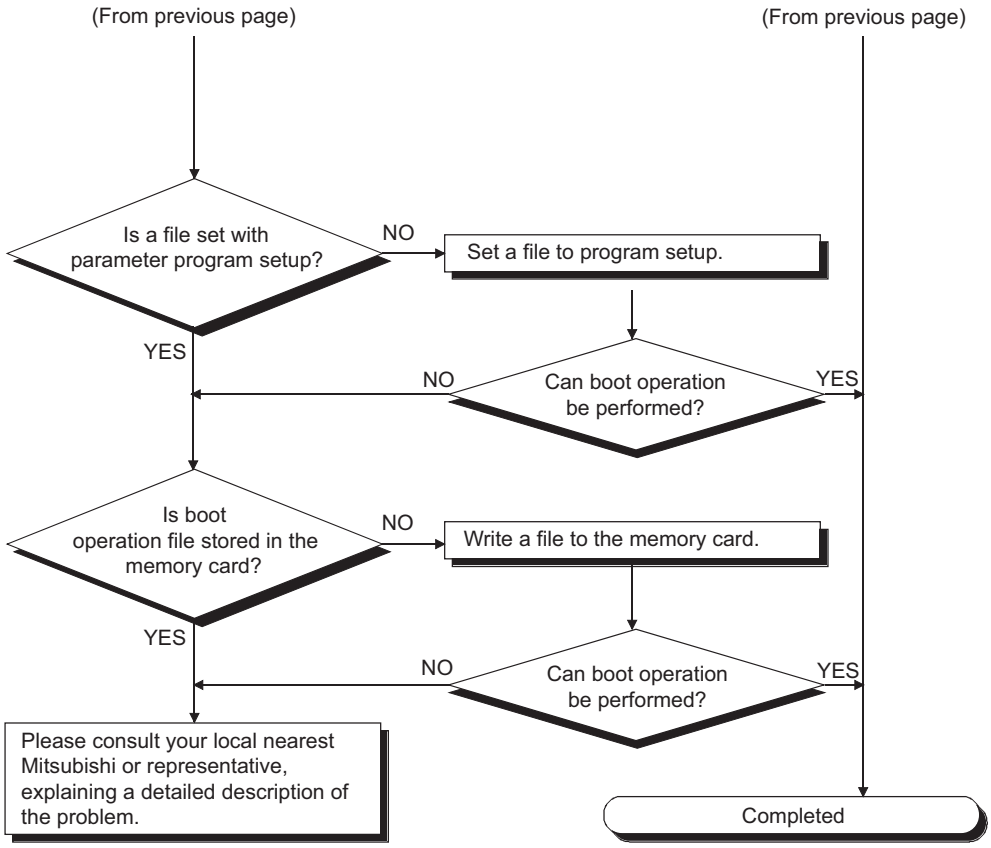


Figure 12.20 When boot operation cannot be performed from the memory card

12.2.24 When “UNIT VERIFY ERR.” has occurred

Refer to the following flowchart when “UNIT VERIFY ERR.” has occurred at programmable controller power-on or during operation.

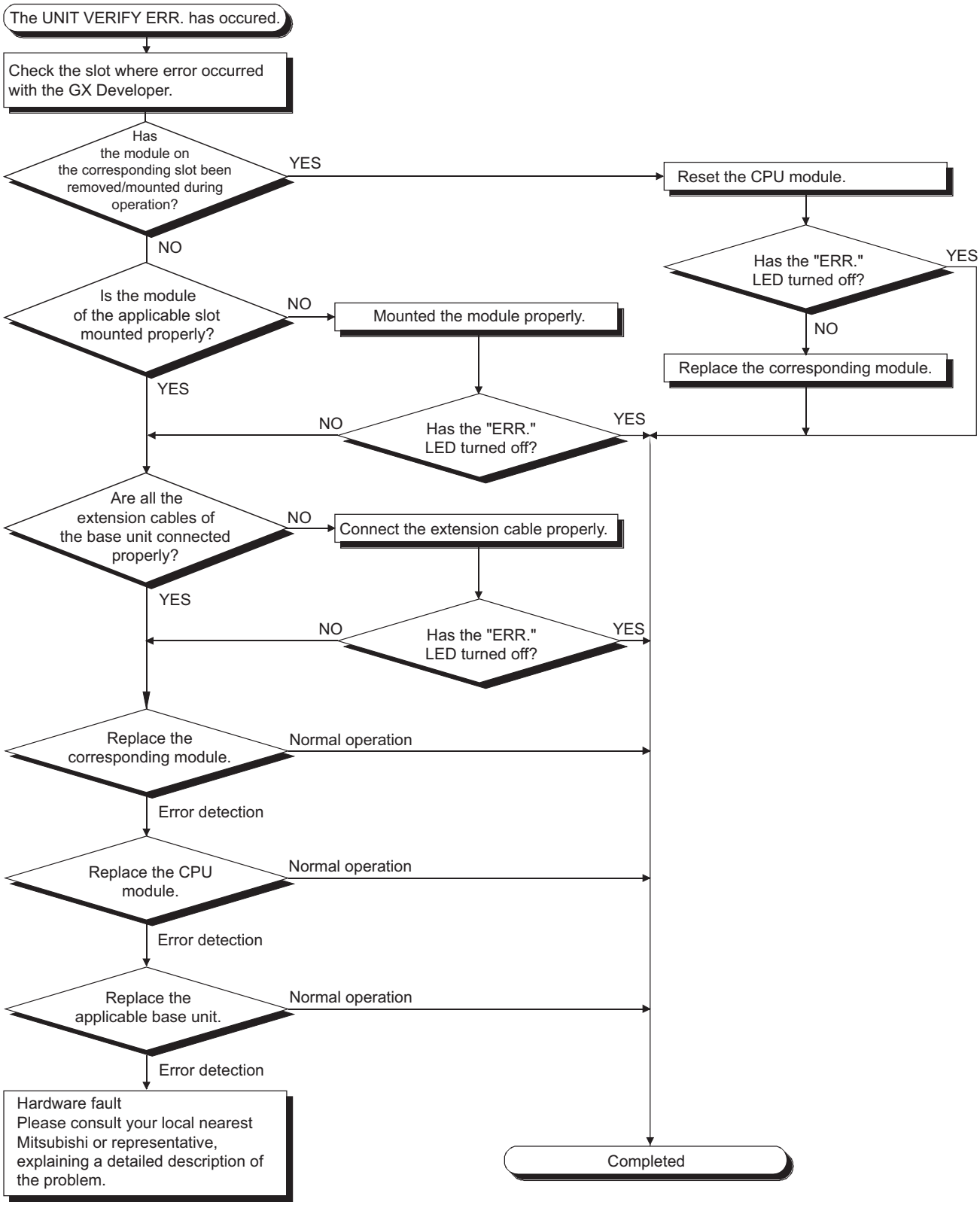


Figure 12.21 When “UNIT VERIFY ERR.” has occurred

12.2.25 When “CONTROL BUS ERR.” has occurred

Refer to the following flowchart when “CONTROL BUS ERR.” has occurred at programmable controller power-on or during operation.

This flow chart is applicable only when a slot/base unit can be specified by the error code.

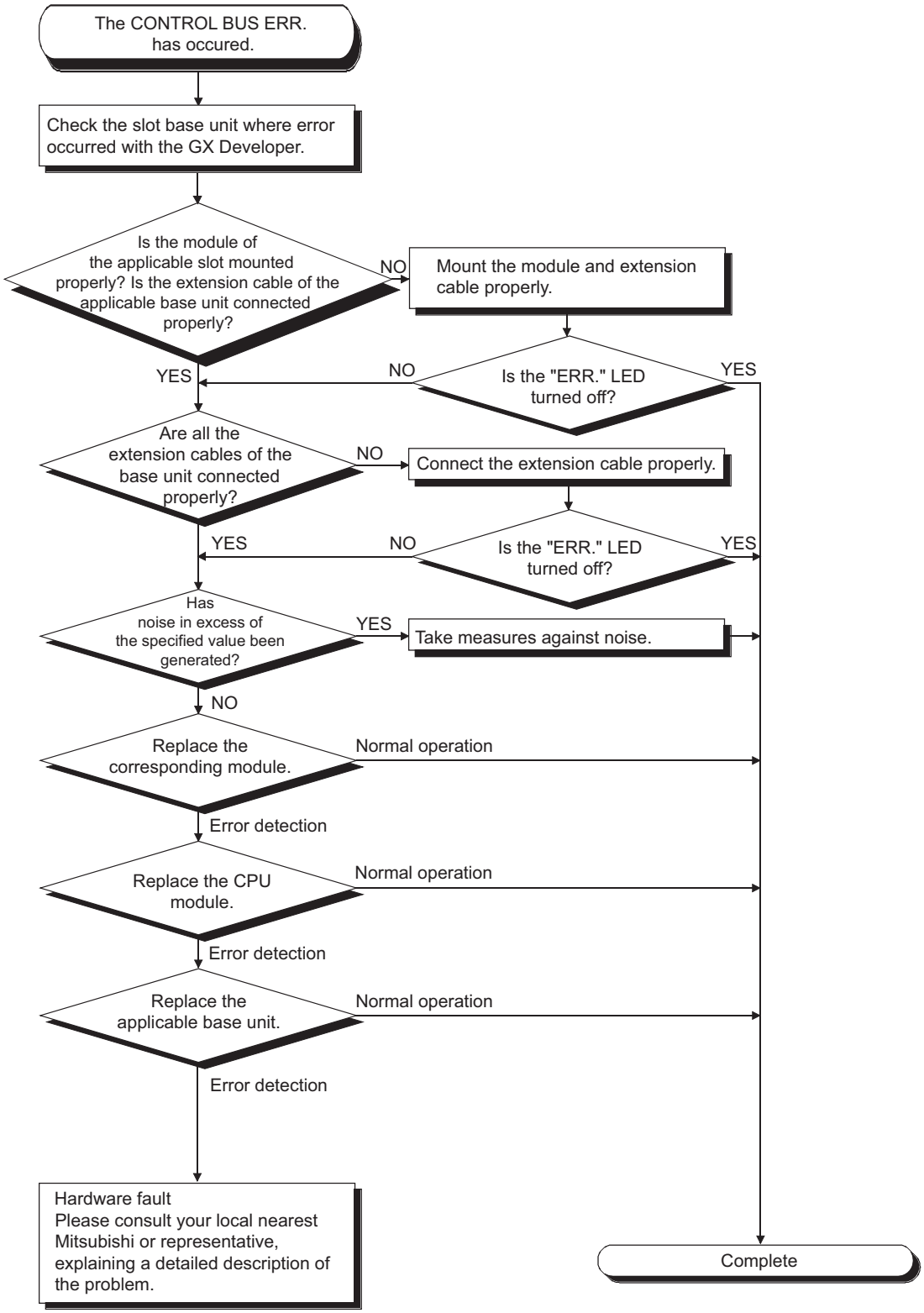


Figure 12.22 When “CONTROL BUS ERR.” has occurred

12.2.26 When the CPU module does not start

Refer to the following flowchart when the CPU module does not start upon power-on.

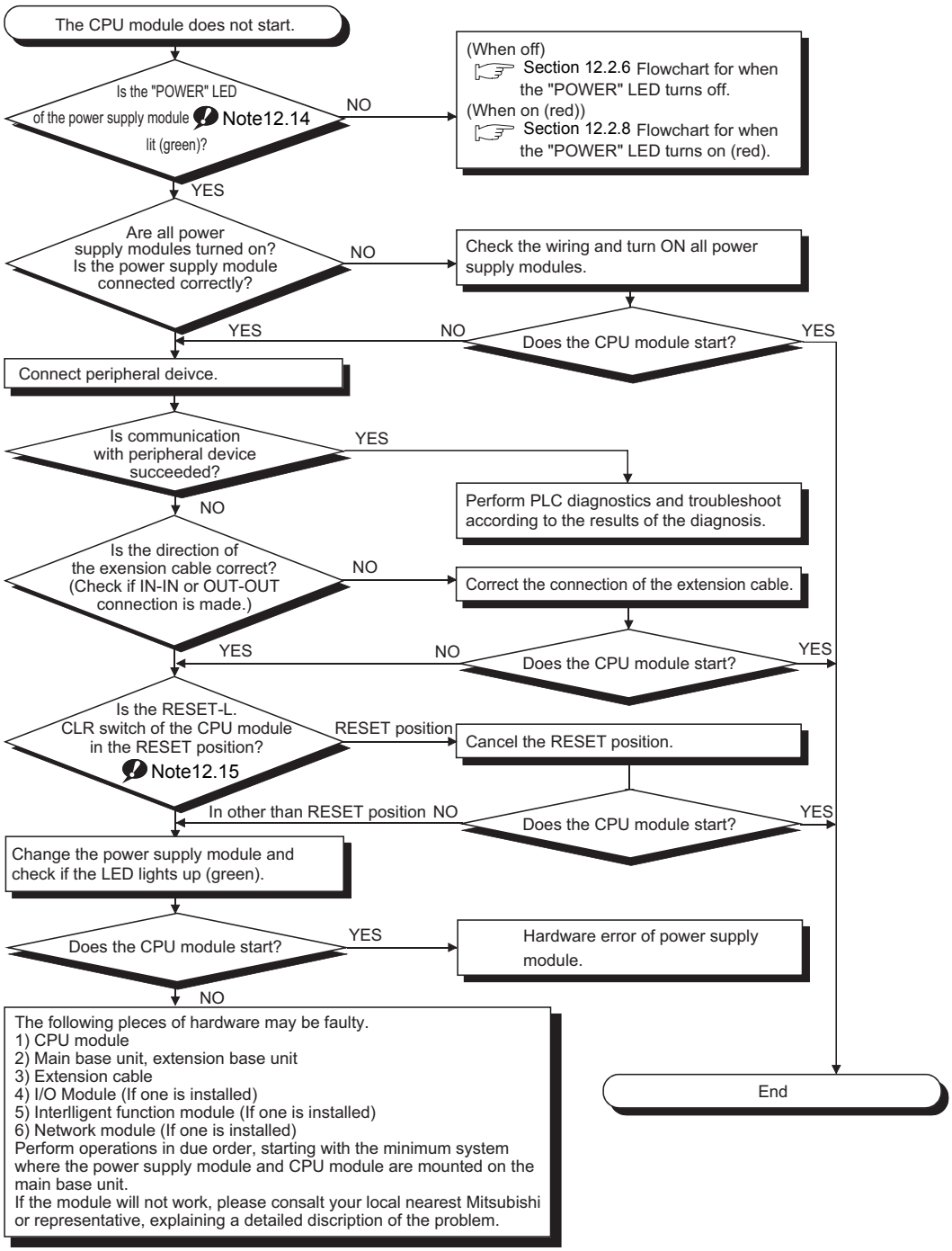


Figure 12.23 When the CPU module does not start

Note12.14 **Basic**

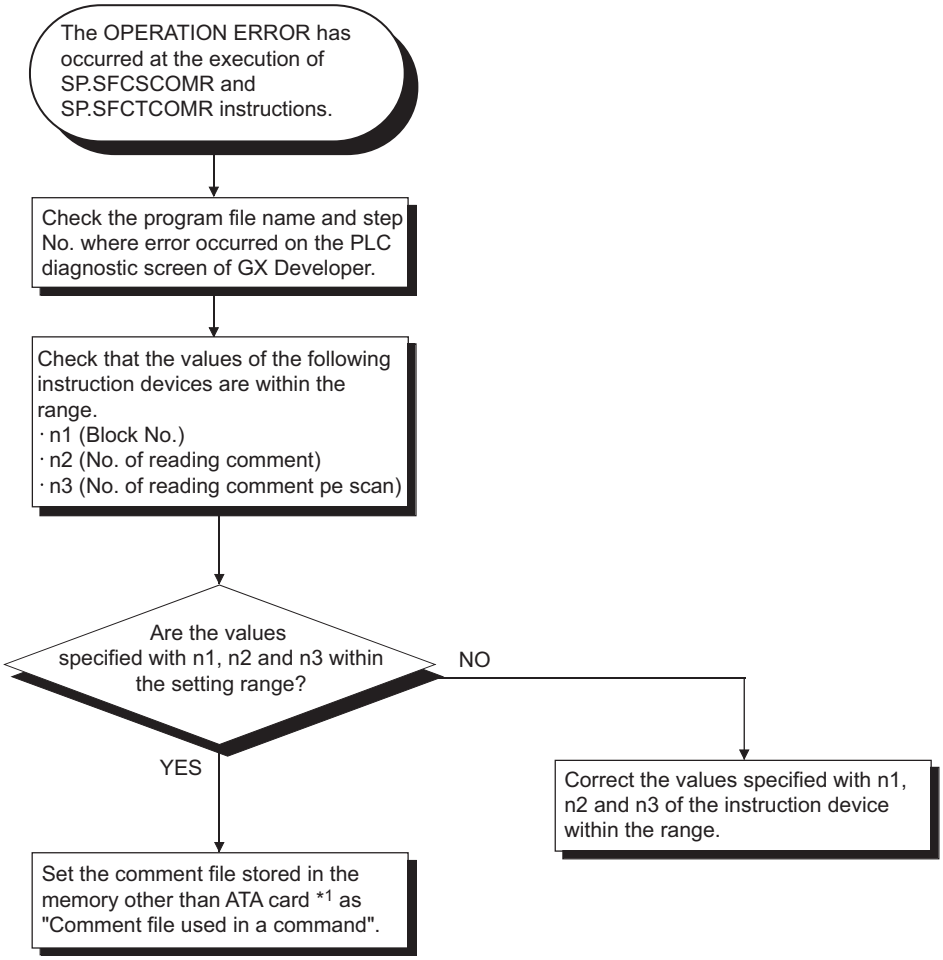
For the Basic model QCPU, it applied to the CPU module (power supply section) is.

Note12.15 **Basic**

For the Basic model QCPU, check if the RUN/STOP/RESET switch of CPU module is in the RESET position.

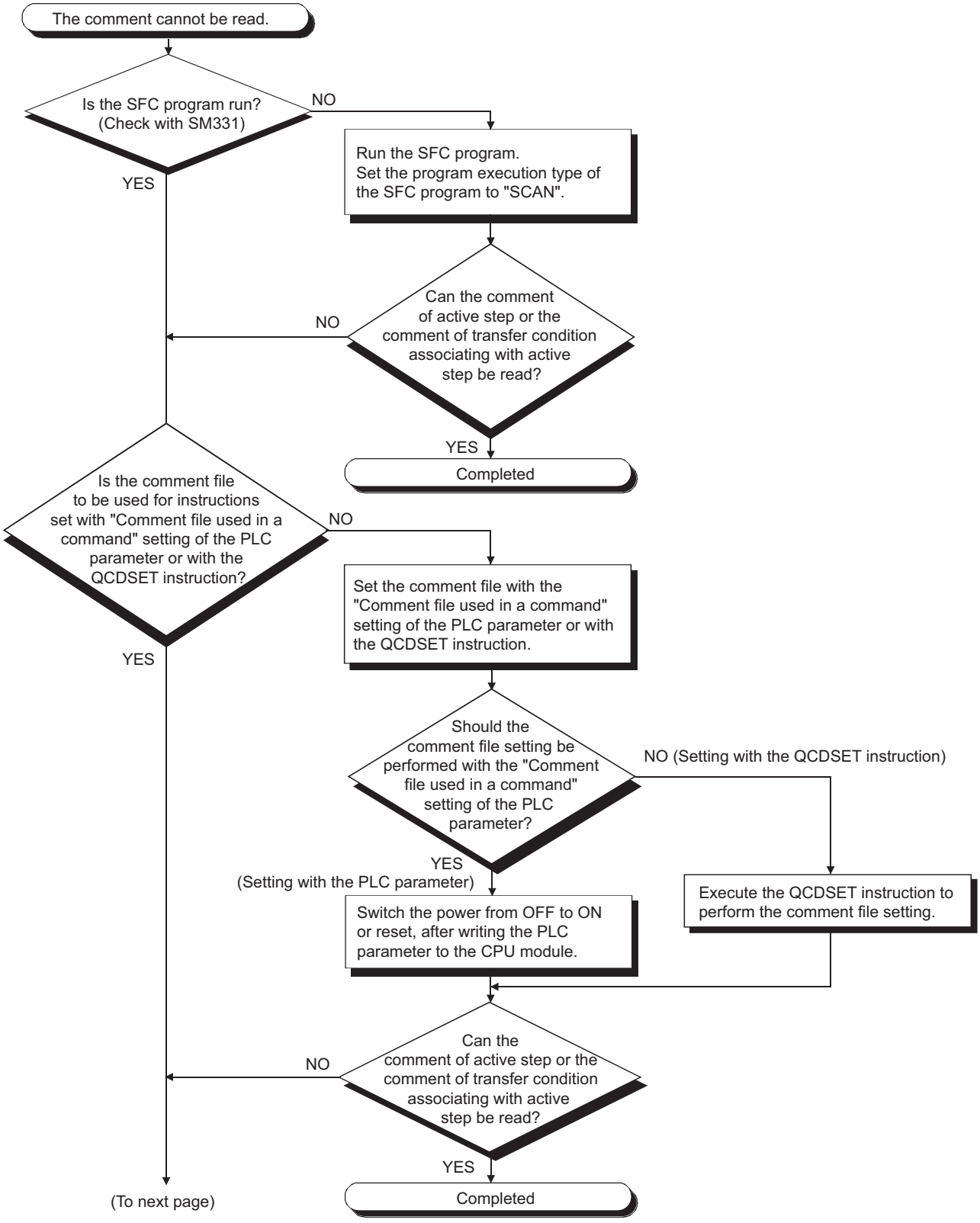
12.2.27 When “OPERATION ERROR” has occurred at execution of the S(P).SFCSCOMR and S(P).SFCTCOMR instructions.

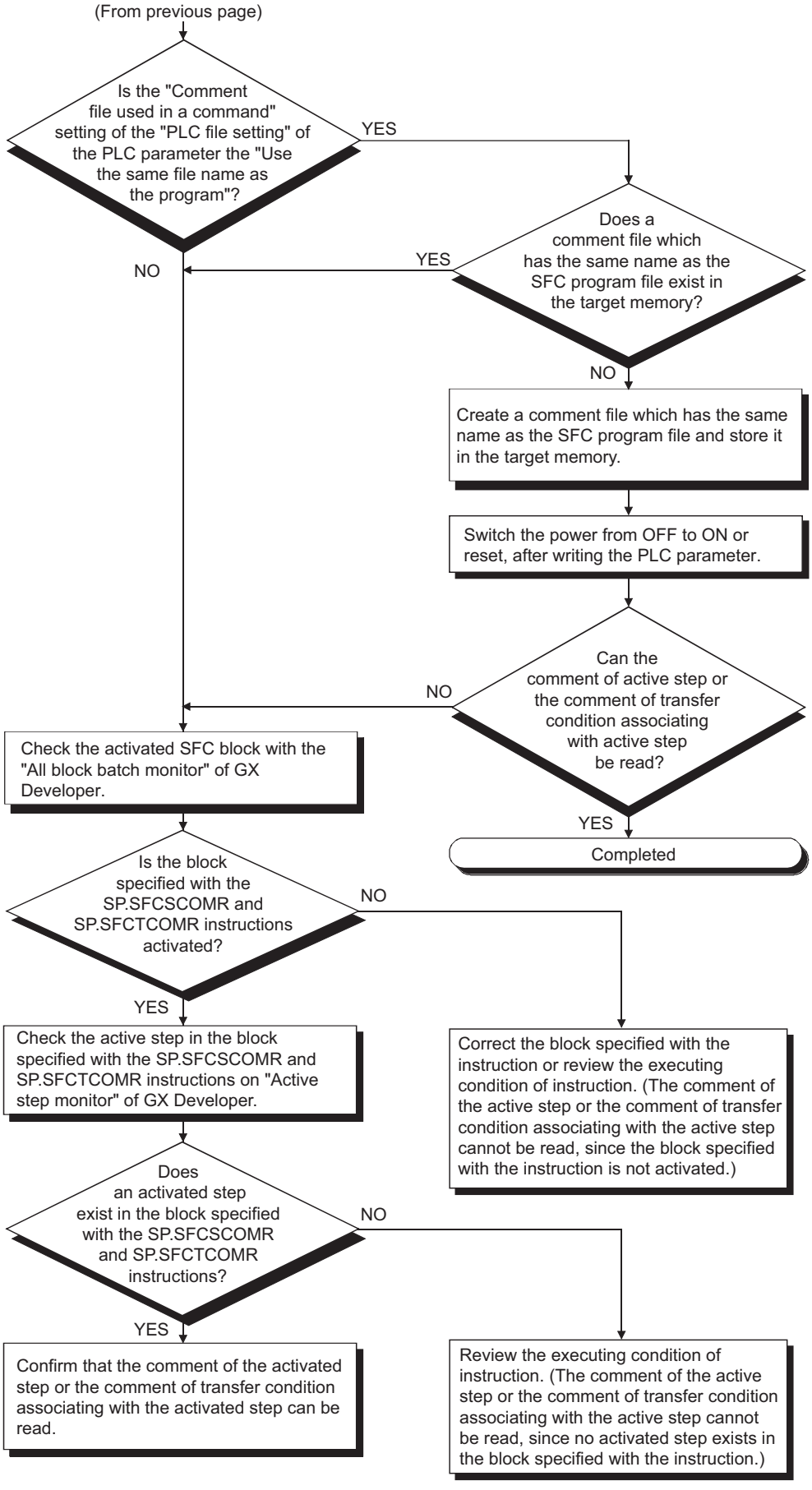
Refer to the following flowchart when “OPERATION ERROR” (error code: 4100) has occurred at execution of the S(P).SFCSCOMR and S(P).SFCTCOMR instructions.



12.2.28 When comments cannot be read at execution of the S(P).SFCSCOMR and S(P).SFCTCOMR instructions

Refer to the following flowchart when any comment of active step or transfer condition associating with active step cannot be read at execution of the S(P).SFCSCOMR and S(P).SFCTCOMR instructions

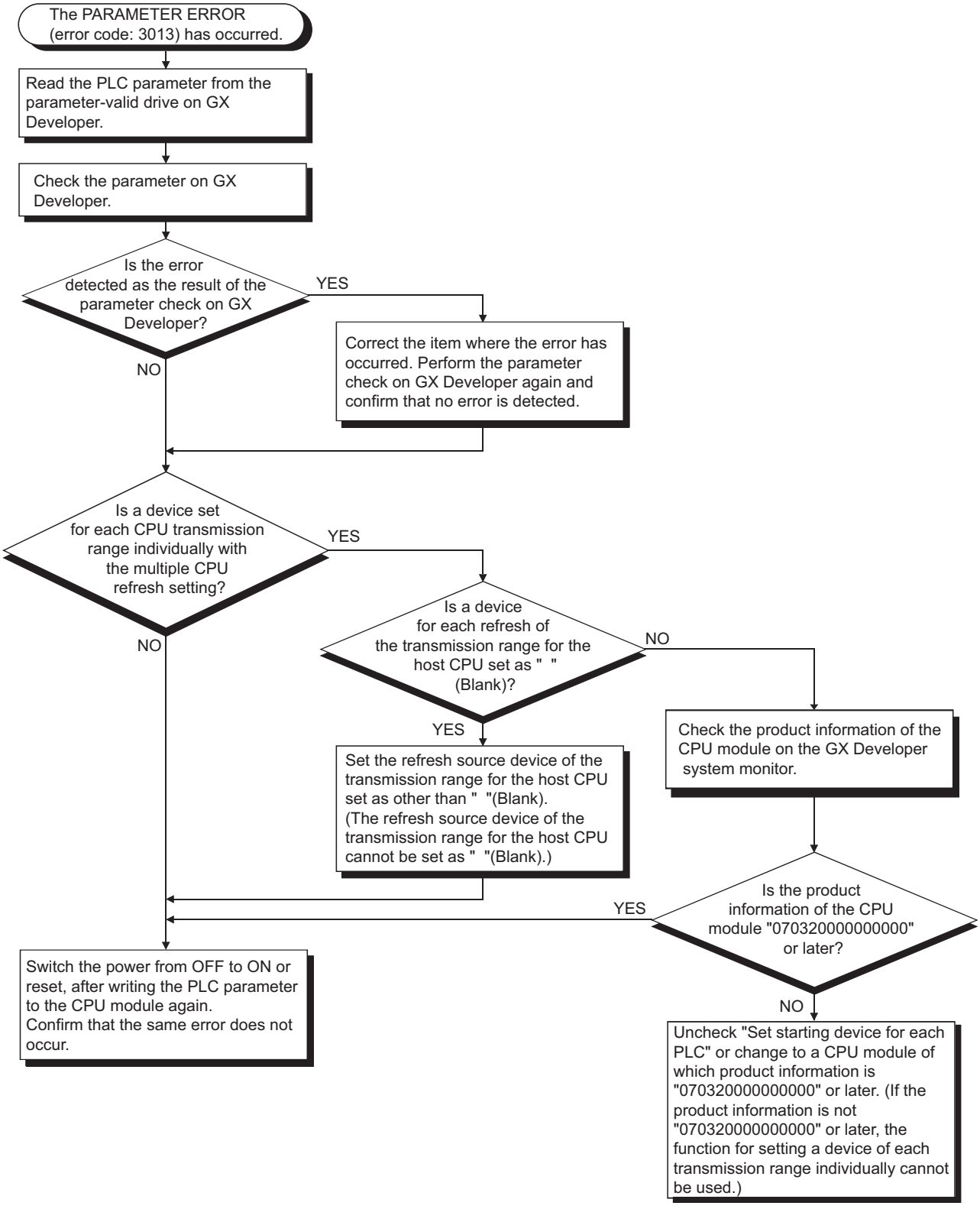



(From previous page)
Is the "Comment file used in a command" setting of the "PLC file setting" of the PLC parameter the "Use the same file name as the program"?
YES
NO
Does a comment file which has the same name as the SFC program file exist in the target memory?
YES
NO
Create a comment file which has the same name as the SFC program file and store it in the target memory.
Switch the power from OFF to ON or reset, after writing the PLC parameter.
Can the comment of active step or the comment of transfer condition associating with active step be read?
NO
YES
Completed
Check the activated SFC block with the "All block batch monitor" of GX Developer.
Is the block specified with the SP.SFCSCOMR and SP.SFCTCOMR instructions activated?
NO
YES
Correct the block specified with the instruction or review the executing condition of instruction. (The comment of the active step or the comment of transfer condition associating with the active step cannot be read, since the block specified with the instruction is not activated.)
Check the active step in the block specified with the SP.SFCSCOMR and SP.SFCTCOMR instructions on "Active step monitor" of GX Developer.
Does an activated step exist in the block specified with the SP.SFCSCOMR and SP.SFCTCOMR instructions?
NO
YES
Review the executing condition of instruction. (The comment of the active step or the comment of transfer condition associating with the active step cannot be read, since no activated step exists in the block specified with the instruction.)
Confirm that the comment of the activated step or the comment of transfer condition associating with the activated step can be read.

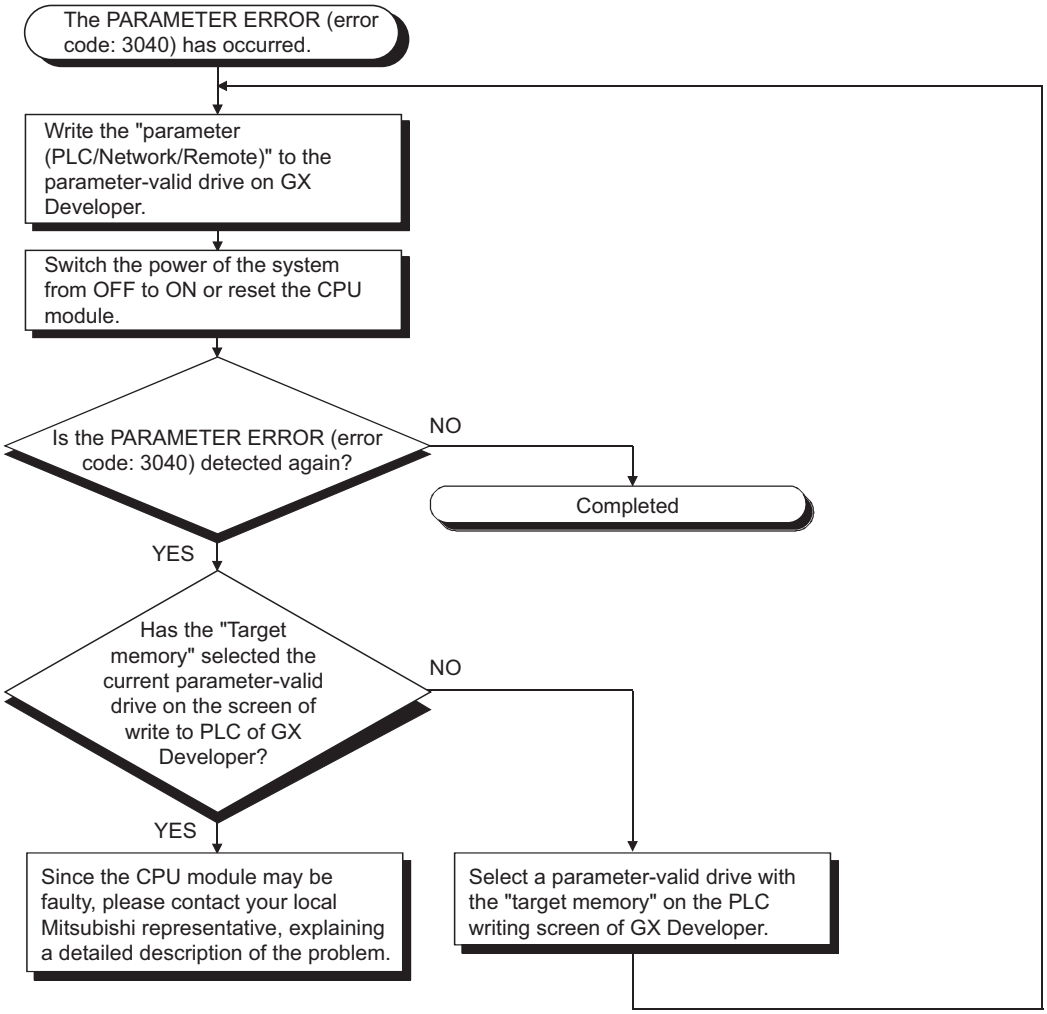
12.2.29 When “PARAMETER ERROR” has occurred at power on or reset.

Refer to the following flowchart when “PARAMETER ERROR” occurs at power ON/reset.

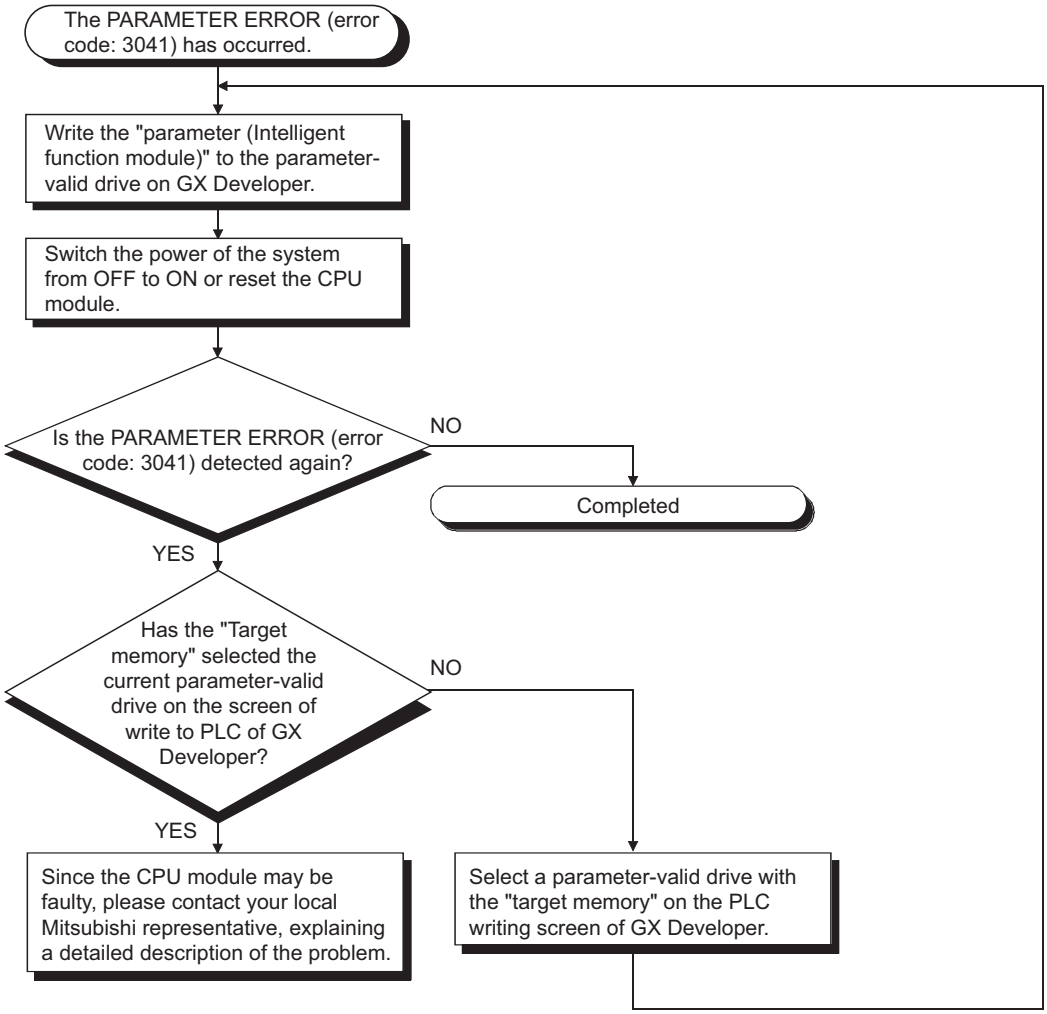
(1) When “PARAMETER ERROR” (error code: 3013) has occurred



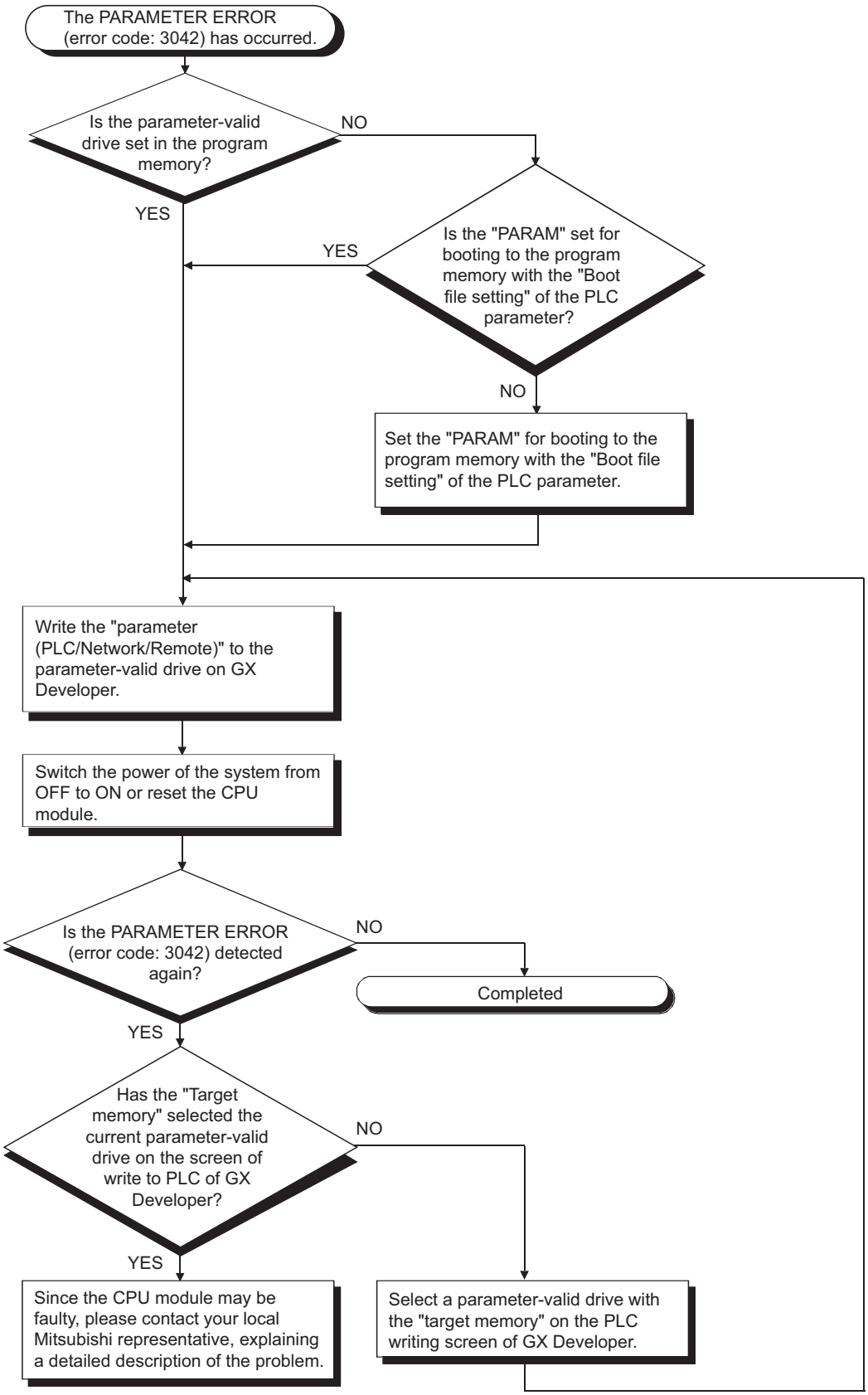
(2) When “PARAMETER ERROR” (error code: 3040) has occurred.



(3) When PARAMETER ERROR (error code: 3041) has occurred.

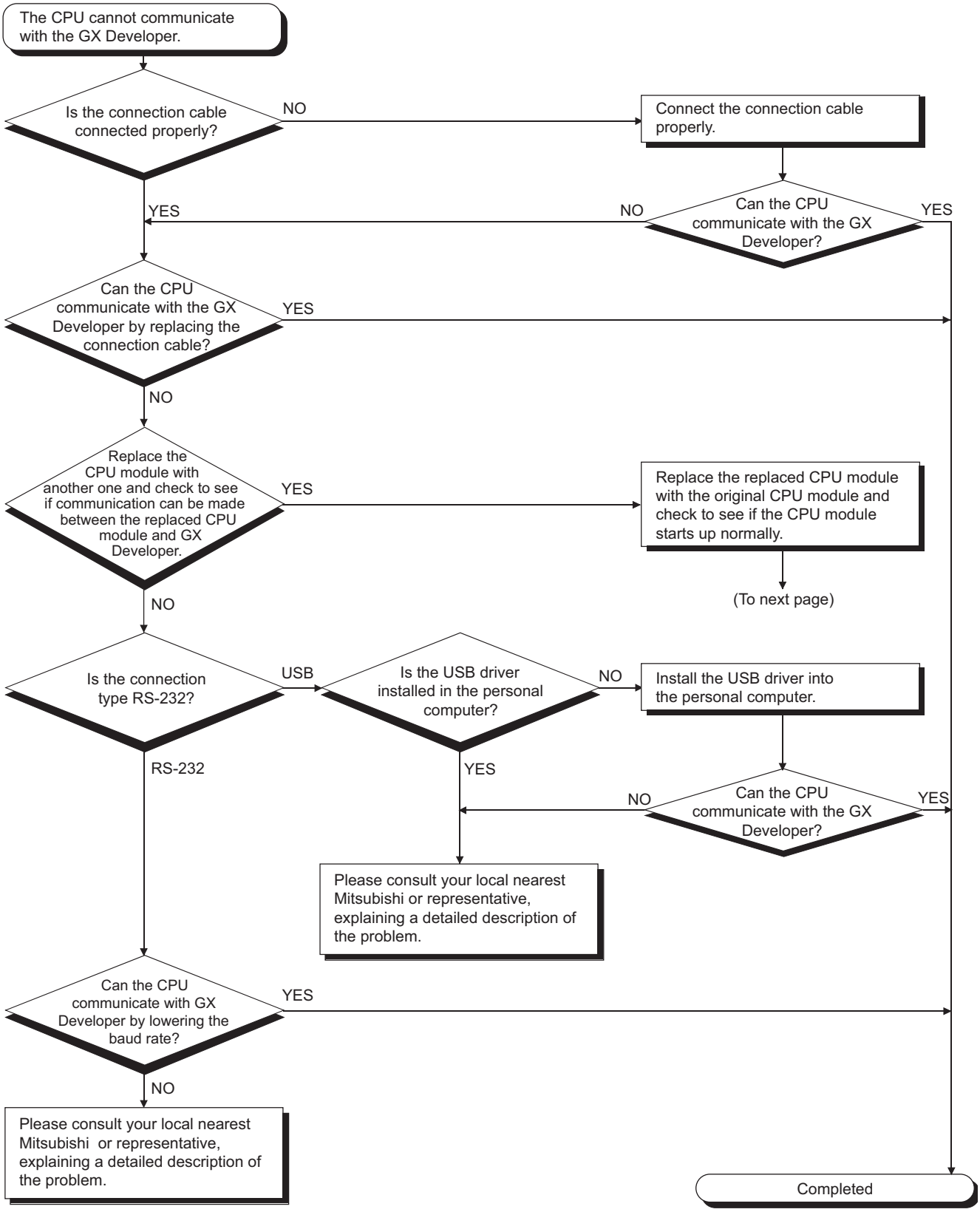


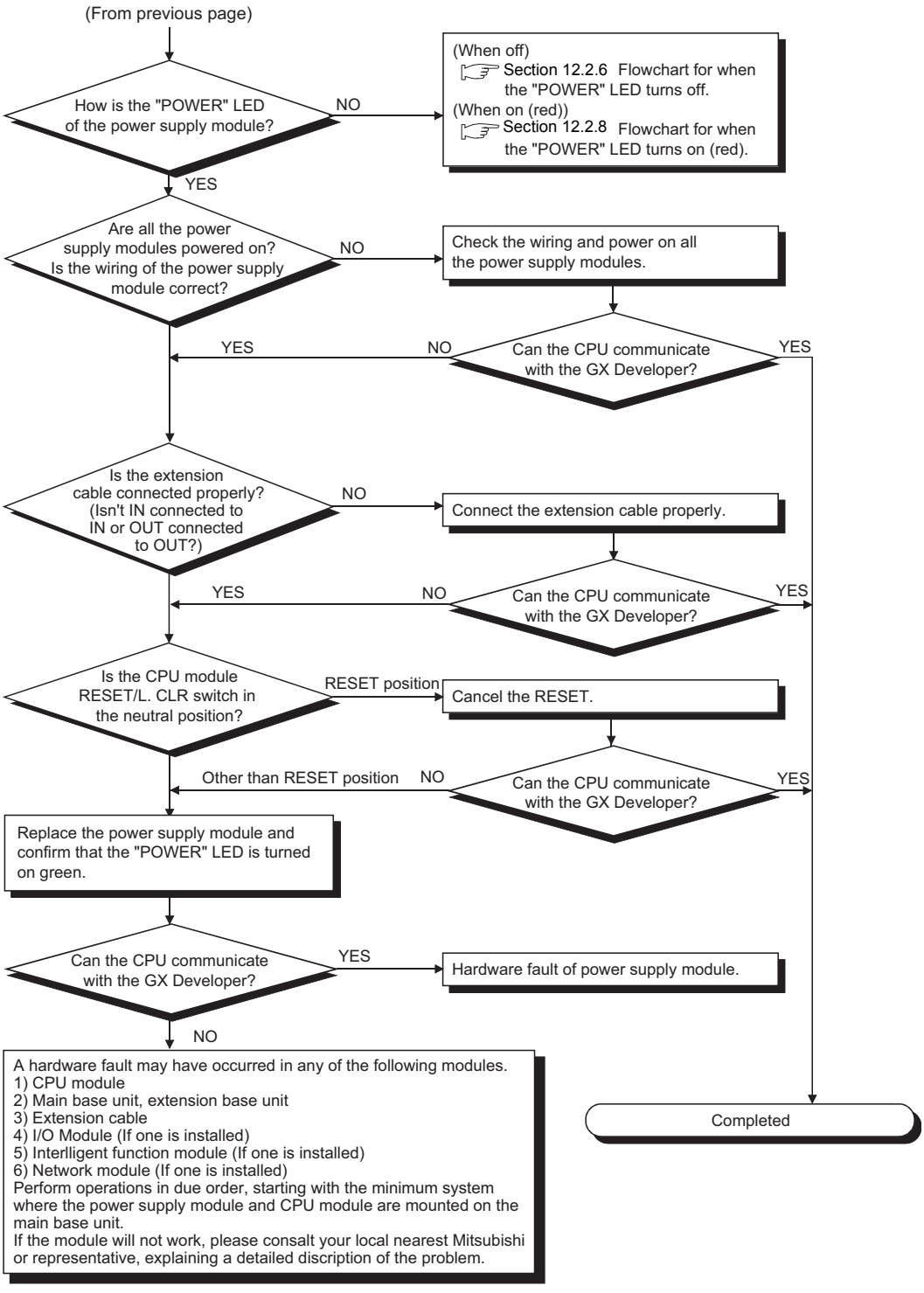
(4) When PARAMETER ERROR (error code: 3042) has occurred.



12.2.30 When the CPU cannot communicate with GX Developer

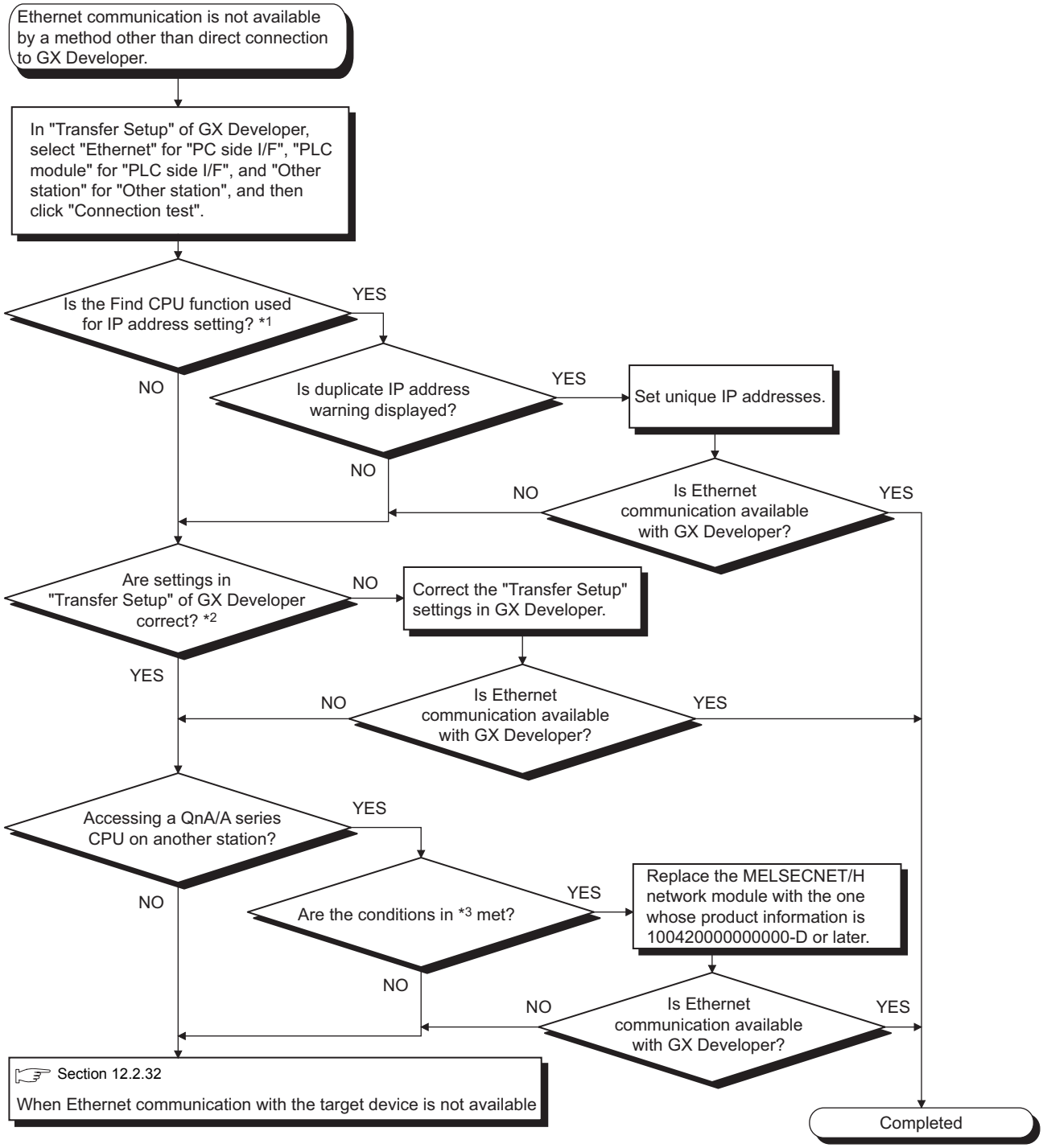
Refer to the following flowchart when communication with peripheral device is disabled when connecting the CPU module with GX Developer.




(From previous page)
How is the "POWER" LED of the power supply module?
NO
(When off)
Section 12.2.6 Flowchart for when the "POWER" LED turns off.
(When on (red))
Section 12.2.8 Flowchart for when the "POWER" LED turns on (red).
YES
Are all the power supply modules powered on? Is the wiring of the power supply module correct?
NO
Check the wiring and power on all the power supply modules.
YES
NO
Can the CPU communicate with the GX Developer?
YES
Is the extension cable connected properly? (Isn't IN connected to IN or OUT connected to OUT?)
NO
Connect the extension cable properly.
YES
NO
Can the CPU communicate with the GX Developer?
YES
Is the CPU module RESET/L. CLR switch in the neutral position?
RESET position
Cancel the RESET.
Other than RESET position
NO
Can the CPU communicate with the GX Developer?
YES
Replace the power supply module and confirm that the "POWER" LED is turned on green.
Can the CPU communicate with the GX Developer?
YES
Hardware fault of power supply module.
NO
A hardware fault may have occurred in any of the following modules.
1) CPU module
2) Main base unit, extension base unit
3) Extension cable
4) I/O Module (If one is installed)
5) Interlligent function module (If one is installed)
6) Network module (If one is installed)
Perform operations in due order, starting with the minimum system where the power supply module and CPU module are mounted on the main base unit.
If the module will not work, please consalt your local nearest Mitsubishi or representative, explaining a detailed discription of the problem.
Completed

12.2.31 When Ethernet communication is not available other than by direct connection to GX Developer

Refer to the following flowchart when Ethernet communication is not available other than by connecting GX Developer directly.



*1: If the target CPU is not found by the Find CPU function, check the following.

Route:

- Check that access to the target CPU does not pass through any router.
- Check the parameters.
- Check that the Find CPU function is not rejected by a parameter setting of the target CPU.

Computer-side settings:

- Check if an IP address is set.
- Check if use of the Ethernet port is enabled.
- Check if the firewall setting is disabled.
  When enabled, check if communication with Built-in Ethernet QCPU is excluded in the setting.
- Check if communication with Built-in Ethernet QCPU is disabled by security software.

CPU-side settings:

- Is the load for service processing too high in the target CPU? (If so, increase the service process time in Service process setting of PLC parameters.)

*2: Check the following:

PC side I/F Ethernet board setting

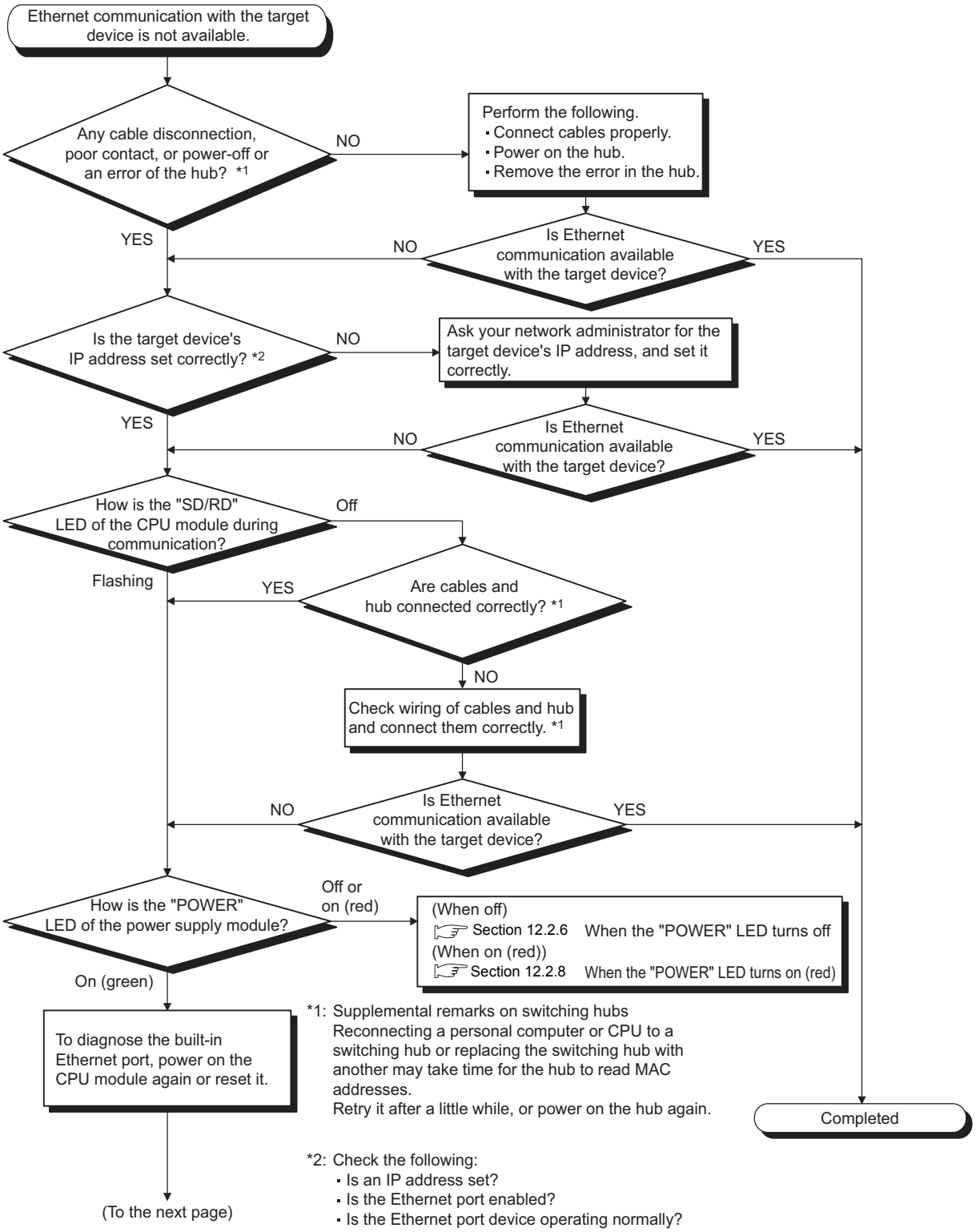
- Correct protocol specification (TCP/UDP)?
  PC side I/F Detailed setting of PLC module
- Isn't direct CPU connection selected?
- Correct IP address specification?

*3: Check if all of the following conditions are met:

- The Built-in Ethernet QCPU connected to GX Developer is in a multiple CPU configuration.
- The control CPU of the MELSECNET/H network module on the route is any other than Built-in Ethernet QCPU.
- The product information of the MELSECNET/H network module on the route is: (100320000000000-D or earlier)

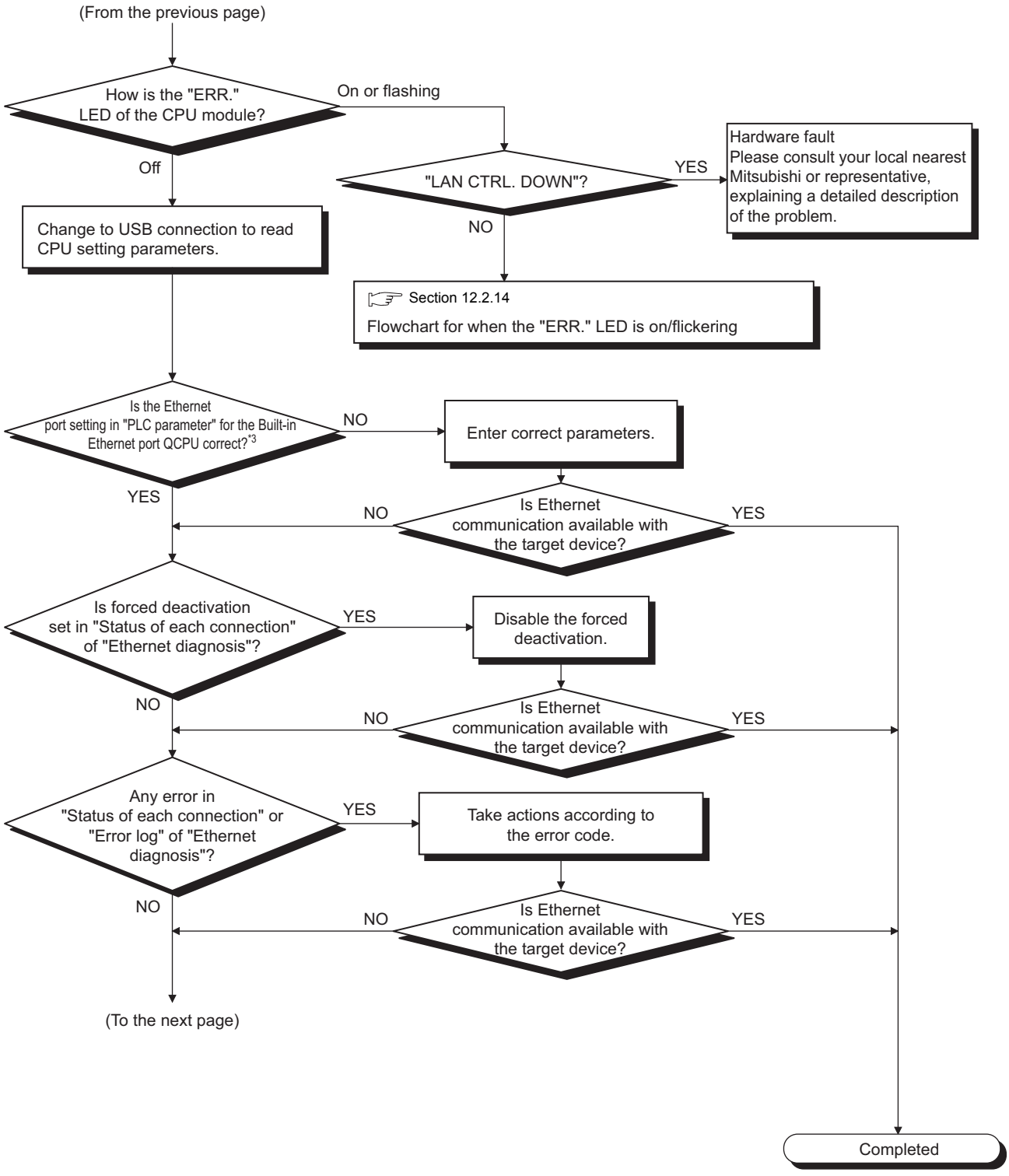
12.2.32 When Ethernet communication with the target device is not available

Refer to the following flowchart when Ethernet communication with the target device is not available.



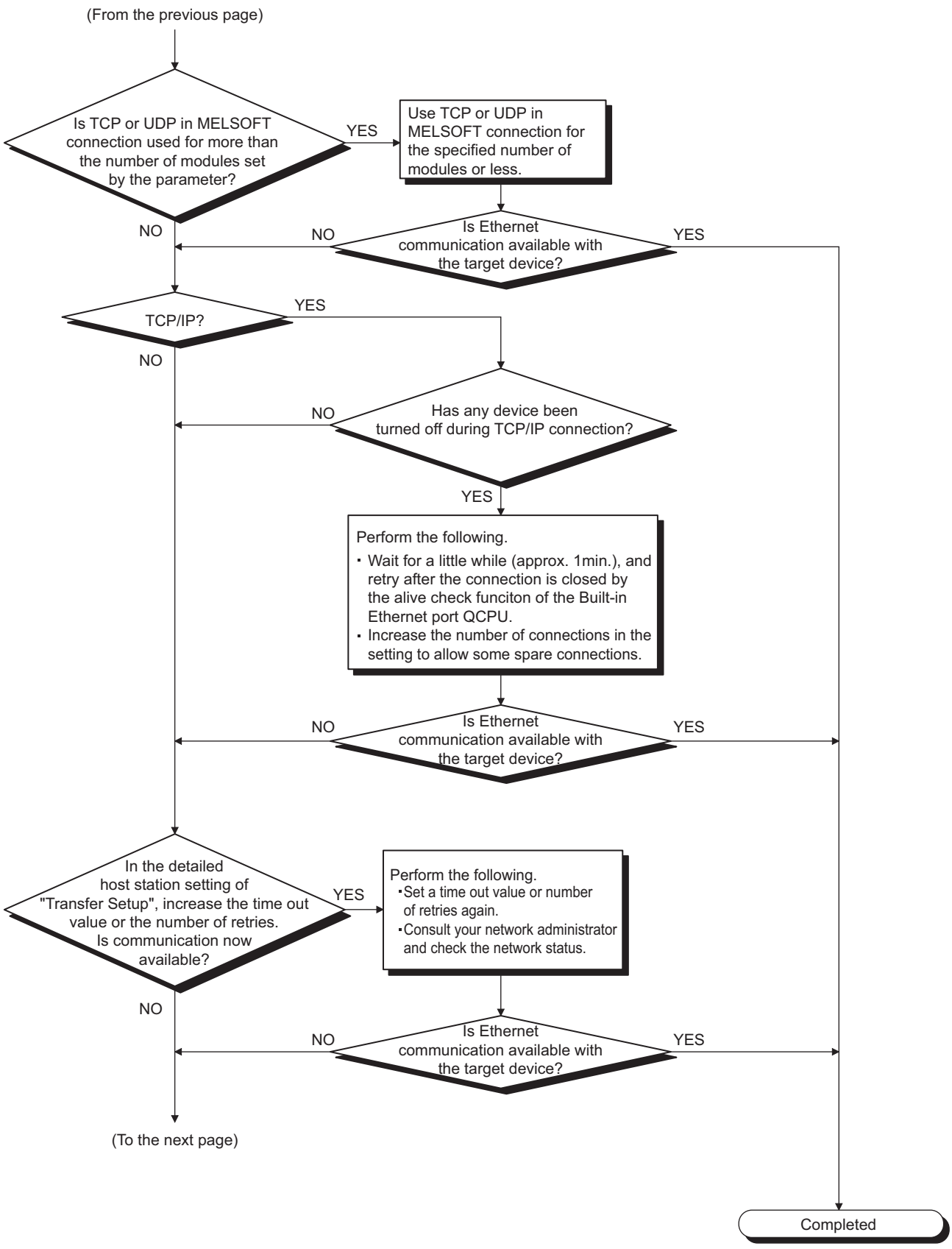
*1: Supplemental remarks on switching hubs
Reconnecting a personal computer or CPU to a switching hub or replacing the switching hub with another may take time for the hub to read MAC addresses.
Retry it after a little while, or power on the hub again.

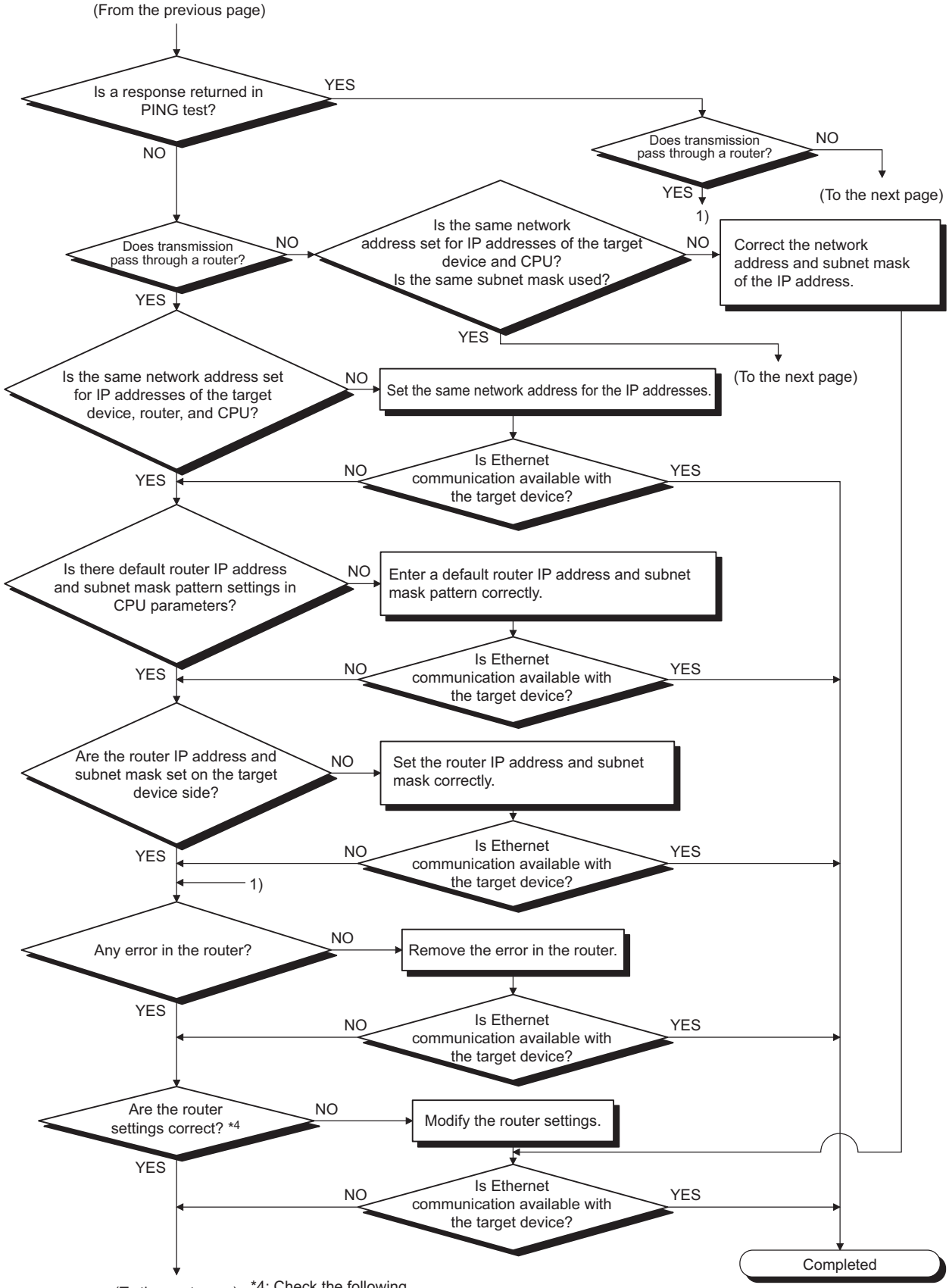
*2: Check the following:
- Is an IP address set?
- Is the Ethernet port enabled?
- Is the Ethernet port device operating normally?
- Is the firewall setting disabled?
  If enabled,is communication with the Built-in Ethernet QCPU excluded in the setting?
- Isn't communication with the Built-in Ethernet QCPU disabled by security software?



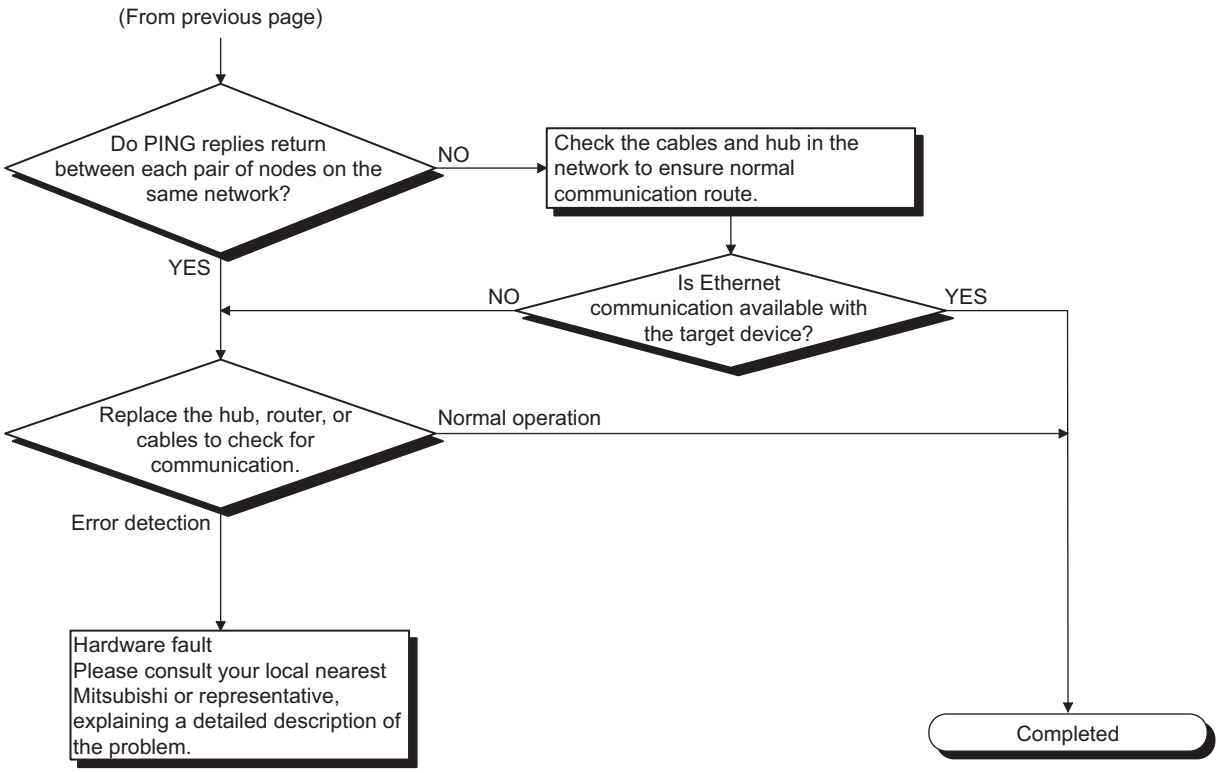
*3: Confirm the following:

- Correct IP address?
- Normal subnet mask pattern?
- Normal default router IP address?
- Protocol in the open setting, protocol desired for the function, and whether the settings are completed for the number of modules used for the function?


(From the previous page)
Is TCP or UDP in MELSOFT connection used for more than the number of modules set by the parameter?
YES
Use TCP or UDP in MELSOFT connection for the specified number of modules or less.
NO
NO
Is Ethernet communication available with the target device?
YES
TCP/IP?
YES
NO
NO
Has any device been turned off during TCP/IP connection?
YES
Perform the following.
- Wait for a little while (approx. 1min.), and retry after the connection is closed by the alive check funciton of the Built-in Ethernet port QCPU.
- Increase the number of connections in the setting to allow some spare connections.
NO
Is Ethernet communication available with the target device?
YES
In the detailed host station setting of "Transfer Setup", increase the time out value or the number of retries. Is communication now available?
YES
Perform the following.
- Set a time out value or number of retries again.
- Consult your network administrator and check the network status.
NO
NO
Is Ethernet communication available with the target device?
YES
(To the next page)
Completed

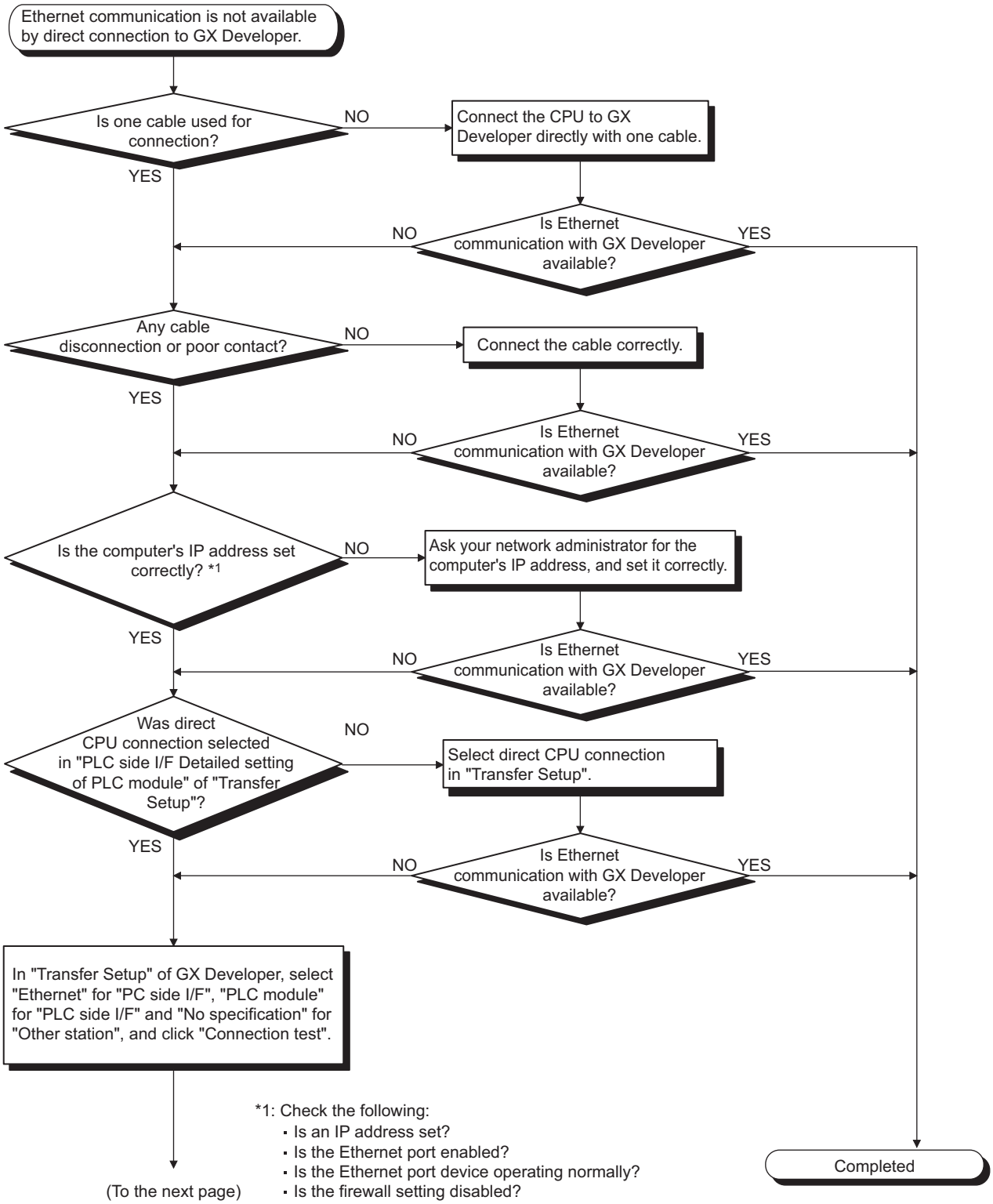


*4: Check the following.
- Are the routing settings for the Built-in Ethernet port QCPU and target devices correct?
- Isn't communication with the Built-in Ethernet QCPU disabled by any security or security software?

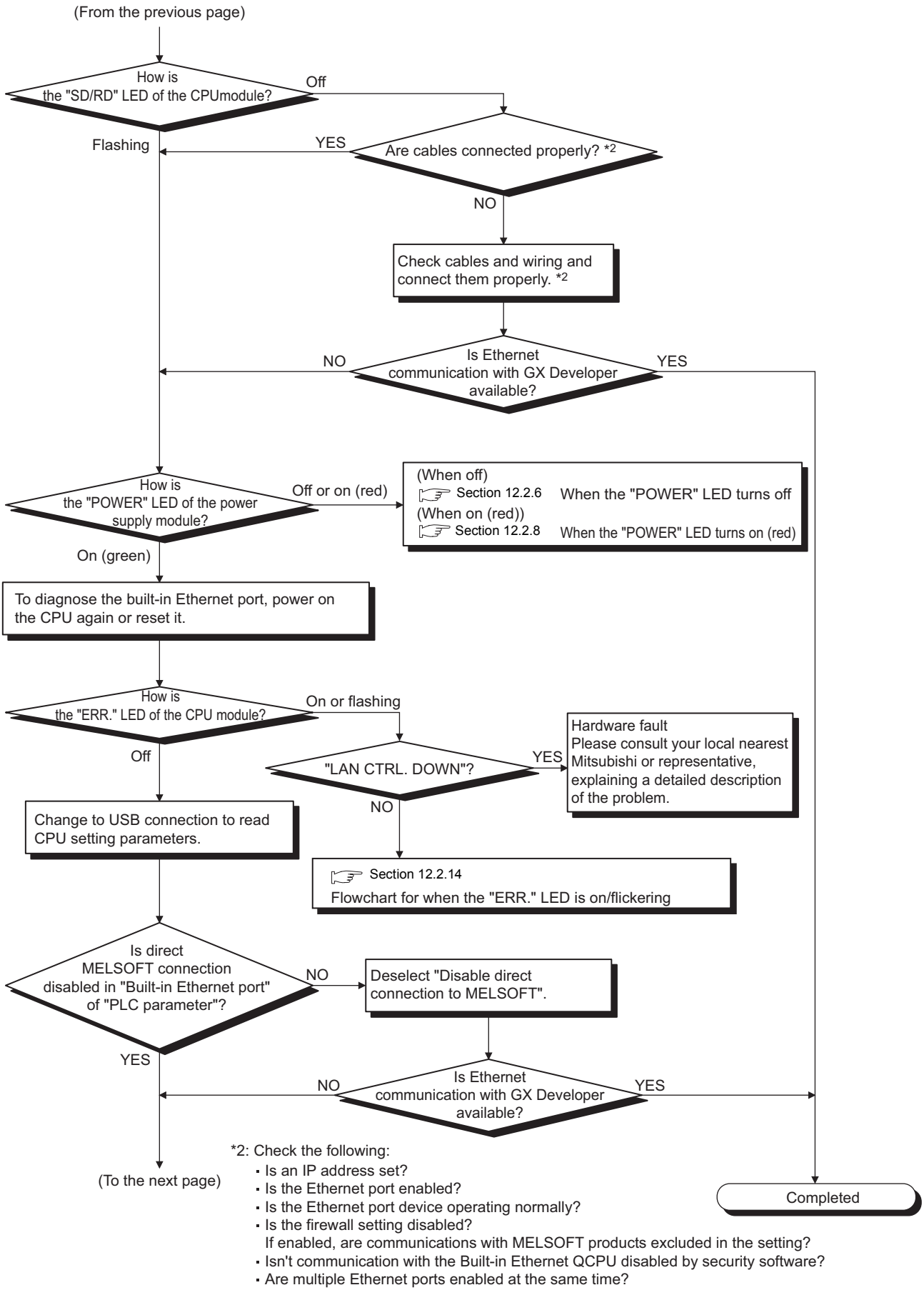

(From previous page)
Do PING replies return between each pair of nodes on the same network?
NO
Check the cables and hub in the network to ensure normal communication route.
YES
NO
Is Ethernet communication available with the target device?
YES
Replace the hub, router, or cables to check for communication.
Normal operation
Error detection
Hardware fault
Please consult your local nearest Mitsubishi or representative, explaining a detailed description of the problem.
Completed

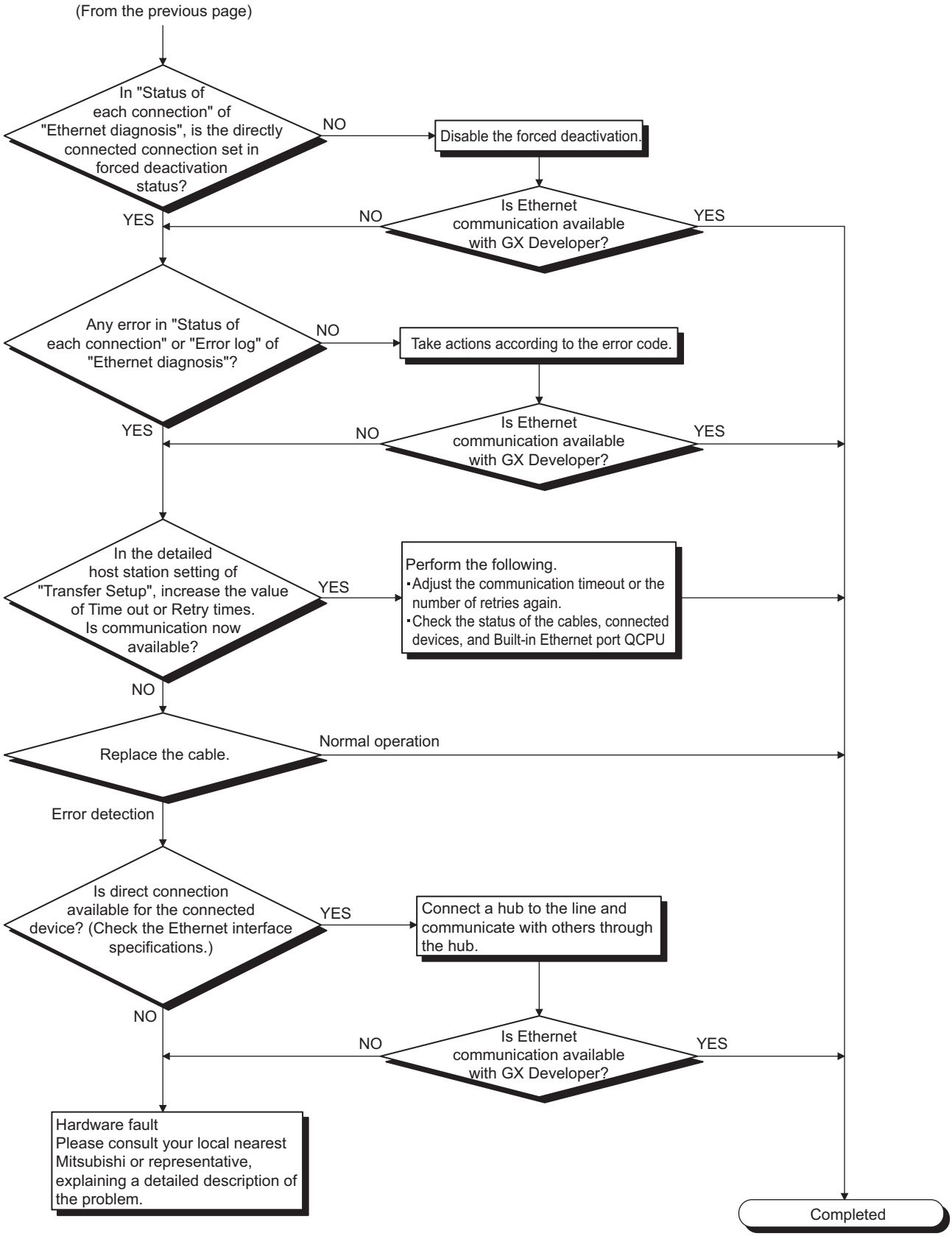
12.2.33 When Ethernet communication is not available by direct connection to GX Developer

Refer to the following flowchart when Ethernet communication is not available by direct connection to GX Developer.



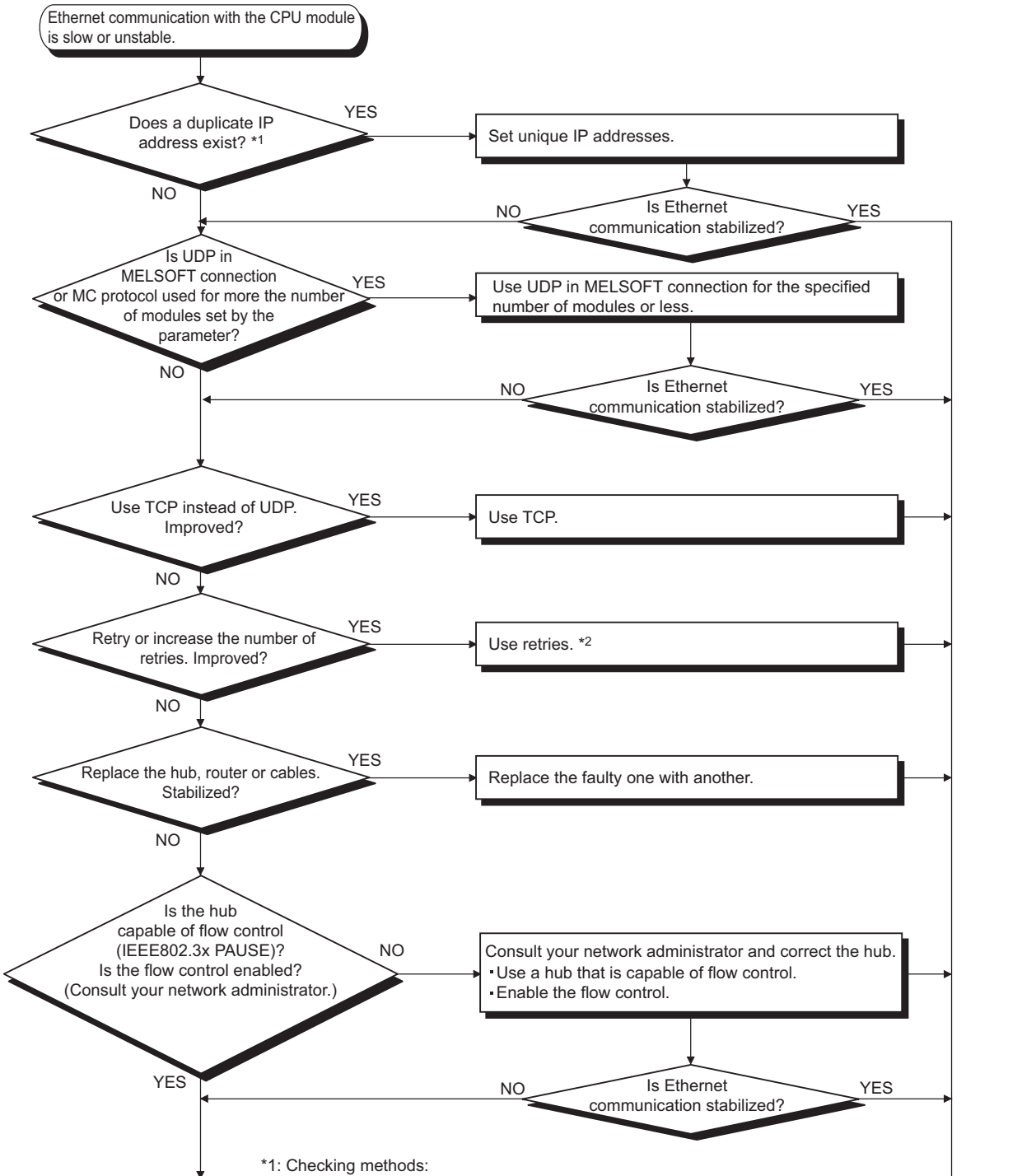
*1: Check the following:
- Is an IP address set?
- Is the Ethernet port enabled?
- Is the Ethernet port device operating normally?
- Is the firewall setting disabled?
  If enabled, are communications with MELSOFT products excluded in the setting?
- Isn't communication with the Built-in Ethernet QCPU disabled by security software?
- Are multiple Ethernet ports enabled at the same time?


(From the previous page)
How is the "SD/RD" LED of the CPUmodule?
Off
Flashing
YES
Are cables connected properly? *2
NO
Check cables and wiring and connect them properly. *2
NO
Is Ethernet communication with GX Developer available?
YES
How is the "POWER" LED of the power supply module?
Off or on (red)
(When off)
Section 12.2.6
When the "POWER" LED turns off
(When on (red))
Section 12.2.8
When the "POWER" LED turns on (red)
On (green)
To diagnose the built-in Ethernet port, power on the CPU again or reset it.
How is the "ERR." LED of the CPU module?
On or flashing
Off
"LAN CTRL. DOWN"?
YES
Hardware fault
Please consult your local nearest Mitsubishi or representative, explaining a detailed description of the problem.
NO
Change to USB connection to read CPU setting parameters.
Section 12.2.14
Flowchart for when the "ERR." LED is on/flickering
Is direct MELSOFT connection disabled in "Built-in Ethernet port" of "PLC parameter"?
NO
Deselect "Disable direct connection to MELSOFT".
YES
NO
Is Ethernet communication with GX Developer available?
YES
(To the next page)
Completed
*2: Check the following:
- Is an IP address set?
- Is the Ethernet port enabled?
- Is the Ethernet port device operating normally?
- Is the firewall setting disabled?
  If enabled, are communications with MELSOFT products excluded in the setting?
- Isn't communication with the Built-in Ethernet QCPU disabled by security software?
- Are multiple Ethernet ports enabled at the same time?


(From the previous page)
In "Status of each connection" of "Ethernet diagnosis", is the directly connected connection set in forced deactivation status?
NO
Disable the forced deactivation.
YES
NO
Is Ethernet communication available with GX Developer?
YES
Any error in "Status of each connection" or "Error log" of "Ethernet diagnosis"?
NO
Take actions according to the error code.
YES
NO
Is Ethernet communication available with GX Developer?
YES
In the detailed host station setting of "Transfer Setup", increase the value of Time out or Retry times. Is communication now available?
YES
Perform the following.
・Adjust the communication timeout or the number of retries again.
・Check the status of the cables, connected devices, and Built-in Ethernet port QCPU
NO
Replace the cable.
Normal operation
Error detection
Is direct connection available for the connected device? (Check the Ethernet interface specifications.)
YES
Connect a hub to the line and communicate with others through the hub.
NO
NO
Is Ethernet communication available with GX Developer?
YES
Hardware fault
Please consult your local nearest Mitsubishi or representative, explaining a detailed description of the problem.
Completed

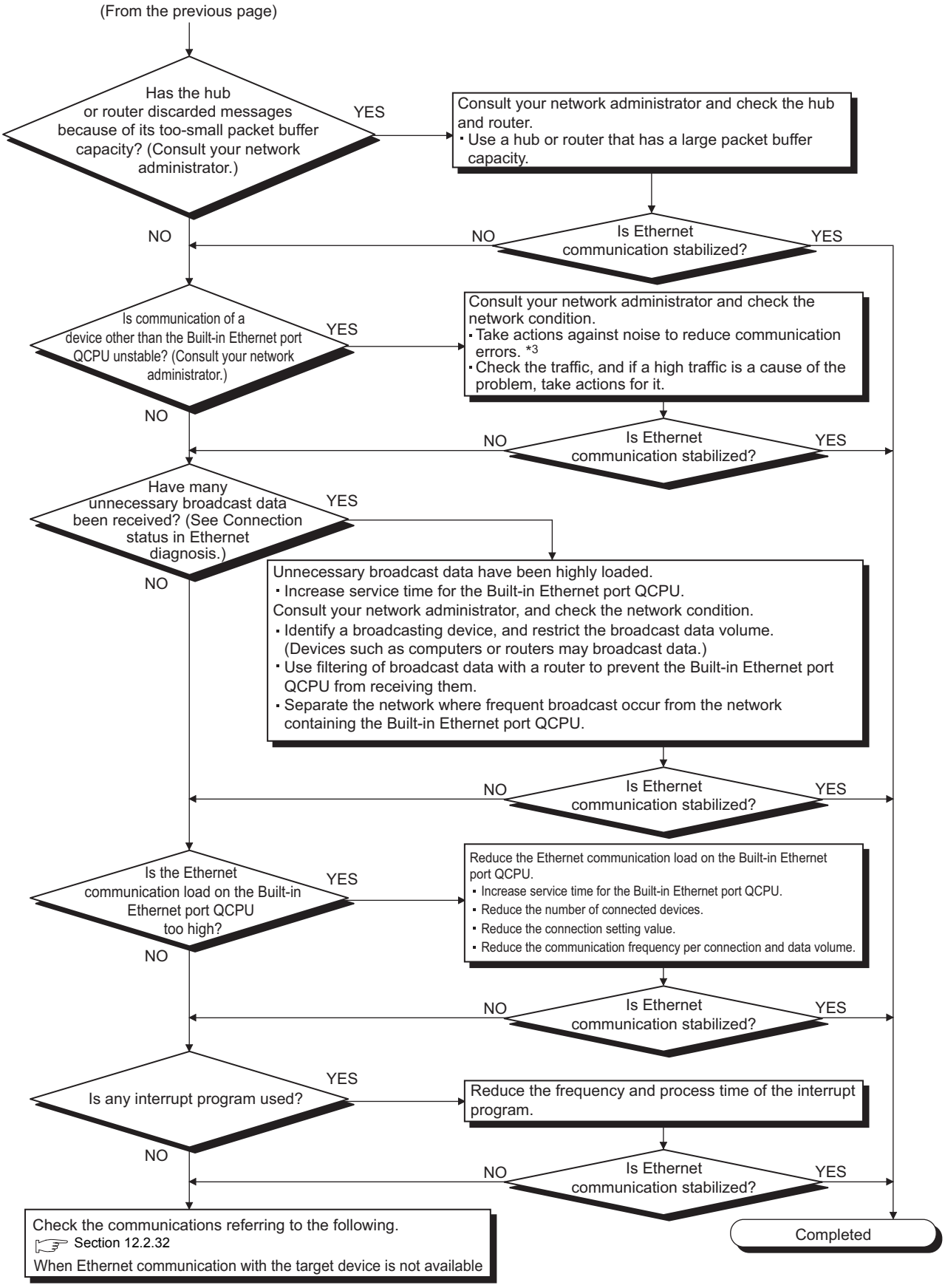
12.2.34 When Ethernet communication with CPU module is slow or unstable

Refer to the following flowchart when Ethernet communication with a CPU module is slow or unstable.



*1: Checking methods:
- With the Find CPU function of GX Developer, check the Built-in Ethernet port QCPU for IP address duplication.
- Disconnect a suspected device from the network, and run PING test from another device to its address. If a reply is returned, there is a device with a duplicate IP address.
- Check respective IP address settings.

*2: If transmissions pass through a wireless LAN, some packets may be lost resulting in unstable Ethernet communication.
Using retries may increase stability of Ethernet communication.


(From the previous page)
Has the hub or router discarded messages because of its too-small packet buffer capacity? (Consult your network administrator.)
YES
Consult your network administrator and check the hub and router.
・Use a hub or router that has a large packet buffer capacity.
NO
NO
Is Ethernet communication stabilized?
YES
Is communication of a device other than the Built-in Ethernet port QCPU unstable? (Consult your network administrator.)
YES
Consult your network administrator and check the network condition.
・Take actions against noise to reduce communication errors. *3
・Check the traffic, and if a high traffic is a cause of the problem, take actions for it.
NO
NO
Is Ethernet communication stabilized?
YES
Have many unnecessary broadcast data been received? (See Connection status in Ethernet diagnosis.)
YES
NO
Unnecessary broadcast data have been highly loaded.
・Increase service time for the Built-in Ethernet port QCPU.
Consult your network administrator, and check the network condition.
・Identify a broadcasting device, and restrict the broadcast data volume. (Devices such as computers or routers may broadcast data.)
・Use filtering of broadcast data with a router to prevent the Built-in Ethernet port QCPU from receiving them.
・Separate the network where frequent broadcast occur from the network containing the Built-in Ethernet port QCPU.
NO
Is Ethernet communication stabilized?
YES
Is the Ethernet communication load on the Built-in Ethernet port QCPU too high?
YES
Reduce the Ethernet communication load on the Built-in Ethernet port QCPU.
・Increase service time for the Built-in Ethernet port QCPU.
・Reduce the number of connected devices.
・Reduce the connection setting value.
・Reduce the communication frequency per connection and data volume.
NO
NO
Is Ethernet communication stabilized?
YES
Is any interrupt program used?
YES
Reduce the frequency and process time of the interrupt program.
NO
NO
Is Ethernet communication stabilized?
YES
Check the communications referring to the following.
Section 12.2.32
When Ethernet communication with the target device is not available
Completed

*3 : A communication error may occur due to high-frequency noise emitted from a device other than programmable controllers. The following measures can be taken to protect network systems from high-frequency noise.

Wiring

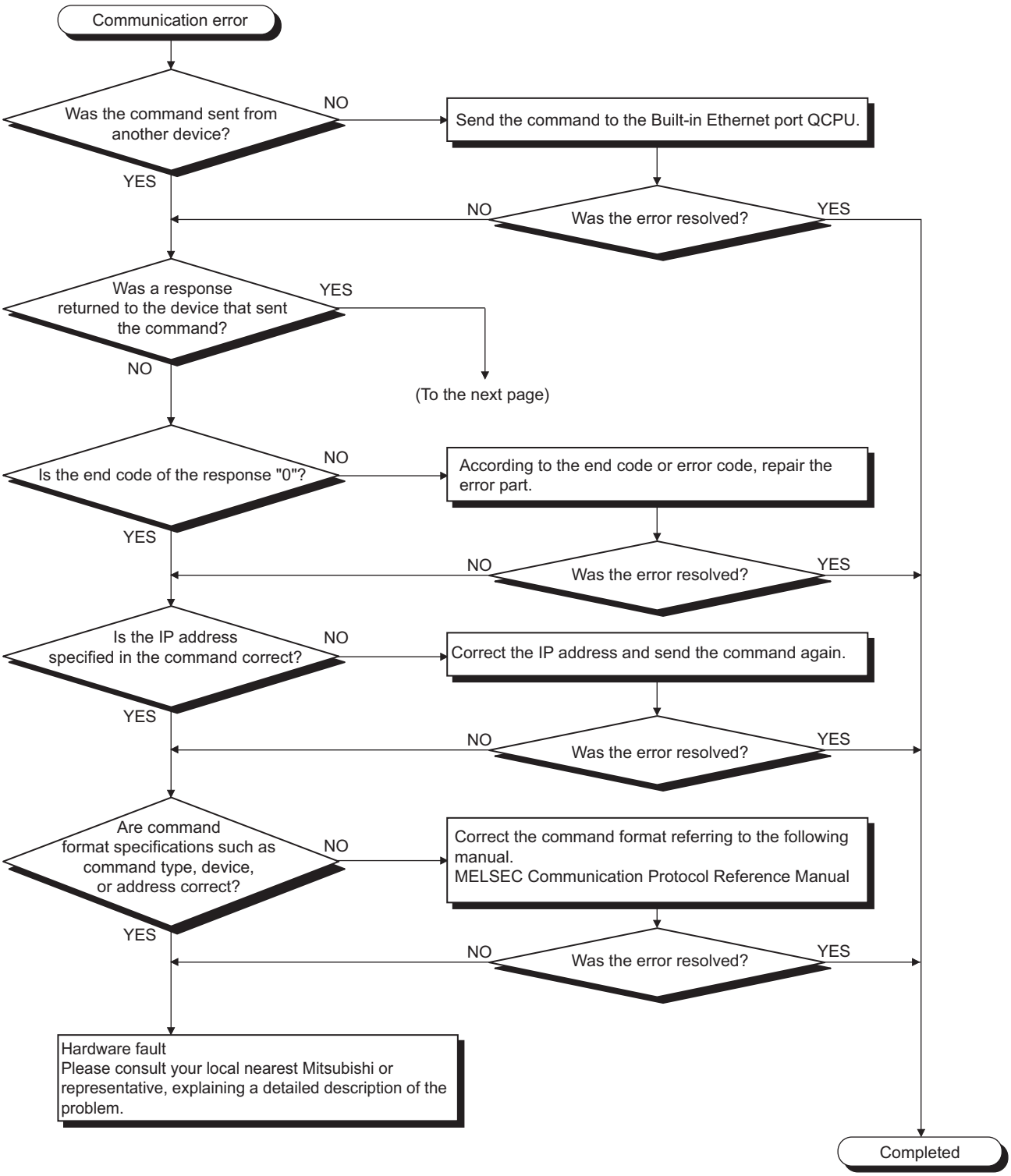
- Do not install twisted pair cables together with the main circuit or power cables.
- Put twisted pair cables in a duct.
- Replace UTP cables with STP cables.

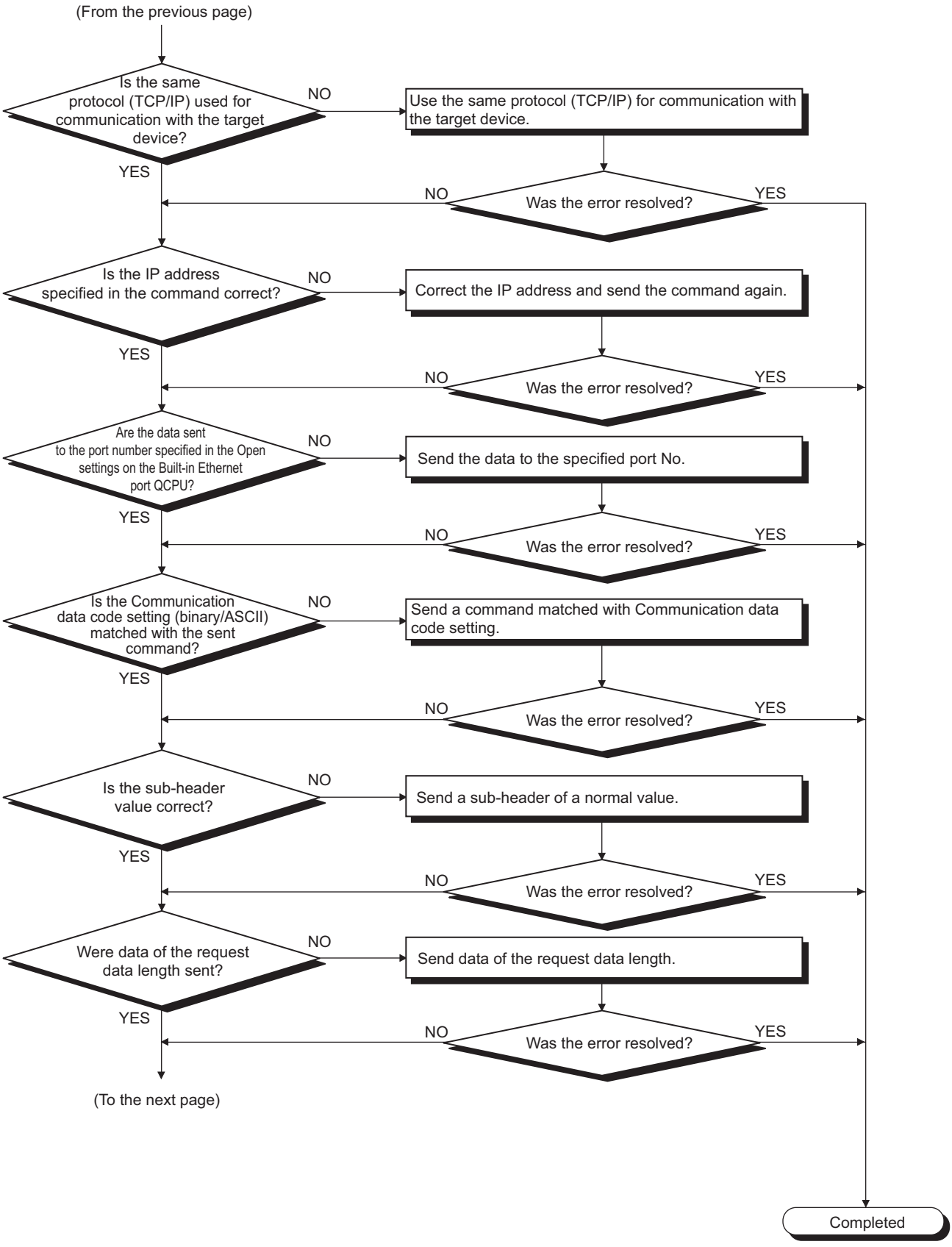
Communication method

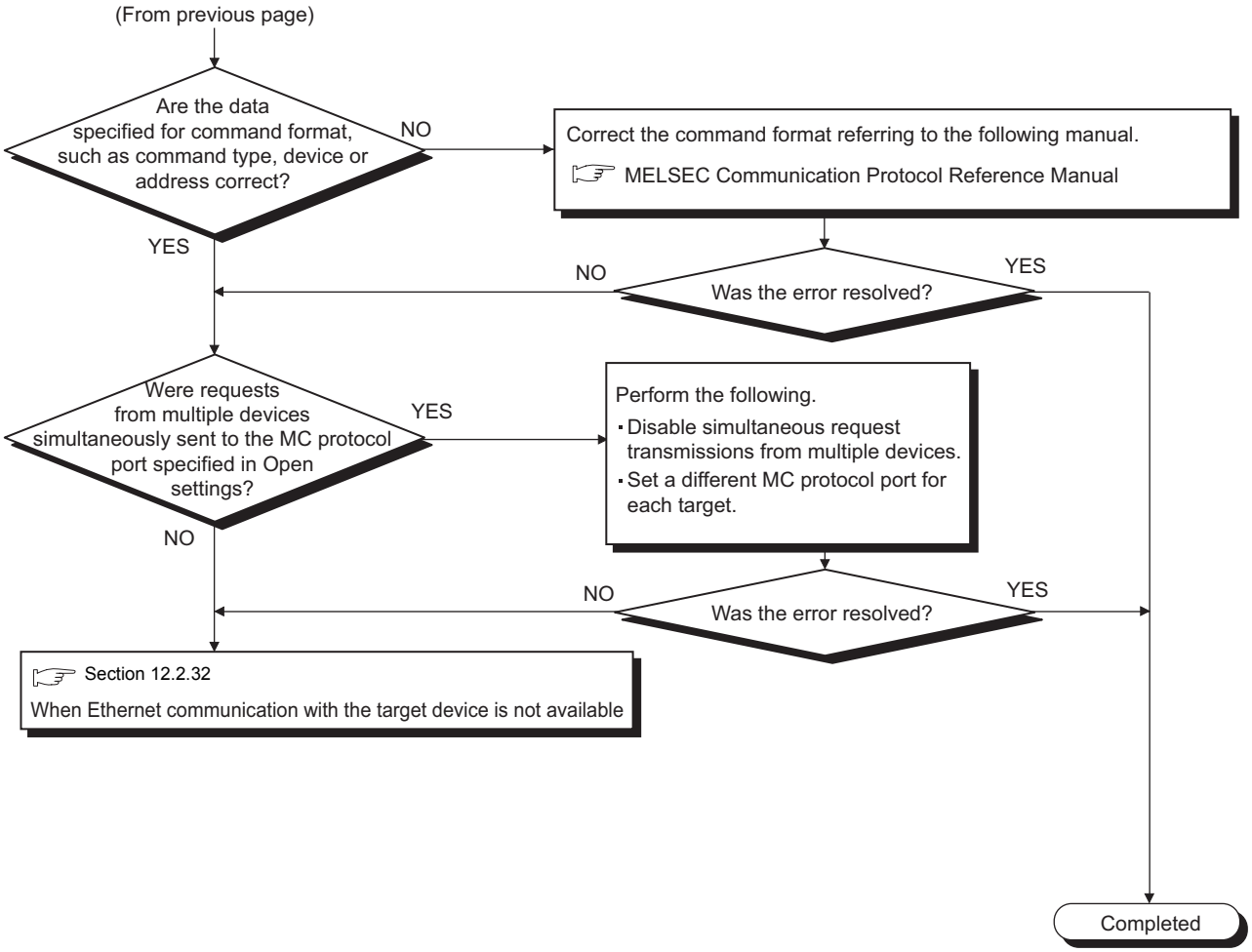
- Use TCP/IP to exchange data with the target device.
- Increase the number of communication retries, if necessary.
- 10Mbps communication
- In the case of using 100Mbps, replace the hub with a 10Mbps hub and perform data communication at a transmission speed of 10Mbps.

12.2.35 When an error has occurred during MC protocol communication

Refer to the following flowchart when an error has occurred during MC protocol communication.

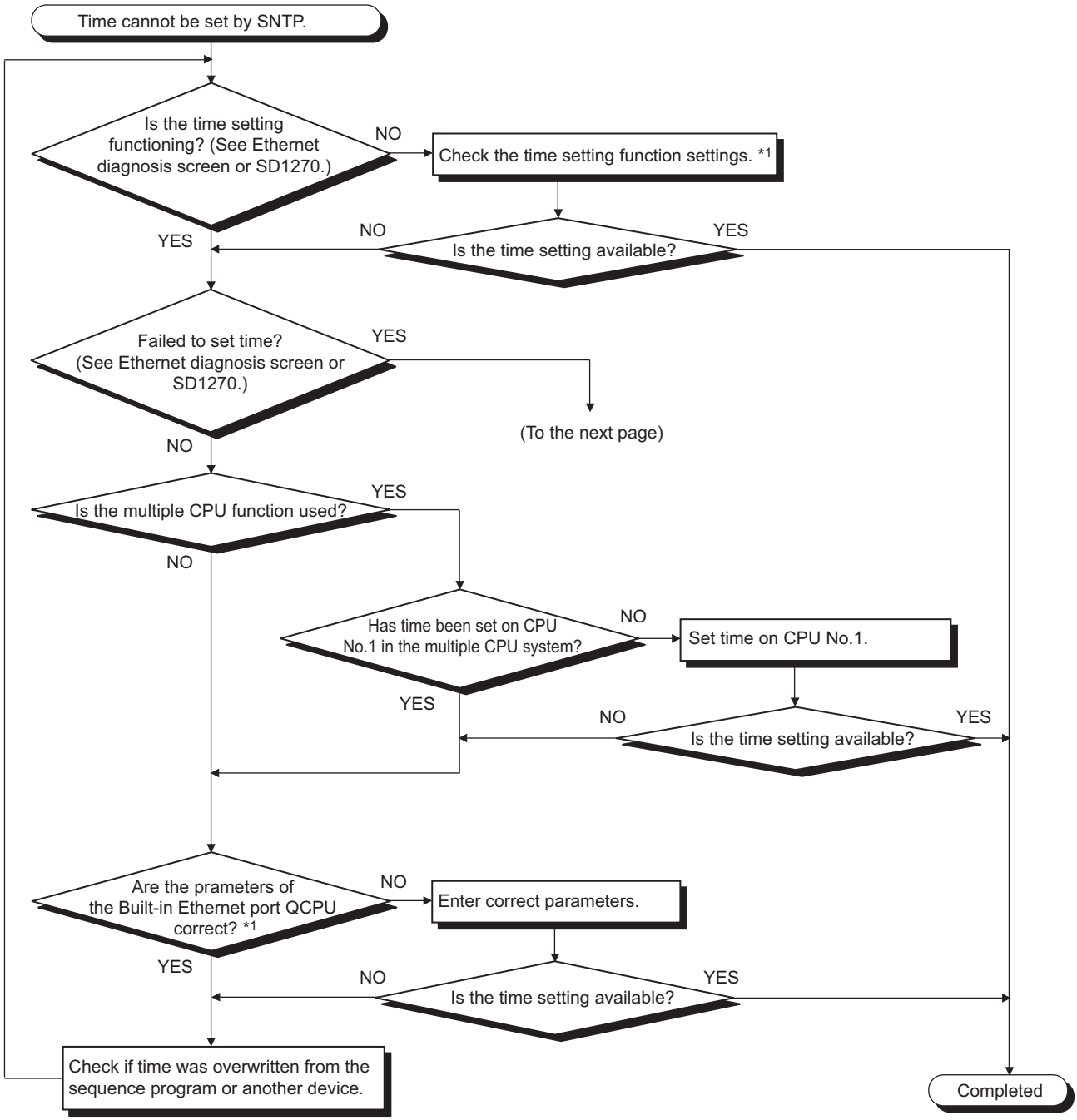


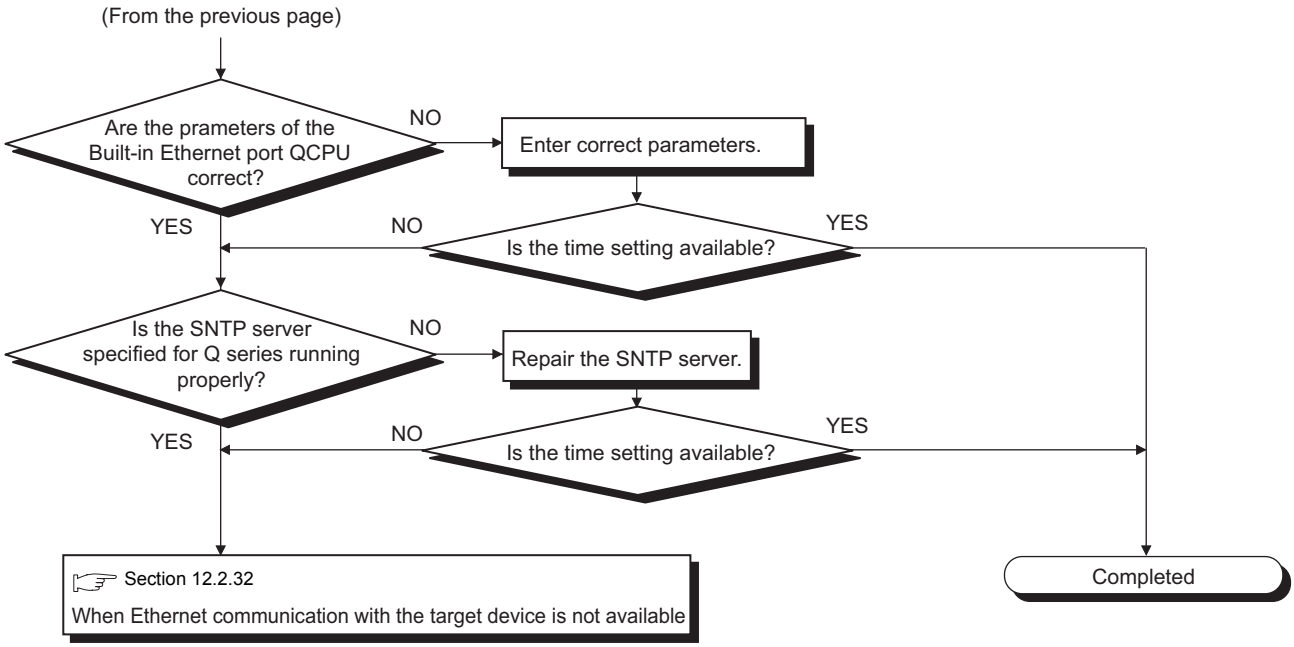

(From the previous page)
Is the same protocol (TCP/IP) used for communication with the target device?
NO
Use the same protocol (TCP/IP) for communication with the target device.
YES
NO
Was the error resolved?
YES
Is the IP address specified in the command correct?
NO
Correct the IP address and send the command again.
YES
NO
Was the error resolved?
YES
Are the data sent to the port number specified in the Open settings on the Built-in Ethernet port QCPU?
NO
Send the data to the specified port No.
YES
NO
Was the error resolved?
YES
Is the Communication data code setting (binary/ASCII) matched with the sent command?
NO
Send a command matched with Communication data code setting.
YES
NO
Was the error resolved?
YES
Is the sub-header value correct?
NO
Send a sub-header of a normal value.
YES
NO
Was the error resolved?
YES
Were data of the request data length sent?
NO
Send data of the request data length.
YES
NO
Was the error resolved?
YES
(To the next page)
Completed


(From previous page)
Are the data specified for command format, such as command type, device or address correct?
NO
Correct the command format referring to the following manual.
MELSEC Communication Protocol Reference Manual
YES
NO
Was the error resolved?
YES
Were requests from multiple devices simultaneously sent to the MC protocol port specified in Open settings?
YES
Perform the following.
Disable simultaneous request transmissions from multiple devices.
Set a different MC protocol port for each target.
NO
NO
Was the error resolved?
YES
Section 12.2.32
When Ethernet communication with the target device is not available
Completed

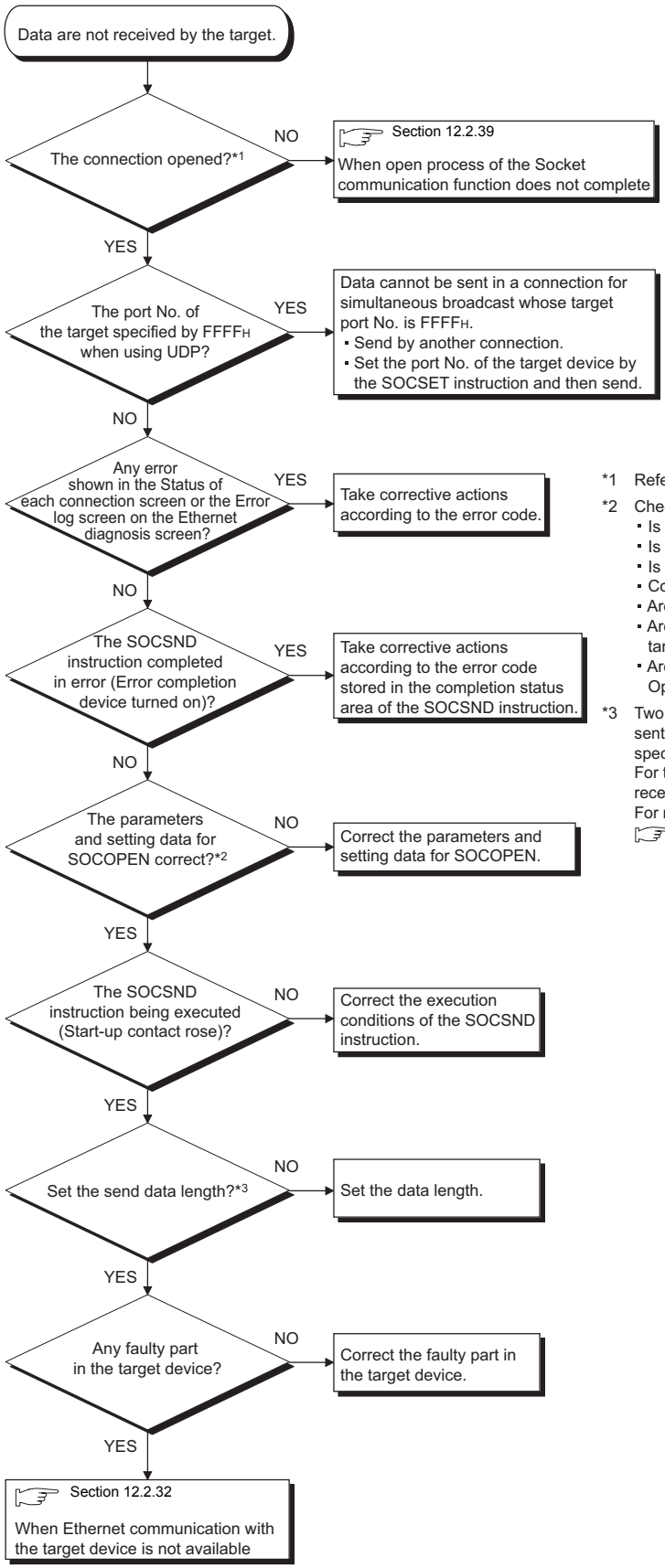
12.2.36 When clock data cannot be set by SNTP

Refer to the following flowchart when clock data cannot be set by SNTP.




(From the previous page)
Are the prameters of the Built-in Ethernet port QCPU correct?
NO
Enter correct parameters.
YES
NO
Is the time setting available?
YES
Is the SNTP server specified for Q series running properly?
NO
Repair the SNTP server.
YES
NO
Is the time setting available?
YES
Section 12.2.32
When Ethernet communication with the target device is not available
Completed

12.2.37 When unable to receive data on the external device side by the Socket communication function

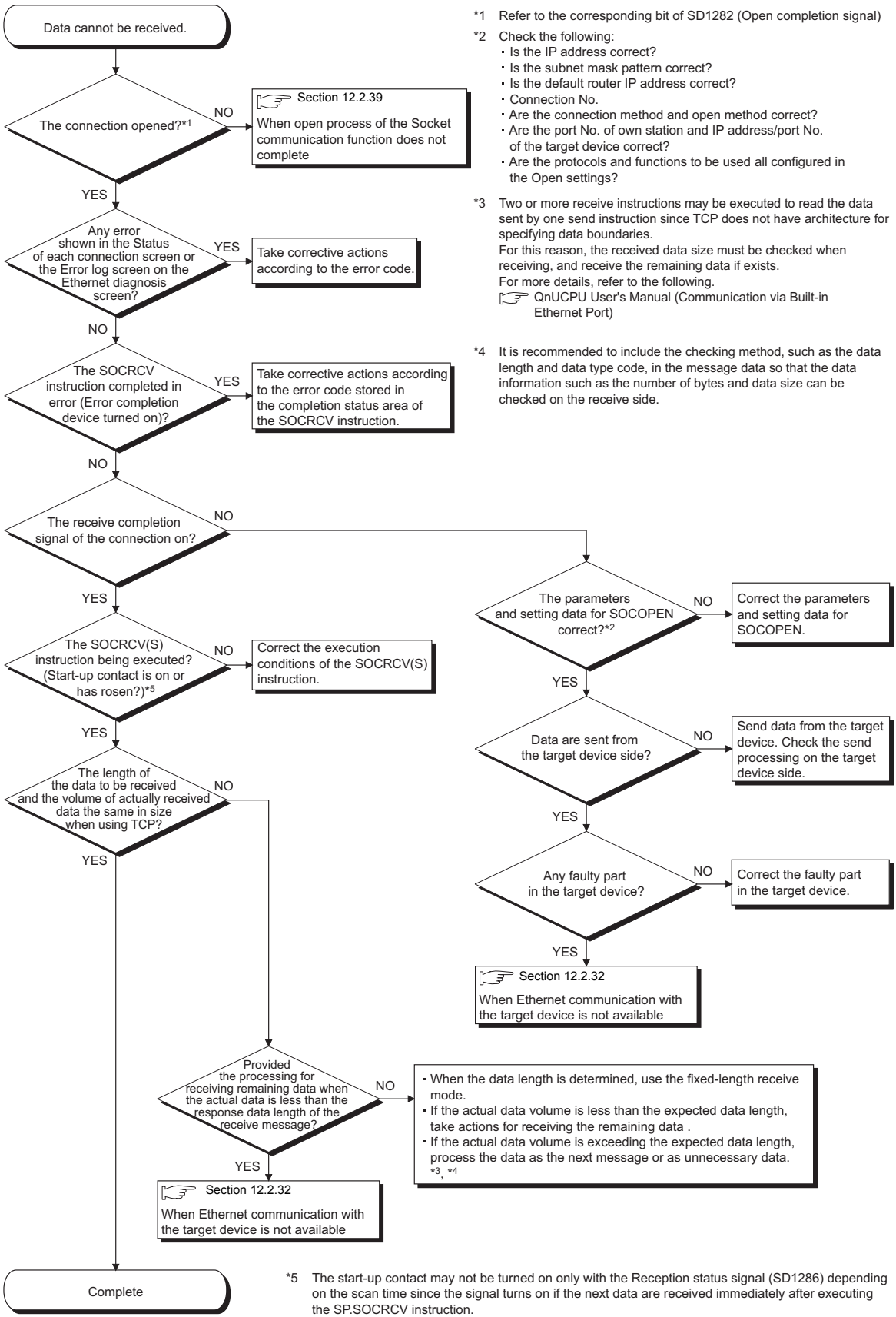


*1 Refer to the corresponding bit of SD1282 (Open completion signal).

*2 Check the following:
- Is the IP address correct?
- Is the subnet mask pattern correct?
- Is the default router IP address correct?
- Connection No.
- Are the connection method and open method correct?
- Are the port No. of own station and IP address/port No. of the target device correct?
- Are the protocols and functions to be used all configured in the Open settings?

*3 Two or more receive instructions may be executed to read the data sent by one send instruction since TCP does not have architecture for specifying data boundaries.
For this reason, the received data size must be checked when receiving, and receive the remaining data if exists.
For more details, refer to the following.
☞ QnUCPU User's Manual (Communication via Built-in Ethernet Port)

12.2.38 When unable to receive data by the Socket communication function



*1 Refer to the corresponding bit of SD1282 (Open completion signal)

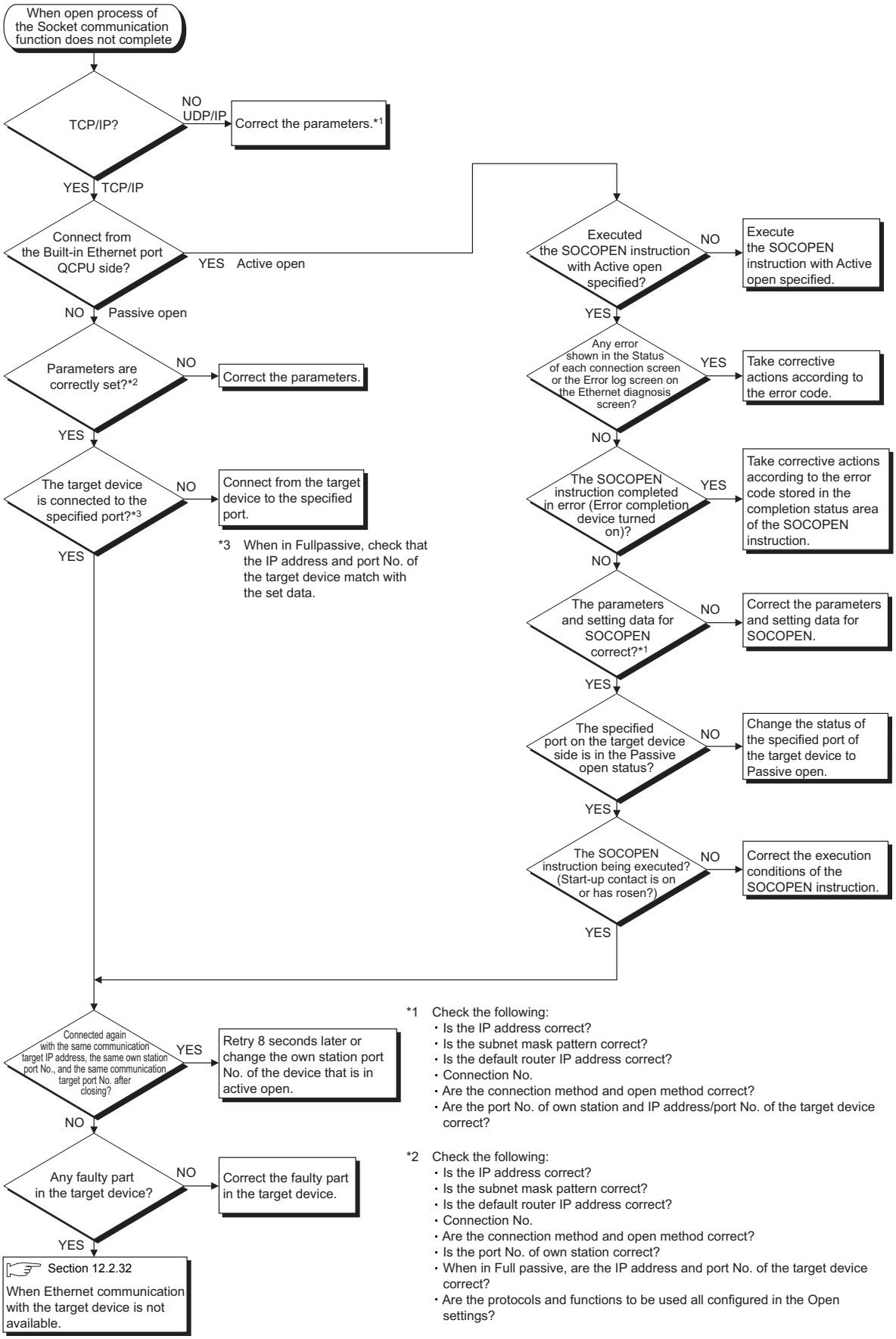
*2 Check the following:
- Is the IP address correct?
- Is the subnet mask pattern correct?
- Is the default router IP address correct?
- Connection No.
- Are the connection method and open method correct?
- Are the port No. of own station and IP address/port No. of the target device correct?
- Are the protocols and functions to be used all configured in the Open settings?

*3 Two or more receive instructions may be executed to read the data sent by one send instruction since TCP does not have architecture for specifying data boundaries.
For this reason, the received data size must be checked when receiving, and receive the remaining data if exists.
For more details, refer to the following.
☞ QnUCPU User's Manual (Communication via Built-in Ethernet Port)

*4 It is recommended to include the checking method, such as the data length and data type code, in the message data so that the data information such as the number of bytes and data size can be checked on the receive side.

*5 The start-up contact may not be turned on only with the Reception status signal (SD1286) depending on the scan time since the signal turns on if the next data are received immediately after executing the SP.SOCRCV instruction.
In this case, provide a normal close contact of the completion device of the SP.SOCRCV instruction in the start-up condition of the instruction.

12.2.39 When open process of the Socket communication function does not complete



12.3 Error Code List

The CPU module uses the self diagnostics function to display error information (on the LED) and stores the information into the special relay SM and special register SD, when an error occurs in the following situations:

- When the Progammable Controller is powered ON.
- When the CPU module is switched from STOP to RUN.
- While the CPU module is running.

If an error occurs when a communication request is issued from the peripheral device, intelligent function module or network system to the CPU module, the CPU module returns the error code (4000_H to $4FFF_H$) to the request source.

The following describes the description of errors which occur in the CPU module and the corrective actions for the errors.

(1) How to read the error code list

The following describes how to read Section 12.3.3 Error code list (1000 to 1999) to Section 12.3.9 Error code list (7000 to 10000).

(a) Error code, common information and individual information

Alphanumeric characters in the parentheses of the titles indicate the special register numbers where each information is stored.

(b) Compatible CPU

QCPU	: Indicates all the Q series CPU modules.
Q00J/Q00/Q01	: Indicates the Basic model QCPU.
Qn(H)	: Indicates the High Performance model QCPU.
QnPH	: Indicates the Process CPU.
QnPRH	: Indicates the Redundant CPU.
QnU	: Indicates the Universal model QCPU.
Each CPU module model name	: Indicates the relevant specific CPU module. (Example: Q02U)

12.3.1 Error codes

Errors are detected by the self diagnostic function of the CPU module or detected during communication with the CPU module.

The relation between the error detection pattern, error detection location and error code is shown in Table 12.1.

Table12.1Reference destination

Error detection pattern	Error detection location	Error code	Reference
Detection by the self diagnostics function of CPU module	CPU module	1000 to 10000*1*2	Section 12.3.3 to 12.3.9
Detection at communication with CPU module	CPU module	4000H to 4FFFH	• QCPU User's Manual (Hardware design, Maintenance and Inspection)
	Serial communication module, etc.	7000H to 7FFFH	Serial Communication User's Manual, etc.
	CC-Link module	B000H to BFFFH	CC-Link System Master/Local Module User's Manual
	Ethernet module	C000H to CFFFH	Ethernet Interface Module User's Manual
	CC-Link IE controller network	E000H to EFFFH	CC-Link IE Controller Network Reference Manual
	MELSECNET/H network module	F000H to FFFFH	• MELSECNET/H mode Q Corresponding MELSECNET/H Network System Reference Manual • MELSECNET/10 mode For QnA/Q4AR MELSECNET/10 Network System Reference Manual

*1: CPU module error codes are classified into minor, moderate, major errors as shown below.

- Minor error: Errors that may allow the CPU module to continue the operation, e.g., battery error. (Error code: 1300 to 10000)
- Moderate error: Errors that may cause the CPU module to stop the operation, e.g., WDT error. (Error code: 1300 to 10000)
- Major error: Errors that may cause the CPU module to stop the operation, e.g., RAM error. (Error code: 1000 to 1299)

Determine the error level, i.e. whether the operation can be continued or stopped, by referring to "Operating Statuses of CPU" described in Section 12.3.3 to 12.3.9 "Error Code List"

*2: When detected an error code without being noted in the reference table, please contact your local Mitsubishi representive.

12.3.2 Reading an error code

When an error occurs, reading an error code, error message or the like can be executed with GX Developer.

For the details of the operation method, refer to the operating manual for GX Developer.

12.3.3 Error code list (1000 to 1999)

The following shows the error messages from the error code 1000 to 1999, the contents and causes of the errors, and the corrective actions for the errors.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1000	**[MAIN CPU DOWN]** Runaway or failure of CPU module or failure of main CPU • Malfunctioning due to noise or other reason • Hardware fault **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• Take noise reduction measures. • Reset the CPU module and RUN it again.If the same error is displayed again, this suggests a CPU module hardware fault.(Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
1001	**[MAIN CPU DOWN]** Runaway or failure of CPU module or failure of main CPU • Malfunctioning due to noise or other reason • Hardware fault • Accessed to outlying devices with the device range checks disabled (SM237 is turned on)(This error occurs only when BMOV, FMOV, and DFMOV instructions are executed.) (Universal model QCPU only) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• Take noise reduction measures. • Reset the CPU module and RUN it again.If the same error is displayed again, this suggests a CPU module hardware fault.(Contact your local Mitsubishi representative.) • Check the devices specified by BMOV, FMOV, and DFMOV instructions and correct the device settings. (Universal model QCPU only)		
1002 1003 1004	**[MAIN CPU DOWN]** Runaway or failure of CPU module or failure of main CPU • Malfunctioning due to noise or other reason • Hardware fault **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• Take noise reduction measures. • Reset the CPU module and RUN it again.If the same error is displayed again, this suggests a CPU module hardware fault.(Contact your local Mitsubishi representative.)		
1005	**[MAIN CPU DOWN]** Runaway or failure of CPU module or failure of main CPU • Malfunctioning due to noise or other reason • Hardware fault **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• Take noise reduction measures. • Reset the CPU module and RUN it again.If the same error is displayed again, this suggests a CPU module hardware fault.(Contact your local Mitsubishi representative.)		
	[MAIN CPU DOWN] Boot operation was performed in the transfer destination without formatting. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON	• Before performing boot operation by the parameter, select "Clear program memory" to clear the program memory.		Qn(H) QnPH QnPRH

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1006	**[MAIN CPU DOWN]** Runaway or failure of CPU module or failure of main CPU • Malfunctioning due to noise or other reason • Hardware fault **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• Take noise reduction measures. • Reset the CPU module and RUN it again.If the same error is displayed again, this suggests a CPU module hardware fault.(Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
1007				Qn(H) QnPH QnPRH
1008				
1009	**[MAIN CPU DOWN]** • A failure is detected on the power supply module, CPU module, main base unit, extension base unit or extension cable. • When using the redundant base unit, the redundant power supply module failure in both systems and/or the redundant base unit failure are detected. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	Reset the CPU module and RUN it again.If the same error is detected again, it is considered that the power supply module, CPU module, main base unit, extension base unit or extension cable is faulty. (Contact your local Mitsubishi representative.)		Q00J/Q00/Q01*4 Qn(H)*6 QnPH QnPRH QnU
1010	**[END NOT EXECUTE]** 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. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • When an END instruction executed	• Take noise reduction measures. • Reset the CPU module and RUN it again. If the same error is displayed again, this suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)		QCPU
1020	**[SFCP. END ERROR]** The SFC program cannot be normally terminated due to noise or other reason. • The SFC program cannot be normally terminated due to noise or any similar cause. • The SFC program cannot be normally terminated for any other reason. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • When SFC program is executed	• Take noise reduction measures. • Reset the CPU module and RUN it again. If the same error is displayed again, this suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)		Q00J/Q00/Q01*4 QnPH QnU
1035	**[MAIN CPU DOWN]** Runaway or error of the CPU module was detected. • Malfunction due to noise etc. • Hardware failure **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• Take measures against noise. • Reset the CPU module and run it again. If the same error is displayed again, the CPU module has hardware failure.(Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		QnU

*4 Function version is B or later.
*6 The module whose first 5 digits of serial No. is "04101" or later.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1101	**[RAM ERROR]** The sequence program storing program memory in the CPU module is faulty. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset/ When an END instruction executed	• Take noise reduction measures. • Reset the CPU module and RUN it again. If the same error is displayed again,this suggests a CPU module hardware fault.(Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
1102	**[RAM ERROR]** • The work area RAM in the CPU module is faulty. • The standard RAM and extended RAM in the CPU module are faulty. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset/ When an END instruction executed	• Take noise reduction measures. • Reset the CPU module and RUN it again. If the same error is displayed again,this suggests a CPU module hardware fault.(Contact your local Mitsubishi representative.)		

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1103	**[RAM ERROR]** The device memory in the CPU module is faulty. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	• Take noise reduction measures. • When indexing is performed, check the value of index register to see if it is within the device range. • Reset the CPU module and RUN it again. If the same error is displayed again,this suggests a CPU module hardware fault.(Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
	[RAM ERROR] • The device memory in the CPU module is faulty. • The device out of range is accessed due to indexing, and the device for system is overwritten. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset/ When an END instruction executed			Qn(H)*8 QnPH*8 QnPRH*9
1104	**[RAM ERROR]** The address RAM in the CPU module is faulty. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	• Take noise reduction measures. • Reset the CPU module and RUN it again.If the same error is displayed again, this suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)		QCPU
1105	**[RAM ERROR]** The CPU memory in the CPU module is faulty. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	• Take noise reduction measures. • Reset the CPU module and RUN it again.If the same error is displayed again, this suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)		Q00J/Q00/Q01 QnU
	[RAM ERROR] The CPU shared memory in the CPU module is faulty. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset			Qn(H)*4 QnPH QnPRH QnU
1106	**[RAM ERROR]** The battery is dead. The program memory in the CPU module is faulty. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • STOP ⟶ RUN/When an END instruction executed	• Check the battery to see if it is dead or not. If dead, replace the battery. • 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 Mitsubishi representative, explaining a detailed description of the problem.)		Qn(H) QnPH*7 QnPRH

*4 Function version is B or later.
*7 The module whose first 5 digits of serial No. is "07032" or later.
*8 The module whose first 5 digits of serial No. is "08032" or later.
*9 The module whose first 5 digits of serial No. is "09012" or later.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1107 1108	**[RAM ERROR]** The work area RAM in the CPU module is faulty. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	This suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QnPRH
1109	**[RAM ERROR]** The work area RAM in the CPU module is faulty. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always			Qn(H)*8 QnPH*8 QnPRH*9
1110	**[TRK. CIR. ERROR]** A fault was detected by the initial check of the tracking hardware. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset			QnPRH
1111	**[TRK. CIR. ERROR]** A tracking hardware fault was detected. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset			
1112 1113	**[TRK. CIR. ERROR]** A tracking hardware fault was detected during running. • The tracking cable was disconnected and reinserted without the standby system being powered off or reset. • The tracking cable is not secured by the connector fixing screws. • The error occurred at a startup since the redundant system startup procedure was not followed. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • During running	• Start after checking that the tracking cable is connected. If the same error is displayed again, the cause is the hardware fault of the tracking cable or CPU module. (Please contact your local Mitsubishi representative, explaining a detailed description of the problem.) • Confirm the redundant system startup procedure, and execute a startup again. For details, refer to the QnPRHCPU User's Manual (Redundant System).		QnPRH
1115	**[TRK. CIR. ERROR]** A fault was detected by the initial check of the tracking hardware. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	This suggests a CPU module hardware fault. (Contact your nearest Mitsubishi representative.)		

*8 The module whose first 5 digits of serial No. is "08032" or later.
*9 The module whose first 5 digits of serial No. is "09012" or later.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1116	**[TRK. CIR. ERROR]** A tracking hardware fault was detected during running. • The tracking cable was disconnected and reinserted without the standby system being powered off or reset. • The tracking cable is not secured by the connector fixing screws. • The error occurred at a startup since the redundant system startup procedure was not followed. ■**Collateral information** • Common Information:– • Individual Information:– ■**Diagnostic Timing** • During running	• Start after checking that the tracking cable is connected. If the same error is displayed again, the cause is the hardware fault of the tracking cable or CPU module. (Please contact your local Mitsubishi representative, explaining a detailed description of the problem.) • Confirm the redundant system startup procedure, and execute a startup again. For details, refer to the QnPRHCPU User's Manual (Redundant System).	RUN: Off ERR.: Flicker CPU Status: Stop	QnPRH
1150	**[RAM ERROR]** The memory of the CPU module in the Multiple CPU high speed transmission area is faulty. ■**Collateral information** • Common Information:– • Individual Information:– ■**Diagnostic Timing** • At power ON/ At reset	• Take noise reduction measures. • Reset the CPU module and RUN it again. If the same error is displayed again, the CPU module has hardware failure. Contact your local Mitsubishi representative, explaining a detailed description of the problem.		QnU*10
1160	**[RAM ERROR]** The program memory in the CPU module is overwritten. ■**Collateral information** • Common Information:– • Individual Information:– ■**Diagnostic Timing** • At program execution	• 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 CPU module has hardware failure. Contact your local Mitsubishi representative, explaining a detailed description of the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QnU
1161	**[RAM ERROR]** The data of the device memory built in the CPU module is overwritten. ■**Collateral information** • Common Information:– • Individual Information:– ■**Diagnostic Timing** • At program execution	• Take noise reduction measures. If the same error is displayed again, the CPU module has hardware failure. Contact your local Mitsubishi representative, explaining a detailed description of the problem.		
1162	**[RAM ERROR]** The error of the data held by the battery in the CPU module is detected. (It occurs when the automatic format is not set.) ■**Collateral information** • Common Information:– • Individual Information:– ■**Diagnostic Timing** • At power ON/ At reset	• Take noise reduction measures. • Change the CPU main body or SRAM card battery. If the same error is displayed again, the CPU module has hardware failure. Contact your local Mitsubishi representative, explaining a detailed description of the problem.		
1164	**[RAM ERROR]** The destruction of the data stored in the standard RAM is detected. ■**Collateral information** • Common Information:– • Individual Information:– ■**Diagnostic Timing** • When instruction executed	• Take noise reduction measures. If the same error is displayed again, the CPU module has hardware failure. Contact your local Mitsubishi representative, explaining a detailed description of the problem.		QnU*11

*10 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.
*11 The Q10UD(E)HCPU, Q13UD(E)HCPU, Q20UD(E)HCPU, .Q26UD(E)HCPU only.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1200	**[OPE. CIRCUIT ERR.]** The operation circuit for index modification in the CPU module does not operate normally. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	This suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
1201	**[OPE. CIRCUIT ERR.]** The hardware (logic) in the CPU module does not operate normally. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset			
1202	**[OPE. CIRCUIT ERR.]** The operation circuit for sequence processing in the CPU module does not operate normally. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset			
1203	**[OPE. CIRCUIT ERR.]** The operation circuit for index modification in the CPU module does not operate normally. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • When an END instruction executed			QnPRH
1204	**[OPE. CIRCUIT ERR.]** The hardware (logic) in the CPU module does not operate normally. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • When an END instruction executed			
1205	**[OPE. CIRCUIT ERR.]** The operation circuit for sequence processing in the CPU module does not operate normally. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • When an END instruction executed			

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1300	**[FUSE BREAK OFF]** There is an output module with a blown fuse. **■Collateral information** • Common Information:Module No.(Slot No.) [For Remote I/O network]Network No./ Station No. • Individual Information:– **■Diagnostic Timing** • Always	• 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 GX Developer. 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 main base unit or extension base unit, check the connection status of the extension cable and the earth status of the GOT.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue[*1]	Qn(H) QnPH QnPRH QnU
	[FUSE BREAK OFF] There is an output module with a blown fuse. **■Collateral information** • Common Information:Module No.(Slot No.) [For Remote I/O network]Network No./ Station No. • Individual Information:– **■Diagnostic Timing** • Always	Check ERR. LED of the output modules and replace the module whose LED is lit. (The module with a blown fuse can also be identified using GX Developer. Check the special registers SD130 to SD137 to see if the bit corresponding to the module is "1".)		Q00J/Q00/Q01
1310	**[I/O INT. ERROR]** An interruption has occurred although there is no interrupt module. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • During interrupt	Any of the mounted modules is experiencing a hardware fault. Therefore, check the mounted modules and change the faulty module. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
1311	**[I/O INT. ERROR]** An interrupt request from other than the interrupt module was detected. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • During interrupt	Take action so that an interrupt will not be issued from other than the interrupt module.		Q00J/Q00/Q01[*4] QnU
	[I/O INT. ERROR] An interrupt request from the module where interrupt pointer setting has not been made in the PLC parameter dialog box was detected. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • During interrupt	• 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.		Q00J/Q00/Q01 [*5] QnPRH QnU
1320 1321	**[LAN CTRL.DOWN]** The H/W self-diagnostics detected a LAN controller failure. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	This suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QnU[*13]

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*4 Function version is B or later.
*5 Function version is A.
*13 This applies to the Built-in Ethernet port QCPU.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1401	**[SP. UNIT DOWN]** • There was no response from the intelligent function module/special function module in the initial processing. • The size of the buffer memory of the intelligent function module/special function module is invalid. • The unsupported module is mounted. **■Collateral information** • Common Information:Module No.(Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset/When intelligent function module is accessed	When the unsupported module is mounted, remove it. When the corresponding module is supported, this suggests the intelligent function module/special function module, CPU module and/or base unit is expecting a hardware fault (Contact your local Mitsubishi representative.)	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*2	QCPU
1402	**[SP. UNIT DOWN]** The intelligent function module/special function module was accessed in the program, but there was no response. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:Program error location **■Diagnostic Timing** • When an intelligent function module access instruction is executed	This suggests the intelligient function module/special function module , CPU module and/or base unit is expecting a hardware fault (Contact your local Mitsubishi representative.)		
1403	**[SP. UNIT DOWN]** • The unsupported module is mounted. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • When an END instruction executed	When the unsupported module is mounted, remove it. When the corresponding module is supported, this suggests the intelligent function module/special function module , CPU module and/or base unit is expecting a hardware fault (Contact your local Mitsubishi representative.)		
	[SP. UNIT DOWN] • There was no response from the intelligent function module/special function module when the END instruction is executed. • An error is detected at the intelligent function module/special function module. • The I/O module (intelligent function module/special function module) is nearly removed, completely removed, or mounted during running. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • Always	The CPU module, base module and/or the intelligent function module/special function module that was accessed is experiencing a hardware fault. (Contact your local Mitsubishi representative.)		
1411	**[CONTROL-BUS. ERR.]** When performing a parameter I/O allocation the intelligent function module/special function module could not be accessed during initial communications. (On error occurring, the head I/O number of the corresponding intelligent function module/special function module is stored in the common information.) **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module/special function module, CPU module or base unit is faulty. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU

*2 In the QCPU, either error stop or continue can be selected for each intelligent function module by the parameters.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1412	**[CONTROL-BUS. ERR.]** The FROM/TO instruction is not executable, due to a control bus error with the intelligent function module/special function module. (On error occurring, the program error location is stored in the individual information.) **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:Program error location **■Diagnostic Timing** • During execution of FROM/TO instruction set	Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module/special function module, CPU module or base unit is faulty. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
1413	**[CONTROL-BUS. ERR.]** In a multiple CPU system, a CPU module incompatible with the multiple CPU system is mounted. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• Remove the CPU module incompatible with the multiple CPU system from the main base unit, or replace the CPU module incompatible with the multiple CPU system with a CPU module compatible with the multiple CPU system. • The intelligent function module, CPU module or base unit is faulty. (Contact your local Mitsubishi representative.)		Q00J/Q00/Q01*4 Qn(H)*4 QnPH
	[CONTROL-BUS. ERR.] An error is detected on the system bus. • Self-diagnosis error of the system bus. • Self-diagnosis error of the CPU module **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty. (Contact your local Mitsubishi representative.)		QCPU
1414	**[CONTROL-BUS. ERR.]** • Fault of a loaded module was detected. • In a multiple CPU system, a CPU module incompatible with the multiple CPU system is mounted. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • Always	• Remove the CPU module incompatible with the multiple CPU system from the main base unit, or replace the CPU module with a CPU module compatible with the multiple CPU system. • Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty. (Contact your local Mitsubishi representative.)		Q00J/Q00/Q01*4 Qn(H)*4 QnPH QnU
	[CONTROL-BUS. ERR.] An error is detected on the system bus. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • Always	Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty. (Contact your local Mitsubishi representative.)		Q00J/Q00/Q01*4 Qn(H) QnPH QnPRH QnU

*4 Function version is B or later.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1415	**[CONTROL-BUS. ERR.]** Fault of the main or extension base unit was detected. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • When an END instruction executed	Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	Q00J/Q00/Q01 Qn(H)*4 QnPH QnPRH QnU
	[CONTROL-BUS. ERR.] Fault of the main or extension base unit was detected. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power-ON/ At reset/ When an END instruction executed			Qn(H)*8 QnPH*8
1416	**[CONTROL-BUS. ERR.]** System bus fault was detected at power-on or reset. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset			Qn(H)*4 QnPH QnU
	[CONTROL-BUS. ERR.] In a multiple CPU system, a bus fault was detected at power-on or reset. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset			Q00/Q01*4 QnU
1417	**[CONTROL-BUS. ERR.]** A reset signal error was detected on the system bus. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always			QnPRH
1418	**[CONTROL-BUS.ERR.]** In the redundant system, at power-on/reset or switching system, the control system cannot access the extension base unit since it failed to acquire the access right. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power-ON/ At reset/ At Switching execution	Reset the CPU module and RUN it again. If the same error is displayed again, the CPU module, the Q6□WRB, or hardware of extension cable is faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		QnPRH*9
1430	**[MULTI-C.BUS ERR.]** The error of host CPU is detected in the Multiple CPU high speed bus. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	Reset the CPU module and RUN it again. If the same error is displayed again, the CPU module has hardware failure. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		QnU*10

*4 Function version is B or later.
*8 The module whose first 5 digits of serial No. is "08032" or later.
*9 The module whose first 5 digits of serial No. is "09012" or later.
*10 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1431	**[MULTI-C.BUS ERR.]** The communication error with other CPU is detected in the Multiple CPU high speed bus. **■Collateral information** • Common Information:Module No. (CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	• Take noise reduction measures. • Check the main base unit mounting status of the CPU module. • Reset the CPU module and RUN it again. If the same error is displayed again, the CPU module has hardware failure. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)	RUN: Off ERR.: Flicker CPU Status: Stop	QnU*10
1432	**[MULTI-C.BUS ERR.]** The communication time out with other CPU is detected in the Multiple CPU high speed bus. **■Collateral information** • Common Information:Module No. (CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	Reset the CPU module and RUN it again. If the same error is displayed again, the CPU module has hardware failure. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		
1433 1434 1435	**[MULTI-C.BUS ERR.]** The communication error with other CPU is detected in the Multiple CPU high speed bus. **■Collateral information** • Common Information:Module No. (CPU No.) • Individual Information:– **■Diagnostic Timing** • Always	• Take noise reduction measures. • Check the main base unit mounting status of the CPU module. • Reset the CPU module and RUN it again. If the same error is displayed again, the CPU module has hardware failure. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		
1436	**[MULTI-C.BUS ERR.]** The error of the Multiple CPU high speed main base unit is detected. (The error of the Multiple CPU high speed bus is detected.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	Reset the CPU module and RUN it again. If the same error is displayed again, the CPU module has hardware failure. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		
1437		• Take noise reduction measures. • Check the main base unit mounting status of the CPU module. • Reset the CPU module and RUN it again. If the same error is displayed again, the CPU module has hardware failure. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		
1439	**[MULTI-C.BUS ERR.]** An error of the multiple CPU high speed main base unit was detected. (An error of the multiple CPU high speed bus was detected.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	Reset the CPU module and RUN it again. If the same error is displayed again, the CPU module has hardware failure. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		
1500	**[AC/DC DOWN]** • A momentary power supply interruption has occurred. • The power supply went off. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	Check the power supply.	RUN: On ERR.: Off CPU Status: Continue	QCPU

*10 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1510	**[SINGLE PS. DOWN]** The power supply voltage of either of redundant power supply modules on the redundant base unit dropped. **■Collateral information** • Common Information:Base No./ Power supply No. • Individual Information:– **■Diagnostic Timing** • Always	Check the power supplied to the redundant power supply modules mounted on the redundant base unit.	RUN: On ERR.: On CPU Status: Continue	Qn(H)*6 QnPH*6 QnPRH QnU*12
1520	**[SINGLE PS. ERROR]** On the redundant base unit, the one damaged redundant power supply module was detected. **■Collateral information** • Common Information:Base No./ Power supply No. • Individual Information:– **■Diagnostic Timing** • Always	Hardware fault of the redundant power supply module. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		
1600	**[BATTERY ERROR*3]** • The battery voltage in the CPU module has dropped below stipulated level. • The lead connector of the CPU module battery is not connected. • The lead connector of the CPU module battery is not securely engaged. **■Collateral information** • Common Information:Drive Name • Individual Information:– **■Diagnostic Timing** • Always	• Change the battery. • If the battery is for program memory, standard RAM or for the back-up power function, install a lead connector. • Check the lead connector of the CPU module for looseness. Firmly engage the connector if it is loose.	RUN: On ERR.: Off CPU Status: Continue	QCPU
1601	**[BATTERY ERROR*3]** Voltage of the battery on memory card has dropped below stipulated level. **■Collateral information** • Common Information:Drive Name • Individual Information:– **■Diagnostic Timing** • Always	Change the battery.		Qn(H) QnPH QnPRH QnU*14
1610	**[FLASH ROM ERROR]** The number of writing to flash ROM (standard ROM and system securement area) exceeds 100,000 times. (Number of writings >100,000 times) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • When writing to ROM	Change the CPU module.	RUN: On ERR.: On CPU Status: Continue	QnU

*3 BAT. LED is displayed at BATTERY ERROR.
*6 The module whose first 5 digits of serial No. is "04101" or later.
*12 The module whose first 5 digits of serial No. is "10042" or later.
*14 The Universal model QCPU except the Q00UJCPU, Q00UCPU, and Q01UCPU.

12.3.4 Error code list (2000 to 2999)

The following shows the error messages from the error code 2000 to 2999, the contents and causes of the errors, and the corrective actions for the errors.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2000	**[UNIT VERIFY ERR.]** In a multiple CPU system, a CPU module incompatible with the multiple CPU system is mounted. **■Collateral information** • Common Information:Module No. (Slot No.) [For Remote I/O network] Network No./Station No. • Individual Information:– **■Diagnostic Timing** • When an END instruction executed	Replace the CPU module incompatible with the multiple CPU system with a CPU module compatible with the multiple CPU system.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	Qn(H)*3 QnPH
	[UNIT VERIFY ERR.] The I/O module status is different from the I/O module information at power ON. • I/O module (or intelligent function module) is not installed properly or installed on the base unit. **■Collateral information** • Common Information:Module No. (Slot No.) [For Remote I/O network] Network No./Station No. • Individual Information:– **■Diagnostic Timing** • When an END instruction executed	Read the error common information at the GX Developer, and check and/or change the module that corresponds to the numerical value (module number) there. Alternatively, monitor special registers SD150 to SD157 using GX Developer, and check and replace the module where the bit of its data is "1".		Q00J/Q00/Q01
	[UNIT VERIFY ERR.] I/O module information power ON is changed. • I/O module (or intelligent function module/special function module) not installed properly or installed on the base unit. **■Collateral information** • Common Information:Module No. (Slot No.) [For Remote I/O network] Network No./Station No. • Individual Information:– **■Diagnostic Timing** • When an END instruction executed	• Read the common information of the error using the peripheral device, and check and/or change the module that corresponds to the numerical value (module number) there. • Alternatively, monitor the special registers SD1400 to SD1431 at a peripheral device, 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.		Qn(H) QnPH QnPRH QnU
2001	**[UNIT VERIFY ERR.]** During operation, a module was mounted on the slot where the empty setting of the CPU module was made. **■Collateral information** • Common Information:Module No. (CPU No.) • Individual Information:– **■Diagnostic Timing** • When an END instruction executed	During operation, do not mount a module on the slot where the empty setting of the CPU module was made.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*2	Q00J/Q00/Q01*3 QnU
2010	**[BASE LAY ERROR]** • More than applicable number of extension base units have been used. • When a GOT was bus-connected, the CPU module was reset while the power of the GOT was OFF. **■Collateral information** • Common Information:Base No. • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Use the allowable number of extension base units or less. • Power on the Progammable Controller and GOT again.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00J/Q00/Q01*3 QnPRH Q00UJ Q00U/Q01U Q02U

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*2 Either error stop or continue can be selected for each module by the parameters.
*3 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2011	**[BASE LAY ERROR]** The QA1S6□B, QA6□B, or QA6ADP+A5□B/A6□B was used as the base unit. **■Collateral information** • Common Information:Base No. • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Do not use the QA1S6□B, QA6□B, or QA6ADP+A5□B/A6□B as the base unit.		Q00J/Q00/Q01*3 QnPH QnPRH QnU
2012	**[BASE LAY ERROR]** The GOT is bus-connected to the main base unit of the redundant system. The following errors are detected in the CPU redundant system compatible with the extension base unit. • The base unit other than the Q6□WRB is connected to the extension stage No.1. • The base unit is connected to any one of the extension stages No.2 to No.7, although the Q6□WRB does not exist in the extension stage No.1 . • The other system CPU module is incompatible with the extension base unit. • The Q5□B, QA1S6□B, QA6□B or QA6ADP+A5□B/A6□B is connected. • The number of slots of the main base unit for both systems is different. Information of the Q6□WRB cannot be read correctly. **■Collateral information** • Common Information:Base No. • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Remove a bus connection cable for GOT connection connected to the main base unit. • Use the Q6□WRB (fixed to the extension stage No.1) • Use the CPU module compatible with the extension base unit for the other system. • Do not use the Q5□B, QA1S6□B, QA6□B or QA6ADP+A5□B/A6□B for the base unit. • Use the main base unit which has the same number of slots. • Hardware failure of the Q6□WRB. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)	RUN: Off ERR.: Flicker CPU Status: Stop	QnPRH*6
2013	**[BASE LAY ERROR]** Stage number of the Q6□WRB is recognized as other than extension stage No.1 in the redundant system. **■Collateral information** • Common Information:Base No. • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Hardware failure of the Q6□WRB. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		
2020	**[EXT.CABLE ERR.]** The following errors are detected in the redundant system. • At power-on/reset, the standby system has detected the error in the path between the control system and the Q6□WRB. • The standby system has detected the error in the path between the host system CPU and the Q6□WRB at END processing. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power-ON/At reset/ When an END instruction executed	Check to see if the extension cable between the main base unit and the Q6□WRB is connected correctly. If not, connect it after turning OFF the main base unit where the extension cable will be connected. If the cable is connected correctly, hardware of the CPU module, Q6□WRB, or extension cable is faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		QnPRH*6

*3 The function version is B or later.
*6 The module whose first 5 digits of serial No. is "09012" or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2100	**[SP. UNIT LAY ERR.]** The slot to which the QI60 is mounted is set to other than Inteli (intelligent function module) or Interrupt (interrupt module) in the I/O assignment of PLC parameter. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Make setting again to match the PLC parameter I/O assignment with the actual loading status.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*3 QnPH QnPRH
	[SP. UNIT LAY ERR.] • In the I/O assignment setting of PLC parameter, Inteli (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, switch setting was made to the module that has no 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. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Make the PLC parameter's 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.		Qn(H) QnPH QnPRH QnU
	[SP. UNIT LAY ERR.] • In the parameter I/O allocation settings, an Inteli (intelligent function module) was allocated to a location reserved for an I/O module or vice versa. • In the parameter I/O allocation settings, a module other than CPU (or nothing) was allocated to a location reserved for a CPU module or vice versa. • 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. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Reset the parameter I/O allocation setting to conform to the actual status of the intelligent function module and the CPU module.		Q00J/Q00/Q01
2101	**[SP. UNIT LAY ERR.]** 13 or more A-series special function modules (except for the A1SI61) that can initiate an interrupt to the CPU module have been installed. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Reduce the A series special function modules (except the A1SI61) that can make an interrupt start to the CPU module to 12 or less.		Qn(H)

*3 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2102	**[SP. UNIT LAY ERR.]** Seven or more A1SD51S have been installed. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Keep the number of A1SD51S to six or fewer.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)
2103	**[SP. UNIT LAY ERR.]** • Two or more QI60/A1SI61 modules are mounted in a single CPU system. • Two or more QI60/A1SI61 modules are set to the same control CPU in a multiple CPU system. • Two or more A1SI61 modules are loaded in a multiple CPU system. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Reduce the number of QI60/A1SI61 modules mounted in the single CPU system to one. • Change the number of QI60/A1SI61 modules set to the same control CPU to only one in the multiple CPU system. • Reduce the number of A1SI61 modules to only one in the multiple CPU system. When using an interrupt module with each QCPU in a multiple CPU system, replace it with the QI60. (Use one A1SI61 module + max. three QI60 modules or only the QI60 modules.)		Qn(H)*3 QnPH
	[SP. UNIT LAY ERR.] Two or more QI60, A1SI61 interrupt modules have been mounted. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Install only 1 QI60, A1SI61 module.		Qn(H) QnPRH
	[SP. UNIT LAY ERR.] Two or more QI60 modules are mounted. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Reduce the QI60 modules to one.		Q00J/Q00/Q01*5
	[SP. UNIT LAY ERR.] Two or more QI60 modules where interrupt pointer setting has not been made are mounted. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Reduce the QI60 modules to one. • Make interrupt pointer setting to the second QI60 module and later.		Q00J/Q00/Q01*3 QnU

*3 The function version is B or later.
*5 The module whose first 5 digits of serial No. is "04101" or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2106	**[SP.UNIT LAY ERR.]** • Two or more MELSECNET/H modules are mounted. • Two or more CC-Link IE controller network modules are mounted. • Two or more Ethernet modules are mounted. **■Collateral information** • Common Information:Module No. • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Reduce the number of MELSECNET/H modules to one. • Reduce the number of CC-Link IE controller network modules to one. • Reduce the number of Ethernet modules to one.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00UJ
	[SP.UNIT LAY ERR.] • Five or more MELSECNET/H and CC-Link IE controller network modules in total are mounted in the entire system. • Two or more MELSECNET/H modules are mounted in the entire system. • Two or more CC-Link IE controller network modules are mounted in the entire system. • Two or more Ethernet modules are mounted in the entire system. **■Collateral information** • Common Information:Module No. • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Reduce the number of MELSECNET/H and CC-Link IE controller network modules to four or less in total in the entire system. • Reduce the number of MELSECNET/H modules to one in the entire system. • Reduce the number of CC-Link IE controller network modules to one in the entire system. • Reduce the number of Ethernet modules to one in the entire system.		Q00U/Q01U
	[SP.UNIT LAY ERR.] • Three or more MELSECNET/H and CC-Link IE controller network modules in total are mounted in the entire system. • Three or more Ethernet interface modules are mounted in the entire system. **■Collateral information** • Common Information:Module No. • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Reduce the MELSECNET/H and CC-Link IE controller network modules up to two or less in the entire system. • Reduce the Ethernet interface modules up to two or less in the entire system.		Q02U
	[SP.UNIT LAY ERR.] • Five or more MELSECNET/H and CC-Link IE controller network modules in total are mounted in the entire system. • Five or more Ethernet interface modules are mounted in the entire system. **■Collateral information** • Common Information:Module No. • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Reduce the MELSECNET/H and CC-Link IE controller network modules up to four or less in the entire system. • Reduce the Ethernet interface modules up to four or less in the entire system.		QnU[*7]
	[SP.UNIT LAY ERR.] • Three or more CC-Link IE controller network modules are mounted in the entire system. • Five or more MELSECNET/H and CC-Link IE controller network modules in total are mounted in the entire system. **■Collateral information** • Common Information:Module No. • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Reduce the CC-Link IE controller network modules up to two or less in the entire system. • Reduce the total number of the MELSECNET/H and CC-Link IE controller network modules up to four or less in the entire system.		Qn(H)[*6] QnPH[*9] QnPRH[*9]

*6 The module whose first 5 digits of serial No. is "09012" or later.
*7 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.
*9 The module whose first 5 digits of serial No. is "10042" or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2106	**[SP. UNIT LAY ERR.]** • Five or more MELSECNET/H modules have been installed. • Five or more Ethernet interface modules have been installed. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Reduce the number of MELSECNET/H modules to four or less. • Reduce the number of Ethernet modules to four or less.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H) QnPH QnPRH
	[SP. UNIT LAY ERR.] • Two or more MELSECNET/H modules were installed. • Two or more Ethernet modules were installed. • Three or more CC-Link modules were installed. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Reduce the MELSECNET/H modules to one or less. • Reduce the Ethernet modules to one or less. • Reduce the CC-Link modules to two or less.		Q00J/Q00/Q01
	[SP. UNIT LAY ERR.] • The same network number or same station number is duplicated in the MELSECNET/H network system. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Check the network number and station number.		Q00J/Q00/Q01 Qn(H) QnPH QnPRH
2107	**[SP. UNIT LAY ERR.]** The start X/Y set in the PLC parameter's I/O assignment settings is overlapped with the one for another module. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Make the PLC parameter's I/O assignment setting again so it is consistent with the actual status of the intelligent function module/special function modules.		QCPU
2108	**[SP. UNIT LAY ERR.]** • Network module A1SJ71LP21, A1SJ71BR11, A1SJ71AP21, A1SJ71AR21, or A1SJ71AT21B dedicated for the A2USCPU has been installed. • Network module A1SJ71QLP21 or A1SJ71QBR11 dedicated for the Q2AS has been installed. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Replace the network module for the A2USCPU or the network module for the Q2ASCPU with the MELSECNET/H module.		Qn(H)

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2110	**[SP. UNIT ERROR]** • The location designated by the FROM/TO instruction set is not the intelligent function module/special function module. • The module that does not include buffer memory has been specified by the FROM/TO instruction. • The intelligent function module/special function module, Network module being accessed is faulty. • Station not loaded was specified using the instruction whose target was the CPU share memory. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed	• Read the individual information of the error using the GX Developer, check the FROM/TO instruction that corresponds to that numerical value (program error location), and correct when necessary. • The intelligent function module/special function module that was accessed is experiencing a hardware fault. Therefore, change the faulty module. Alternatively, contact your local Mitsubishi representative.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	Q00J/Q00/Q01 Qn(H)*3 QnPH QnPRH QnU
2111	**[SP. UNIT ERROR]** • The location designated by a link direct device (J□\□) is not a network module. • The I/O module (intelligent function module/special function module) was nearly removed, completely removed, or mounted during running. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed			QCPU
2112	**[SP. UNIT ERROR]** • The module other than intelligent function module/special function module is specified by the intelligent function module/special function module dedicated instruction. Or, it is not the corresponding intelligent function module/special function module. • There is no network No. specified by the network dedicated instruction. Or the relay target network does not exit. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed/STOP ⟶ RUN	Read the individual information of the error using a peripheral device, and check the special function module /special function module dedicated instruction (network instruction) that corresponds to the value (program error part) to make modification.		
2113	**[SP. UNIT ERROR]** The module other than network module is specified bythe network dedicated instruction. **■Collateral information** • Common Information:FFFF$_H$ (fixed) • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed/STOP ⟶ RUN			Qn(H) QnPH

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*3 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2114	**[SP. UNIT ERROR]** An instruction, which on execution specifies other stations, has been used for specifying the host CPU. (An instruction that does not allow the host CPU to be specified). **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed/ STOP ⟶ RUN	Read the individual information of the error using the GX Developer, check the program corresponding that value (program error location), and make correction.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/Continue	Q00J/Q00/Q01*3 Qn(H)*3 QnPH QnU
2115	**[SP. UNIT ERROR]** An instruction, which on execution specifies the host CPU, has been used for specifying other CPUs. (An instruction that does not allow other stations to be specified). **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed/ STOP ⟶ RUN			Q00J/Q00/Q01*3 Qn(H)*3 QnPH
2116	**[SP. UNIT ERROR]** • An instruction that does not allow the under the control of another CPU to be specified is being used for a similar task. • Instruction was executed for the A or QnA module under control of another CPU. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed/ STOP ⟶ RUN			Q00J/Q00/ Q01*3 Qn(H)*3 QnPH QnU
2117	**[SP. UNIT ERROR]** A CPU module that cannot be specified in the instruction dedicated to the multiple CPU system was specified. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed/ STOP ⟶ RUN			
2118	**[SP. UNIT ERROR]** When the online module change setting is set to be “enabled” in the PLC parameter in a multiple CPU system, intelligent function module controlled by other CPU using the FROM instruction/intelligent function module device (U□\□G) is specified. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed	• When performing the online module change in a multiple CPU system, correct the program so that access will not be made to the intelligent function module controlled by the other CPU. • When accessing the intelligent function module controlled by the other CPU in a multiple CPU system, set the online module change setting to be “disabled” by parameter.		Qn(H)*3 QnPH QnU*7

*3 The function version is B or later.
*7 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2120	**[SP. UNIT LAY ERR.]** The locations of the Q5□B/Q6□B, QA1S6□B/QA6□B, and QA6ADP+A5□B/A6□B are improper. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Check the location of the base unit.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00J/Q00/Q01*4 Qn(H) QnPH
2121	**[SP. UNIT LAY ERR.]** The CPU module is installed to other than the CPU slot and slots 0 to 2. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Check the loading position of the CPU module and reinstall it at the correct slot.		Qn(H) QnPH
2122	**[SP. UNIT LAY ERR.]** The QA1S6□B/QA6□B and QA6ADP+A5□B/A6□B are used for the main base unit. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Replace the main base unit with a usable one.		Qn(H) QnPH QnPRH
2124	**[SP. UNIT LAY ERR.]** • A module is mounted on the 65th slot or later slot. • A module is mounted on the slot whose number is greater than the number of slots specified at [Slots] in [Standard setting] of the base setting. • A module is mounted on the slot whose number of I/O points exceeds 4096 points. • A module is mounted on the slot whose number of I/O points strides 4096 points. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Remove the module mounted on the 65th slot or later slot. • Remove the module mounted on the slot whose number is greater than the number of slots specified at [Slots] in [Standard setting] of the base setting. • Remove the module mounted on the slot whose number of I/O points exceeds 4096 points. • Replace the module with the one whose number of occupied points does not exceed 4096 points.		Qn(H) QnPH QnPRH QnU*7
	[SP. UNIT LAY ERR.] • A module is mounted on after the 25th slot (on after the 17th slot for the Q00UJ). • A module is mounted on the slot whose number is later than the one set in the "Base setting" on the I/O assignment tab of PLC parameter in GX Developer. • A module is mounted on the slot for which I/O points greater than 1024 (greater than 256 for the Q00UJ) is assigned. • A module is mounted on the slot for which I/O points is assigned from less than 1024 to greater than 1024 (from less than 256 to greater than 256 for the Q00UJ). **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Remove the module mounted on after the 25th (on after the 17th slot for the Q00UJ). • Remove the module mounted on the slot whose number is later than the one set in the "Base setting" on the I/O assignment tab of PLC parameter in GX Developer. • Remove the module mounted on the slot for which I/O points greater than 1024 (greater than 256 for the Q00UJ) is assigned. • Replace the end module with the one whose number of occupied points is within 1024 (within 256 for the Q00UJ).		Q00UJ Q00U/Q01U

*4 The function version is A.
*7 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2124	**[SP. UNIT LAY ERR.]** • A module is mounted on the 37th slot or later slot. • A module is mounted on the slot whose number is greater than the number of slots specified at [Slots] in [Standard setting] of the base setting. • A module is mounted on the slot whose number of I/O points exceeds 2048 points. • A module is mounted on the slot whose number of I/O points strides 2048 points. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Remove the module mounted on the 37th slot or later slot. • Remove the module mounted on the slot whose number is greater than the number of slots specified at [Slots] in [Standard setting] of the base setting. • Remove the module mounted on the slot whose number of I/O points exceeds 2048 points. • Replace the module with the one whose number of occupied points does not exceed 2048 points.	RUN: Off ERR.: Flicker CPU Status: Stop	Q02U
	[SP. UNIT LAY ERR.] • A module is mounted on the 25th slot or later slot. (The 17th slot or later slot for the Q00J.) • A module is mounted on the slot whose number is greater than the number of slots specified at [Slots] in [Standard setting] of the base setting. • A module is mounted on the slot whose number of I/O points exceeds 1024 points. (256 points for the Q00J.) • A module is mounted on the slot whose number of I/O points strides 1024 points. (256 points for the Q00J.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Remove the module mounted on the 25th slot or later slot. (The 17th slot or later slot for the Q00J.) • Remove the module mounted on the slot whose number is greater than the number of slots specified at [Slots] in [Standard setting] of the base setting. • Remove the module mounted on the slot whose number of I/O points exceeds 1024 points. (256 points for the Q00J.) • Replace the module with the one whose number of occupied points does not exceed 1024 points. (256 points for the Q00J.)		Q00J/Q00/Q01
	[SP. UNIT LAY ERR.] 5 or more extension base units were added. (3 bases for Q00J) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Remove 5 or more extension base units. (3 bases for Q00J)		Q00J/Q00/Q01[*4]
2125	**[SP. UNIT LAY. ERR.]** • A module which the QCPU cannot recognise has been installed. • There was no response form the intelligent function module/special function module. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	• Install a usable module. • The intelligent function module/special function module is experiencing a hardware fault. (Contact your local Mitsubishi representative.)		QCPU

*4 The function version is A.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2126	**[SP. UNIT LAY. ERR.]** CPU module locations in a multiple CPU system are either of the following. • There are empty slots between the QCPU and QCPU/motion controller. • A module other than the High Performance model QCPU/Process CPU (including the motion controller) is mounted on the left-hand side of the High Performance model QCPU/Process CPU. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	• Mount modules on the available slots so that the empty slots will be located on the right-hand side of the CPU module. • Remove the module mounted on the left-hand side of the High Performance model QCPU/Process CPU, and mount the High Performance model QCPU/Process CPU on the empty slot. Mount the motion CPU on the right-hand side of the High Performance model QCPU/Process CPU.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*3 QnPH
2128	**[SP.UNIT LAY ERR.]** The unusable module is mounted on the extension base unit in the redundant system. **■Collateral information** • Common Information:Module No. • Individual Information:– **■Diagnostic Timing** • At power-ON/ At reset	• Remove the unusable module from the extension base unit.		QnPRH*6
2150	**[SP. UNIT VER. ERR.]** 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. **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ At writing to progurammable controller	• 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.		Q00J/Q00/Q01 QnPH QuU*10
2151	**[SP. UNIT VER. ERR.]** Either of the following modules incompatible with the redundant system has been mounted in a redundant system. • CC-Link IE controller network modules • MELSECNET/H modules • Ethernet modules **■Collateral information** • Common Information:Module No. (Slot No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ At writing to progurammable controller	Use either of the following modules compatible with the redundant system. • CC-Link IE controller network modules • MELSECNET/H modules • Ethernet modules		QnPRH

*3 The function version is B or later.
*6 The module whose first 5 digits of serial No. is "09012" or later.
*10 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
	[MISSING PARA.] There is no parameter file in the drive specified as valid parameter drive by the DIP switches. **■Collateral information** • Common Information:Drive Name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN	• Check and correct the valid parameter drive settings made by the DIP switches. • Set the parameter file to the drive specified as valid parameter drive by the DIP switches.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H) QnPH QnPRH
2200	**[MISSING PARA.]** There is no parameter file at the program memory. **■Collateral information** • Common Information:Drive Name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN	Set the parameter file to the program memory.		Q00J/Q00/Q01
	[MISSING PARA.] Parameter file does not exist in all drives where parameters will be valid. **■Collateral information** • Common Information:Drive Name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN	Set a parameter file in a drive to be valid.		QuU
2210	**[BOOT ERROR]** The contents of the boot file are incorrect. **■Collateral information** • Common Information:Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	Check the boot setting.		Q00J/Q00/Q01*3 Qn(H) QnPH QnPRH QnU
2211	**[BOOT ERROR]** File formatting is failed at a boot. **■Collateral information** • Common Information:Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	• Reboot. • CPU module hardware fault. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		Qn(H) QnPRH QnU
2220	**[RESTORE ERROR]** • The device information (number of points) backuped by the device data backup function is different from the number of device points of the PLC parameter. After this error occurred, perform restore per power-on/reset until the number of device points is identical to the number of device points in the PLC parameter, or until the backup data is deleted. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	• Set the number of device points at the time of backup to the device point setting in [PLC parameter]. Then, turn ON from OFF power supply, or reset the CPU and cancel reset. • Delete the backuped data, and turn ON from OFF power supply, or reset the CPU and cancel reset.		QnU

*3 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2221	**[RESTORE ERROR]** • The device information backuped by the device data backup function is incomplete. (Turning power supply OFF or reset is suspected.) Do not return the data when this error occurs. Also, delete the incomplete device information at the time of this error occurrence. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	Reset the CPU module and run it again.	RUN: Off ERR.: Flicker CPU Status: Stop	QnU
2225	**[RESTORE ERROR]** The model name of the restoration destination CPU module is different from the one of the backup source CPU module. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	Execute a restore for the CPU module whose name is same as the backup source CPU module.		
2226	**[RESTORE ERROR]** • ·The backup data file is destroyed. (The content of the file is different from the check code. • Reading the backup data from the memory card is not successfully completed. • Since the write protect switch of the SRAM card is set to on (write inhibited), the checked "Restore for the first time only" setting cannot be performed. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	• Execute a restore of other backup data because the backup data may be destructed. • Set the write protect switch of the SRAM card to off (write enabled).		
2227	**[RESTORE ERROR]** Writing the backup data to the restoration destination drive is not successfully completed. **■Collateral information** • Common Information:File name/Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/ At reset	Execute a restore for the other CPU module too because the CPU module may be damaged.		
2300	**[ICM. OPE. ERROR]** • 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. **■Collateral information** • Common Information:Drive name • Individual Information:– **■Diagnostic Timing** • When memory card is inserted or removed	• Remove memory card after placing the memory card in/out switch OFF. • Turn on the card insert switch after inserting a memory card.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	Qn(H) QnPH QnPRH QnU*11

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*11 The Universal model QCPU except the Q00UJCPU, Q00UCPU, and Q01UCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2301	**[ICM. OPE. ERROR]** • The memory card has not been formatted. • Memory card format status is incorrect. • The QCPU file does not exist in the Flash card. **■Collateral information** • Common Information:Drive name • Individual Information:– **■Diagnostic Timing** • When memory card is inserted or removed/When memory card is inserted	• Format memory card. • Reformat memory card. • Write the QCPU file the Flash card	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	Qn(H) QnPH QnPRH QnU*11
	[ICM. OPE. ERROR] SRAM card failure is detected. (It occurs when automatic format is not set.) Writing parameters was performed duruing setting file registers. **■Collateral information** • Common Information:Drive name • Individual Information:– **■Diagnostic Timing** • When memory card is inserted or removed/When memory card is inserted	Format SRAM card after changing battery of SRAM card. Write a parameter, which set the file register at "Not available", in CPU, and then perform the ioperation.		QnU*11
2302	**[ICM. OPE. ERROR]** A memory card that cannot be used with the CPU module has been installed. **■Collateral information** • Common Information:Drive name • Individual Information:– **■Diagnostic Timing** • When memory card is inserted or removed	• Format memory card. • Reformat memory card. • Check memory card.		Qn(H) QnPH QnPRH QnU*11
2400	**[FILE SET ERROR]** Automatic write to standard ROM was performed on the CPU module that is incompatible with automatic write to standard ROM. (Memory card where automatic write to standard ROM was selected in the boot file was fitted and the parameter enable drive was set to the memory card.) **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/ At writing to proguramma-ble controller	• Execute automatic write to standard ROM on the CPU module which is compatible with automatic write to standard ROM. • Using GX Developer, perform write of parame-ters and programs to standard ROM. • Change the memory card for the one where automatic write to standard ROM has not been set, and perform boot operation from the memory card.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*3 QnPH QnPRH
	[FILE SET ERROR] The file designated at the PLC file settings in the parameters cannot be found. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/ At writing to proguramma-ble controller	• Read the individual information of the error using peripheral device, check to be sure that the parameter drive name and file name correspond to the numerical values there (parameter num-ber), and correct. • Create a file created using parameters, and load it to the CPU module.		QCPU

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*3 The function version is B or later.
*11 The Universal model QCPU except the Q00UJCPU, Q00UCPU, and Q01UCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2401	**[FILE SET ERROR]** Program memory capacity was exceeded by performing boot operation or automatic write to standard ROM. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/ At writing to progurammable controller	• 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.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*3 QnPH QnPRH
	[FILE SET ERROR] Program memory capacity was exceeded by performing boot operation. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/ At writing to progurammable controller			QnU
	[FILE SET ERROR] The file specified by parameters cannot be made. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/ At writing to progurammable controller	• Read the individual information of the error using the peripheral device, 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.		QCPU
	[FILE SET ERROR] • Although setting is made to use the device data storage file, there is no empty capacity required for creating the device data storage file in the standard ROM. • When the latch data backup function (to standard ROM) is used, there is no empty capacity required for storing backup data in standard ROM. (The parameter number "$FFFF_H$" is displayed for the error individual information.) • Standard RAM capacity is insufficient that error history of the module cannot be stored. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/ At writing to progurammable controller	Secure the empty capacity of the standard ROM.		QnU
2410	**[FILE OPE. ERROR]** • The specified program does not exist in the program memory. This error may occur when the ECALL, EFCALL, PSTOP, PSCAN, POFF or PLOW instruction is executed. • The specified file does not exist. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed	• Read the individual information of the error using the peripheral device, 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. • In case a specified file does not exist, write the file to a target memory and/or check the file specified with the instruction again.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	Qn(H) QnPH QnPRH QnU

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*3 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2411	**[FILE OPE. ERROR]** • The file is the one which cannot be specified by the sequence program (such as comment file). • 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 or POFF instruction is executed. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed	Read the individual information of the error using the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	Qn(H) QnPH QnPRH QnU
2412	**[FILE OPE. ERROR]** The SFC program file is one that cannot be designated by the sequence program. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed	Read the individual information of the error using the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct.		Qn(H) QnPH QnPRH QnU
2413	**[FILE OPE. ERROR]** No data has been written to the file designated by the sequence program. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Program error location **■Diagnostic Timing** • When instruction executed	Read the individual information of the error using the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct. Check to ensure that the designated file has not been write protected.		Qn(H) QnPH QnPRH
2500	**[CAN'T EXE. PRG.]** • 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 setting is changed, only the parameter is written into the PLC. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN	• Read the common information of the error using the peripheral device, 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.	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
	[CAN'T EXE. PRG.] After the index modification of the PLC parameter is changed, only the parameter is written to the PLC. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN	When the index modification of the PLC parameter is changed, batch-write the parameter and program file into the PLC.		QnU

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2501	**[CAN'T EXE. PRG.]** There are multiple program files although "none" has been set at the PLC parameter program settings. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN	Edit the PLC parameter program setting to "yes". Alternatively, delete unneeded programs.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H) QnPH QnPRH QnU
	[CAN'T EXE. PRG.] • There are three or more program files. • The program name differs from the program contents. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN	• Delete unnecessary program files. • Match the program name with the program contents.		Q00J/Q00/Q01
2502	**[CAN'T EXE. PRG.]** The program file is incorrect. Alternatively, the file contents are not those of a sequence program. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN	Check whether the program version is ＊ ＊ ＊.QPG, and check the file contents to be sure they are for a sequence program.		QCPU
	[CAN'T EXE. PRG.] The program file is not the one for the redundant CPU. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN	Create a program using GX Developer or PX Developer for which the PLC type has been set to the redundant CPU (Q12PRH/Q25PRH), and write it to the CPU module.		QnPRH
2503	**[CAN'T EXE. PRG.]** There are no program files at all. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN	• Check program configuration. • Check parameters and program configuration.		QCPU
2504	**[CAN'T EXE. PRG.]** Two or more SFC normal programs or control programs have been designated. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN			Qn(H) QnPH QnPRH QnU
	[CAN'T EXE. PRG.] There are two or more SFC programs. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ STOP ⟶ RUN	Reduce the SFC programs to one.		Q00J/Q00/Q01*3

*3 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2700	**[REMOTE PASS.FAIL]** The count of remote password mismatches reached the upper limit. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	Check for illegal accesses. If any illegal access is identified, take actions such as disabling communication of the connection. If no illegal access is identified, clear the error and perform the following. (Clearing the error also clears the count of remote password mismatches.) • Check if the remote password sent is correct. • Check if the remote password has been locked. • Check if concurrent access was made from multiple devices to one connection by UDP. • Check if the upper limit of the remote password mismatch count is too low.	RUN: ON ERR.: ON CPU Status: Continue	QnU*8
2710	**[SNTP OPE.ERROR]** Time setting failed when the programmable controller was powered ON or reset. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • When time setting function is executed	• Check if the time setting function is set up correctly. • Check if the specified SNTP server is operating normally, or if any failure has occurred on the network connected to the specified SNTP server computer.	RUN: Off/ON ERR.: Flicker/ON CPU Status: Stop/Continue	

*8 This applies to the Built-in Ethernet port QCPU.

12.3.5 Error code list (3000 to 3999)

The following shows the error messages from the error code 3000 to 3999, the contents and causes of the errors, and the corrective actions for the errors.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3000	**[PARAMETER ERROR]** 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. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN/ At writing to progurammable controller	• 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.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*1 QnPH QnU*10
	[PARAMETER ERROR] The PLC parameter settings for timer time limit setting, the RUN-PAUSE contact, the common pointer number, general data processing, number of empty slots, system interrupt settings, baud rate setting, and service processing setting are outside the range that can be used by the CPU module. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN/ At writing to progurammable controller	• Read the individual information of the error using the peripheral device, check the parameter item corresponding to the numerical value (parameter No.), and correct it. • Rewrite corrected parameters to the CPU module, reload the CPU power supply and/or reset the module. • If the same error occurs, it is thought to be a hardware error. (Contact your local Mitsubishi representative.)		QCPU
	[PARAMETER ERROR] In a program memory check, the check capacity has not been set within the range applicable for the CPU module. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN/ At writing to progurammable controller			QnPH QnPRH*5
	[PARAMETER ERROR] The parameter settings in the error individual information (special register SD16) are illegal. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN/ At writing to progurammable controller			QCPU
	[PARAMETER ERROR] The ATA card is set to the memory card slot when the specified drive for the file register is set to “memory card (ROM)” and [Use the following file] or [Use the same file name as the program] (either one is allowed) is set in the PLC file setting. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN/ At writing to progurammable controller			QnU*11

*1 The function version is B or later.
*5 The module whose first 5 digits of serial No. is "07032" or later.
*10 The Universal model QCPU except the Q00UJCPU.
*11 The Universal model QCPU except the Q00UJCPU, Q00UCPU, and Q01UCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3001	**[PARAMETER ERROR]** The parameter settings are corrupted. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN/ At writing to progurammable controller	• Read the individual information of the error using the peripheral device, check the parameter item corresponding to the numerical value (parameter No.), and correct it. • Rewrite corrected parameters to the CPU module, reload the CPU power supply and/or reset the module. • If the same error occurs, it is thought to be a hardware error. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
3002	**[PARAMETER ERROR]** When "Use the following file" is selected for the file register in the PLC file setting of the PLC parameter dialog box, the specified file does not exist although the file register capacity has been set. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN/ At writing to progurammable controller	• Read the individual information of the error using the peripheral device, check the parameter item corresponding to the numerical value (parameter No.), and correct it. • Rewrite corrected parameters to the CPU module, reload the CPU power supply and/or reset the module. • If the same error occurs, it is thought to be a hardware error. (Contact your local Mitsubishi representative.)		Qn(H) QnPH QnPRH
	[PARAMETER ERROR] When [Use the following file] is set for the file register in the PLC file setting of the PLC parameter dialog box and the capacity of file register is not set, the file register file does not exist in the specified target memory. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN/ At writing to progurammable controller			QnU*10
	[PARAMETER ERROR] When [Use the following file.] is set for the device data storage file in [PLC file] of [PLC parameter], and [Capacity] is not set, the device data storage file does not exist in the target memory. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN/ At writing to progurammable controller			QnU

*10 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3003	**[PARAMETER ERROR]** The automatic refresh range of the multiple CPU system exceeded the file register capacity. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • When an END instruction executed	Change the file register file for the one refresh-enabled in the whole range.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*1 QnPH QnU*10
	[PARAMETER ERROR] The number of devices set at the PLC parameter device settings exceeds the possible CPU module range. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP ⟶ RUN/ At writing to progurammable controller	• Read the individual information of the error using the peripheral device, check the parameter item corresponding to the numerical value (parameter No.), and correct it. • If the error is still generated following the correction of the parameter settings, the possible cause is the memory errorm of the CPU module's program memory or the memory card. (Contact your local Mitsubishi representative.)		QCPU
3004	**[PARAMETER ERROR]** The parameter file is incorrect. Alternatively, the contents of the file are not parameters. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP ⟶ RUN/ At writing to progurammable controller	Check whether the parameter file version is ＊ ＊ ＊.QPA, and check the file contents to be sure they are parameters.		
3005	**[PARAMETER ERROR]** The contents of the parameter are broken. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-ON/ At reset/ STOP ⟶ RUN	• Read the individual information of the error using the peripheral device, check the parameter item corresponding to the numerical value (parameter No.), and correct it. • Write the modified parameter items to the CPU module again, and power-on the Programmable Controller or reset the CPU module. • When the same error occurs again, the hardware is faulty. Contact your local Mitsubishi representative, explaining a detailed description of the problem.		Qn(H)*7 QnPH*9 QnPRH*9
3006	**[PARAMETER ERROR]** • The high speed interrupt is set in a Q02CPU. • The high speed interrupt is set in a multiple CPU system. • The high speed interrupt is set when aQA1S6□B or QA6□B is used. • No module is installed at the I/O address designated by the high speed interrupt. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP ⟶ RUN/ At writing to progurammable controller	• Delete the setting of the Q02CPU' s high speed interrupt. To use high speed interrupts, change the CPU module to one of the Q02H/Q06H/ Q12H/Q25HCPU. • To use a multiple CPU system, delete the setting of the high-speed interrupt. To use high speed interrupts, change the system to a single CPU system. • To use either the QA1S6□B or QA6□B, delete the setting of the high speed interrupt. To use high speed interrupts, do not use the QA1S6□B/ QA6□B. • Re-examine the I/O address designated by the high speed interrupt setting.		Qn(H)*4

*1 The function version is B or later.
*4 The module whose first 5 digits of serial No. is "04012" or later.
*7 The module whose first 5 digits of serial No. is "09012" or later.
*9 The module whose first 5 digits of serial No. is "10042" or later.
*10 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3007	**[PARAMETER ERROR]** The parameter file in the drive specified as valid parameter drive by the DIP switches is inapplicable for the CPU module. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP → RUN/ At writing to progurammable controller	Create parameters using GX Developer, and write them to the drive specified as valid parameter drive by the DIP switches.	RUN: Off ERR.: Flicker CPU Status: Stop	QnPRH
3009	**[PARAMETER ERROR]** In a multiple CPU system, the modules for AnS, A, Q2AS and QnA have been set to multiple control CPUs. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP → RUN/ At writing to progurammable controller	Re-set the parameter I/O assignment to control them under one CPU module. (Change the parameters of all CPUs in the multiple CPU system.)		Qn(H)*1
3010	**[PARAMETER ERROR]** The parameter-set number of CPU modules differs from the actual number in a multiple CPU system. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP → RUN/ At writing to progurammable controller	Match the number of (CPU modules in multiple CPU setting) - (CPUs set as empty in I/O assignment) with that of actually mounted CPU modules.		Qn(H)*1 QnPH
3012	**[PARAMETER ERROR]** Multiple CPU setting or control CPU setting differs from that of the reference CPU settings in a multiple CPU system. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP → RUN/ At writing to progurammable controller	Match the multiple CPU setting or control CPU setting in the PLC parameter with that of the reference CPU (CPU No.1) settings.		Q00/Q01*1 Qn(H)*1 QnU

*1 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3013	**[PARAMETER ERROR]** Multiple CPU auto 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. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP → RUN/ At writing to progurammable controller	Check the following in the multiple CPU auto refresh setting and make correction. • When specifying the bit device, specify a multiple of 16 for the refresh starting device. • Specify the device that may be specified for the refresh device. • Set the number of send points to an even number.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*1 QnPH
	[PARAMETER ERROR] In a multiple CPU system, the multiple CPU auto refresh setting is any of the following. • The total number of transmission points is greater than the maximum number of refresh points. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP → RUN/ At writing to progurammable controller	Check the following in the multiple CPU auto refresh setting and make correction. • The total number of transmission points is within the maximum number of refresh points.		Q00/Q01*1
	[PARAMETER ERROR] In a multiple CPU system, the multiple CPU auto refresh setting is any of the following. • 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 send points is greater than the maximum number of refresh points. • The setting of the refresh range crosses over the boundary between the internal user device and the extended data register (D) or extended link register (W). **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP → RUN/ At writing to progurammable controller	Check the following in the multiple CPU auto refresh setting and make correction. • Specify the device that may be specified for the refresh device. • Set the number of send points to an even number. • Set the total number of send points within the range of the maximum number of refresh points. • Set the refresh range so that it does not cross over the boundary between the internal user device and the extended data register (D) or extended link register (W).		QnU*10
3014	**[PARAMETER ERROR]** • In a multiple CPU system, the online module change parameter (multiple CPU system parameter) settings differ from those of the reference CPU. • In a multiple CPU system, the online module change setting is enabled although the CPU module mounted does not support online module chang parameter. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP → RUN/ At writing to progurammable controller	• Match the online module change parameter with that of the reference CPU. • If the CPU module that does not support online module change is mounted, replace it with the CPU module that supports online module change.		Qn(H) QnPH QnU*8

*1 The function version is B or later.
*8 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.
*10 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3015	**[PARAMETER ERROR]** In a multiple CPU system configuration, the CPU verified is different from the one set in the parameter setting. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number/CPU No. **■Diagnostic Timing** • At power-On/ At reset/ STOP → RUN/ At writing to progurammable controller	Read the individual information of the error using the peripheral device, check the parameter item corresponding to the numerical value (parameter No./CPU No.) and parameter of target CPU, and correct them.	RUN: Off ERR.: Flicker CPU Status: Stop	QnU*8
3016	**[PARAMETER ERROR]** The CPU module incompatible with multiple CPU synchronized boot-up is set as the target for the synchronized boot-up in the [Multiple CPU synchronous startup setting]. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number/ CPU No. **■Diagnostic Timing** • At power ON/ At reset/ At writing to progurammable controller	Delete the CPU module incompatible with multiple CPU synchronized boot-up from the setting.		
3040	**[PARAMETER ERROR]** The parameter file is damaged. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	With GX Developer, write [PLC parameter/Network parameter/Remote password] to a valid drive then reload the power supply for system and/or reset the CPU module. If the same error occurs, it is thought to be hardware error. (Contact your local Mitsubishi representative.)		Qn(H)*5 QnPH*5 QnPRH*5
3041	**[PARAMETER ERROR]** Parameter file of intelligent function module is damaged. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	With GX Developer, write [Intelligent function module parameter] to a valid drive to write the parameters then reload the power supply for system and/or reset the CPU module. If the same error occurs, it is thought to be a hardware error. (Contact your local Mitsubishi representative.)		
3042	**[PARAMETER ERROR]** The system file that have stored the remote password setting information is damaged. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• With GX Developer, write [PLC parameter/Network parameter/Remote password] to a valid drive then reload the power supply for system and/or reset the CPU module. If the same error occurs, it is thought to be a hardware error. (Contact your local Mitsubishi representative.) • When a valid drive for parameter is set to other than [program memory], set the parameter file (PARAM) at the boot file setting to be able to transmit to the program memory. With GX Developer, write [PLC parameter/Network parameter/Remote password] to a valid drive then reload the power supply for system and/or reset the CPU module. If the same error occurs, it is thought to be hardware error. (Contact your local Mitsubishi representative.)		

*5 The module whose first 5 digits of serial No. is "07032" or later.
*8 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3100	**[LINK PARA. ERROR]** In a multiple CPU system, the CC-Link IE controller network module controlled by another CPU is specified as the head I/O number of the CC-Link IE controller network module. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-ON/ At reset/ STOP ⟶ RUN	• Delete the network parameter of the CC-Link IE controller network module controlled by another CPU. • Change the setting to the head I/O number of the CC-Link IE controller network module controlled by host CPU.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*7 QnPH*9 QnU
	[LINK PARA. ERROR] The network parameter of the CC-Link IE controller network operating as the normal station is overwritten to the control station. Or, the network parameter of the CC-Link IE controller network operating as the control station is overwritten to the normal station. (The network parameter is updated on the module by resetting.) **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-ON/ At reset/ STOP ⟶ RUN	Reset the CPU module.		Qn(H)*7 QnPH*9 QnPRH*9 QnU
	[LINK PARA. ERROR] • The number of modules actually mounted is different from that is set in Network parameter for MELSECNET/H. • The head I/O number of the actually mounted module is different from the one set in the network parameter of the CC-Link IE controller network. • Data cannot be handled in the parameter exists. • The network type of CC-Link IE controller network is overwritten during power-on. (When changing the network type, switch RESET to RUN.) **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-ON/ At reset/ STOP ⟶ RUN	• Check the network parameter and actual mounting status, and if they differ, make them matched. When network parameters are modified, write them to the CPU module. • Check the setting of extension base unit stage number. • Check the connection status of extension base unit and extension cable. When the GOT is bus-connected to the main base unit or extension base unit, also check its connection status. If an error occurs even after performing the above checks, the hardware may be faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		
	[LINK PARA. ERROR] • The CC-Link IE controller network module is specified for the head I/O number of network parameter in the MELSECNET/H. • The MELSECNET/H module is specified for the head I/O number of network parameter in the CC-Link IE controller network. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-ON/ At reset/ STOP ⟶ RUN			

*7 The module whose first 5 digits of serial No. is "09012" or later.
*9 The module whose first 5 digits of serial No. is "10042" or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3100	**[LINK PARA. ERROR]** • Although the CC-Link IE controller network module is mounted, network parameter for the CC-Link IE controller network module is not set. • Although the CC-Link IE controller network and MELSECNET/H modules are mounted, network parameter for the MELSECNET/H module is not set. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-ON/ At reset/ STOP ⟶ RUN	• Check the network parameter and actual mounting status, and if they differ, make them matched. When network parameters are modified, write them to the CPU module. • Check the setting of extension base unit stage number. • Check the connection status of extension base unit and extension cable. When the GOT is bus-connected to the main base unit or extension base unit, also check its connection status. If an error occurs even after performing the above checks, the hardware may be faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*7 QnPH*9 QnPRH*9 QnU
	[LINK PARA. ERROR] 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. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	• 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.		Q00/Q01*1 Qn(H)*1 QnPH QnU*10
	[LINK PARA. ERROR] The network parameter of the MELSECNET/H operating as the normal station is overwritten to the control station. Or, the network parameter of the MELSECNET/H operating as the control station is overwritten to the normal station. (The network parameter is updated on the module by resetting.) **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Reset the CPU module.		Qn(H)*1 QnPH QnPRH QnU
	[LINK PARA. ERROR] • The number of modules actually mounted is different from that is set in Network parameter for 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 network type of MELSECNET/H is overwritten during power-on. (When changing the network type, switch RESET to RUN.) • The mode switch of MELSECNET/H module*5 is outside the range. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	• 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 Mitsubishi representative, explaining a detailed description of the problem.) • Set the mode switch of MELSECNET/H module*5 within the range.		QCPU

*1 The function version is B or later.
*5 The module whose first 5 digits of serial No. is "07032" or later.
*7 The module whose first 5 digits of serial No. is "09012" or later.
*9 The module whose first 5 digits of serial No. is "10042" or later.
*10 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3101	**[LINK PARA. ERROR]** The link refresh range exceeded the file register capacity. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • When an END instruction executed	Change the file register file for the one that enables entire range refresh.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*1 QnPH QnPRH QnU*10
	[LINK PARA. ERROR] • When the station number of the MELSECNET/H module is 0, the PLC-to-PLC network parameter has been set. • When the station number of the MELSECNET/H module is other than 0, the remote master parameter setting has been made. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Correct the type or station number of the MELSECNET/H module in the network parameter to meet the used system.		Qn(H)*1 QnPH QnPRH
	[LINK PARA. ERROR] The refresh parameter for the CC-Link IE controller network is outside the range. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	• 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 Mitsubishi representative, explaining a detailed description of the problem.)		Qn(H)*7 QnPH*9 QnPRH*9 QnU
	[LINK PARA. ERROR] • 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. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN			QCPU
	[LINK PARA. ERROR] A multi-remote I/O network was configured using a module that does not support the MELSECNET/H multi-remote I/O network. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Use a module that supports the MELSECNET/H multi-remote I/O network.		QnPH

*1 The function version is B or later.
*7 The module whose first 5 digits of serial No. is "09012" or later.
*9 The module whose first 5 digits of serial No. is "10042" or later.
*10 The Universal model QCPU except the Q00UJCPU.

<table>
<tr><th>Error Code (SD0)</th><th>Error Contents and Cause</th><th>Corrective Action</th><th>LED Status
CPU Status</th><th>Corresponding CPU</th></tr>
<tr><td rowspan="3">3101</td><td>[LINK PARA. ERROR]
• The system A of the MELSECNET/H remote master station has been set to other than Station No. 0.
• The system B of the MELSECNET/H remote master station has been set to Station No. 0.
■Collateral information
• Common Information:File name/ Drive name
• Individual Information:Parameter number
■Diagnostic Timing
• At power ON/At reset/STOP ⟶ RUN</td><td>• Set the system A of the MELSECNET/H remote master station to Station No. 0.
• Set the system B of the MELSECNET/H remote master station to any of Station No. 1 to 64.</td><td rowspan="3">RUN:
Off
ERR.:
Flicker

CPU Status:
Stop</td><td>QnPRH</td></tr>
<tr><td>[LINK PARA. ERROR]
Since the number of points of the B/W device set in [Device] of the PLC parameter is lower than the number of B/W refresh device points shown in the following table when parameters of the MELSECNET/H are not set, the refresh between the CPU module and the MELSECNET/H cannot be performed..
<table>
<tr><th colspan="2">Refresh device</th><th>No. of refresh device points of B device</th><th>No. of refresh device points of W device</th></tr>
<tr><td rowspan="4">No. of mountable network modules</td><td>1</td><td>8192 points (8192 points×1 module)</td><td>8192 points (8192 points×1 module)</td></tr>
<tr><td>2</td><td>8192 points (4096 points×2 modules)</td><td>8192 points (4096 points×2 modules)</td></tr>
<tr><td>3</td><td>6144 points (2048 points×3 modules)</td><td>6144 points (2048 points×3 modules)</td></tr>
<tr><td>4</td><td>8192 points (2048 points×4 modules)</td><td>8192 points (2048 points×4 modules)</td></tr>
</table>
■Collateral information
• Common Information:File name/ Drive name
• Individual Information:Parameter number
■Diagnostic Timing
• At power ON/At reset/STOP ⟶ RUN</td><td>Set the refresh parameter of the MELSECNET/H in accordance with the number of points of B/W devices set in [Device] of the PLC parameter.</td><td>Qn(H)*7
QnPH*7
QnPRH*7
QnU</td></tr>
<tr><td>[LINK PARA. ERROR]
The setting of the network refresh range crosses over the boundary between the internal user device and the extended data register (D) or extended link register (W).
■Collateral information
• Common Information:File name/ Drive name
• Individual Information:Parameter number
■Diagnostic Timing
• At power ON/At reset/STOP ⟶ RUN</td><td>Set the network refresh range so that it does not cross over the boundary between the internal user device and the extended data register (D) or extended link register (W).</td><td>QnU</td></tr>
</table>

*7 The module whose first 5 digits of serial No. is "09012" or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3102	**[LINK PARA. ERROR]** A CC-Link IE controller network parameter error was detected. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	• Correct and write the network parameters. • If the error occurs after correction, it suggests a hardware fault. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*7 QnPH*9 QnPRH*9 QnU
	[LINK PARA. ERROR] • The network module detected a network parameter error. • A MELSECNET/H network parameter error was detected. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN			QCPU
	[LINK PARA. ERROR] The station No. specified in pairing setting are not correct. • The stations are not numbered consecutively. • Pairing setting has not been made for the CPU module at the normal station. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Refer to the troubleshooting of the network module, and if the error is due to incorrect pairing setting, reexamine the pairing setting of the network parameter.		QnPRH
	[LINK PARA. ERROR] The CC-Link IE controller network module whose first 5 digits of serial No. is "09041" or earlier is mounted. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Mount the CC-Link IE controller network module whose first 5 digits of serial No. is "09042" or later.		QnU
	[LINK PARA. ERROR] Group cyclic function in CC-Link IE controller network that does not correspond to group cyclic function is set. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Set group cyclic function in function version D or later of CC-Link IE controller network.		QnU*9
	[LINK PARA. ERROR] Paring setting in CC-Link IE controller network modules installed in CPUs except for redundant CPUs was performed. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Examine the paring setting for the network parameter in the control staion.		Q00J/Q00/Q01 Qn(H)*9 QnPH*9 QnU*9

*7 The module whose first 5 digits of serial No. is "09012" or later.
*9 The module whose first 5 digits of serial No. is "10042" or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3102	**[LINK PARA. ERROR]** • LB/LW own station send range at LB/LW4000 or later was set. • LB/LW setting (2) was performed. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Examine the network range assignments for the network parameter in the control station.		Q00J/Q00/Q01
3103	**[LINK PARA. ERROR]** In a multiple CPU system, Ethernet interface module under control of another station is specified to the start I/O number of the Ethernet network parameter. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	• Delete the Ethernet network parameter of Ethernet interface module under control of another station. • Change the setting to the start I/O number of Ethernet interface module under control of the host station.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00/Q01*1 Qn(H)*1 QnPH QnU*10
	[LINK PARA. ERROR] • Although the number of modules has been set to one or greater number in the Ethernet module count parameter setting, the number of actually mounted module is zero. • The start I/O No. of the Ethernet network parameter differs from the I/O No. of the actually mounted module. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	• Correct and write the network parameters. • If the error occurs after correction, it suggests a hardware fault. (Contact your local Mitsubishi representative.)		QCPU
	[LINK PARA. ERROR] • Ethernet module whose network type is set to "Ethernet (main base)" is mounted on the extension base unit in the redundant system. • Ethernet module whose network type is set to "Ethernet (extension base)" is mounted on the main base unit in the redundant system. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN			QnPRH*7
3104	**[LINK PARA. ERROR]** • The Ethernet, MELSECNET/H and MELSECNET/10 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 number is outside the range of the used CPU module. • The Ethernet-specific parameter setting is not normal. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	• Correct and write the network parameters. • If the error occurs after correction, it suggests a hardware fault. (Contact your local Mitsubishi representative.)		QCPU

*1 The function version is B or later.
*7 The module whose first 5 digits of serial No. is "09012" or later.
*10 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3105	**[LINK PARA. ERROR]** In a multiple CPU system, the CC-Link module under control of another station is specified as the head I/O number of the CC-Link network parameter. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	• Delete the CC-Link network parameter of the CC-Link module under control of another station. • Change the setting to the start I/O number of the CC-Link module under control of the host station.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00/Q01[*1] Qn(H)[*1] QnPH QnU[*10]
	[LINK PARA. ERROR] • 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 start 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. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	• Correct and write the network parameters. • If the error occurs after correction, it suggests a hardware fault. (Contact your local Mitsubishi representative.)		QCPU
	[LINK PARA. ERROR] • CC-Link module whose station type is set to “master station (compatible with redundant function)” is mounted on the extension base unit in the redundant system. • CC-Link module whose station type is set to “master station (extension base)” is mounted on the main base unit in the redundant system. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN			QnPRH[*7]

*1 The function version is B or later.
*7 The module whose first 5 digits of serial No. is "09012" or later.
*10 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3106	**[LINK PARA. ERROR]** The CC-Link link refresh range exceeded the file register capacity. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • When an END instruction executed	Change the file register file for the one refresh-enabled in the whole range.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*1 QnPH QnPRH QnU
	[LINK PARA. ERROR] The network refresh parameter for CC-Link is out of range. **■Collateral information** • Common Information:File name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP → RUN	Check the parameter setting.		QCPU
	[LINK PARA. ERROR] The setting of the network refresh range crosses over the boundary between the internal user device and the extended data register (D) or extended link register (W). **■Collateral information** • Common Information:File name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP → RUN	Set the network refresh range so that it does not cross over the boundary between the internal user device and the extended data register (D) or extended link register (W).		QnU
3107	**[LINK PARA. ERROR]** • The CC-Link parameter setting is incorrect. • The set mode is not allowed for the version of the mounted CC-Link module. **■Collateral information** • Common Information:File name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset/STOP → RUN	Check the parameter setting.		QCPU
3200	**[SFC PARA. ERROR]** The parameter setting is illegal. • Though Block 0 was set to "Automatic start" in the SFC setting of the PLC parameter dialog box, Block 0 does not exist. **■Collateral information** • Common Information:File name • Individual Information:Parameter number **■Diagnostic Timing** • STOP → RUN	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.		Q00J/Q00/Q01*1 QnPH QnPRH QnU
3201	**[SFC PARA. ERROR]** The block parameter setting is illegal. **■Collateral information** • Common Information:File name • Individual Information:Parameter number **■Diagnostic Timing** • STOP → RUN			Qn(H) QnPH QnPRH

*1 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3202	**[SFC PARA. ERROR]** The number of step relays specified in the device setting of the PLC parameter dialog box is less than that used in the program. **■Collateral information** • Common Information:File name • Individual Information:Parameter number **■Diagnostic Timing** • STOP ⟶ RUN	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H) QnPH QnPRH
3203	**[SFC PARA. ERROR]** The execution type of the SFC program specified in the program setting of the PLC parameter dialog box is other than scan execution. **■Collateral information** • Common Information:File name • Individual Information:Parameter number **■Diagnostic Timing** • At power-ON/ At reset/ STOP ⟶ RUN*3			Qn(H) QnPH QnPRH QnU
3300	**[SP. PARA ERROR]** The start I/O number in the intelligent function module parameter set on GX Configurator differs from the actual I/O number. **■Collateral information** • Common Information:File name • Individual Information:Parameter number*2 **■Diagnostic Timing** • At power-On/ At reset/ STOP ⟶ RUN/ At writing to progurammable controller	Check the parameter setting.		QCPU
3301	**[SP. PARA ERROR]** • The refresh setting of the intelligent function module exceeded the file register capacity. • The intelligent function module set in GX Configurator differs from the actually mounted module. **■Collateral information** • Common Information:File name • Individual Information:Parameter number*2 **■Diagnostic Timing** • At power-On/ At reset/ STOP ⟶ RUN/ At writing to progurammable controller	• Change the file register file for the one which allows refresh in the whole range. • Check the parameter setting.		Q00J/Q00/Q01 Qn(H)*1 QnPH QnPRH QnU
	[SP. PARA ERROR] The intelligent function module's refresh parameter setting is outside the available range. **■Collateral information** • Common Information:File name • Individual Information:Parameter number*2 **■Diagnostic Timing** • At power-On/ At reset/ STOP ⟶ RUN/ At writing to progurammable controller	Check the parameter setting.		QCPU
	[SP. PARA ERROR] The setting of the refresh parameter range crosses over the boundary between the internal user device and the extended data register (D) or extended link register (W). **■Collateral information** • Common Information:File name • Individual Information:Parameter number*2 **■Diagnostic Timing** • At power-On/ At reset/ STOP ⟶ RUN/ At writing to progurammable controller	Set the refresh parameter range so that it does not cross over the boundary between the internal user device and the extended data register (D) or extended link register (W).		QnU

*1 The function version is B or later.
*2 Parameter No. is the value gained by dividing the head I/O number of parameter in the intelligent function module set by GX Configurator by 10H.
*3 The diagnostic timing of CPU modules except for Universal QCPU can be performed only when switching the CPU modules to run.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3302	**[SP. PARA ERROR]** The intelligent function module's refresh parameter are abnormal. **■Collateral information** • Common Information:File name • Individual Information:Parameter number*2 **■Diagnostic Timing** • At power-On/ At reset/ STOP ⟶ RUN/ At writing to progurammable controller	Check the parameter setting.	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
3303	**[SP. PARA ERROR]** 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. **■Collateral information** • Common Information:File name/ Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power-On/ At reset/ STOP ⟶ RUN/ At writing to progurammable controller	• 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.		Q00/Q01*1 Qn(H)*1 QnPH QnU*10
3400	**[REMOTE PASS. ERR.]** The head I/O number of the target module of the remote password is set to other than 0_H to $0FF0_H$. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Change the head I/O number of the target module to be within the 0_H to $0FF0_H$ range.		Qn(H)*1 QnPH QnPRH QnU*7
	[REMOTE PASS. ERR.] The head I/O number of the target module of the remote password is set to other than 0_H to $07E0_H$. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Change the head I/O number of the target module to be within the 0_H to $07E0_H$ range.		Q02U
	[REMOTE PASS. ERR.] The head I/O number of the target module of the remote password is outside the following range. • Q00JCPU: 0_H to $1E0_H$ • Q00CPU/Q01CPU: 0_H to $3E0_H$ **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Change the head I/O number of the target module of the remote password for the number within the following range. • Q00JCPU: 0_H to $1E0_H$ • Q00CPU/Q01CPU: 0_H to $3E0_H$		Q00J/Q00/Q01*1

*1 The function version is B or later.
*2 Parameter No. is the value gained by dividing the head I/O number of parameter in the intelligent function module set by GX Configurator by 10H.
*7 The module whose first 5 digits of serial No. is "09012" or later.
*10 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3401	**[REMOTE PASS. ERR.]** 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 module) • Intelligent function module other than serial communication module, modem interface module or Ethernet module • Serial communication module or Ethernet module of function version A The intelligent function module where remote password is available is not mounted. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Mount serial communication module, modem interface module or Ethernet module of function version B or later in the position specified in the head I/O No. of the remote password file.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*1 QnPH QnPRH QnU
	[REMOTE PASS. ERR.] Any of the following modules is not mounted on the slot specified for the head I/O number of the remote password. • Serial communication module of function version B or later • Ethernet module of function version B or later • Modem interface module of function version B or later **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	Mount any of the following modules in the position specified for the head I/O number of the remote password. • Serial communication module of function version B or later • Ethernet module of function version B or later • Modem interface module of function version B or later		Q00J/Q00/Q01*1
	[REMOTE PASS. ERR.] 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. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	• Change it for the Ethernet module of function version B or later connected by the host CPU. • Delete the remote password setting.		Qn(H)*1 QnPH QnU*10

*1 The function version is B or later.
*10 The Universal model QCPU except the Q00UJCPU.

12.3.6 Error code list (4000 to 4999)

The following shows the error messages from the error code 4000 to 4999, the contents and causes of the errors, and the corrective actions for the errors.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4000	**[INSTRCT. CODE ERR]** • The program contains an instruction code that cannot be decoded. • An unusable instruction is included in the program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP → RUN When instruction executed	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.	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
4001	**[INSTRCT. CODE ERR]** The program contains a dedicated instruction for SFC although it is not an SFC program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP → RUN When instruction executed			Q00J/Q00/Q01*2 Qn(H) QnPH QnPRH QnU
4002	**[INSTRCT. CODE ERR]** • The name of dedicated instruction specified by the program is incorrect. • The dedicated instruction specified by the program cannot be executed by the specified module. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP → RUN When instruction executed			QCPU
4003	**[INSTRCT. CODE ERR]** The number of devices for the dedicated instruction specified by the program is incorrect. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP → RUN When instruction executed			
4004	**[INSTRCT. CODE ERR]** The device which cannot be used by the dedicated instruction specified by the program is specified. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP → RUN When instruction executed			

*2 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4010	**[MISSING END INS.]** There is no END (FEND) instruction in the program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN	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.	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
4020	**[CAN'T SET(P)]** The total number of internal file pointers used by the program exceeds the number of internal file pointers set in the parameters. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN			Qn(H) QnPH QnPRH QnU
4021	**[CAN'T SET(P)]** • The common pointer Nos. assigned to files overlap. • The local pointer Nos. assigned to files overlap. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN			QCPU
4030	**[CAN'T SET(I)]** The allocation pointer Nos. assigned by files overlap. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/STOP ⟶ RUN			
4100	**[OPERATION ERROR]** The instruction cannot process the contained data. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			QCPU
	[OPERATION ERROR] Access error of ATA card occurs by SP.FREAD/SP.FWRITE instructions. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	• Take measurements against noise. • Reset and restart the CPU module. When the same error is displayed again, the ATA card has hardware failure. (Please consult your local Mitsubishi service center or representative, explaining a detailed description of the problem.)	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	Qn(H) QnPH QnPRH QnU*11
	[OPERATION ERROR] The file being accessed by other functions with SP.FWRITE instruction was accessed. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	• Stop the file accessed with other functions to execute SP.FWRITE instruction. • Stop the access with othrer functions and the SP.FWRITE instructuion to execute at same time.		QnU*11

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*11 The Universal model QCPU except the Q00UJCPU, Q00UCPU, and Q01UCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4101	**[OPERATION ERROR]** • The number of setting data dealt with the instruction exceeds the applicable range. • The storage data and constant of the device specified by the instruction exceeds the applicable range. • When writing to the host CPU shared memory, the write prohibited area is specified for the write destination address. • The range of storage data of the device specified by the instruction is duplicated. • The device specified by the instruction exceeds the range of the number of device points. • The interrupt pointer No. specified by the instruction exceeds the applicable range. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	QCPU
	[OPERATION ERROR] • The storage data of file register specified by the instruction exceeds the applicable range. Or, file register is not set. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			QnU*10
	[OPERATION ERROR] • The block data that crosses over the boundary between the internal user device and the extended data register (D) or extended link register is specified (including 32-bit binary, real number (single precision, double precision), indirect address, and control data) **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			QnU

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*10 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4102	**[OPERATION ERROR]** In a multiple CPU system, the link direct device (J□\□) was specified for the network module under control of another station. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	• 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.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	Q00/Q01*2 Qn(H)*2 QnPH QnU*10
	[OPERATION ERROR] • The network No. or station No. specified for the dedicated instruction is wrong. • The link direct device (J□\□) setting is incorrect. • The module No./ network No./number of character strings exceeds the range that can be specified. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.		QCPU
	[OPERATION ERROR] • The specification of character string (" ") specified by dedicated instruction cannot be used for the character string. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			QnU
4103	**[OPERATION ERROR]** The configuration of the PID dedicated instruction is incorrect. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			Q00J/Q00/ Q01*2 Qn(H) QnPRH QnU
4105	**[OPERATION ERROR]** PLOADP/PUNLOADP/PSWAPP instructins were executed while setting program memory check. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	• Delete the program memory check setting. • When using the program memory check, delete PLOADP/PUNLOADP/PSWAPP instructions.		QnPH*5
4107	**[OPERATION ERROR]** 33 or more multiple CPU dedicated instructions were executed from one CPU module. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Using the multiple CPU dedicated instruction completion bit, provide interlocks to prevent one CPU module from executing 33 or more multiple CPU dedicated instructions.		Q00/Q01*2 Qn(H)*2 QnPH Q00U/Q01U Q02U

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*2 The function version is B or later.
*5 The module whose first 5 digits of serial No. is "07032" or later.
*10 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4109	**[OPERATION ERROR]** With high speed interrupt setting PR, PRC, UDCNT1, UDCNT2, PLSY or PWM instruction is executed. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Delete the high-speed interrupt setting. When using high-speed interrupt, delete the PR, PRC, UDCNT1, UDCNT2, PLSY and PWM instructions.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/Continue*1	Qn(H)*3
4111	**[OPERATION ERROR]** 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. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using GX Developer, and check and correct the error step corresponding to that value (program error location).		Q00/Q01*2 QnU
4112	**[OPERATION ERROR]** The CPU module that cannot be specified with the multiple CPU dedicated instruction was specified. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			Q00/Q01*2 QnU*10
4113	**[OPERATION ERROR]** • When the SP.DEVST instruction is executed, the number of writing to the standard ROM of the day exceeds the value specified by SD695. • The value outside the specified range is set to SD695. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	• Check that the number of execution of the SP.DEVST instruction is proper. • Execute the SP.DEVST instruction again the following day or later day. Or, arrange the value of SD695. • Correct the value of SD695 so that it does not exceed the range.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/Continue	QnU
4120	**[OPERATION ERROR]** Since the manual system switching enable flag (special register SM1592) is OFF, manual system switching cannot be executed by the control system switching instruction (SP. CONTSW). **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	To execute control system switching by the SP. CONTSW instruction, turn ON the manual system switching enable flag (special register SM1592).	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/Continue*1	QnPRH
4121	**[OPERATION ERROR]** • In the separate mode, the control system switching instruction (SP. CONTSW) was executed in the standby system CPU module. • In the debug mode, the control system switching instruction (SP. CONTSW) was executed. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	• Reexamine the interlock signal for the SP. CONTSW instruction, and make sure that the SP. CONTSW instruction is executed in the control system only. (Since the SP. CONTSW instruction cannot be executed in the standby system, it is recommended to provide an interlock using the operation mode signal or like.) • As the SP. CONTSW instruction cannot be executed in the debug mode, reexamine the interlock signal related to the operation mode.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/Continue*1	QnPRH

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*2 The function version is B or later.
*3 The module whose first 5 digits of serial No. is "04012" or later.
*10 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4122	**[OPERATION ERROR]** • The dedicated instruction was executed to the module mounted on the extension base unit in the redundant system. • The instruction for accessing the intelligent function module mounted on the extension base unit from the standby system at separate mode was executed. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	• Delete the dedicated instruction for the module mounted on the extension base unit. • Delete the instruction for accessing the intelligent function module mounted on the extension base unit from the standby system.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/Continue	QnPRH*6
4130	**[OPERATION ERROR]** Instructions to read SFC step comment (S(P).SFCSCOMR) and SFC transition condition comment (S(P).SFCTCOMR) are executed for the comment file in ATA card **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When END/other instruction executed	Target comment file is to be other than the comment file in ATA card.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	Qn(H)*4 QnPH*5 QnPRH
4131	**[OPERATION ERROR]** The SFC program is started up by the instruction while the other SFC program has not yet been completed. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Check the SFC program specified by the instruction. Or, check the executing status of the SFC program.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/Continue	QnU
4140	**[OPERATION ERROR]** Operation where the input data is special value ("-0", unnormalized number, nonnumeric, ±∞) is performed. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check the error step corresponding to the numerical value (program error part), and correct it.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	
4141	**[OPERATION ERROR]** Overflow occurs at operation. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check the error step corresponding to the numerical value (program error part), and correct it.		
4200	**[FOR NEXT ERROR]** No NEXT instruction was executed following the execution of a FOR instruction. Alternatively, there are fewer NEXT instructions than FOR instructions. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*4 The module whose first 5 digits of serial No. is "07012" or later.
*5 The module whose first 5 digits of serial No. is "07032" or later.
*6 The module whose first 5 digits of serial No. is "09012" or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4201	**[FOR NEXT ERROR]** A NEXT instruction was executed although no FOR instruction has been executed. Alternatively, there are more NEXT instructions than FOR instructions. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
4202	**[FOR NEXT ERROR]** More than 16 nesting levels are programmed. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Keep nesting levels at 16 or under.		
4203	**[FOR NEXT ERROR]** A BREAK instruction was executed although no FOR instruction has been executed prior to that. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.		
4210	**[CAN'T EXECUTE(P)]** The CALL instruction is executed, but there is no subroutine at the specified pointer. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			
4211	**[CAN'T EXECUTE(P)]** There was no RET instruction in the executed subroutine program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.		
4212	**[CAN'T EXECUTE(P)]** The RET instruction exists before the FEND instruction of the main routine program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			
4213	**[CAN'T EXECUTE(P)]** More than 16 nesting levels are programmed. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Keep nesting levels at 16 or under.		

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4220	**[CAN'T EXECUTE(I)]** Though an interrupt input occurred, the corresponding interrupt pointer does not exist. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QCPU
4221	**[CAN'T EXECUTE(I)]** An IRET instruction does not exist in the executed interrupt program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			
4223	**[CAN'T EXECUTE(I)]** The IRET instruction exists before the FEND instruction of the main routine program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			
	[CAN'T EXECUTE(I)] • The IRET instruction was executed in the fixed scan execution type program. • The STOP instruction was executed in the fixed scan execution type program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			QnU
4225	**[CAN'T EXECUTE(I)]** The interrupt pointer for the module mounted on the extension base unit is set in the redundant system. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power-ON/At reset	Delete the setting of interrupt pointer for the module mounted on the extension base unit, since it cannot be used.		QnPRH*6
4230	**[INST. FORMAT ERR.]** The number of CHK and CHKEND instructions is not equal. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.		Qn(H) QnPH
4231	**[INST. FORMAT ERR.]** The number of IX and IXEND instructions is not equal. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			QCPU

*6 The module whose first 5 digits of serial No. is "09012" or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4235	**[INST. FORMAT ERR.]** The configuration of the check conditions for the CHK instruction is incorrect. Alternatively, a CHK instruction has been used in a low speed execution type program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H) QnPH
4350	**[MULTI-COM.ERROR]** • The multiple CPU high-speed transmission dedicated instruction used in the program specifies the wrong CPU module. Or, the setting in the CPU module is incompatible with the multiple CPU high-speed transmission dedicated instruction. • The reserved CPU is specified. • The uninstalled CPU is specified. • The head I/O number of the target CPU/16 (n1) is outside the range of $3E_H$ to $3E3_H$. • The CPU module where the instruction cannot be executed is specified. • The instruction is executed in a single CPU system. • The host CPU is specified. • The instruction is executed without setting the "Use multiple CPU high speed communication". **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			QnU*7
4351	**[MULTI-COM.ERROR]** • The multiple CPU high-speed transmission dedicated instruction specified by the program cannot be executed to the specified target CPU module. • The instruction name is wrong. • The instruction unsupported by the target CPU module is specified. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			
4352	**[MULTI-COM.ERROR]** The number of devices for the multiple CPU high-speed transmission dedicated instruction specified by the program is wrong. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			

*7 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4353	**[MULTI-COM.ERROR]** The device which cannot be used for the multiple CPU high-speed transmission dedicated instruction specified by the program is specified. ■**Collateral information** • Common Information:Program error location • Individual Information:– ■**Diagnostic Timing** • When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QnU*7
4354	**[MULTI-COM.ERROR]** The character string which cannot be handled by the multiple CPU high-speed transmission dedicated instruction is specified. ■**Collateral information** • Common Information:Program error location • Individual Information:– ■**Diagnostic Timing** • When instruction executed			
4355	**[MULTI-COM.ERROR]** The number of read/write data (number of request/receive data) for the multiple CPU high-speed transmission dedicated instruction specified by the program is not valid. ■**Collateral information** • Common Information:Program error location • Individual Information:– ■**Diagnostic Timing** • When instruction executed			QnU*7
4400	**[SFCP. CODE ERROR]** No SFCP or SFCPEND instruction in SFC program. ■**Collateral information** • Common Information:Program error location • Individual Information:– ■**Diagnostic Timing** • STOP ⟶ RUN	Write the program to the CPU module again using GX Developer.		Qn(H) QnPH QnPRH
4410	**[CAN'T SET(BL)]** The block number designated by the SFC program exceeds the range. ■**Collateral information** • Common Information:Program error location • Individual Information:– ■**Diagnostic Timing** • STOP ⟶ RUN			Q00J/Q00/Q01*2 Qn(H) QnPH QnPRH QnU
4411	**[CAN'T SET(BL)]** Block number designations overlap in SFC program. ■**Collateral information** • Common Information:Program error location • Individual Information:– ■**Diagnostic Timing** • STOP ⟶ RUN			
4420	**[CAN'T SET(S)]** A step number designated in an SFC program exceeds the range. ■**Collateral information** • Common Information:Program error location • Individual Information:– ■**Diagnostic Timing** • STOP ⟶ RUN			

*2 The function version is B or later.
*7 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4421	**[CAN'T SET(S)]** Total number of steps in all SFC programs exceed the maximum. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP → RUN	Write the program to the CPU module again using GX Developer.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00J/Q00/Q01*2 Qn(H) QnPH QnPRH QnU
4422	**[CAN'T SET(S)]** Step number designations overlap in SFC program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP → RUN			
4423	**[CAN'T SET(S)]** The total number of (maximum step No.+1) of each block exceeds the total number of step relays. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP → RUN	Correct the total number of step relays so that it does not exceed the total number of (maximum step No.+1) of each block.		Q00J/Q00/Q01*2 QnU
4430	**[SFC EXE. ERROR]** The SFC program cannot be executed. • The data of the block data setting is illegal. • The SFC data device of the block data setting is beyond the device setting range set in the PLC parameter. **■Collateral information** • Common Information:File name/Drive name • Individual Information:– **■Diagnostic Timing** • STOP → RUN	• Write the program to the CPU module again using GX Developer. • After correcting the setting of the SFC data device, write it to the CPU module. • After correcting the device setting range set in the PLC parameter, write it to the CPU module.		
4431	**[SFC EXE. ERROR]** The SFC program cannot be executed. • The block parameter setting is abnormal. **■Collateral information** • Common Information:File name/Drive name • Individual Information:– **■Diagnostic Timing** • STOP → RUN	Write the program to the CPU module again using GX Developer.		
4432	**[SFC EXE. ERROR]** The SFC program cannot be executed. • The structure of the SFC program is illegal. **■Collateral information** • Common Information:File name/Drive name • Individual Information:– **■Diagnostic Timing** • STOP → RUN			

*2 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4500	**[SFCP. FORMAT ERR.]** The numbers of BLOCK and BEND instructions in an SFC program are not equal. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP ⟶ RUN	Write the program to the CPU module again using the peripheral device.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H) QnPH QnPRH
4501	**[SFCP. FORMAT ERR.]** The configuration of the STEP* to TRAN* to TSET to SEND instructions in the SFC program is incorrect. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP ⟶ RUN			
4502	**[SFCP. FORMAT ERR.]** The structure of the SFC program is illegal. • STEPI* instruction does not exist in the block of the SFC program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP ⟶ RUN			Q00J/Q00/Q01*2 Qn(H) QnPH QnPRH QnU
4503	**[SFCP. FORMAT ERR.]** The structure of the SFC program is illegal. • The step specified in the TSET instruction does not exist. • In jump transition, the host step number was specified as the destination step number. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP ⟶ RUN	• Write the program to the CPU module again using GX Developer. • Read the common information of the error using GX Developer, and check and correct the error step corresponding to that value (program error location).		
4504	**[SFCP. FORMAT ERR.]** The structure of the SFC program is illegal. • The step specified in the TAND instruction does not exist. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP ⟶ RUN	Write the program to the CPU module again using GX Developer.		

*2 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4505	**[SFCP. FORMAT ERR.]** The structure of the SFC program is illegal. • In the operation output of a step, the SET Sn/BLmSn or RST Sn/BLmSn instruction was specified for the host step. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP → RUN	Read the common information of the error using GX Developer, and check and correct the error step corresponding to that value (program error location).	RUN: Off ERR.: Flicker CPU Status: Stop	Q00J/Q00/Q01*2 QnU
4506	**[SFCP. FORMAT ERR.]** The structure of the SFC program is illegal. • In a reset step, the host step number was specified as the destination step. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP → RUN			
4600	**[SFCP. OPE. ERROR]** The SFC program contains data that cannot be processed. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/Continue*1	Qn(H) QnPH QnPRH
4601	**[SFCP. OPE. ERROR]** Exceeds device range that can be designated by the SFC program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			
4602	**[SFCP. OPE. ERROR]** The START instruction in an SFC program is preceded by an END instruction. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)
*2 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4610	**[SFCP. EXE. ERROR]** The active step information at presumptive start of the SFC program is incorrect. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP ⟶ RUN	Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. The program is automatically subjected to an initial start.	RUN: On ERR.: On CPU Status: Continue	Qn(H) QnPH QnPRH
4611	**[SFCP. EXE. ERROR]** Key-switch was reset during RUN when presumptive start was designated for SFC program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • STOP ⟶ RUN			
4620	**[BLOCK EXE. ERROR]** Startup was executed at a block in the SFC program that was already started up. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.		
4621	**[BLOCK EXE. ERROR]** Startup was attempted at a block that does not exist in the SFC program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	• Read the common information of the error using GX Developer, and check and correct the error step corresponding to that value (program error location). • Turn ON if the special relay SM321 is OFF.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00J/Q00/Q01*2 Qn(H) QnPH QnPRH QnU
4630	**[STEP EXE. ERROR]** Startup was executed at a block in the SFC program that was already started up. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.		Qn(H) QnPH QnPRH

*2 The function version is B or later.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4631	**[STEP EXE. ERROR]** • Startup was attempted at the step that does not exist in the SFC program. Or, the step that does not exist in the SFC program was specified for end. • Forced transition was executed based on the transition condition that does not exit in the SFC program. Or, the transition condition for forced transition that does not exit in the SFC program was canceled. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	• Read the common information of the error using the peripheral device, and check and correct the error step corresponding to that value (program error location). • Turn ON if the special relay SM321 is OFF.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00J/Q00/Q01*2 Qn(H) QnPH QnPRH QnU
4632	**[STEP EXE. ERROR]** There were too many simultaneous active steps in blocks that can be designated by the SFC program. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed	Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.		Qn(H) QnPH QnPRH QnU
4633	**[STEP EXE. ERROR]** There were too many simultaneous active steps in all blocks that can be designated. **■Collateral information** • Common Information:Program error location • Individual Information:– **■Diagnostic Timing** • When instruction executed			

*2 The function version is B or later.

12.3.7 Error code list (5000 to 5999)

The following shows the error messages from the error code 5000 to 5999, the contents and causes of the errors, and the corrective actions for the errors.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
5000	**[WDT ERROR]** • The scan time of the initial execution type program exceeded the initial execution monitoring time specified in the PLC RAS setting of the PLC parameter. **■Collateral information** • Common Information:Time (value set) • Individual Information:Time (value actually measured) **■Diagnostic Timing** • Always	• Read the individual information of the error from the peripheral device, check its value (time), and shorten the scan time. • Change the initial execution monitoring time or the WDT value in the PLC RAS setting of the PLC parameter. • Resolve the endless loop caused by jump transition.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H) QnPH QnPRH QnU
	[WDT ERROR] • The power supply of the standby system is turned OFF. • The tracking cable is disconnected or connected without turning off or resetting the standby system. • The tracking cable is not secured by the connector fixing screws. **■Collateral information** • Common Information:Time (value set) • Individual Information:Time (value actually measured) **■Diagnostic Timing** • Always	• Since power-off of the standby system increases the control system scan time, reset the WDT value, taking the increase of the control system scan time into consideration. • When the tracking cable is disconnected during operation, securely connect it and restart the CPU module. If the same error is displayed again, the tracking cable or CPU module has a hardware fault. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		QnPRH
5001	**[WDT ERROR]** • The scan time of the program exceeded the WDT value specified in the PLC RAS setting of the PLC parameter. **■Collateral information** • Common Information:Time (value set) • Individual Information:Time (value actually measured) **■Diagnostic Timing** • Always	• Read the individual information of the error using the peripheral device, check its value (time), and shorten the scan time. • Change the initial execution monitoring time or the WDT value in the PLC RAS setting of the PLC parameter. • Resolve the endless loop caused by jump transition.		QCPU
	[WDT ERROR] • The power supply of the standby system is turned OFF. • The tracking cable is disconnected or connected without turning off or resetting the standby system. • The tracking cable is not secured by the connector fixing screws. **■Collateral information** • Common Information:Time (value set) • Individual Information:Time (value actually measured) **■Diagnostic Timing** • Always	• Since power-off of the standby system increases the control system scan time, reset the WDT value, taking the increase of the control system scan time into consideration. • When the tracking cable is disconnected during operation, securely connect it and restart the CPU module. If the same error is displayed again, the tracking cable or CPU module has a hardware fault. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		QnPRH

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
5010	**[PRG. TIME OVER]** The program scan time exceeded the constant scan setting time specified in the PLC RAS setting of the PLC parameter. **■Collateral information** • Common Information:Time (value set) • Individual Information:Time (value actually measured) **■Diagnostic Timing** • Always	• Review the constant scan setting time. • Review the constant scan setting time and low speed program execution time in the PLC parameter so that the excess time of constant scan can be fully secured.	RUN: On ERR.: On CPU Status: Continue	Qn(H) QnPH QnPRH QnU
	[PRG. TIME OVER] The low speed program execution time specified in the PLC RAS setting of the PLC parameter exceeded the excess time of the constant scan. **■Collateral information** • Common Information:Time (value set) • Individual Information:Time (value actually measured) **■Diagnostic Timing** • Always			Qn(H) QnPH QnPRH
	[PRG. TIME OVER] The program scan time exceeded the constant scan setting time specified in the PLC RAS setting of the PLC parameter. **■Collateral information** • Common Information:Time (value set) • Individual Information:Time (value actually measured) **■Diagnostic Timing** • Always	Review the constant scan setting time in the PLC parameter so that the excess time of constant scan can be fully secured.		Q00J/Q00/Q01
5011	**[PRG. TIME OVER]** The scan time of the low speed execution type program exceeded the low speed execution watch time specified in the PLC RAS setting of the PLC parameter dialog box. **■Collateral information** • Common Information:Time (value set) • Individual Information:Time (value actually measured) **■Diagnostic Timing** • Always	Read the individual information of the error using the peripheral device, check the numerical value (time) there, and shorten scan time if necessary. Change the low speed execution watch time in the PLC RAS setting of the PLC parameter dialog box.		Qn(H) QnPH

12.3.8 Error code list (6000 to 6999)

The following shows the error messages from the error code 6000 to 6999, the contents and causes of the errors, and the corrective actions for the errors.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6000	**[FILE DIFF.]** In a redundant system, the control system and standby system do not have the same programs and parameters. The file type detected as different between the two systems can be checked by the file name of the error common information. • The program is different. (File name = ********.QPG) • The PLC parameters/network parameters/redundant parameters are different. (File name = PARAM.QPA) • The remote password is different. (File name = PARAM.QPA) • The intelligent function module parameters are different. (File name = IPARAM.QPA) • The device initial values are different. (File name = ********.QDI) • The capacity of each write destination within the CPU for online pchange of multiple program blocks is different. (File name = MBOC.QMB) (This can be detected from the standby system of the redundant system.) **■Collateral information** • Common Information:File name • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/ At tracking cable connection/At changing to backup mode/At completion of write during RUN/At system switching/At switching both systems into RUN	• Match the programs and parameters of the control system and standby system. • Verify the systems by either of the following procedures 1), 2) to clarify the differences between the files of the two systems, then correct a wrong file, and execute “Write to PLC“ again. 1) After reading the programs/parameters of System A using GX Developer or PX Developer, verify them with those of System B. 2) Verify the programs/parameters of GX Developer or PX Developer saved in the offline environment with those written to the CPU modules of both systems. • When the capacity of each write destination within the CPU for online change of multiple program blocks is different between the two systems, take corrective action 1) or 2). 1) Using the memory copy from control system to standby system, copy the program memory from the control system to the standby system. 2) Format the CPU module program memories of both systems. (For the capacity of each write destination within the CPU for online change of multiple program blocks, set the same value to both systems.)	RUN: Off ERR.: Flicker CPU Status: Stop	QnPRH
6001	**[FILE DIFF.]** In a redundant system, the valid parameter drive settings (SW2, SW3) made by the DIP switches are not the same. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/At tracking cable connection/At operation mode change	Match the valid parameter drive settings (SW2, SW3) by the DIP switches of the control system and standby system.		

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6010	**[OPE. MODE DIFF.]** The operational status of the control system and standby system in the redundant system is not the same. (This can be detected from the standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	Synchronise the operation statuses of the control system and standby system.	RUN: On ERR.: On CPU Status: Continue	QnPRH
6020	**[OPE. MODE DIFF.]** At power ON/reset, the RUN/STOP switch settings of the control system and standby system are not the same in a redundant system. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Set the RUN/STOP switches of the control system and standby system to the same setting.	RUN: Off ERR.: Flicker CPU Status: Stop	
6030	**[UNIT LAY. DIFF.]** • In a redundant system, the module configuration differs between the control system and standby system. • The network module mode setting differs between the two systems. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:Module No. • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/At tracking cable connection/At operation mode change	• Match the module configurations of the control system and standby system. • In the redundant setting of the network parameter dialog box, match the mode setting of System B to that of System A.		
6035	**[UNIT LAY. DIFF.]** In a redundant system, the CPU module model name differs between the control system and standby system. (This can be detected from the standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/At tracking cable connection/At operation mode change	Match the model names of the control system and standby system.		

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6036	**[UNIT LAY. DIFF.]** A difference in the remote I/O configuration of the MELSECNET/H multiplexed remote I/O network between the control system and standby system of a redundant system was detected. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:Module No. • Individual Information:– **■Diagnostic Timing** • Always	Check the network cables of the MELSECNET/H multiplexed remote I/O network for disconnection.	RUN: Off ERR.: Flicker CPU Status: Stop	QnPRH
6040	**[CARD TYPE DIFF.]** In a redundant system, the memory card installation status (installed/not installed) differs between the control system and standby system. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Match the memory card installation statuses (set/not set) of the control system and standby system.		
6041	**[CARD TYPE DIFF.]** In a redundant system, the memory card type differs between the control system and standby system. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Match the memory card types of the control system and standby system.		
6050	**[CAN'T EXE. MODE]** The function inexecutable in the debug mode or operation mode (backup/separate mode) was executed. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	Execute the function executable in the debug mode or operation mode (backup/separate mode).	RUN: On ERR.: On CPU Status: Continue	
6060	**[CPU MODE DIFF.]** In a redundant system, the operation mode (backup/separate) differs between the control system and standby system. (This can be detected from the standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/At tracking cable connection	Match the operation modes of the control system and standby system.	RUN: Off ERR.: Flicker CPU Status: Stop	

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6061	**[CPU MODE DIFF.]** In a redundant system, the operation mode (backup/separate) differs between the control system and standby system. (This can be detected from the standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • When an END instruction executed	Match the operation modes of the control system and standby system.	RUN: Off ERR.: Flicker CPU Status: Stop	QnPRH
6062	**[CPU MODE DIFF.]** Both System A and B are in the same system status (control system). (This can be detected from the system B of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset/At tracking cable connection	Power the CPU module (System B) which resulted in a stop error, OFF and then ON.		
6100	**[TRK. TRANS. ERR.]** • An error (e.g. retry limit exceeded) occurred in tracking data transmission. (This error may be caused by tracking cable removal or other system power-off (including reset).) • The error occurred at a startup since the redundant system startup procedure was not followed. **■Collateral information** • Common Information:Tracking transmission data classification • Individual Information:– **■Diagnostic Timing** • Always	• Check the CPU module or tracking cable. If the error still occurs, this indicates the CPU module or tracking cable is faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.) • Confirm the redundant system startup procedure, and execute a startup again.	RUN: On ERR.: On CPU Status: Continue	
6101	**[TRK. TRANS. ERR.]** • A timeout error occurred in tracking (data transmission). (This error may be caused by tracking cable removal or other system power-off (including reset).) • The error occurred at a startup since the redundant system startup procedure was not followed. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:Tracking transmission data classification • Individual Information:– **■Diagnostic Timing** • Always			

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6102	**[TRK. TRANS. ERR.]** A data sum value error occurred in tracking (data reception). (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• Check the CPU module or tracking cable. If the error still occurs, this indicates the CPU module or tracking cable is faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.) • Confirm the redundant system startup procedure, and execute a startup again.	RUN: On ERR.: On CPU Status: Continue	QnPRH
6103	**[TRK. TRANS. ERR.]** • A data error (other than sum value error) occurred in tracking (data reception). (This error may be caused by tracking cable removal or other system power-off (including reset).) • The error occurred at a startup since the redundant system startup procedure was not followed. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always			
6105	**[TRK. TRANS. ERR.]** • An error (e.g. retry limit exceeded) occurred in tracking (data transmission). (This error may be caused by tracking cable removal or other system power-off (including reset).) • The error occurred at a startup since the redundant system startup procedure was not followed. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:Tracking transmission data classification • Individual Information:– **■Diagnostic Timing** • Always			
6106	**[TRK. TRANS. ERR.]** • A timeout error occurred in tracking (data transmission). (This error may be caused by tracking cable removal or other system power-off (including reset).) • The error occurred at a startup since the redundant system startup procedure was not followed. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:Tracking transmission data classification • Individual Information:– **■Diagnostic Timing** • Always	• Check the CPU module or tracking cable. If the error still occurs, this indicates the CPU module or tracking cable is faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.) • Confirm the redundant system startup procedure, and execute a startup again.		

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6107	**[TRK. TRANS. ERR.]** A data sum value error occurred in tracking (data reception). (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• Check the CPU module or tracking cable. If the error still occurs, this indicates the CPU module or tracking cable is faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.) • Confirm the redundant system startup procedure, and execute a startup again.	RUN: On ERR.: On CPU Status: Continue	QnPRH
6108	**[TRK. TRANS. ERR.]** • A data error (other than sum value error) occurred in tracking (data reception). (This error may be caused by tracking cable removal or other system power-off (including reset).) • The error occurred at a startup since the redundant system startup procedure was not followed. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always			
6110	**[TRK. SIZE ERROR]** The tracking capacity exceeded the allowed range. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:Tracking capacity excess error factor • Individual Information:– **■Diagnostic Timing** • When an END instruction executed	Reexamine the tracking capacity.		
6111	**[TRK. SIZE ERROR]** The control system does not have enough file register capacity for the file registers specified in the tracking settings. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • When an END instruction executed	Switch to the file registers of which capacity is greater than the file registers specified in the tracking settings.		
6112	**[TRK. SIZE ERROR]** File registers greater than those of the standby system were tracked and transmitted from the control system. (This can be detected from the standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • When an END instruction executed	Switch to the file registers of which capacity is greater than the file registers specified in the tracking settings.		

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6120	**[TRK. CABLE ERR.]** • A start was made without the tracking cable being connected. • A start was made with the tracking cable faulty. • As the tracking hardware on the CPU module side was faulty, communication with the other system could not be made via the tracking cable. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Make a start after connecting the tracking cable. If the same error still occurs, this indicates the tracking cable or CPU module side tracking transmission hardware is faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)	RUN: Off ERR.: Flicker CPU Status: Stop	QnPRH
6130	**[TRK. DISCONNECT]** • The tracking cable was removed. • The tracking cable became faulty while the CPU module is running. • The CPU module side tracking hardware became faulty. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• If the tracking cable was removed, connect the tracking cable to the connectors of the CPU modules of the two systems. • When the error is not resolved after connecting the tracking cable to the connectors of the CPU modules of the two systems and resetting the error, the tracking cable or CPU module side tracking hardware is faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)	RUN: On ERR.: On CPU Status: Continue	
6140	**[TRK.INIT. ERROR]** • The other system did not respond during initial communication at power ON/reset. • The error occurred at a startup since the redundant system startup procedure was not followed. (This can be detected from the control system or standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Power the corresponding CPU module OFF and then ON again, or reset it and then unreset. If the same error still occurs, this indicates the CPU module is faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.) • Confirm the redundant system startup procedure, and execute a startup again.	RUN: Off ERR.: Flicker CPU Status: Stop	
6200	**[CONTROL EXE.]** The standby system has been switched to the control system in a redundant system. (Detected by the CPU that was switched from the standby system to the control system) Since this error code does not indicate the error information of the CPU module but indicates its status, the error code and error information are not stored into SD0 to 26, but are stored into the error log every system switching. (Check the error information by reading the error log using GX Developer.) **■Collateral information** • Common Information:Reason(s) for system switching • Individual Information:– **■Diagnostic Timing** • Always	–	RUN: On ERR.: Off CPU Status: No error	

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6210	**[STANDBY]** The control system has been switched to the standby system in a redundant system. (Detected by the CPU that was switched from the control system to the standby system) Since this error code does not indicate the error information of the CPU module but indicates its status, the error code and error information are not stored into SD0 to 26, but are stored into the error log every system switching. (Check the error information by reading the error log using GX Developer.) **■Collateral information** • Common Information:Reason(s) for system switching • Individual Information:– **■Diagnostic Timing** • Always	–	RUN: On ERR.: Off CPU Status: No error	QnPRH
6220	**[CAN'T SWITCH]** System switching cannot be executed due to standby system error/ tracking cable error/ online module change in execution at separate mode. Causes for switching system at control system are as follows: • System switching by SP. CONTSW instruction • System switching request from network module **■Collateral information** • Common Information:Reason(s) for system switching • Individual Information:Reason(s) for system switching failure **■Diagnostic Timing** • At switching execution	• Check the status of the standby system and resolve the error. • Complete the online module change.	RUN: On ERR.: On CPU Status: No error	
6300	**[STANDBY SYS. DOWN]** Any of the following errors was detected in the backup mode. • The standby system has not started up in the redundant system. • The standby system has developed a stop error in the redundant system. • The CPU module in the debug mode was connected to the operating control system. (This can be detected from the control system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• Check whether the standby system is on or not, and if it is not on, power it on. • Check whether the standby system has been reset or not, and if it has been reset, unreset it. • Check whether the standby system has developed a stop error or not, and if it has developed the error, remove the error factor and restart it. • When the CPU module in the debug mode was connected to the control system operating in the backup mode, make connection so that the control system and standby system are combined correctly.	RUN: On ERR.: On CPU Status: Continue	

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6310	**[CONTROL SYS. DOWN]** Any of the following errors was detected in the backup mode. • The control system has not started up in the redundant system. • The control system has developed a stop error in the redundant system. • The CPU module in the debug mode was connected to the operating standby system. • The error occurred at a startup since the redundant system startup procedure was not followed. (This can be detected from the standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	• The standby system exists but the control system does not exist. • Check whether the system other than the standby system is on or not, and if it is not on, power it on. • Check whether the system other than the standby system has been reset or not, and if it is has been reset, unreset it. • Check whether the system other than the standby system has developed a stop error or not, and if has developed the error, remove the error factor, set the control system and standby system to the same operating status, and restart. • When the CPU module in the debug mode was connected to the control system operating in the backup mode, make connection so that the control system and control system are combined correctly. • Confirm the redundant system startup procedure, and execute a startup again.	RUN: Off ERR.: Flicker CPU Status: Stop	QnPRH
6311 6312	**[CONTROL SYS. DOWN]** • As consistency check data has not transmitted from the control system in a redundant system, the other system cannot start as a standby system. • The error occurred at a startup since the redundant system startup procedure was not followed. (This can be detected from the standby system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Replace the tracking cable. If the same error still occurs, this indicates the CPU module is faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.) • Confirm the redundant system startup procedure, and execute a startup again.	RUN: Off ERR.: Flicker CPU Status: Stop	
6313	**[CONTROL SYS. DOWN]** The control system detected the error of the system configuration and informed it to the standby system (host system) in the redundant system. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Restart the system after checking that the connection between base unit and the system configuration (type/number/parameter of module) are correct.	RUN: Off ERR.: Flicker CPU Status: Stop	QnPRH*1
6400	**[PRG. MEM. CLEAR]** The memory copy from control system to standby system was executed, and the program memory was cleared. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At execution of the memory copy from control system to standby system	After the memory copy from control system to standby system is completed, switch power OFF and then ON, or make a reset.	RUN: Off ERR.: Flicker CPU Status: Stop	QnPRH

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6410	**[MEM.COPY EXE]** The memory copy from control system to standby system was executed. (This can be detected from the control system of the redundant system.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At execution of the function of copying memory from control system to standby system	–	RUN: On ERR.: On CPU Status: Continue	QnPRH
6500	**[TRK. PARA. ERROR]** The file register file specified in the tracking setting of the PLC parameter dialog box does not exist. **■Collateral information** • Common Information:File name/Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset	Read the individual information of the error using GX Developer, and check and correct the drive name and file name. Create the specified file.	RUN: Off ERR.: Flicker CPU Status: Stop	
6501	**[TRK. PARA. ERROR]** The file register range specified in the device detail setting of the tracking setting of the PLC parameter dialog box exceeded the specified file register file capacity. **■Collateral information** • Common Information:File name/Drive name • Individual Information:Parameter number **■Diagnostic Timing** • At power ON/At reset	Read the individual information of the error using GX Developer, and increase the file register capacity.		

12.3.9 Error code list (7000 to 10000)

The following shows the error messages from the error code 7000 to 10000, the contents and causes of the errors, and the corrective actions for the errors.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
7000	**[MULTI CPU DOWN]** • 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. • CPU modules other than CPU No.1 were removed from the base unit in operation, or reset. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • Always	• Read the individual information of the error using GX Developer, identify the error of the CPU module, and remove the error. • Remove the CPU module incompatible with the multiple CPU system from the main base unit. • Check the mounting status of CPU modules other than CPU No.1 and whether the CPU modules were reset.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00/Q01*1 Qn(H)*1 QnPH QnU*6
	[MULTI CPU DOWN] In a multiple CPU system, CPU other than CPU No.1 cannot be started up due to stop error of the CPU No.1 at power-on, which occurs to CPU No.2 to No.4. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Read the individual information of the error using GX Developer, identify the error of the CPU module, and remove the error.		Q00/Q01*1 Qn(H)*1 QnPH QnU*6
7002	**[MULTI CPU DOWN]** • 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. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Reset the CPU module and RUN it again. If the same error is displayed again, this suggests the hardware fault of any of the CPU modules. (Contact your local Mitsubishi representative.) • Remove the CPU module incompatible with the multiple CPU system from the main base unit. Or, replace the CPU module incompatible with the multiple CPU system with the compatible one.		Q00/Q01*1 Qn(H)*1 QnPH
	[MULTI CPU DOWN] • There is no response from the target CPU module in a multiple CPU system during initial communication. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Reset the CPU module and RUN it again. If the same error is displayed again, this suggests the hardware fault of any of the CPU modules. (Contact your local Mitsubishi representative.)		QnU*6
7003	**[MULTI CPU DOWN]** There is no response from the target CPU module in a multiple CPU system at initial communication stage. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Reset the CPU module and RUN it again. If the same error is displayed again, this suggests the hardware fault of any of the CPU modules. (Contact your local Mitsubishi representative.)		Q00/Q01*1 Qn(H)*1 QnPH

*1 The function version is B or later.
*6 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
7004	**[MULTI CPU DOWN]** In a multiple CPU system, a data error occurred in communication between the CPU modules. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • Always	• 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 is faulty. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)	RUN: Off ERR.: Flicker CPU Status: Stop	Q00/Q01*1 QnU*6
7010	**[MULTI EXE. ERROR]** • 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.) • In a multiple CPU system, any of the CPU No. 2 to 4 was reset with power ON. (The CPU whose reset state was cancelled was used to detect an error.) **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Read the individual information of the error using GX Developer, and replace the faulty CPU module. • Replace the CPU module with the one compatible with the multiple CPU system. • Do not reset any of the No. 2 to 4 CPU modules. • Reset CPU No. 1 and restart the multiple CPU system.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00/Q01*1 Qn(H)*1 QnPH QnU*6
	[MULTI EXE. ERROR] The PC CPU module-compatible software package (PPC-DRV-01)*5 whose version is 1.06 or earlier is used in a multiple CPU system. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Change the version of the PC CPU module-compatible software package (PPC-DRV-01)*5 to 1.07 or later.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00/Q01*1
	[MULTI EXE. ERROR] The Q172(H)CPU(N) or Q173(H)CPU(N) is mounted on the multiple CPU high-speed main base unit (Q3□DB). (This may result in a module failure.) **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Replace the Q172(H)CPU(N) and Q173(H)CPU(N) with the Motion CPU compatible with the multiple CPU high-speed main base unit.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*4 QnPH*4
	[MULTI EXE. ERROR] The Universal model QCPU (except Q02UCPU) and Q172(H)CPU(N) are mounted on the same base unit. (This may result in a module failure.) **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Check the QCPU and Motion CPU that can be used in a multiple CPU system, and change the system configuration.	RUN: Off ERR.: Flicker CPU Status: Stop	

*1 The function version is B or later.
*4 The module whose first 5 digits of serial No. is "09082" or later.
*6 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
	[MULTI EXE. ERROR] 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. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Correct the multiple CPU automatic refresh setting. • Correct the "I/O sharing when using multiple CPUs" setting.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00/Q01*1 QnU*6
7011	**[MULTI EXE. ERROR]** The system configuration for using the Multiple CPU high speed transmission function is not met. • The QnUCPU is not used for the CPU No.1. • The Multiple CPU high speed main base unit (Q3□DB) is not used. • Points other than 0 is set to the send range for the CPU module incompatible with the multiple CPU high speed transmission function. • Points other than 0 is set to the send range for the CPU module incompatible with the multiple CPU. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Change the system configuration to meet the conditions for using the Multiple CPU high speed transmission function. • Set the send range of CPU, that does not correspond to multiple CPU compatible area, at 0 point, when performing automatic refreshing in multiple CPU compatible area.	RUN: Off ERR.: Flicker CPU Status: Stop	QnU*3
7013	**[MULTI EXE. ERROR]** The Q172(H)CPU(N) or Q173(H)CPU(N) is mounted to the CPU slot or slots 0 to 2. (The module may break down.) **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Check the QCPU and Motion CPU that can be used in a multiple CPU system, and change the system configuration. • Remove the Motion CPU incompatible with the multiple CPU system.	RUN: Off ERR.: Flicker CPU Status: Stop	QnU
7020	**[MULTI CPU ERROR]** 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.) **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • Always	Read the individual information of the error using the peripheral device, check the error of the CPU module resulting in CPU module fault, and remove the error.	RUN: On ERR.: On CPU Status: Continue	Q00/Q01*1 Qn(H)*1 QnPH QnU*6
7030	**[CPU LAY. ERROR]** 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. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• 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.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00J/Q01/Q01*1 QnU

*1 The function version is B or later.
*3 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.
*6 The Universal model QCPU except the Q00UJCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
7031	**[CPU LAY. ERROR]** An assignment error occurred within the range of the number of CPUs specified in the multiple CPU setting of the PLC parameter dialog box. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• 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.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00J/Q01/Q01*1 QnU
7032	**[CPU LAY. ERROR]** • The number of CPU modules mounted in a multiple CPU system is wrong. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Configure a system so that the number of mountable modules of each CPU module does not exceed the maximum number of mountable modules specified in the specification.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00/Q01*1 QnU*6
7035	**[CPU LAY. ERROR]** The CPU module has been mounted on the inapplicable slot. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Mount the CPU module on the applicable slot.	RUN: Off ERR.: Flicker CPU Status: Stop	Q00J/Q00/Q01*1 QnPRH QnU
7036	**[CPU RAY ERROR]** The host CPU No. set by the multiple CPU setting and the host CPU No. determined by the mounting position of the CPU module are not the same. **■Collateral information** • Common Information:Module No.(CPU No.) • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	• Mount the mounting slot of the CPU module correctly. • Correct the host CPU No. set by the multiple CPU setting to the CPU No. determined by the mounting position of the CPU module.	RUN: Off ERR.: Flicker CPU Status: Stop	QnU*3
8031	**[INCORRECT FILE]** The error of stored file (enabled parameter file) is detected. **■Collateral information** • Common Information:– • Individual Information:File diagnostic information **■Diagnostic Timing** • At power-On/ • At reset/ • STOP → RUN/At writing to progurammable controller	Write the file shown as SD17 to SD22 of individual information to the drive shown as SD16(L) of individual information, and turn ON from OFF the power supply of the CPU module or cancel the reset. If the same error is displayed again, the CPU module has hardware failure. Contact your local Mitsubishi representative, explaining a detailed description of the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QnU
9000	**[F****]** Annunciator (F) was set ON **■Collateral information** • Common Information:Program error location • Individual Information:Annunciator number **■Diagnostic Timing** • When instruction executed	Read the individual information of the error using the peripheral device, and check the program corresponding to the numerical value (annunciator number).	RUN: On ERR.: On/Off *2 CPU Status: Continue RUN: ERR.: USER LED On CPU Status: Continue	QCPU

*1 The function version is B or later.
*3 The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

Error Code (SD0)	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
9010	**[<CHK>ERR ***-***]** Error detected by the CHK instruction. **■Collateral information** • Common Information:Program error location • Individual Information:Failure No. **■Diagnostic Timing** • When instruction executed	Read the individual information of the error using the peripheral device, and check the program corresponding to the numerical value (error number) there.	RUN: On ERR.: Off USER LED On CPU Status: Continue	Qn(H) QnPH QnPRH
9020	**[BOOT OK]** Storage of data onto ROM was completed normally in automatic write to standard ROM. (BOOT LED also flickers.) **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • At power ON/At reset	Use the DIP switches to set the valid parameter drive to the standard ROM. Then, switch power on again, and perform boot operation from the standard ROM.	RUN: Off ERR.: Flicker CPU Status: Stop	Qn(H)*1 QnPH QnPRH
10000	**[CONT. UNIT ERROR]** In the multiple CPU system, an error occurred in the CPU module other than the Process CPU/High Performance model QCPU. **■Collateral information** • Common Information:– • Individual Information:– **■Diagnostic Timing** • Always	Check the details of the generated error by connecting to the corresponding CPU module using GX Developer.	RUN: Off ERR.: Flicker CPU Status: Continue	Qn(H)*1 QnPH

*1 The function version is B or later.

12.3.10 Canceling of Errors

Q series CPU module can perform the cancel operation for errors only when the errors allow the CPU module to continue its operation.
To cancel the errors, follow the steps shown below.

1) Eliminate the cause of the error.
2) Store the error code to be canceled in the special register SD50.
3) Energize the special relay SM50 (OFF → ON).
4) The error to be canceled is canceled.

After the CPU module is reset by the canceling of the error, the special relays, special registers, and LEDs associated with the error are returned to the status under which the error occurred.
If the same error occurs again after the cancellation of the error, it will be registered again in the error history.

When multiple enunciators(F) detected are canceled, the first one with No. F only is canceled.

Refer to the following manual for details of error canceling.
→ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

Point

(1) When the error is canceled with the error code to be canceled stored in the SD50, the lower one digit of the code is neglected.
(Example)
If error codes 2100 and 2101 occur, and error code 2100 to cancel error code 2101.
If error codes 2100 and 2111 occur, error code 2111 is not canceled even if error code 2100 is canceled.

(2) Errors developed due to trouble in other than the CPU module are not canceled even if the special relay (SM50) and special register (SD50) are used to cancel the error.
(Example)
Since "SP. UNIT DOWN" is the error that occurred in the base unit (including the extension cable), intelligent function module, etc. the error cause cannot be removed even if the error is canceled by the special relay (SM50) and special register (SD50).
Refer to the error code list and remove the error cause.

Memo

12.3.11 Error codes returned to request source during communication with CPU module

The Q series CPU module returns an error code to the request source if an error occurs at a request of communication from GX Developer, intelligent function module or network system.

Point

This error code is not an error that is detected by the CPU module self-diagnosis function, so it is not stored in the special relay (SD0).
When the request source is a GX Developer, a message or an error code is displayed.
When the request source is an intelligent function module or network system, an error is returned to the process that was requested.

The error contents of the error codes (4000H to 4FFFH) detected by the CPU module and the messages displayed by the GX Developer are shown in .

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
4000H	Common error	Serial communication sum check error	• Connect the serial communication cable correctly. • Take noise reduction measures.
4001H		Unsupported request was executed.	• Check the command data of the MC protocol, etc. • Check the CPU module model name selected in the peripheral device.
4002H		Unsupported request was executed.	• Check the command data of the MC protocol, etc. • Check the CPU module model name selected in the peripheral device.
4003H		Command for which a global request cannot be performed was executed.	Check the command data of the MC protocol, etc.
4004H		Any operation for the CPU module is prohibited by the system protect function provided against the following events. • The system protect switch is ON. • The CPU module is starting.	• Set the system protect switch of the CPU module to OFF. • Perform operation again after the CPU module has completed starting.
4005H		The volume of data handled according to the specified request is too large.	Check the command data of the MC protocol, etc.
4006H		Serial communication could not be initialized.	• Check with the external device maker for the support condition. • Check the CPU module model name selected in the peripheral device.
4008H		The CPU module is BUSY. (The buffer is not vacant).	After the free time has passed, reexecute the request.
4010H	CPU mode error	Since the CPU module is running, the request contents cannot be executed.	Execute after setting the CPU module to STOP status.
4013H		Since the CPU module is not in a STOP status, the request contents cannot be executed.	Execute after setting the CPU module to STOP status.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
4021H	CPU file related error	The specified drive memory does not exist or there is an error.	• Check the specified drive memory status. • After backing up the data in the CPU module, execute programmable controller memory format.
4022H		The file with the specified file name or file No. does not exist.	Check the specified file name and file No.
4023H		The file name and file No. of the specified file do not match.	Delete the file and then recreate the file.
4024H		The specified file cannot be handled by a user.	Do not access the specified file.
4025H		The specified file is processing the request from the other peripheral device.	Forcibly execute the request, or make the request again after the processing from the other peripheral device is completed.
4026H		The file password or drive keyword set to the target drive (memory) must be specified.	Make access after specifying the file password or drive keyword set to the target drive (memory).
4027H		The specified range exceeds the file range.	Check the specified range and access within that range.
4028H		The same file already exists.	Forcefully execute the request forcibly. Or reexecute after changing the file name.
4029H		The specified file capacity cannot be obtained.	Revise the specified file contents. Or reexecute after cleaning up and reorganizing the specified drive memory.
402AH		The specified file is abnormal.	After backing up the data in the CPU module, execute programmable controller memory format.
402BH		The request contents cannot be executed in the specified drive memory.	Execute again after setting the CPU module to the STOP status. Execute programmable controller memory arrangement to increase the continuous free space of the drive (memory).
402CH		The requested operation cannot be executed currently.	Execute again after a while.
4030H	CPU device specified error	The specified device name cannot be handled.	Check the specified device name.
4031H		The specified device No. is outside the range.	• Check the specified device No. • Check the device assignment parameters of the CPU module.
4032H		There is a mistake in the specified device qualification. The unusable device name (TS,TC,SS,SC,CS,CC) must be specified in MC protocol random reading, random writing (word), monitor registeration and monitor command.	• Check the specified device qualification method. • Check the specified device name.
4033H		Writing cannot be done because the specified device is for system use.	Do not write the data in the specified device, and do not turn on or off.
4034H		Cannot be executed since the completion device for the dedicated instruction cannot be turned ON.	Since the completion device for the target station CPU module cannot be turned ON by the SREAD instruction/SWRITE instruction, execute again after setting the operating status of the target station CPU module to the RUN status.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
4040H	Intelligent function module specification error	The request contents cannot be executed in the specified intelligent function module.	Check whether the specified module is the intelligent function module having the buffer memory.
4041H		The access range exceeds the buffer memory range of the specified intelligent function module.	Check the header address and access number of points and access using a range that exists in the intelligent function module.
4042H		The specified intelligent function module cannot be accessed.	• Check that the specified intelligent function module is operating normally. • Check the specified module for a hardware fault.
4043H		The intelligent function module does not exist in the specified position.	Check the I/O No. of the specified intelligent function module.
4044H		A control bus error occurred during access to the intelligent function module.	Check the specified intelligent function module and other modules and base units for a hardware fault.
4050H	Protect error	The request contents cannot be executed because the memory card write protect switch is on.	Turn off the memory card write protect switch.
4051H		The specified device memory cannot be accessed.	Check the following and make it countermeasures. • Is the memory one that can be used? • Is the specified drive memory correctly installed?
4052H		The specified file attribute is read only so the data cannot be written.	Do not write data in the specified file. Or change the file attribute.
4053H		An error occurred when writing data to the specified drive memory.	Check the specified drive memory. Or reexecute write after changing the corresponding drive memory.
4054H		An error occurred when deleting the data in the specified drive memory.	Check the specified drive memory. Or re-erase after replacing the corresponding drive memory.
4060H	Online registration error	The online debug function is being executed by the other peripheral device.	• Execute the function again after the operation of the other peripheral device has ended. • When the operation was suspended by the other peripheral device, execute the function again after executing it on the other peripheral device to normally complete the operation.
4061H		Communication of the online debug function was unsuccessful.	• Execute communication after the registering the online debug function (e.g.online program change/trace/conditional monitor). • Execute again after checking the communication route such as the communication cable.
4063H		The registered number of locked files exceeded the maximum value.	Execute again after file access by the other peripheral device has ended.
4064H		The specified data of the online debug function is incorrect.	• Check the set data of the online debug function (e.g. online program change/trace/conditional monitor). • Execute again after checking the communication route such as the communication cable.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
4065H	Online registration error	The device allocation information differs from the parameter.	Check the device assignment parameters of the CPU module or the device assignment of the request data.
4066H		The specified drive keyword/file password is wrong.	• Correct the drive keyword of the specified drive. • Correct the file password of the specified file.
4067H		Monitor communication was unsuccessful.	• Check the system area capacity of the user setting specified for programmable controller memory format. • Execute again after checking the communication route such as the communication cable.
4068H		Operation is disabled since the same operation is being executed from the other peripheral device.	Execute the function again after the operation from the other peripheral device has been ended.
406AH		The drive (memory) number that cannot be handled (other than 0 to 4) was specified.	Check the specified drive and specify the correct drive.
4070H	Circuit inquiry error	The program not yet corrected and the one corrected by online program change are different.	Execute Read from PLC to make the program of the peripheral device the same as that of the CPU module, and then execute online program change again.
4080H	Other errors	Request data error	Check the request data specified in the MC protocol, etc.
4081H		The sort subject cannot be detected.	Check the data to be searched.
4082H		The specified command is executing and therefore cannot be executed.	Execute the command again after the request from the other peripheral device is completed.
4083H		An attempt was made to perform operation for the program not registered to the parameters.	Register the program to the parameters.
4084H		The specified pointer P, I did not exist.	Check the pointer P, I in the specified data.
4085H		Pointer P, I cannot be specified because the program is not specified in the parameter.	Specify pointer P, I after registering the program to be executed in the parameter.
4086H		Pointer P, I has already been added.	Check the pointer No. to be added and make correction.
4087H		Trying to specify too many pointer P, I.	Check the specified pointer P, I and make a correction.
4088H		• The specified step No. is not the start of the instruction. • Program stored in the CPU is different from the relevant program.	• Check and correct the specified step No. • Read from PLC to make the program of the peripheral device the same as that of the CPU module, and write to PLC during RUN again.
4089H		An attempt was made to insert/delete the END instruction by online program change.	• Check the specified program file contents. • Write the program after setting the CPU module to the STOP status.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
408AH	Other errors	The file capacity was exceeded by the write during Run.	• Check the capacity of the specified program file. • Write the program after setting the CPU module to the STOP status.
408BH		The remote request cannot be executed.	• Reexecute after the CPU module is in a status where the mode request can be executed. • For remote operation, set the parameter to "Enable remote reset".
408CH		An attempt was made to remote-start the program, which uses the CHK instruction, as a low speed program.	• The program including the CHK instruction cannot be executed at low speed. Execute again after checking the program.
408DH		The instruction code that cannot be handled exists.	• Check whether the model of the used CPU module is correct or not. • The sequence program where online program change was attempted includes the instruction that cannot be handled by the CPU module model name set in the project. Reexamine the sequence program and delete that instruction.
408EH		The write step is illegal.	• Write the program after setting the CPU module to the STOP status. • The starting position of online program change is not specified with the correct program step No. Check whether the used peripheral device supports the CPU module model name and CPU module version set in the project.
40A0H	SFC device specification error	A block No. outside the range was specified.	Check the setting contents and make a correction.
40A1H		A number of blocks that exceeds the range was specified.	Check the number of settings and make a correction.
40A2H		A step No. that is outside the range was specified.	Check the setting contents and make a correction.
40A3H		Step range limit exceeded	Check the number of settings and make a correction.
40A4H		The specified sequence step No. is outside the range.	Check the setting contents and make a correction.
40A5H		The specified device is outside the range.	Check the number of settings and make a correction.
40A6H		The block specification pattern and step specification pattern were wrong.	Check the setting contents and make a correction.
40B0H	SFC file related error	The drive (memory) specified in SFC file operation is wrong.	Check the setting contents and make a correction.
40B1H		The SFC program specified in SFC file operation does not exist.	Check the specified file name and make a correction.
40B2H		The program specified in SFC file operation is not an SFC program.	Check the specified file name and make a correction.
40B3H		Using online program change of SFC, an attempt was made to execute rewrite operation of the "SFC dedicated instruction", such as the "STEP start instruction or transition start instruction", that shows an SFC chart. (SFC dedicated instruction cannot be written during RUN.)	Write the program after setting the CPU module to the STOP status.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
4100H	Other errors	CPU module hardware fault	Change the CPU module.
4101H		Serial communication connection was executed for a different CPU module series.	Check the CPU module series.
4102H		An attempt was made to erase the Flash ROM during use of the file register.	Execute again after setting the CPU module to the STOP status.
4103H		The instruction written during RUN is wrong or illegal.	Execute online program change again, or write the program after setting the CPU module to the STOP status.
4105H		CPU module internal memory hardware fault	Change the CPU module.
4106H		The command cannot be executed since the CPU module is performing system initialization processing.	Execute the operation again after the CPU module has started.
4107H		An attempt was made to perform the operation of the function unavailable for the target CPU module model name.	Do not execute the function unsupported by the target CPU module.
4108H		Operation cannot be made normally by device monitor/test.	Execute device monitor/test again. Before execution, check that access is not made to the access prohibited area.
4109H		The specified operation cannot be executed since the monitoring, set the condition for other application in same computer, is in execution.	Execute the request again after deregistering the monitoring condition on the same screen.
410AH		The specified command cannot be executed because of online prgram change.	Execute the request again after the online program change.
410BH		The registration of monitoring condition was canceled because of online program change.	Execute the registration of monitoring condition again after the online program change.
4110H	CPU mode error	Since the CPU module is in a stop error status, it cannot execute the request.	Execute the request again after resetting the CPU module.
4111H		The requested operation cannot be performed since the other CPU modules have not yet started in the multiple CPU system.	Execute the request again after the other CPU modules have started.

Error code (Hexadecimal)	Error item	Error details	Corrective action
4121H	File-related errors File-related errors	The specified drive (memory) or file does not exist.	Execute again after checking the specified drive (memory) or file.
4122H		The specified drive (memory) or file does not exist.	Execute again after checking the specified drive (memory) or file.
4123H		The specified drive (memory) is abnormal.	Execute programmable controller memory format to make the drive (memory) normal. In the case of the Flash ROM, check the data to be written to the Flash ROM, and write them to the Flash ROM.
4124H		The specified drive (memory) is abnormal.	Execute programmable controller memory format to make the drive (memory) normal. In the case of the Flash ROM, check the data to be written to the Flash ROM, and write them to the Flash ROM.
4125H		The specified drive (memory) or file is performing processing.	Execute again after a while.
4126H		The specified drive (memory) or file is performing processing.	Execute again after a while.
4127H		File password mismatch	Execute again after checking the file password.
4128H		File password mismatch with copy destination	Execute again after checking the file password.
4129H		Cannot be executed since the specified drive (memory) is ROM.	Execute again after changing the target drive (memory).
412AH		Cannot be executed since the specified drive (memory) is ROM.	Execute again after changing the target drive (memory).
412BH		The specified drive (memory) is write-inhibited.	Execute again after changing the write inhibit condition or drive (memory).
412CH		The specified drive (memory) is write-inhibited.	Execute again after changing the write inhibit condition or drive (memory).
412DH		The specified drive (memory) does not have enough free space.	Execute again after increasing the free space of the drive (memory).
412EH		The specified drive (memory) does not have enough free space.	Execute again after increasing the free space of the drive (memory).
412FH		The drive (memory) capacity differs between the drive (memory) copy destination and copy source.	Execute again after checking the drive (memory) copy destination and copy source.
4130H		The drive (memory) type differs between the drive (memory) copy destination and copy source.	Execute again after checking the drive (memory) copy destination and copy source.
4131H		The file name of the file copy destination is the same as that of the copy source.	Execute again after checking the file names.
4132H		The specified number of files does not exist.	Execute again after checking the specified data.
4133H		The specified drive (memory) has no free space.	Execute again after increasing the free space of the drive (memory).
4134H		The attribute specification data of the file is wrong.	Execute again after checking the specified data.
4135H		The date/time data of the peripheral device (personal computer) is beyond the range.	Execute again after checking the clock setting of the peripheral device (personal computer).
4136H		The specified file already exists.	Execute again after checking the specified file name.
4137H		The specified file is read-only.	Execute again after changing the condition of the specified file.
4138H		Simultaneously accessible files exceeded the maximum.	Execute again after decreasing file operations.
4139H		The specified file has exceeded the already existing file range.	Execute again after checking the size of the specified file.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
413A$_H$	File-related errors File-related errors	The specified file has exceeded the already existing file size.	Execute again after checking the size of the specified file.
413B$_H$		The same file was accessed simultaneously from different peripheral devices.	Execute again after a while.
413C$_H$		The specified file is write-inhibited.	Execute again after changing the file condition.
413D$_H$		The specified file capacity cannot be secured.	Execute again after increasing the capacity of the specified drive (memory).
413E$_H$		Operation is disabled for the specified drive (memory).	Execute again after changing the target drive (memory).
413F$_H$		The file is inhibited from write to the standard RAM.	Execute again after changing the specified drive (memory).
414A$_H$	Intelligent function module specification error	Operation was executed for the intelligent function module of the non-control group in the multiple CPU system.	Execute the operation again from the control CPU of the target module.
414C$_H$		The I/O address of the specified CPU module is wrong.	Execute again after checking the I/O address of the specified CPU module.
4150$_H$	File-related errors	An attempt was made to format the drive protected by the system.	Do not format the target drive (memory) as it cannot be formatted.
4151$_H$		An attempt was made to delete the file protected by the system.	Do not delete the target file as it cannot be deleted.
4160$_H$	Online registration error	The registered number of forced inputs/outputs exceeded the maximum value.	Deregister the unused forced inputs/outputs.
4165$_H$		The multiple-block online change system file does not exist.	Execute again after securing the area that enables multiple-block online change at the time of programmable controller memory format.
4166$_H$		Cannot be executed since file batch online change is being made by the same starting source.	Since the file batch online change executed previously remains abnormally terminated for some reason (example: communication disturbance during execution), file batch online change is disabled. Forcibly perform new file batch online change.
4167$_H$		Cannot be executed since file batch online change is being made from the other starting source.	Since the file batch online change executed previously from the other communication route remains abnormally terminated for some reason (example: communication disturbance during execution), file batch online change is disabled. If file batch online change is not being executed by the other peripheral device, forcibly perform new file batch online change.
4168$_H$		The registered number of device test with executing condition exceeds 32.	Deregister the device test with executing condition in CPU module, or decrease the number of registering device test with executing condition at one time.
4169$_H$		The device test with executing condition has never been registered.	Deregister the device test with executing condition after checking the registered number of device test with executing condition in CPU module.
416A$_H$		The specified executing condition does not exist. (Device test with executing condition)	Check whether the specified executing conditions (program, step No. operation timing, device name) in deregistering are registered.
416B$_H$		The specified program is SFC program. (Device test with executing condition)	Check the specifing program name in de/registering the device test with executing condition.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
4170H	Ethernet I/F Error	The passward is wrong.	Check the specified remote passward then, execute the lock/unlock processing of the remote password again.
4171H		The port for communication use is at remote passsword locking status.	Execute communication after unlocking the remote password processing.
4174H		Requested for a wrong module to unlock remote password.	• Stop transmitting from several modules simultaneously when setting a remote password and using User Datagram Protocol (UDP) in MELSOFT connection. • The MELSOFT connection can be used with Transmission Control protocol (TCP) when setting a remote password.
4176H		Communication error occured in direct connection.	• Do not specify the direct connection when using other connection setting. • Do not turn off the CPU power during communication, reset the power, and plug out the cable in direct connection.
4178H		• File operation is disabled since File Transfer Protocol (FTP) function is in operation. • Online operation that requires file access is performed while File Transfer Protocol (FTP) function is in operation.	Retry after the operation for FTP function is completed.
4180H		System error.(The setting data in OS is abnormal.)	• Check whether the power module and the programmable controller CPU are attached properly. • Check whether the system's use environment is within the range of the programmable controller CPU genaral specifications. • Check whether the power capacity is sufficient. • Reset the CPU module. If the error is shown once again, the CPU module hardware must be abnormal. Please contact with system service stations, agencies, or branch offices nearby and consult forl the problems.
4181H		Transmission to the receiving modules is unsuccessful.	• Check the receiving module operation. • Check the status of the lines, such as cables, hubs and routes,connected to receiving modules. • Some line packets may be engaged. Retry to communicate a little while later.
4182H		Communication with receiving modules caused a time-out error.	• Check the receiving module operation. • Check the status of the lines such as a cable, a hub and a route to receiving modules. • Some line packets may be engaged. Retry to communicate a little while later.
4183H		Communication with receiving modules was interrupted.	• Check the receiving module operation. • Check the status of the lines such as cables, hubs and routes connected to receiving modules.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
4184_H	Ethernet I/F Error	• Communication processing buffer has been ran out since requests were consecutively received in MC protocol. • Communication processing buffer has been ran out since received data read is not performed or cannot keep up with the volume. • Communication processing is not available since the communication processing buffer has been ran out.	• For MC protocol, send a request after receiving a response to the previous request. • For socket communication, enable received data read. • For socket communication, decrease the number of data sent from the target device.
4185_H		• The connection to the target device is disconnected before sending a response using MC protocol • The connection to the target device is disconnected during communication	• For MC protocol, keep the connection until a response is sent. • Keep the connection until a sequence of communication is completed. • Other error such as 4184H may be the cause. If any other error has occurred, take corrective action of that error.
4186_H		System error (The argument data in OS is abnormal.)	• Check whether the power module and programmable controller CPU are attached properly. • Check whether the system use environment is within the range of the programmable controller CPU genaral specifications. • Check whether the power capacity is sufficient. • Reset the CPU module. If the error is shown once again, the CPU module hardware is abnormal. Please contact with system service, agency, or branch office nearby and tell the problems.
4187_H		System error (The wait processing in OS is abnormal.)	
4188_H		System error (The data length in OS is abnormal.)	
4189_H		System error (The protocol information in OS is abnormal.)	
$418A_H$		System error (The address data of communicating module in OS is abnormal.)	
$418B_H$		System error (The protocol information in OS is abnormal.)	
$418C_H$		System error (The protocol specification processing in OS is abnormal.)	
$418D_H$		System error (The typed data in OS is abnormal.)	
$418E_H$		System error (The expedited data processing in OS is abnormal.)	
$418F_H$ 4190_H		System error (The protocol information in OS is abnormal.)	
4191_H		System error (The address data of communicating module in OS is abnormal.)	
4192_H		System error (The host module address processing in OS is abnormal.)	
4193_H to 4196_H		System error (The transmission processing in OS is abnormal.)	
4197_H 4198_H		System error (The connection processing in OS is abnormal.)	
4199_H		System error (The connection termination processing is abnormal.)	
$419A_H$		System error (The connection processing in OS is abnormal.)	
$419B_H$		System error (The connection termination processing is abnormal.)	
$419C_H$ $419D_H$		System error (The processing order in OS is abnormal.)	

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
419E$_H$	Ethernet I/F Error	Connection to the module was unsuccessful or interrupped.	• Check the receiving module operation. • Check the status of the lines such as a cable, a hub and a route to receiving modules • Retry to connect a little while later, if the error occured in communication.
419F$_H$		System error (The I/O control processing is abnormal.)	• Check whether the power module and programmable controller CPU are attached properly. • Check whether the system use environment is within the range of the programmable controller CPU genaral specifications. • Check whether the power capacity is sufficient. • Reset the CPU module. If the error is shown once again, the CPU module hardware is abnormal. Please contact with system
41A0$_H$		Data cannot be sent since the target device has no free space in receive area (TCP window size is zero).	• Retry after a while • Check the behavior of the target device. • Check whether the target device is processing data receiving. • Check whether the QnUDE(H)CPU is sending any unnecessary data.
41A1$_H$	Ethernet I/F socket communication error	The port number setting for the Built-in Ethernet port QCPU is invalid.	Correct the port number.
41A2$_H$		The port number setting for the target device is invalid.	
41A3$_H$		• For TCP/IP, the same Host station port No. is specified as MC protocol. • For TCP/IP, a connection with the same host station No. and the same destination port No. are already specified to one communication target.	• Specify a port number that is not duplicated with that of MC protocol • Review port numbers of the Built-in Ethernet port QCPU and correct if duplicated.
41A4$_H$		• For UDP/IP, the same Host station port No. is specified as MC protocol. • For UDP/IP, the specified host station No. is duplicated.	• Specify a port number that is not duplicated with that of MC protocol • Review port numbers of the Built-in Ethernet port QCPU and target device and correct if duplicated.
41A5$_H$		The IP address setting of the target device for OPEN processing is invalid.	Correct the IP address. Specify A, B, or C for the class.
41A6$_H$		Connection was not established in OPEN processing for TCP connection.	• Check the bihavior of the target device. • Check OPEN processing of the target device. • Correct the port No. of the Built-in Ethernet port QCPU and the IP address, port No., and open processing method of the target device. • Check whether the cables are securely connected.
41A8$_H$		Data length is out of permissible range.	• Correct the data length. • If the data is longer than the range, split the data and send them.
41AB$_H$		Failed to send data due to resend timeout in TCP.	• Review the IP address and Ethernet address of the target device. • Check whether the target device has the ARP function. If not, communicate with the one that has the ARP function. • Check the bihavior of the target device. • The line may be congested with packets. Resend data after a while. • Check whether the cables are securely connected.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
$41AC_H$	Ethernet I/F socket communication error	The target device cannot be found.	• Check the bihavior of the target device. • Check whether the cables are securely connected.
$41AD_H$		Data cannot be send due to no connection or disconnection of the cable.	• Check whether the cables are securely connected. • Check the line status by PING test from the target device. • Check the status of Built-in Ethernet port QCPU by self diagnostic test (Built-in Ethernet port QCPU reset) • Send data again
$41B4_H$		The connection number setting is invalid.	• Specify the connection No. within 1 to 16. • Check whether "Socket communication" is selected for "Open system" parameter.
$41B6_H$		The specified connection has already completed OPEN processing.	Perform CLOSE processing and then OPEN processing.
$41B7_H$		• The specified connection has not completed OPEN processing.	• Reexecute after OPEN processing is completed.
$41B9_H$		• Contents of control data is not correct. • Open instruction was executed through open settings parameter even though parameters are not set for "Open settings".	• Correct the contents of the control data. • Configure the open settings parameters or execute the OPEN instruction through control data.
$41C1_H$	File-related errors	The format information data of the specified drive (memory) is abnormal.	The file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
$41C2_H$		File open specification data for file access is wrong.	Execute again after checking the specification data.
$41C3_H$		Simultaneously accessible files exceeded the maximum.	Execute again after decreasing file operations.
$41C4_H$		Simultaneously accessible files exceeded the maximum.	Execute again after decreasing file operations.
$41C5_H$		The specified file does not exist.	Execute again after checking the file.
$41C7_H$		The specified file or drive (memory) does not exist.	Execute again after checking the file or drive (memory).
$41C8_H$		The specified file has exceeded the already existing file range.	Execute again after checking the size of the specified file. If the error recurs after re-execution, the file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
$41C9_H$		Access to the file sector was unsuccessful. The format information data of the target drive (memory) is abnormal.	After backing up the data in the CPU module, execute programmable controller memory format.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
41CA$_H$	File-related errors	Access to the file sector was unsuccessful. The format information data of the target drive (memory) is abnormal.	After backing up the data in the CPU module, execute programmable controller memory format.
41CB$_H$		The file name is specified in a wrong method.	Execute again after checking the file name.
41CC$_H$		The specified file does not exist.	Execute again after checking the file.
41CD$_H$		Access to the file is inhibited by the system.	Do not access the specified file.
41CE$_H$		The specified file is write-disabled since its attribute is read-only.	The specified file is write-inhibited. Execute again after checking the attribute.
41CF$_H$		The specified drive (memory) capacity was exceeded.	Execute again after checking the drive (memory) capacity.
41D0$_H$		The specified drive (memory) has no free space.	Execute again after increasing the free space of the drive (memory).
41D1$_H$		The file name is specified in a wrong method.	Execute again after checking the file name. If the error recurs after re-execution, the file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
41D4$_H$		The specified file has exceeded the already existing file range.	Execute again after checking the size of the specified file. If the error recurs after re-execution, the file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
41D5$_H$		The file of the same name exists.	Forcibly execute the request, or execute after changing the file name.
41D6$_H$		The format information data of the specified drive (memory) is abnormal.	The file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
41D7$_H$		The format information data of the specified drive (memory) is abnormal.	The file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
41D8$_H$		The specified file is being accessed.	Execute again after a while.
41DF$_H$		The specified drive (memory) is write-protected.	Execute again after canceling the write protect of the specified drive (memory).
41E0$_H$		The specified drive (memory) is abnormal or does not exist.	• Execute again after checking whether the memory card has been installed. • After backing up the data, execute programmable controller memory format.
41E1$_H$		Access to the flash ROM was unsuccessful.	• After backing up the data, execute write to PLC (Flash ROM). • Execute again after checking whether the specified drive is the Flash ROM card and whether the memory card size is correct.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
$41E4_H$	File-related errors	Access to the memory card was unsuccessful.	• Execute again after checking whether the memory card has been installed. • Execute again after replacing the memory card. • After backing up the data, execute programmable controller memory format.
$41E7_H$		The format information data of the specified drive (memory) is abnormal.	The file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
$41E8_H$		The format information data of the specified drive (memory) is abnormal.	The file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
$41E9_H$		The specified file is being accessed.	Execute again after some time.
$41EB_H$		The file name is specified in a wrong method.	Execute again after checking the file name.
$41EC_H$		The file system of the specified drive (memory) is logically corrupted.	The file information data may have been corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
$41ED_H$		The specified drive (memory) does not have continuous free space. (The free space for file is sufficient but the continuous free space is insufficient.)	Execute again after deleting unnecessary files or executing programmable controller memory arrangement.
$41EF_H$		Creation of power failure backup for the specified drive (memory) was unsuccessful.	Execute again after checking whether the memory card has been installed.
$41F0_H$		The power failure backup data of the specified drive (memory) are corrupted.	Execute again after checking whether the memory card has been installed.
$41F1_H$		The power failure backup for the specified drive (memory) has a repair command.	Execute again after checking whether the memory card has been installed.
$41F2_H$		Operation cannot be performed since the specified drive (memory) is Flash ROM.	Execute again after checking the specified drive (memory). When performing operation for the Flash ROM, use write to PLC (Flash ROM).
$41F8_H$		The identical data is being accessed by the other peripheral devices.	PLC write to the program memory or transfer to the backup memory is in execution. Access the data again after checking that the above-mentioned function has been completed.
$41FA_H$		Program was written beyond the area where the program can be executed.	Execute again after reducing either the already written program or newly written program.
$41FB_H$		Operation is being performed for the file already specified for the same peripheral device.	Execute again after the currently performed operation is completed.
$41FC_H$		An attempt was made to erase the drive (memory) being used.	The specified drive (memory) is being used and cannot be erased.
$41FD_H$		There are no data written to the Flash ROM.	Write a file by executing write to PLC (Flash ROM).
$41FE_H$		The memory card has not been inserted.	Insert or re-insert the memory card.
$41FF_H$		The memory card type differs.	Check the memory card type.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
41CA$_H$	File-related errors	Access to the file sector was unsuccessful. The format information data of the target drive (memory) is abnormal.	After backing up the data in the CPU module, execute programmable controller memory format.
41CB$_H$		The file name is specified in a wrong method.	Execute again after checking the file name.
41CC$_H$		The specified file does not exist.	Execute again after checking the file.
41CD$_H$		Access to the file is inhibited by the system.	Do not access the specified file.
41CE$_H$		The specified file is write-disabled since its attribute is read-only.	The specified file is write-inhibited. Execute again after checking the attribute.
41CF$_H$		The specified drive (memory) capacity was exceeded.	Execute again after checking the drive (memory) capacity.
41D0$_H$		The specified drive (memory) has no free space.	Execute again after increasing the free space of the drive (memory).
41D1$_H$		The file name is specified in a wrong method.	Execute again after checking the file name. If the error recurs after re-execution, the file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
41D4$_H$		The specified file has exceeded the already existing file range.	Execute again after checking the size of the specified file. If the error recurs after re-execution, the file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
41D5$_H$		The file of the same name exists.	Forcibly execute the request, or execute after changing the file name.
41D6$_H$		The format information data of the specified drive (memory) is abnormal.	The file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
41D7$_H$		The format information data of the specified drive (memory) is abnormal.	The file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
41D8$_H$		The specified file is being accessed.	Execute again after a while.
41DF$_H$		The specified drive (memory) is write-protected.	Execute again after canceling the write protect of the specified drive (memory).
41E0$_H$		The specified drive (memory) is abnormal or does not exist.	• Execute again after checking whether the memory card has been installed. • After backing up the data, execute programmable controller memory format.
41E1$_H$		Access to the flash ROM was unsuccessful.	• After backing up the data, execute write to PLC (Flash ROM). • Execute again after checking whether the specified drive is the Flash ROM card and whether the memory card size is correct.
41E4$_H$		Access to the memory card was unsuccessful.	• Execute again after checking whether the memory card has been installed. • Execute again after replacing the memory card. • After backing up the data, execute programmable controller memory format.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
$41E7_H$	File-related errors	The format information data of the specified drive (memory) is abnormal.	The file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
$41E8_H$		The format information data of the specified drive (memory) is abnormal.	The file information data may be corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
$41E9_H$		The specified file is being accessed.	Execute again after some time.
$41EB_H$		The file name is specified in a wrong method.	Execute again after checking the file name.
$41EC_H$		The file system of the specified drive (memory) is logically corrupted.	The file information data may have been corrupted. After backing up the data in the CPU module, execute programmable controller memory format.
$41ED_H$		The specified drive (memory) does not have continuous free space. (The free space for file is sufficient but the continuous free space is insufficient.)	Execute again after deleting unnecessary files or executing programmable controller memory arrangement.
$41EF_H$		Creation of power failure backup for the specified drive (memory) was unsuccessful.	Execute again after checking whether the memory card has been installed.
$41F0_H$		The power failure backup data of the specified drive (memory) are corrupted.	Execute again after checking whether the memory card has been installed.
$41F1_H$		The power failure backup for the specified drive (memory) has a repair command.	Execute again after checking whether the memory card has been installed.
$41F2_H$		Operation cannot be performed since the specified drive (memory) is Flash ROM.	Execute again after checking the specified drive (memory). When performing operation for the Flash ROM, use write to PLC (Flash ROM).
$41F8_H$		The identical data is being accessed by the other peripheral devices.	PLC write to the program memory or transfer to the backup memory is in execution. Access the data again after checking that the above-mentioned function has been completed.
$41FA_H$		Program was written beyond the area where the program can be executed.	Execute again after reducing either the already written program or newly written program.
$41FB_H$		Operation is being performed for the file already specified for the same peripheral device.	Execute again after the currently performed operation is completed.
$41FC_H$		An attempt was made to erase the drive (memory) being used.	The specified drive (memory) is being used and cannot be erased.
$41FD_H$		There are no data written to the Flash ROM.	Write a file by executing write to PLC (Flash ROM).
$41FE_H$		The memory card has not been inserted.	Insert or re-insert the memory card.
$41FF_H$		The memory card type differs.	Check the memory card type.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
4200H	Online module change-related error	The requested processing cannot be performed since online module change is not enabled in the setting of the multiple CPU setting parameter.	Do not make a request where an error occurred, or make a request again after enabling online module change in the setting of the multiple CPU setting parameter.
4201H		The requested processing cannot be performed since online module change is enabled in the setting of the multiple CPU setting parameter.	Do not make a request where an error occurred, or make a request again after disabling online module change in the setting of the multiple CPU setting parameter.
4202H		The requested processing cannot be performed since an online module change is being performed.	Make a request again after completion of the online module change.
4203H		The module mounted on the main base unit cannot be replaced online since the extension base unit is mounted.	Take following procedures to replace the module mounted on the main base unit. • Switch the system where the target module to be replaced is mounted to the standby system. • Turn OFF power supply of the standby system. • Replace the target module.
4204H		The specified module of the extension base unit cannot be replaced online since it is connected to the standby system.	Change the connection destination to the control system and perform the online module change again. (This corrective action can be made to the module mounted on the extension base unit only.)
4210H		The specified head I/O number is outside the range.	When making a request, specify the head I/O number of the module that will be changed online.
4211H		An online module change request is abnormal.	Check the command used to make a request.
4212H		An online module change is already being made for other equipment.	Make a request again after completion of the online module change, or continue after changing the connection path.
4213H		The specified head I/O number differs from the one registered for online module change.	When making a request, specify the head I/O number of the module being changed online.
4214H		The specified module differs from the one changed online.	Make a request again after mounting the module that is the same as the one changed online.
4215H		The specified module does not exist.	When making a request, specify the head I/O number of the module that will be changed online, or make a request again after mounting the module.
4216H		The specified module is faulty.	Make a request again after changing the module.
4217H		There is no response from the specified module.	Continue the online module changing operation.
4218H		The specified module is incompatible with online module change.	Do not make a request where an error occurred, or make a request again to the module compatible with online module change.
4219H		The specified module is mounted on the extension base unit of the type that requires no power supply module.	Do not make a request to any modules mounted on the extension base unit of the type that requires no power supply module and the main base unit.
421AH		The specified module is not in a control group.	Make a request to the CPU module that controls the specified module.
421BH		An error occurred in the setting of the initial setting parameter of the intelligent function module.	Resume processing after checking the contents of the intelligent function module buffer memory.
421CH		Cannot be executed as the parameter file has been rewritten.	Operation cannot be performed. Operation is interrupted.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
$421D_H$	Online module change-related error	System switching occurs during the online module change.	Connect GX Developer to the new control system and check the status of the online module change. According to the status of online module change, take procedures for it.
$421E_H$		The information of the online module change cannot be sent to the standby system. When the system switching occurs during the online module change, the online module change may not be continued.	The tracking cable may be faulty or the standby system may have an error. • Check the mounting status of the tracking cable or replace the tracking cable. • Check the status of the standby system. When a stop error was detected by the standby system, perform troubleshooting.
$421F_H$		The module mounted on the extension base unit cannot be replaced online when the connection destination is set to the standby system in the separate mode.	• Set the connection destination of a programming tool to the present control system. • Perform the online module change to the module mounted on the extension base unit again.
4240_H	Redundant system-related error	Any of the following unsupported operations was executed for the standby system. • Operation mode change • System switching • Memory copy from control system to standby system	Execute the operation again after changing the transfer setup to the control system.
4241_H		Communication cannot be made since the standby system has been powered off or reset or is in a user watchdog timer error or CPU module hardware fault status.	Request communication after powering on the standby system or setting its Reset switch to the neutral position.
4242_H		Communication with the standby system cannot be made since the tracking cable is faulty or disconnected.	Cannot be executed since the tracking cable is disconnected or faulty. Execute again after checking the tracking cable for disconnection or changing it for a normal one.
4243_H		The command cannot be executed since the standby system is in stop error.	Execute again after removing the stop error of the standby system.
4244_H		The command cannot be executed since the operation status differs from that of the standby system.	Execute again after placing the standby system in the same operation status (RUN/STOP) as the control system.
4245_H		Other system CPU module status error	Check that the other system CPU module has normally started up and that the tracking cable is connected.
4246_H		The command cannot be executed since operation mode (separate/backup) change or system (control/standby system) switching is being executed.	Execute again after the operation mode change or system switching being executed is completed.
4247_H		Memory copy from control system to standby system is already being executed.	Execute again after memory copy from control system to standby system is completed. Check the following and take corrective action. • Is SM1596 of the control system or standby system ON? (ON: Memory copy being executed) Execute again after SM1596 has turned OFF since it is turned OFF by the system on completion of memory copy. • Is SM1597 of the control system ON? (ON: Memory copy completed) Execute again after turning OFF SM1597 of the control system.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
4248H	Redundant system-related error	• Communication was made during system switching. • The system specified in the transfer setup (request destination module I/O number) does not exist.	• Execute again after system switching. • After checking whether the specified system exists or not, restart communication.
4249H		The redundant system is not established. (Control system/standby system or System A/ System B not yet definite)	• Normally start the system as the redundant system. (Make communication again after establishing the system.) • Execute again after changing the transfer setup (request destination module I/O number) to "No settings have been made" (03FFH).
424AH		The command that could not be processed was executed when the transfer setup (request destination module I/O number) is Control system/ Standby system/System A/System B.	Execute again after changing the transfer setup (request destination module I/O number) to "No settings have been made" (03FFH).
424BH		The command cannot be executed since system switching is inhibited by the manual system switching enable flag (SM1592).	Manual system switching is inhibited by the manual system switching enable flag (SM1592). Execute again after turning ON SM1592.
424CH		The specified command cannot be executed during online program change operation.	Execute again after the online program change operation is finished.
424DH		The transfer setup or function unavailable for the debug mode was used.	• Execute again after changing to the backup mode. • Execute again after changing the transfer setup (request destination module I/O number) to System A or control system.
424EH		The control system/standby system specifying method is not supported.	This function cannot be executed since it is not supported.
424FH		System switching was executed by the other condition during execution of system switching by GX Developer.	Although system switching was executed from GX Developer, system switching was executed first by the other condition. Check the system for any problem and execute the operation again as necessary.
4250H		Sum check error occurred in tracking communication.	Execute communication again after changing the tracking cable. If the same error recurs after the tracking cable is changed, the cause is the hardware fault of the CPU module. (Please contact your local nearest Mitsubishi or representative, explaining a detailed description of the problem.)
4251H		The command cannot be executed in the separate mode.	Execute again after changing to the backup mode.
4252H		System switching was not executed since an error occurred in the redundant system compatible network module of the standby system.	By monitoring SD1690 (other system network module No. that issued system switching request), identify the faulty redundant-compatible intelligent module of the standby system, then remove the module fault, and execute again.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
4253_H	Redundant system-related error	Since a communication error or system switching occurred during online program change to the control system CPU module, online program change to the standby CPU module cannot be executed.	Since a communication error or system switching occurred during execution of online program change to the control system CPU module, online program change redundant tracking was suspended. Execute online program change again after confirming that communication with the control system CPU module and standby system CPU module can be normally made. When long time is taken for communication between GX Developer and control system CPU module or standby system CPU module, the error may be avoided by adjusting SD1710 (standby system online program change start waiting time).
4254_H		The command cannot be executed since an error was detected in the tracking communication hardware.	The tracking cable may not be connected correctly, or the tracking communication hardware of the CPU module may be faulty. Check the connection status of the tracking cable. If the condition is not restored to normal after the cable connection status is corrected, the possible cause is the hardware fault of the CPU module.
4255_H		The command cannot be executed since tracking communication is being prepared.	Tracking communication is being prepared when it is connected. Execute the operation again after a while (about 1 second).
4256_H		The command cannot be executed since a time-out error occurred in tracking communication.	The tracking cable may not be connected correctly, or the tracking communication hardware of the CPU module may be faulty. Check the connection status of the tracking cable. If the condition is not restored to normal after the cable connection status is corrected, the possible cause is the hardware fault of the CPU module.
4257_H		The command cannot be executed since the host system CPU module is in a watchdog timer error or CPU module hardware fault status.	The command cannot be executed since the host system is in a watchdog timer error or CPU module hardware fault status. Execute again after checking the host system status.
4258_H		Operation mode being changed (from backup mode to separate mode)	Execute again after completing the operation mode change by changing the status from STOP to RUN using the RUN/STOP switch of the CPU module whose RUN LED is flickering or remote operation.
4259_H		Operation mode change is being executed in the communication route different from the current one from the other peripheral device.	Execute again in the same communication route as the one where the operation mode change was executed.
$425B_H$		Although the communication was made via the intelligent function module mounted on the extension base unit, the combination of the connection destination specification (Redundant CPU specification) and the command is unsupported.	Change the combination of the connection destination specification and the command to the supported combination.
$425C_H$		System switching cannot be made since the module mounted on the extension base unit is being replaced online.	Switch systems after the online module change has been completed.
$425D_H$		Operation mode cannot be changed since the module mounted on the extension base unit is being replaced online.	Change the operation mode after the online module change has been completed.

Table12.2 Error code

Error code (Hexadecimal)	Error item	Error details	Corrective action
4A00H	Link-related error	• Access to the specified station cannot be made since the routing parameters are not set to the start source CPU module and/or relay CPU module. • For routing via a multiple CPU system, the control CPU of the network module for data routing has not started. • When System A/System B is not yet identified in a redundant system configuration, communication was made with the other station via the network module.	• Set to the related stations the routing parameters for access to the specified station. • Retry after a while, or start communication after confirming that the system for data routing has started. • In a redundant system configuration, connect the tracking cable, start System A/System B normally, and then restart communication.
4A01H		The network of the No. set to the routing parameters does not exist.	Check and correct the routing parameters set to the related stations.
4A02H		Access to the specified station cannot be made.	• Check the network module/link module for an error or offline status. • Check to see if the network number/PC number setting has no mistake.
4A03H		A request for network test was issued.	Check the request data of the MC protocol, etc.
4B00H	Target-related error	An error occurred in the access destination or relay station, or the specified transfer setup (request destination module I/O number) is illegal.	• Take corrective action after checking the error that occurred at the specified access destination or the relay station to the accessed station. • Check the transfer setup (request destination module I/O number or programmable controller number) in the request data of the MC protocol, etc.
4B01H		The target is not the No. 1 CPU of the multiple CPU system.	Execute the request for the No. 1 CPU of the multiple CPU system.
4B02H		The request is not addressed to the CPU module.	Perform operation for the module that can execute the specified function.
4B03H		• The specified route is not supported by the specified CPU module version. • The communication target CsPU is not mounted.	Check whether the specified route is supported or not.
4B04H		The specified transfer setup (request destination module I/O number) is not supported.	In the target setup, an illegal value is set as the head I/O number of the target module.
4C00H	Multiple CPU-related error	The specified device is unavailable for the motion CPU or outside the device range.	Check the request data contents.
4C08H		There are a total of 33 or more DDWR and DDRD requests.	Execute again after reducing the number of DDWR and DDRD requests to be executed simultaneously.
4C09H		The specification of the requested CPU module No. is illegal.	Check the request data contents.

12.4 Module Change during System Operation

This section explains how to change the module online (with power on) without stopping the system.

12.4.1 Online module change

An online module change Note12.15 is a function that allows the Q series module mounted on the main base unit or extension base unit to be changed during system control executed by the Process CPU or Redundant CPU.
Using an online module change, the module that failed during control can be replaced with the module of the same model name.

Point

- An online module change cannot add a module or change the current module for another module.
- When executing an online module change for the Process CPU in the multiple CPU system, it is necessary to specify "Online module change enable for other CPU" in the multiple CPU setting of the PLC parameter dialog box.
  Also, there are restrictions on the versions of the CPU modules that comprise the multiple CPU system. For details, refer to the following.
  QCPU User's Manual (Multiple CPU System)
- Perform an online module change after confirming that the system outside the programmable controller will not malfunction.
- To prevent an electric shock, operating module malfunction, etc., provide a switch or similar individually cutting-off means for the external power supply of the module to be changed online.
- It is recommended to verify that the operations of the unchanged modules will not be affected by executing an online module change in an actual system beforehand to confirm the following
  - The means and structure that will cut off the connection with the external device are correct.
  - ON/OFF of switches, etc. has no influence.
- Do not mount/remove the module onto/from base unit or terminal block more than 50 times (IEC 61131-2 compliant), after the first use of the product.
  Failure to do so may cause the module to malfunction due to poor contact of connector.

Note12.15 Basic High performance Universal
The Basic model QCPU, High Performance model QCPU and Universal model QCPU are not compatible with an online module change.

(1) System configuration that allows online module change

An online module change can be peformed under the following conditions.

(a) Modules that can be changed online

The modules that can be changed online are shown in Table12.3.

Table12.3 Modules that can be changed online

Module type		Restrictions
Input module		No restrictions
Output module		
I/O combined module		
Intelligent function module	Analog-digital converter module	Supported by function version C.
	Digital-analog converter module	
	Temperature input module	
	Temperature control module	
	Pulse input module	

*1: When using Redundant CPU and/or connecting a extension base unit, online module change cannot be performed to a intelligent function module mounted on the main base unit.

The modules other than listed above cannot be changed online.
For whether the above intelligent function modules can be changed online or not and their changing procedures, refer to the manual of the used intelligent function module.

(b) Versions of GX Developer that supports online module change

GX Developer is required to perform an online module change.
For GX Developer version, refer to the following

When Process CPU is used : ☞Section 2.1.6

When Redundant CPU is used : ☞QnPRHCPU User's Manual (Redundant System)

An online module change can also be performed from GX Developer via a network.

(c) Restrictions on base units

1) When the slim type main base unit (Q3☐SB) is used, an online module change cannot be performed.
2) When the extension base unit of the type that requires no power supply module (Q5☐SB) is used, an online module change cannot be performed for the modules mounted on all base units connected.
3) When the redundant type extension base unit (Q6☐WRB) is used, the online module change cannot be performed to all modules connected to the main base unit.

(d) Control status of CPU module

1) An online module change can be executed when a stop error has not occurred.
Whether an online module change can be executed or not depending on the control status of the CPU module is shown in Table12.4.

Table12.4 Whether online module change can be executed or not

Control status	RUN status*1	STOP status	PAUSE status	At stop error
Whether online module change can be executed or not	Can be executed	Can be executed	Can be executed	Cannot be executed

*1: Including the case where a continue error has occurred in the RUN status.

2) An online module change can be continued if the control status of the CPU module is changed to the STOP/PAUSE status during the online module change.
In either of the following cases, however, the online module change cannot be continued.
•When the CPU module is reset
•When a stop error occurs

(e) Number of modules that can be changed online

The number of modules that can be changed online at one time is one for each CPU module.
Multiple modules cannot be changed simultaneously.

(2) Restrictions on online module change

The following operations cannot be performed during an online module change.

- Issue an online module change request from multiple GX Developers to one CPU module.
- Write parameters to the CPU module during online module change.

Point

The following message appears (refer to Figure 12.24) if an online module change request is issued from another GX Developer to the CPU module during online module change.
After confirming the message, select "Yes" or "No".

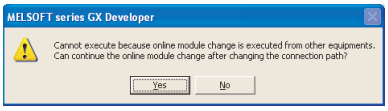


Figure 12.24 Message screen

When "Yes" is selected
Online module change operation is switched to "GX Developer 2)" that issued the request later. (Operation is continued from the pre-switching status.)

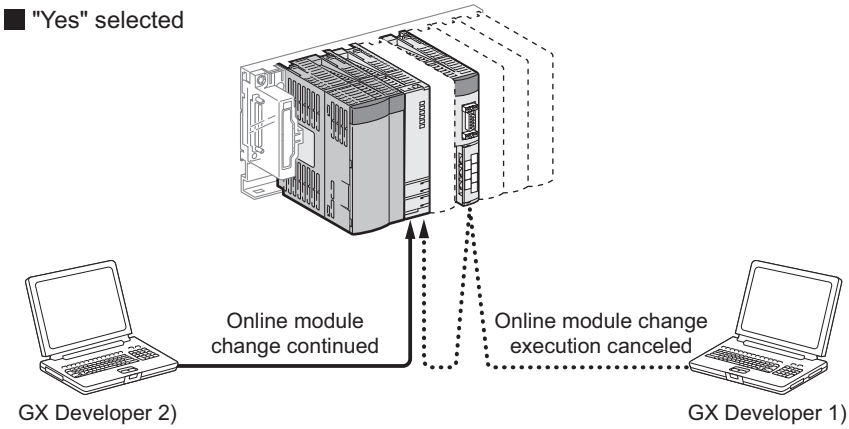


Figure 12.25 Online module change (When "Yes" is selected)

When "No" is selected
The operation of online module change "GX Developer 2)" requested later is suspended. (Online module change "GX Developer 1)" executed first is continued.)

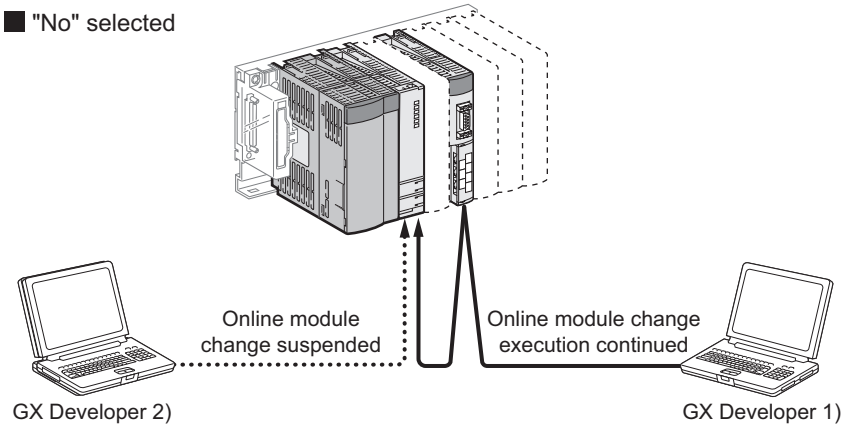


Figure 12.26 Online module change (When "No" is selected)

(3) Special relays and special register related to online module change

Information during online module change is stored into the special relays (SM235, SM236) and special register (SD235).

- Whether the online module change of the corresponding CPU module is executed or not can be checked by monitoring SM235, SM236 and SD235.
- SM235: Online module change flag (turns on during online module change)
- SM236: Flag that turns on only one scan after online module change (turns on only one scan after completion of online module change)
- SD235: Module being changed online (stores the starting I/O number of the module being changed online/10H)

Refer to Section 12.7 for details of SM235 and SM236 and to Section 12.8 for details of SD235.

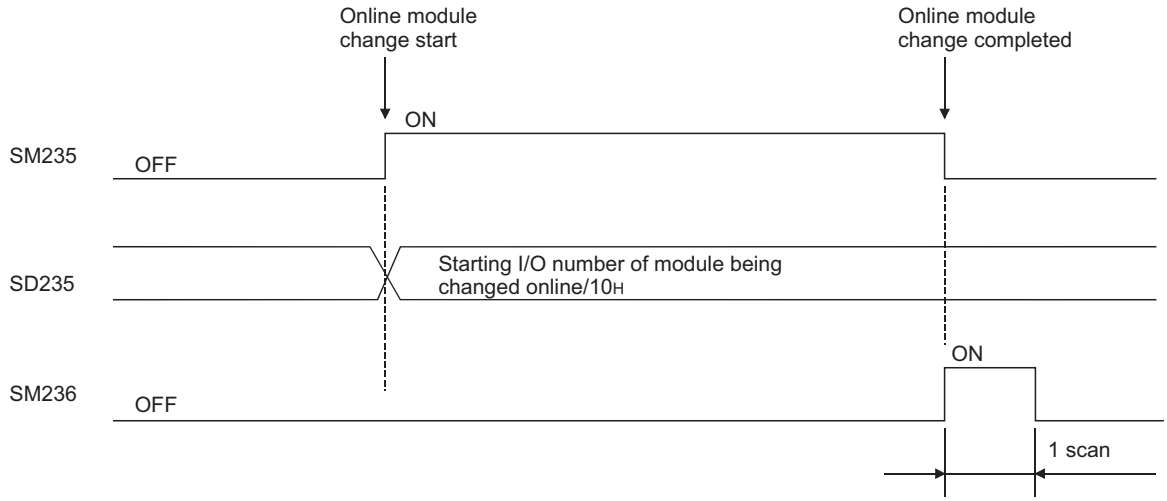


Figure 12.27 Time chart

(4) Online module change procedure

The following explains the online module change procedure of the I/O module.

For the online module change procedure of the intelligent function module, refer to the manual of the used intelligent function module.

Point

- It is recommended to turn off the output (Y) from the output module/I/O combined module to be changed online before it is changed.
- When making an online module change for the Redundant CPU, specify "No settings have been made (Default)", "System A" or "System B" as the target system in the "transfer setup" by GX Developer.
  Do not specify the "Control system" or "Standby system" as the target system.
  If the "Control system" or "Standby system" is specified in the transfer setup, the following error dialog (refer to Figure 12.28) appears at execution of an online module change.
  When the following error dialog is displayed, change the target system to "No settings have been made (Default)", "System A" or "System B", and then perform an online module change.

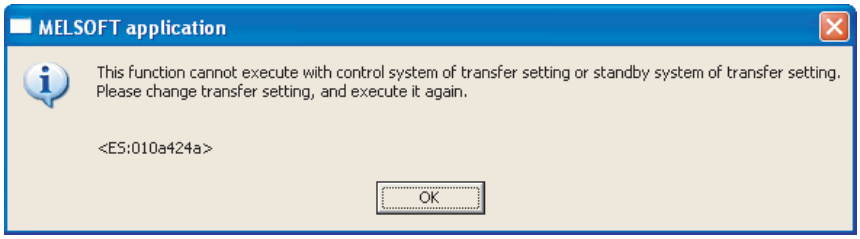


Figure 12.28 Error dialog box

- When executing online module change for the module mounted on the extension base unit in the Redundant CPU, access cannot be made to a module mounted on the extension base unit from the standby system. Set [Transfer setup] in GX Developer, checking that the trasnfer target Redundant CPU module is the control system.

1) Choose [Diagnostics] → [Online module change] on GX Developer, and select the "Online module change" mode.

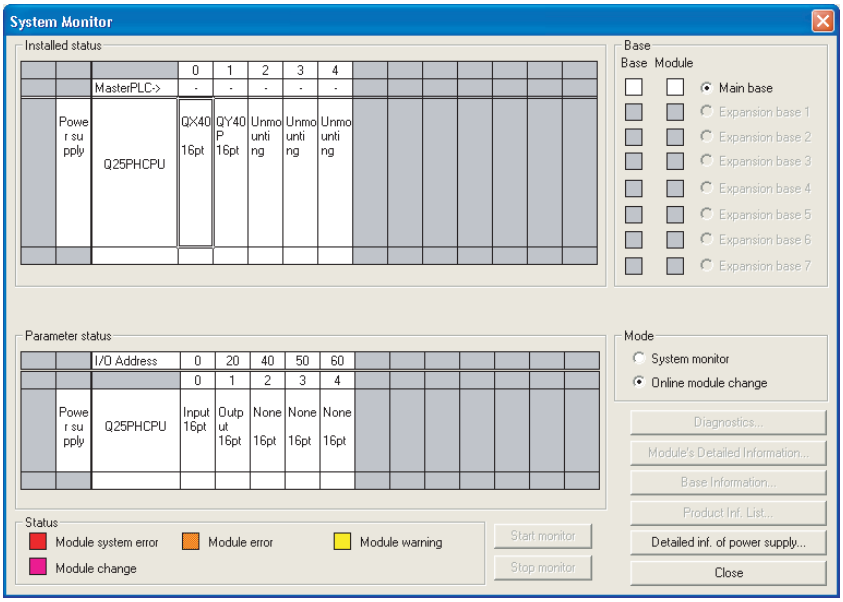


Figure 12.29 System monitor

2) Double-click the module to be changed online to display the online module change screen. (Table12.5 shows the communication status with the target module for online module change when the following screen (refer to Figure 12.30) is displayed.)

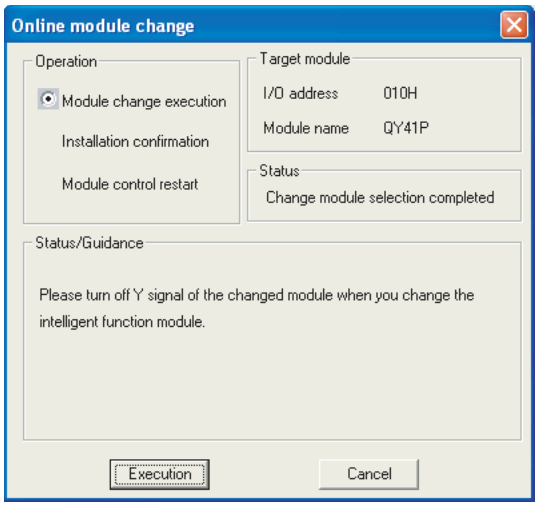


Figure 12.30 Online module change screen

Table12.5 Communication status with the module

Target module, item		Executed/Not executed
Input module refresh		Executed
Output module refresh		Executed
I/O hybrid module	Input refresh	Executed
	Output refresh	Executed
Intelligent function module	Input refresh	Executed
	Output refresh	Executed
	FROM/TO instruction	Executed
	Instruction using intelligent function module device	Executed
	Intelligent dedicated instruction	Executed
	Intelligent automatic refresh	Executed
	Buffer memory batch monitor	Executed

3) Click the Execution button to enable a module change.
(Table12.6 shows the communication status with the target module for online module change when the following screen (refer to Figure 12.31) is displayed.)

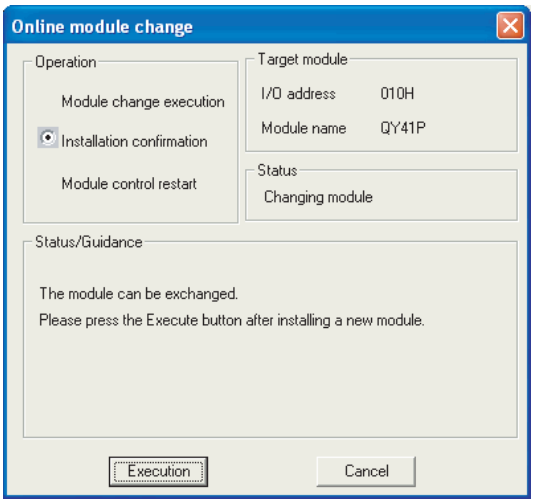


Figure 12.31 Online module change screen

Table12.6 Communication status with the module

Target module, item		Executed/Not executed
Input module refresh		Not executed (Data held)
Output module refresh		Not executed
I/O hybrid module	Input refresh	Not executed (Data held)
	Output refresh	Not executed
Intelligent function module	Input refresh	Not executed
	Output refresh	Not executed
	FROM/TO instruction	No processing
	Instruction using intelligent function module device	No processing
	Intelligent dedicated instruction	No processing
	Intelligent automatic refresh	No processing
	Buffer memory batch monitor	Communication error

4) With a switch or other device, cut off the connection with the external device (module I/O signals).
5) Turn off the switch of the external power supply for module to shut off power supply.
6) Disconnect the terminal block or connector from the module.
7) Remove the module. (☞ Section 10.3.3)
8) Mount a new module on the same slot. (☞ Section 10.3.3)
9) Connect the terminal block or connector to the module.
10) Turn on the switch of the external power supply for module to resume power supply.
11) With a switch or other device, make a connection with the external device (module I/O signals).

12)After mounting the module, click the Execution button.

(Table12.7 shows the communication status with the target module for online module change when the following screen (refer to Figure 12.32) is displayed.)

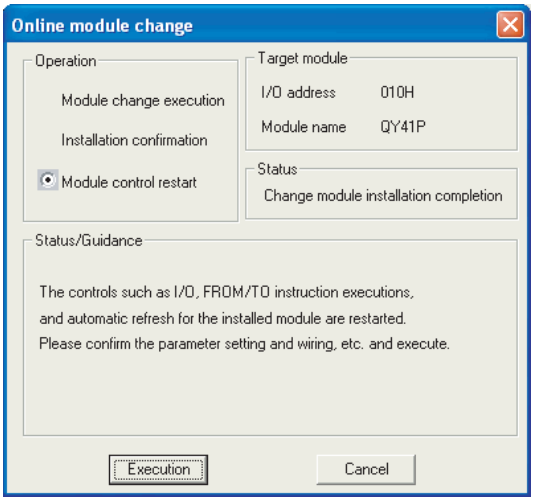


Figure 12.32 Online module change screen

Table12.7 Communication status with the module

Target module, item		Executed/Not executed
Input module refresh		Not executed (Data held)
Output module refresh		Not executed
I/O hybrid module	Input refresh	Not executed (Data held)
	Output refresh	Not executed
Intelligent function module	Input refresh	Executed
	Output refresh	Executed
	FROM/TO instruction	No processing
	Instruction using intelligent function module device	No processing
	Intelligent dedicated instruction	No processing
	Intelligent automatic refresh	No processing
	Buffer memory batch monitor	Executed

Point

When the initial settings of the intelligent function module have been made by GX Configulator, the set data are written to the intelligent function module.

13)Click the Execution button to start control.

14)The Online module change completed screen appears.

(Table12.8 shows the communication status with the target module for online module change when the following screen (refer to Figure 12.33) is displayed.)

Figure 12.33 Online module change screen

Table12.8 Communication status with the module

Target module, item		Executed/Not executed
Input module refresh		Executed
Output module refresh		Executed
I/O hybrid module	Input refresh	Executed
	Output refresh	Executed
Intelligent function module	Input refresh	Executed
	Output refresh	Executed
	FROM/TO instruction	Executed
	Instruction using intelligent function module device	Executed
	Intelligent dedicated instruction	Executed
	Intelligent automatic refresh	Executed
	Buffer memory batch monitor	Executed

(5) Operation in case of system switching occurrence during online module change (When Redundant type extension base unit is used)

The following describes the procedures to be taken when the system switching occurs during online module change is performed to the module mounted on the extension base unit in the Redundant CPU.

1) Connect GX Developer to the new control system.

2) Check the status of the module where the online module change was performed at [System Monitor].

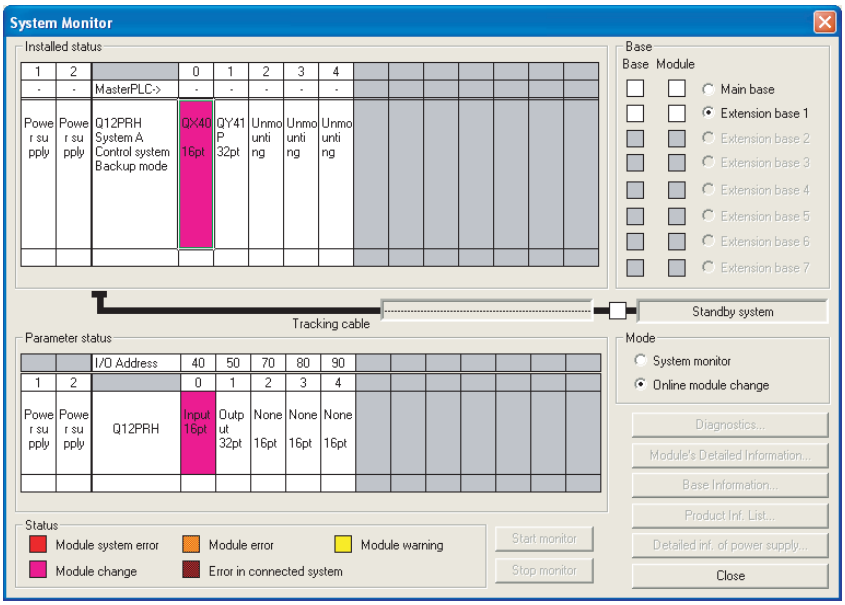


Figure 12.34 System monitor

3) When selecting [Online module change] in a status of a module being replaced online, screen shown in Figure 12.30 is displayed.

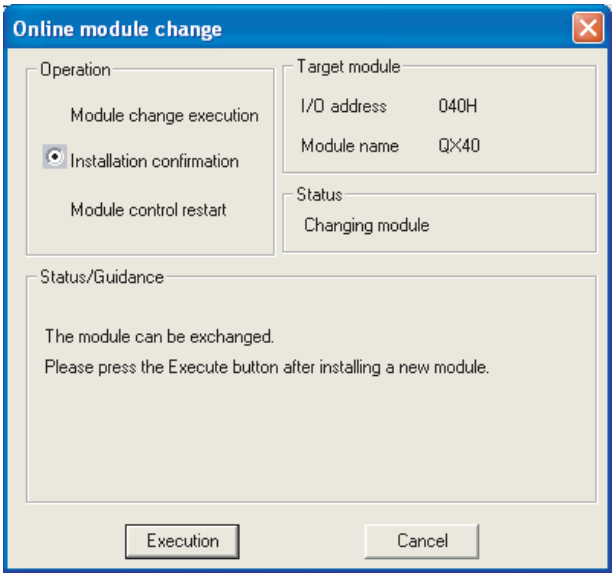


Figure 12.35 Online module change screen

4) Continue the operation that has been executed before system switching occurrence.

Point

- When connecting the new control system and clicking the Execution button, the message shown in Figure 12.31 may be shown. In this case, select [Yes] and continue operation for the online module change.

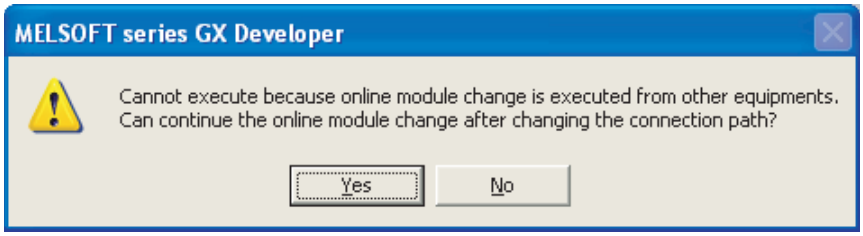


Figure 12.36 Message dialog box

- At the time of completion of the online module change, the error dialog box shown in Figure 12.32 may be shown, but the online module change is completed normally.

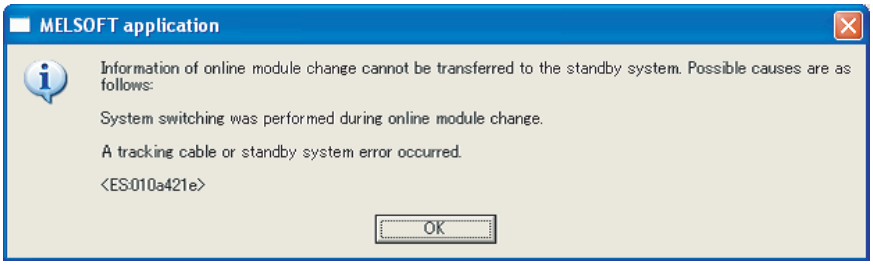


Figure 12.37 Error dialog box

12.4.2 Change of redundant power supply module

Following the flowchart shown below, change a faulty redundant power supply module online (with power on).
(It is assumed that the other redundant power supply module is normally operating.)

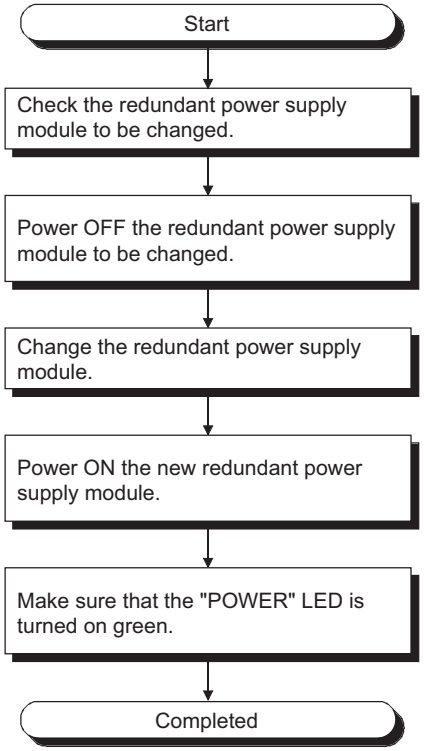


Figure 12.38 Redundant power supply module replacement procedure

Point

- If either redundant power supply module fails, change it for a normal one earlier than usual (within 14 days as a guideline).
  If it does not fail, it is recommended to change the redundant power supply module for a new one after five years have elapsed.
- Change the redundant power supply module with extreme care, referring to Section 10.3.3(1).
  If the module fixing projection of the redundant power supply module comes off from the module fixing hole of the redundant base unit, an error will occur due to connector damage.
- When the redundant power supply system is used, a "continue" error will occur due to a redundant power supply module failure. Cancel the error after changing the faulty redundant power supply module for a normal one.
  Note12.16, Note12.17
- When the redundant power supply system is used, the failure status of the redundant power supply module can be checked by the system monitor of GX Developer (Version 8.18U or later) or the special relay SM1781/special register SD1781. Note12.16, Note12.17
  For details of the system monitor, refer to the following.
  GX Developer Operating Manual

Note12.16 **Basic**

Failure of redundant power supply cannot be detected by the Basic model QCPU.

Note12.17 **High performance** **Process**

When using the High Performance QCPU or the Process CPU, confirm the versions of CPU module and GX Developer. (Appendix 2)

12.5 I/O Module Troubleshooting

This section explains possible problems with I/O circuits and their corrective actions.

12.5.1 Input circuit troubleshooting

The following describes possible problems with input circuits and their corrective actions.

Table12.9 Input circuit problems and corrective actions

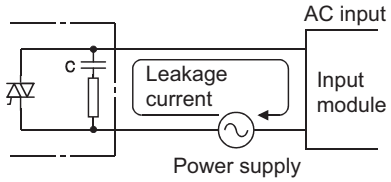
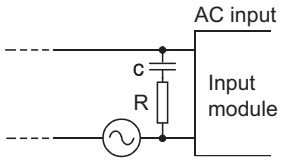
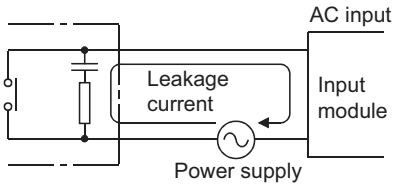
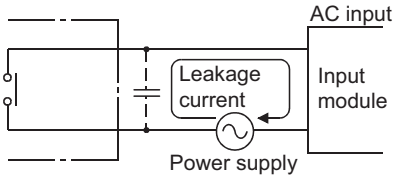
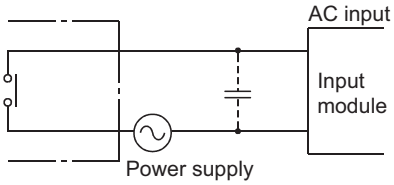
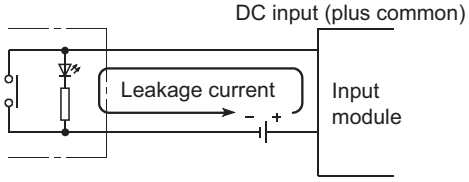
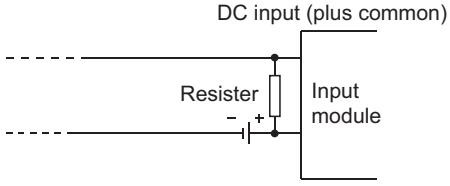
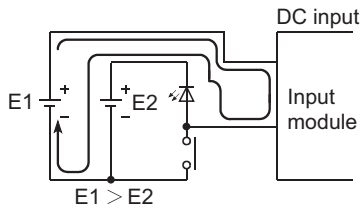
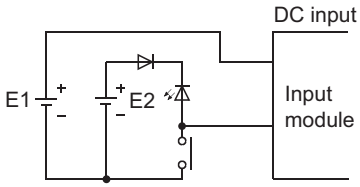
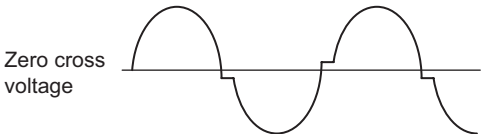
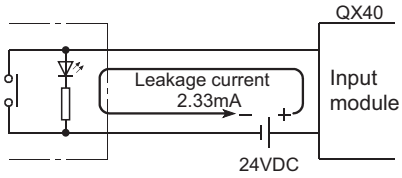
	Condition	Cause	Corrective Action
Example 1	Input signal is not turned off.	• Leakage current of input switch (e.g. drive by non-contact switch). 	• Connect an appropriate CR so that the voltage across the terminals of the input module becomes lower than the off voltage.  It is recommended to use 0.1 to 47μF+47 to 120Ω(1/2W) for the CR constant.
Example 2	Input signal is not turned off.	• Drive by a limit switch with neon lamp. 	• Same as Example 1. • Provide an independent display circuit separately.
Example 3	Input signal is not turned off.	• Leakage current due to line capacity of wiring cable. (Line capacity C of twisted pair wire is approx. 100 pF/m). 	• Same as Example 1. (However, leakage current is not generated when the power supply is located in the input equipment side as shown below.) 
Example 4	Input signal is not turned off.	• Drive by a switch with LED display. 	• Connect an appropriate resistor so that the current across the input module becomes lower than the off current.  *: A calculation example of the resistance to be connected is shown on the following page.

Table12.9 Input circuit problems and corrective actions (Continued)

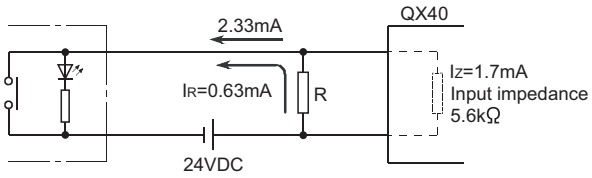
	Condition	Cause	Corrective Action
Example 5	Input signal is not turned off.	• Sneak path due to the use of two power supplies. 	• Use only one power supply. • Connect a sneak path prevention diode. (Figure below) 
Example 6	Input signal is not turned on (AC input module)	Stepwise distortion as shown below appears to the zero cross voltage of input signal (AC). 	Improve input signal waveform by using the on-line system etc.
Example 7	False input due to noise	Depending on response time setting, noise is imported as input.	Change the response time setting. Example: 1ms to 5ms (When excessive noise is cyclic, shorter response time setting may produce a higher effect.) When the above action is not effective, take measures against noise to block excessive noise, e.g. avoid tying the power cables and control cables in a bundle, and add surge absorbers to the noise sources such as the relays and contactors used with the same power supply.

<Calculation example of the resistance to be connected in Example 4>

- Connecting a switch with LED display, in which a maximum 2.33mA leakage current flows when 24VDC is supplied to the QX40.



- In this case, the circuit does not satisfy the condition that the off current of the QX40 is 1.7mA or less. Connect a resistance as follows.



(To the next page)

(From preceding page)

- In order to satisfy the condition that the OFF current of the QX40 is 1.7mA or less, the resistance R, in which a 0.63mA or more current flows, shall be connected.
  Calculating with the formula "IR: IZ = Z (Input impedance): R",

$$R < \frac{I_Z}{I_R} \times Z \text{ (Input impedance)} = \frac{1.7}{0.63} \times 5.6 = 15.11[k\Omega]$$

  the resistance R will be R<15.11kΩ.
  Consequently, if the resistance R is set to 12kΩ, the electric power W of the resistance R will be calculated in the following formula,
  W= (Input voltage)^2/R=28.8^2/12000=0.069[W].

- Since the resistance requires the electric power which is 3 to 5 times of the power actually consumed, the resistance to be connected to the corresponding terminal shall be 12.0kΩ and 1/4 to 1[W].

- The OFF voltage of the QX40 when the resistance R calculated above is connected will be 8.90[V]

$$\frac{1}{\frac{1}{12.0[k\Omega]} + \frac{1}{5.6[k\Omega]}} \times 2.33[mA] = 8.90[V]$$

  This also satisfies the condition that the OFF voltage of the QX40 is 11V or less.

12.5.2 Output circuit troubleshooting

This section explains trouble examples and troubleshooting in the output circuit.

Table12.10 Output circuit troubleshooting

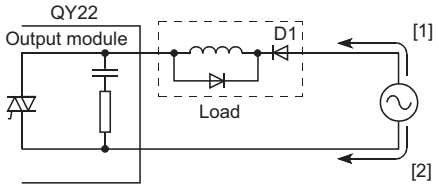
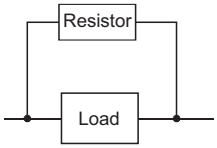
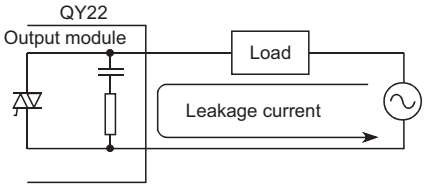
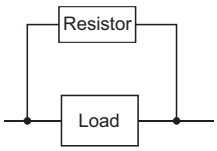
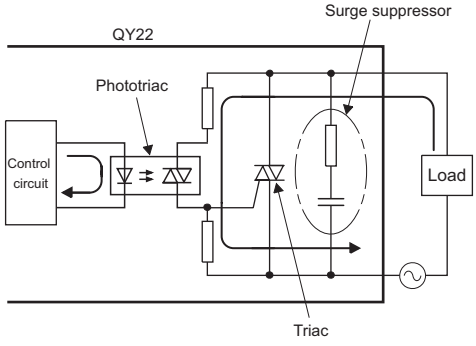
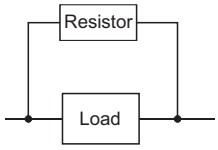
	Condition	Cause	Corrective Action
Example 1	Excessive voltage is applied to load when output turns off.	• When load is half-wave rectified inside (This is typical of some solenoids.)  • When the polarity of the power supply is [1], the capacitor C is charged. When the polarity is [2], the voltage charged in C plus the power supply voltage is applied to across D1. The maximum value of the voltage is approx. 2.2E. (This usage does not pose problems to the output components but may deteriorate the diode built in the load, causing burnout, etc.)	• Connect a resistor of several ten KΩ to several hundred KΩ at both ends of the load. 
Example 2	Load does not turn off.(Triac output)	• Leakage current due to the built-in surge suppressor 	• Connect a resistor at both ends of the load. (If the wiring from the output module to the load is long, be careful since there may be a leakage current due to the line capacity.) 
Example 3	The load is not turned off. (Triac output)	• The load current is lower than the minimum load current. • When the load current is lower than the minimum load current of the output module, the triac does not operate and the load current flows into a phototriac as shown by the arrow in the following figure. When an inductive load is being connected, the load may not be turned off since surge at the time of off is applied to the phototriac. 	• Connect a resistor to both ends of a load so that the load current is higher than the minimum load current. 

Table12.10 Output circuit troubleshooting (Continued)

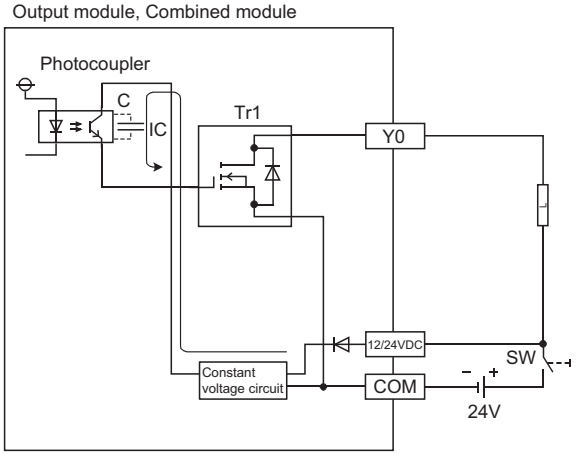
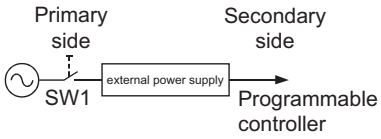
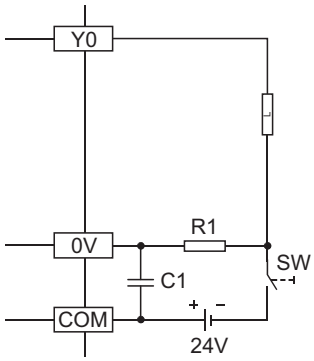
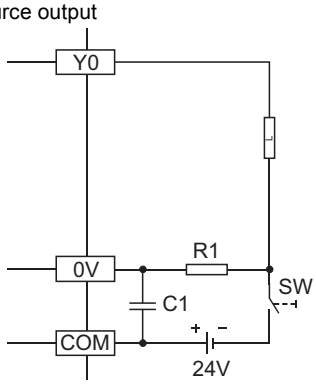
	Situation	Cause	Countermeasure
Example 4	When the external power supply turns on, the load is turned on for a moment.	Erroneous output due to the stray capacitance (C) between collector and emitter of hotocoupler. (There is no erroneous output at normal load. An erroneous output may occur at high sensitivity load (such as solid state relay).) Output module, Combined module  I	When turning on or off the external power, check that the external power supply rising edge is 10ms or more, and switch the SW1 to the primary side of external power supply.  When switching to the secondary side of the external power supply is required, the external power supply rising edge connected a condenser must be slow, and measured 10ms or more. Sink output  Source output  *: Measures will not be effective to the following module due to the characterictic of external power supply circuit. • QY81P

Table12.10 Output circuit troubleshooting (Continued)

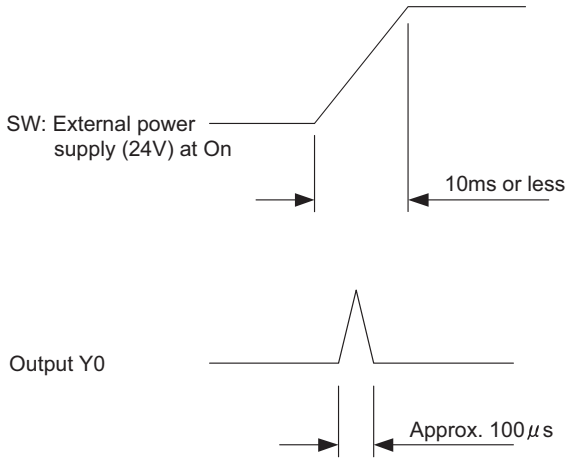
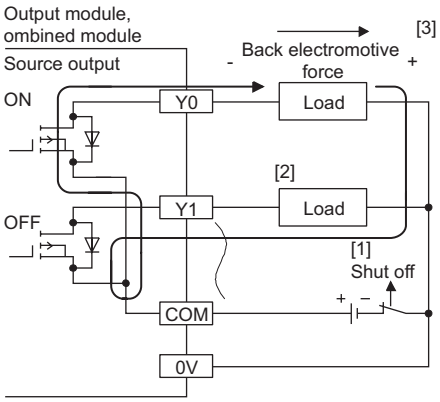
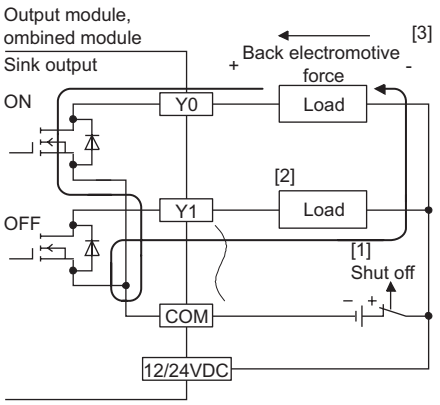
	Situation	Cause	Countermeasure
Example 4	When the external power supply turns on, the load is turned on for a moment.	If the external power supply is turned on precipitously, Ic current flows due to the stray capacitance (C) between collector and emitter of hotocoupler. Ic current flows to the next stage of transister Tr1 gate and Y0 output turns on by 100μs 	R1: Several tens of ohms Power capacity ≧ (external power supply current*1)^2 × resistance value × (3 to 5)*2 C1: Several hundreds of microfarads 50V *1 Refer to consumption current of the external power supply for modules used in this manual. *2 Select the power capacity of resistance to be 3 to 5 times lager than the actual power consumption. (Example) R1=40Ω, C1=300μF Use the below expression to calculated a time constant C1 × R1=300 × 10^{-6} × 40 =12 × 10^{-3}s =12ms

Table12.10 Output circuit troubleshooting (Continued)

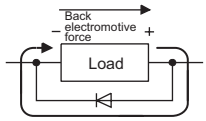
	Situation	Cause	Countermeasure
Example 5	The load which was turned off is turned on for a moment at power-off. (Transistor output)	The load [2] which was turned OFF may be turned ON due to back electromotive force at the time of power-off [1] if an inductive load is used.	Take either of the following measure. • To prevent the generation of the back electromotive force, connect diode in parallel with load where the back electromotive force has been generated.





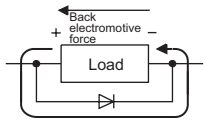
Source output

[3]

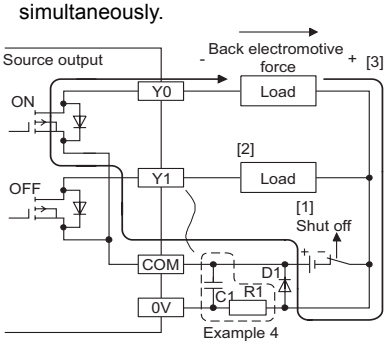


Sink output

[3]



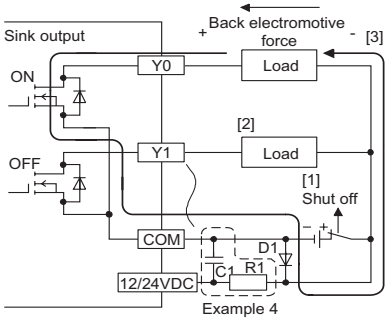
• Connect diode between (+) and (-) of the external power supply so that a sneak path circuit is porvided. Connect the diode to C1 and R1 in parallel when example 4 is performed simultaneously.



Example 4

* Measures will not be effective to the following module due to the characterictic of external power supply circuit.

• QY81P



Example 4

D1: Reverse current VR(VRM)···*1,
Forward current IF(IFM)···*2

* 1 Approx. 10 times the rated voltage of the spec.

Ex.: 24VDC → Approx.200V

*2 More than 2 times the Max. load current (common) of the spec.

Ex: 2A/1 common → More than 4A

12.6 Built-in Ethernet Port Diagnosis

Using the diagnostic function of GX Developer, the module status, parameter settings, communication status, and error log of the Built-in Ethernet port QCPU can be checked.

The relevant screen can be activated by either of the following two methods.

- In GX Developer, select [Diagnostics] → [PLC diagnostics] → [Ethernet diagnosis]

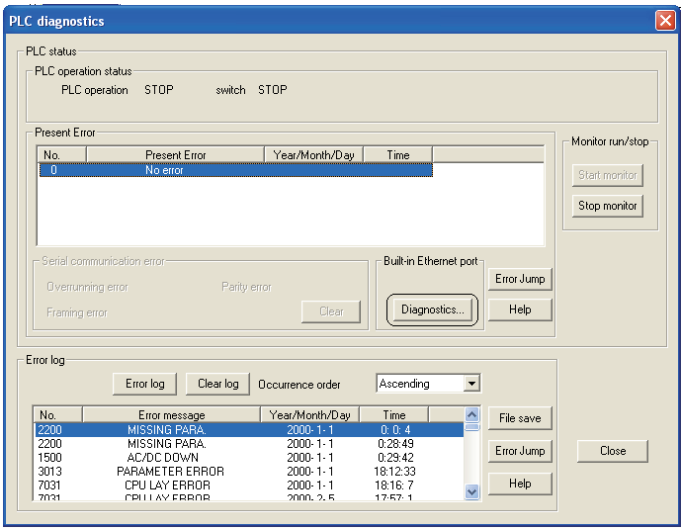


Figure 12.39 PLC Diagnostics screen

- In GX Developer, select [Diagnostics] → [Ethernet diagnostics]

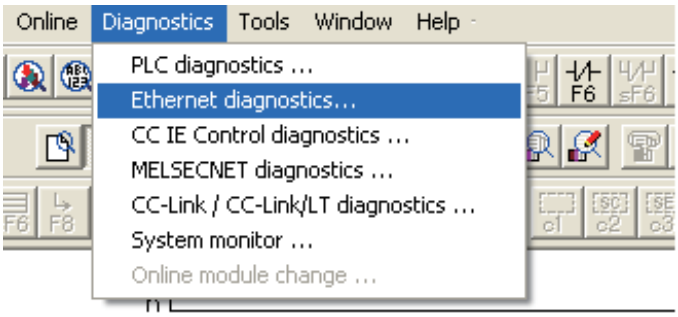


Figure 12.40 Ethernet diagnosis screen

On the following pages, details of the built-in Ethernet port diagnosis screens are described.

(1) Parameter status

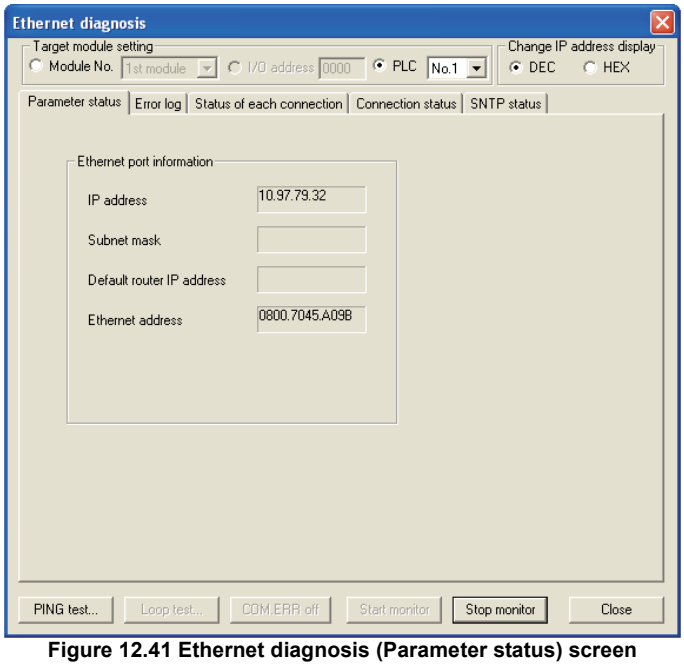


Figure 12.41 Ethernet diagnosis (Parameter status) screen

Table12.11 Ethernet diagnosis (Parameter status) items

Item	Description
IP address	The Ethernet address (MAC address) of the Built-in Ethernet port QCPU can be monitored.
Subnet mask	
Default router IP address	
Ethernet address	

Point

Before performing the Built-in Ethernet port, check that the “CPU” is selected in the Target module setting on the Ethernet diagnosis screen.

(2) Error log

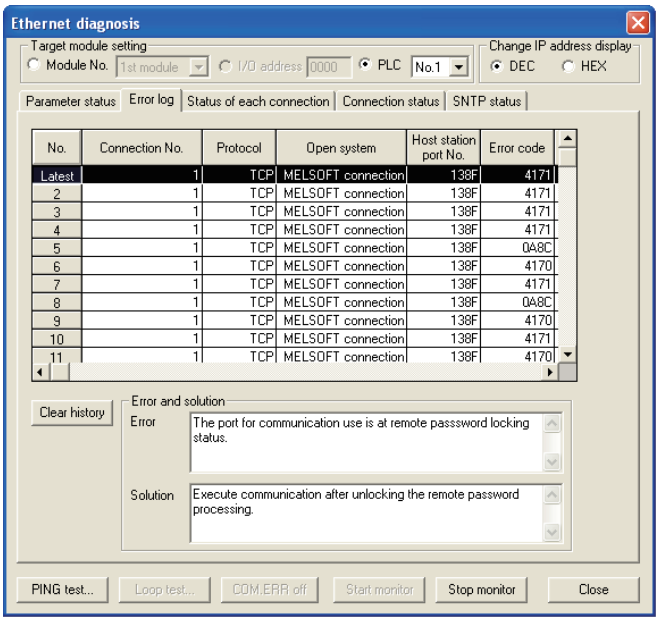


Figure 12.42 Ethernet diagnosis (Error log) screen

Table12.12 Ethernet diagnosis (Error log) items

Item	Description
Connection No.	Displays connection No. of the connection that has an error. UDP connections that function in MELSOFT connection are treated as one connection, and the lowest connection No. is stored in the error log.
Protocol	Displays the settings of PLC parameter.
Open system	
Host station port No.	
Error code	Displays a generated error code.*1 In the case of MELSOFT connection, only the errors related to Ethernet communication are stored in the Error log.
Destination IP address	Displays the IP address of the other device when an error occurs in communication with it.
Destination port No.	Displays the port number of the other device when an error occurs in communication with it.
Command code	Displays command No. when an error occurs in MC protocol communication.
Year/Month/Day, Time	Displays the date and time of error occurrence.
Clear history	Clears the displayed error log.
Error and solution	Displays details of the selected error code and corrective actions.

*1 "SNTP OPE. ERROR" (error code: 2710) is stored in the error log only when the time setting at power-ON or reset has failed.
For results in the case of executing the time setting regularly or by special relay "SM1270" from the sequence program, check the SNTP status screen or special register "SD1270".

Point

Because the error log is battery backed up, the information is retained even if the power is turned off.
Note that the latch data backup function (to the standard ROM) cannot back up the error log to the standard ROM.

(3) Status of each connection

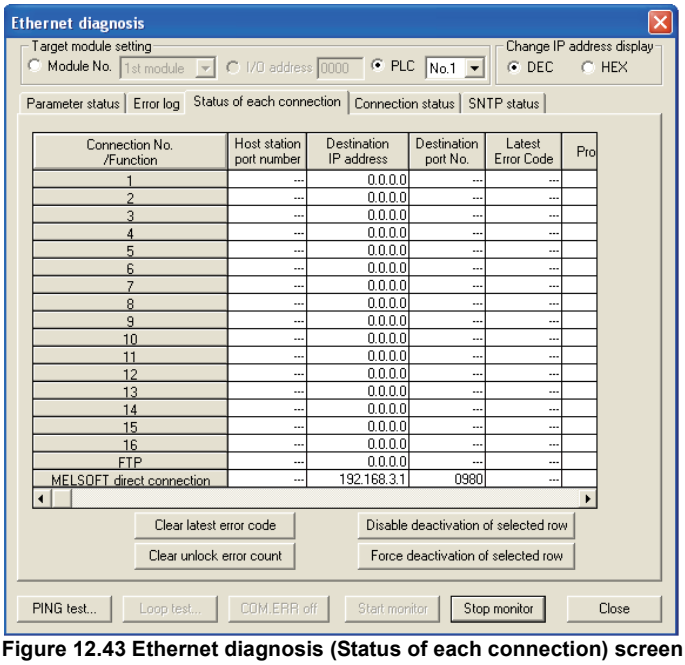


Figure 12.43 Ethernet diagnosis (Status of each connection) screen

Table12.13 Ethernet diagnosis (Status of each connection) items

Item	Description
Host station port number	Displays the setting of PLC parameter.
Destination IP address	Displays the IP address of the target device.*1
Destination port No.	Displays the port number of the target device.*1
Latest Error Code	Displays an error code for an error that occurred on the connection.*1 In the case of MELSOFT connection, only the errors related to Ethernet communication are stored in the Status of each connection.
Protocol	Displays the settings of PLC parameter.
Open system	
TCP status	In TCP connections, displays whether connection with the target device is established or not.*1
Remote password status	Displays the remote password status.*2
Unlock error count	Displays how many times an unlock error has occurred.*1*3
Force deactivation status	If this is set for a connection for which illegal accesses are suspected, communication of the connection is disabled. *1*3

*1: UDP connections that function in MELSOFT connection are treated as one connection. Therefore, for multiple connections, the same information is displayed.
*2: Not displayed when the protocol is UDP and direct connection to GX Developer is used.
*3: The same information is displayed when the protocol is TCP and when multiple MELSOFT connections exist.

(4) Connection status

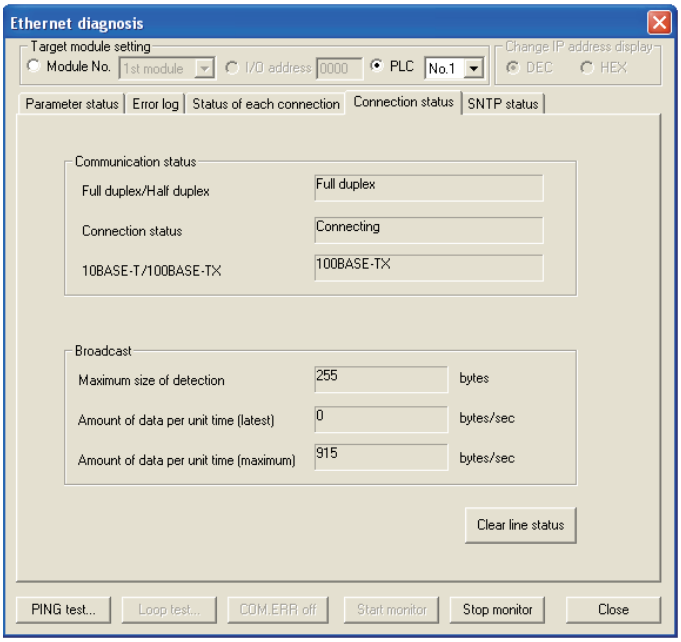


Figure 12.44 Ethernet diagnosis (Connection status) screen

Table12.14 Ethernet diagnosis (Connection status) items

Item	Description
Full duplex/Half duplex	Displays whether the line uses the full or half duplex system.
Connection status	Displays whether a hub or target device is connected or not.
10BASE-T/100BASE-TX	Displays whether the network is 10BASE-T or 100BASE-TX.
Maximum size of detection	Displays the maximum size of discarded broadcast message data.
Amount of data per unit time (latest)	Displays the total size of discarded broadcast message data per unit time.
Amount of data per unit time (maximum)	Displays the maximum total size of discarded broadcast message data per unit time.
Clear line status	Clears the number of receive buffer overflows and broadcast information.

(5) SNTP status

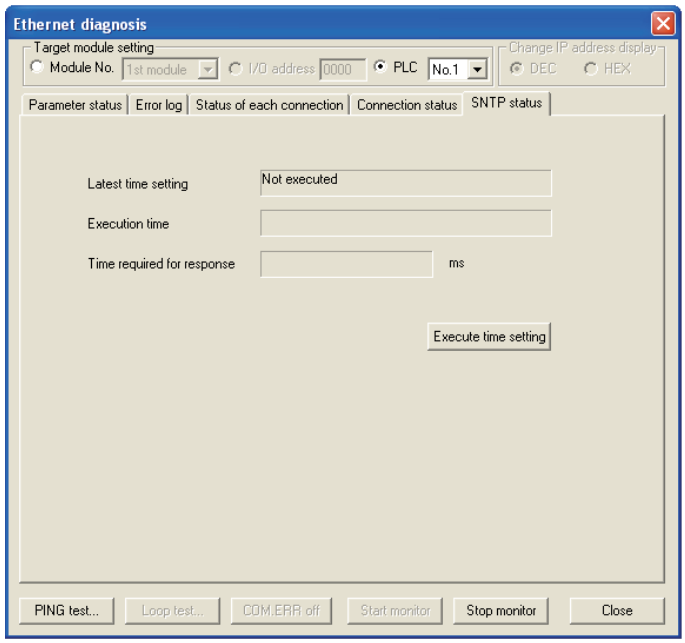


Figure 12.45 Ethernet diagnosis (SNTP status) screen

Table12.15 Ethernet diagnosis (SNTP status) items

Item	Description
Latest time setting	Displays the operation result of the latest time setting.
Execution time	Displays the time data collected by the latest time setting execution.
Time required for response (ms)	Displays the time that was required for time data acquisition in the latest time setting execution.
Execute time setting	Adjusts the clock time.

(6) PING test

PING test is a test by which existence of the Built-in Ethernet port QCPU can be checked from GX Developer.
Performing a PING test for the Built-in Ethernet port QCPU can determine the following:

- Whether the line is connected to the target Built-in Ethernet port QCPU properly
- Whether the parameters for the Built-in Ethernet port QCPU are set correctly

(a) Executing a PING test by GX Developer

In GX Developer, open the Ethernet diagnosis screen and click [PING test]

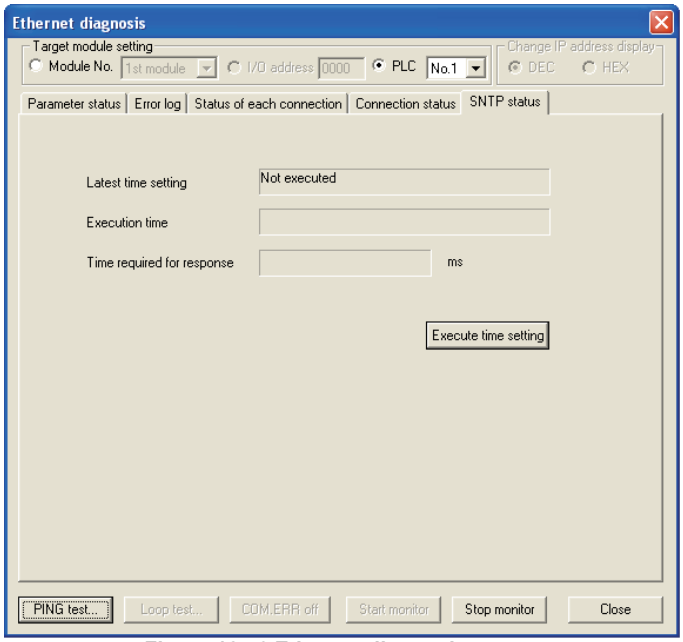


Figure 12.46 Ethernet diagnosis screen

Table12.16 PING test items

Item		Description	Setting range
Address specification	IP address	Specify the IP address of the PING test target station.	(Target station's IP address)
	IP address input form	Select a form for IP address entry.	Decimal/Hexadecimal
	IP address/Host name	Specify a host name of the PING test target station.	-
Setting Options	Display the host name.	In the Result area, displays the test results for the host name corresponding to the IP address.	-
	Specify the data size.	Specify any size of the system data that are sent during a PING test.	1 to 8192 bytes (For the Built-in Ethernet port QCPU, 1460 bytes or less)
	Specify the time of the communication time check.	Specify the time to wait for PING test completion.	1 to 30 seconds
	Specify the number of transmissions.	Specify the number of transmissions.	• Specify the number of times. No. of times: 1 to 50 • Execute till interrupting
Result		Displays PING test results.	-
Success/transmissions		Displays the total number of packet transmissions and the number of successful transmissions.	-

Point

If failed, check the following and run the PING test again.

- The Built-in Ethernet port QCPU installation to the base unit
- Connection to Ethernet
- Respective parameters written to the Built-in Ethernet port QCPU
- Built-in Ethernet port QCPU operating status (whether an error has occurred or not)
- Respective IP addresses set in GX Developer and PING test target stations
- Subnet addresses set in GX Developer and PING test target stations when transmissions do not pass through any router

12.7 SPECIAL RELAY LIST

Special relays, SM, are internal relays whose applications are fixed in the Programmable Controller.

For this reason, they cannot be used by sequence programs in the same way as the normal internal relays.

However, they can be turned ON or OFF as needed in order to control the CPU module.

The heading descriptions in the following special relay lists are shown in 3.1.

Table12.17 Explanation of special relay list

Item	Function of Item
Number	• Indicates special relay number
Name	• Indicates name of special relay
Meaning	• Indicates contents of special relay
Explanation	• Discusses contents of special relay in more detail
Set by (When set)	• Indicates whether the relay is set by the system or user, and, if it is set by the system, when setting is performed. <Set by> S : Set by system U : Set by user (sequence programs or test operations from GX Developer) S/U : Set by both system and user <When set> Indicated only for registers set by system Each END : Set during each END processing Initial : Set only during initial processing (when power supply is turned ON, or when going from STOP to RUN) Status change : Set only when there is a change in status Error : Set when error occurs Instruction execution : Set when instruction is executed Request : Set only when there is a user request (through SM, etc.) System switching : Set when system switching is executed.
Corresponding ACPU M9□□□	• Indicates the corresponding special relay (M9□□□) of the ACPU. (When the contents are changed, the special relay is represented M9□□□ format change. Incompatible with the Q00J/Q00/Q01 and QnPRH.) • New indicates the special relay newly added to the Q series CPU module.
Corresponding CPU	Indicates the corresponding CPU module type name. QCPU : Indicates all the Q series CPU modules. Q00J/Q00/Q01 : Indicates the Basic model QCPU. Qn(H) : Indicates the High Performance model QCPU. QnPH : Indicates the Process CPU. QnPRH : Indicates the Redundant CPU. QnU : Indicates the Universal model QCPU Each CPU module model name: Indicates the relevant specific CPU module. (Example: Q02U)

For details on the following items, refer to the following manuals:

- Networks → Manual of the corresponding network module
- SFC → QCPU(Q mode)/QnACPU Programming Manual (SFC)

Point

Do not change the values of special relays set by the system with user program or device test operations.
Doing so may result in system downtime or communication fault.

(2) Diagnostic Information

Table12.18 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM0	Diagnostic errors	OFF : No error ON : Error	• Turns ON if an error occurs as a result of diagnosis. (Includes when an annunciator is ON, and when an error is detected with CHK instruction) • Remains ON even if the condition is restored to normal thereafter.	S (Error)	New	Qn(H) QnPH QnPRH
			• Turns ON if an error occurs as a result of diagnosis. (Includes when an annunciator is ON) • Remains ON even if the condition is restored to normal thereafter.	S (Error)	New	Q00J/Q00/Q01 QnU
SM1	Self-diagnostic error	OFF : No self-diagnosis errors ON : Self-diagnosis	• Turns ON if an error occurs as a result of diagnosis. (Does not include when an annunciator is ON or when an error is detected by the CHK instruction) • Remains ON even if the condition is restored to normal thereafter.	S (Error)	M9008	Qn(H) QnPH QnPRH
			• Turns ON if an error occurs as a result of diagnosis. (Does not include when an annunciator is ON) • Remains ON even if the condition is restored to normal thereafter.	S (Error)	New	Q00J/Q00/Q01 QnU
SM5	Error common information	OFF : No error common information ON : Error common information	• When SM0 is ON, turns ON if there is error common information	S (Error)	New	QCPU
SM16	Error individual information	OFF : No error individual information ON : Error individual information	• When SM0 is ON, turns ON if there is error individual information	S (Error)	New	
SM50	Error reset	OFF → ON: Error reset	• Conducts error reset operation	U	New	
SM51	Battery low latch	OFF : Normal ON : Battery low	• Turns ON if battery voltage at CPU module or memory card drops below rated value. • Remains ON even if the battery voltage returns to normal thereafter. • Synchronizes with the BAT. LED.	S (Error)	M9007	Qn(H) QnPH QnPRH QnU
			• Turns ON if battery voltage at CPU module drops below rated value. • Remains ON even if the battery voltage returns to normal thereafter. • Synchronous with ERR. LED	S (Error)	New	Q00J/Q00/Q01
SM52	Battery low	OFF : Normal ON : Battery low	• Same as SM51, but turns OFF subsequently when battery voltage returns to normal.	S (Error)	M9006	QCPU
SM53	AC/DC DOWN detection	OFF : AC/DC DOWN not detected ON : AC/DC DOWN detected	• Turns ON if an instantaneous power failure of within 20ms occurs during use of the AC power supply module. Reset when the power supply is switched OFF, then ON.	S (Error)	M9005	
			• Turns ON if an instantaneous power failure of within 10ms occurs during use of the DC power supply module. Reset when the power supply is switched OFF, then ON.			

Table12.18 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM56	Operation error	OFF : Normal ON : Operation error	• ON when operation error is generated • Remains ON if the condition is restored to normal thereafter.	S (Error)	M9011	QCPU
SM60	Blown fuse detection	OFF : Normal ON : Module with blown fuse	• Turns ON if there is at least one output module whose fuse has blown. • Remains ON if the condition is restored to normal thereafter. • Blown fuse status is checked even for remote I/O station output modules.	S (Error)	M9000	
SM61	I/O module verify error	OFF : Normal ON : Error	• Turns ON if the I/O module differs from the status registered at power on. • Remains ON if the condition is restored to normal thereafter. • I/O module verification is also conducted for remote I/O station modules.	S (Error)	M9002	
SM62	Annunciator detection	OFF : Not detected ON : Detected	• Goes ON if even one annunciator (F) goes ON.	S (Instruction execution)	M9009	
SM80	CHK detection	OFF : Not detected ON : Detected	• Goes ON if error is detected by CHK instruction. • Remains ON if the condition is restored to normal thereafter.	S (Instruction execution)	New	Qn(H) QnPH QnPRH
SM90	Startup of monitoring timer for step transition (Enabled only when SFC program exists)	OFF : Not started(monitoring timer reset) ON : Started(monitoring timer started)	Corresponds to SD90	U	M9108	Qn(H) QnPH QnPRH
SM91			Corresponds to SD91		M9109	
SM92			Corresponds to SD92		M9110	
SM93			Corresponds to SD93		M9111	
SM94			Corresponds to SD94		M9112	
SM95			Corresponds to SD95		M9113	
SM96			Corresponds to SD96		M9114	
SM97			Corresponds to SD97		New	
SM98			Corresponds to SD98		New	
SM99			Corresponds to SD99		New	
			• Goes ON when measurement of step transition monitoring timer is commenced. • Resets step transition monitoring timer when it goes OFF.			
SM100	Serial communication function using flag	OFF : Serial communication function is not used. ON : Serial communication function is used.	• Stores the setting of whether the serial communication function is used or not in the serial communication setting parameter	S (Power-ON or reset)	New	Q00/Q01 Q00UJ Q00U Q01U Q02U*7
SM101	Communication protocol status flag	OFF : GX Developer ON : MC protocol communication device	• Stores whether the device that is communicating via the RS-232 interface is GX Developer or MC protocol communication device	S (RS232 communication)		
SM110	Protocol error	OFF : Normal ON : Abnormal	• Turns ON when an abnormal protocol was used to make communication in the serial communication function. • Remains ON if the condition is restored to normal thereafter	S (Error)		
SM111	Communication status	OFF : Normal ON : Abnormal	• Turns ON when the mode used to make communication was different from the setting in the serial communication function. • Remains ON if the condition is restored to normal thereafter.	S (Error)		
SM112	Error information clear	ON : Cleared	• Turns ON when the error codes stored in SM110, SM111, SD110 and SD111 are cleared. (Activated when turned from OFF to ON)	U		
SM113	Overrun error	OFF : Normal ON : Abnormal	• Turns ON when an overrun error occurred in the serial communication error.	S (Error)		
SM114	Parity error	OFF : Normal ON : Abnormal	• Turns ON when a parity error occurred in the serial communication error.	S (Error)		
SM115	Framing error	OFF : Normal ON : Abnormal	• Turns ON when a framing error occurred in the serial communication error.	S (Error)		
SM165	Program memory batch transfer execution status	OFF : Completed ON : Not being executed or Not completed	• Turns ON when the data is written to the program cache memory. • Turns OFF when the program memory batch transfer is completed. • Remains ON if the program memory batch transfer is not executed after the data is written to the program cache memory.	S (When status changed)	New	QnU*6

*6: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10012" or later.
- Q13UDHCPU, Q26UDHCPU

*7: The module whose first 5 digits of serial No. is "10102" or later.

(3) System information

Table12.19 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM202	LED OFF command	OFF→ON : LED OFF	• When this relay goes from OFF to ON, the LEDs corresponding to the individual bits at SD202 go off	U	New	Qn(H) QnPH QnPRH QnU
SM203	STOP contact	STOP status	• Goes ON at STOP status	S (Status change)	M9042	QCPU
SM204	PAUSE contact	PAUSE status	• Goes ON at PAUSE status	S (Status change)	M9041	
SM206	PAUSE enable coil	OFF : PAUSE disabled ON : PAUSE enabled	• PAUSE status is entered if this relay is ON when the PAUSE contact goes ON	U	M9040	
SM210	Clock data set request	OFF : Ignored ON : Set request	• When this relay goes from OFF to ON and after END instruction execution of subsequent scan, clock data stored in SD210 to SD213 are written to the CPU module.	U	M9025	
SM211	Clock data error	OFF : No error ON : Error	• ON when error is generated in clock data (SD210 to SD213) value, and OFF if no error is detected.	S (Request)	M9026	
SM213	Clock data read request	OFF : Ignored ON : Read request	• When this relay is ON, clock data is read to SD210 to SD213 as BCD values.	U	M9028	
SM220	CPU No.1 preparation completed	OFF : CPU No.1 preparation uncompleted ON : CPU No.1 preparation completed	Turned ON when access can be made to the CPU module No.1 from the other CPU module at power-on or reset operation. SM220 is used as interlock for accessing the CPU module No.1 when the multiple CPU synchronous setting is asynchronous.	S (When status changed)	New	QnU
SM221	CPU No.2 preparation completed	OFF : CPU No.2 preparation uncompleted ON : CPU No.2 preparation completed	Turned ON when access can be made to the CPU module No.2 from the other CPU module at power-on or reset operation. SM221 is used as interlock for accessing the CPU module No.2 when the multiple CPU synchronous setting is asynchronous.			QnU*8
SM222	CPU No.3 preparation completed	OFF : CPU No.3 preparation uncompleted ON : CPU No.3 preparation completed	Turned ON when access can be made to the CPU module No.3 from the other CPU module at power-on or reset operation. SM222 is used as interlock for accessing the CPU module No.3 when the multiple CPU synchronous setting is asynchronous.			
SM223	CPU No.4 preparation completed	OFF : CPU No.4 preparation uncompleted ON : CPU No.4 preparation completed	Turned ON when access can be made to the CPU module No.4 from the other CPU module at power-on or reset operation. SM223 is used as interlock for accessing the CPU module No.4 when the multiple CPU synchronous setting is asynchronous.			QnU*5
SM235	Online module change flag	OFF : Online module change is not in progress ON : Online module change in progress	• Turns on during online module change. (for host CPU)	S (During online module change)	New	QnPH
SM236	Online module change complete flag	OFF : Online module change incomplete ON : Online module change complete	• Turns ON for one scan after online module change is complete. • This contact point can only be used by the scan program. (for host CPU)	S (When online module change is complete)	New	
SM237	Device range check inhibit flag	OFF : Device range checked ON : Device range not checked	• Selects whether to check a device range during execution of the BMOV, FMOV or DFMOV instruction (only when the conditions for subset processing are established).	U	New	QnU*6

*5: The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

*6: The relevant modules are as follows:

- The Universal model QCPU whose serial number (first five digits) is "10012" or later.
- Q13UDHCPU, Q26UDHCPU

*8: The Universal model QCPU except the Q00UJCPU.

Table12.19 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM240	No. 1 CPU reset flag	OFF : No. 1 CPU reset cancel ON : No. 1 CPU resetting	• Goes OFF when reset of the No. 1 CPU is canceled. • Comes ON when the No. 1 CPU is resetting (including the case where the CPU module is removed from the base). The other CPUs are also put in reset status.	S (Status change)	New	Q00/Q01*1 Qn(H)*1 QnPH QnU*8
SM241	No. 2 CPU reset flag	OFF : No. 2 CPU reset cancel ON : No. 2 CPU resetting	• Goes OFF when reset of the No. 2 CPU is canceled. • Comes ON when the No. 2 CPU is resetting (including the case where the CPU module is removed from the base). The other CPUs result in "MULTI CPU DOWN" (error code: 7000).			
SM242	No. 3 CPU reset flag	OFF : No. 3 CPU reset cancel ON : No. 3 CPU resetting	• Goes OFF when reset of the No. 3 CPU is canceled. • Comes ON when the No. 3 CPU is resetting (including the case where the CPU module is removed from the base). The other CPUs result in "MULTI CPU DOWN" (error code: 7000).			
SM243	No. 4 CPU reset flag	OFF : No. 4 CPU reset cancel ON : No. 4 CPU resetting	• Goes OFF when reset of the No. 4 CPU is canceled. • Comes ON when the No. 4 CPU is resetting (including the case where the CPU module is removed from the base). The other CPUs result in "MULTI CPU DOWN" (error code: 7000).			Qn(H)*1 QnPH QnU*5
SM244	No. 1 CPU error flag	OFF : No. 1 CPU normal ON : No. 1 CPU during stop error	• Goes OFF when the No. 1 CPU is normal (including a continuation error). • Comes ON when the No. 1 CPU is during a stop error.			Q00/Q01*1 Qn(H)*1 QnPH QnU*8
SM245	No. 2 CPU error flag	OFF : No. 2 CPU normal ON : No. 2 CPU during stop error	• Goes OFF when the No. 2 CPU is normal (including a continuation error). • Comes ON when the No. 2 CPU is during a stop error.			
SM246	No. 3 CPU error flag	OFF : No. 3 CPU normal ON : No. 3 CPU during stop error	• Goes OFF when the No. 3 CPU is normal (including a continuation error). • Comes ON when the No. 3 CPU is during a stop error.			
SM247	No. 4 CPU error flag	OFF : No. 4 CPU normal ON : No. 4 CPU during stop error	• Goes OFF when the No. 4 CPU is normal (including a continuation error). • Comes ON when the No. 4 CPU is during a stop error	S (Status change)	New	Qn(H)*1 QnPH QnU*5
SM250	Max. loaded I/O read	OFF : Ignored ON : Read	• When this relay goes from OFF to ON, maximum loaded I/O number is read to SD250.	U	New	Qn(H) QnPH QnPRH
SM254	All stations refresh command	OFF : Refresh arrival station ON : Refresh all stations	• Effective for the batch refresh (also effective for the low speed cyclic) • Designate whether to receive arrival stations only or to receive all slave stations in the MELSECNET/H.	U	New	
			• Designate whether to receive arrival stations only or to receive all slave stations in the CC-Link IE controller network .			Qn(H)*2 QnPH*6 QnPRH*6
			• Effective for the batch refresh (also effective for the low speed cyclic) • Specify whether to receive only arrival station or all stations in the MELSECNET/H or CC-Link IE controller network.			QnU

*1: This applies to the CPU of function version B or later.
*2: The module whose first 5 digits of serial No. is "09012" or later.
*5: The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.
*6: The module whose first 5 digits of serial No. is "10042" or later.
*8: The Universal model QCPU except the Q00UJCPU.

Table12.19 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM255	MELSECNET/10, MELSECNET/H module 1 information	OFF : Operative network ON : Standby network	• Goes ON for standby network(If no designation has been made concerning active or standby, active is assumed.)	S (Initial)	New	Qn(H) QnPH QnPRH
SM256		OFF : Reads ON : Does not read	• For refresh from link to CPU module (B, W, etc.) indicate whether to read from the link module.	U	New	
SM257		OFF : Writes ON : Does not write	• For refresh from CPU module to link (B, W, etc.), designate whether to write to the link module.	U	New	
SM260	MELSECNET/10, MELSECNET/H module 2 information	OFF : Operative network ON : Standby network	• Goes ON for standby network (If no designation has been made concerning active or standby, active is assumed.)	S (Initial)	New	
SM261		OFF : Reads ON : Does not read	• For refresh from link to CPU module (B, W, etc.) indicate whether to read from the link module.	U	New	
SM262		OFF : Writes ON : Does not write	• For refresh from CPU module to link (B, W, etc.), designate whether to write to the link module.	U	New	
SM265	MELSECNET/10, MELSECNET/H module 3 information	OFF : Operative network ON : Standby network	• Goes ON for standby network (If no designation has been made concerning active or standby, active is assumed.)	S (Initial)	New	
SM266		OFF : Reads ON : Does not read	• For refresh from link to CPU module (B, W, etc.) indicate whether to read from the link module.	U	New	
SM267		OFF : Writes ON : Does not write	• For refresh from CPU module to link (B, W, etc.), designate whether to write to the link module.	U	New	
SM270	MELSECNET/10, MELSECNET/H module 4 information	OFF : Operative network ON : Standby network	• Goes ON for standby network (If no designation has been made concerning active or standby, active is assumed.)	S (Initial)	New	
SM271		OFF : Reads ON : Does not read	• For refresh from link to CPU module (B, W, etc.) indicate whether to read from the link module.	U	New	
SM272		OFF : Writes ON : Does not write	• For refresh from CPU module to link (B, W, etc.), designate whether to write to the link module.	U	New	
SM280	CC-Link error	OFF : Normal ON : Error	• Goes ON when a CC-Link error is detected in any of the installed CC-Link module. Goes OFF when normal operation is restored.	S (Status change)	New	
SM315	Communication reserved time delay enable/disable flag	OFF : Without delay ON : With delay	• This flag is enabled when the time reserved for communication processing is set in SD315. • Turns ON to delay the END processing by the time set in SD315 in order to perform communication processing. (The scan time increases by the period set in SD315.) • Turns OFF to perform the END processing without a delay of the time set in SD315 when there is no communication processing. (Defaults to OFF)	U	New	Q00J/Q00/Q01
SM320	Presence/absence of SFC program	OFF : SFC program absent ON : SFC program present	• Turns ON when an SFC program is registered. • OFF when an SFC program is not registered.	S (Initial)	M9100	Q00J/Q00/Q01*1 Qn(H) QnPH QnPRH QnU
SM321	Start/stop SFC program	OFF : SFC program not executed (stop) ON : SFC program executed (start)	• Initial value is set at the same value as SM320. (Goes ON automatically if SFC program is present.) • Turn this relay from ON to OFF to stop program execution. • Turn this relay from OFF to ON to resume program execution.	S (Initial)/U	M9101form at change	

*1: This applies to the CPU of function version B or later.

Table12.19 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM322	SFC program start status	OFF : Initial start ON : Resume start	• The SFC program starting mode in the SFC setting of the PLC parameter dialog box is set as the initial value. AT initial start: OFF At continued start: ON	S (Initial)/U	M9102form at change	Q00J/Q00/Q01*1 Qn(H) QnPH QnPRH QnU
SM323	Presence/absence of continuous transition for entire block	OFF : Continuous transition not effective ON : Continuous transition effective	Set the presence/absence of continuous transition for the block where "Continuous transition bit" of the SFC data device has not been set.	U	M9103	
SM324	Continuous transition prevention flag	OFF : When transition is executed ON : When no transition	• OFF during operation in the continuous transition mode or during continuous transition, and ON when continuous transition is not executed. • Always ON during operation in the no continuous transition mode.	S (Instruction execution)	M9104	
				S (Status change)	New	
SM325	Output mode at block stop	OFF : OFF ON : Preserves	Select whether the coil outputs of the active steps are held or not at the time of a block stop. • As the initial value, the output mode at a block stop in the parameter is OFF when the coil outputs are OFF, and ON when the coil outputs are held. • All coil outputs go OFF when this relay is OFF. • Coil outputs are preserved when this relay is ON.	S (Initial)/U	M9196	
SM326	SFC device clear mode	OFF : Clear device ON : Preserves device	Selects the device status when the stopped CPU is run after the sequence program or SFC program has been modified when the SFC program exists.	U	New	
SM327	Output during end step execution	OFF : Hold step output turned OFF (cleared) ON : Hold step output held	Select the device status at the time of switching from STOP to program write to RUN.(All devices except the step relay)	S (Initial)/U	New	Qn(H) QnPH QnPRH QnU
				U		Q00J/Q00/Q01*1
SM328	Clear processing mode when end step is reached	OFF : Clear processing is performed. ON : Clear processing is not performed.	Select whether clear processing will be performed or not if active steps other than the ones being held exist in the block when the end step is reached.? • When this relay turns OFF, all active steps are forcibly terminated to terminate the block. • When this relay is ON, the execution of the block is continued as-is. • If active steps other than the ones being held do not exist when the end step is reached, the steps being held are terminated to terminate the block.	U	New	Q00J/Q00/Q01*1 QnU
SM330	Operation mode for low speed execution type program	OFF : Asynchronous mode ON : Synchronous mode	Select whether the low speed execution type program will be executed in the asynchronous mode or in the synchronous mode. • Asynchronous mode (this relay is turned OFF.) Mode in which the operation of the low speed execution type program is performed continuously within the excess time. • Synchronous mode (this relay is turned ON.) Mode in which the operation of the low speed execution type program is not performed continuously and operation is performed from the next scan if there is excess time.	U	New	Qn(H) QnPH
SM331	Normal SFC program execution status	OFF : Not executed ON : Being executed	• Indicates whether the normal SFC program is being executed or not. • Used as an SFC control instruction execution interlock.	S (Status change)	New	Qn(H)*3 QnPH*4 QnPRH
SM332	Program execution management SFC program execution status	OFF : Not executed ON : Being executed	• Indicates whether the program execution management SFC program is being executed or not. • Used as an SFC control instruction execution interlock.			
SM390	Access execution flag	ON indicates completion of intelligent function module access	• The status of the intelligent function module access instruction executed immediately before is stored. (This data is overwritten when the intelligent function module access instruction is executed again.) • Used by the user in a program as a completion bit.	S (Status change)	New	Qn(H) QnPH QnPRH
SM391	GINT instruction execution completion flag	OFF : Not executed ON : Execution completed	Indicates execution status of the S(P).GINT instruction. • Turned OFF before the instruction is executed. • Turned ON after the instruction is completed.	S (Instruction execution)	New	QnU

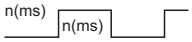
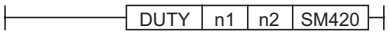
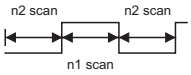
*1: This applies to the CPU of function version B or later.
*3: The module whose first 5 digits of serial No. is "04122" or later.
*4: The module whose first 5 digits of serial No. is "07032" or later.

(4) System clocks/counters

Table12.20 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM400	Always ON	ON OFF	• Normally is ON	S (Every END processing)	M9036	QCPU
SM401	Always OFF	ON OFF	• Normally is OFF	S (Every END processing)	M9037	
SM402	After RUN, ON for 1 scan only	ON OFF 1 scan	• After RUN, ON for 1 scan only. • This connection can be used for scan execution type programs only. • When an initial execution type program is used, this relay turns OFF at the END processing of the scan execution type program in the first scan after RUN. ON OFF Initial execution type program / 1 scan of scan execution type program	S (Every END processing)	M9038	Qn(H) QnPH QnPRH QnU
			• After RUN, ON for 1 scan only.	S (Every END processing)	New	Q00J/Q00/Q01
SM403	After RUN, OFF for 1 scan only	ON OFF 1 scan	• After RUN, OFF for 1 scan only. • This connection can be used for scan execution type programs only. • When an initial execution type program is used, this relay turns OFF at the END processing of the scan execution type program in the first scan after RUN. ON OFF Initial execution type program / 1 scan of scan execution type program	S (Every END processing)	M9039	Qn(H) QnPH QnPRH QnU
			• After RUN, OFF for 1 scan only.	S (Every END processing)	New	Q00J/Q00/Q01
SM404	Low speed execution type programON for 1 scan only after RUN	ON OFF 1 scan	• After RUN, ON for 1 scan only. • This connection can be used for low speed execution type programs only.	S (Every END processing)	New	Qn(H) QnPH
SM405	Low speed execution type programAfter RUN, OFF for 1 scan only	ON OFF 1 scan	• After RUN, OFF for 1 scan only. • This connection can be used for low speed execution type programs only.	S (Every END processing)	New	
SM409	0.01 second clock	0.005s 0.005s	• Repeatedly changes between ON and OFF at 5-ms interval. • When Programmable Controller power supply is turned ON or a CPU module reset is performed, goes from OFF to start. (Note that the ON-OFF status changes when the designated time has elapsed during the execution of the program.)	S (Status change)	New	Qn(H) QnPH QnPRH QnU
SM410	0.1 second clock	0.05s 0.05s	• Repeatedly changes between ON and OFF at each designated time interval. • When Programmable Controller power supply is turned ON or a CPU module reset is performed, goes from OFF to start. (Note that the ON-OFF status changes when the designated time has elapsed during the execution of the program.)	S (Status change)	M9030	QCPU
SM411	0.2 second clock	0.1s 0.1s			M9031	
SM412	1 second clock	0.5s 0.5s			M9032	
SM413	2 second clock	1s 1s			M9033	
SM414	2n second clock	ns ns	• This relay alternates between ON and OFF at intervals of the time (unit: s) specified in SD414. • When Programmable Controller power supply is turned ON or a CPU module reset is performed, goes from OFF to start. (Note that the ON-OFF status changes when the designated time has elapsed during the execution of the program.)	S (Status change)	M9034form at change	

Table12.20 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9□□□	Corresponding CPU
SM415	2n (ms) clock		• This relay alternates between ON and OFF at intervals of the time (unit: ms) specified in SD415. • When Programmable Controller power supply is turned ON or a CPU module reset is performed, goes from OFF to start. (Note that the ON-OFF status changes when the designated time has elapsed during the execution of the program.)	S (Status change)	New	Qn(H) QnPH QnPRH QnU
SM420	User timing clock No.0		• Relay repeats ON/OFF switching at fixed scan intervals. • When Programmable Controller power supply is turned ON or a CPU module reset is performed, goes from OFF to start. (For the redundant CPU, however, this relay is always OFF after system switching.) • The ON/OFF intervals are set with the DUTY instruction  n1: ON scan interval n2: OFF scan interval	S (Every END processing)	M9020	QCPU
SM421	User timing clock No.1				M9021	
SM422	User timing clock No.2				M9022	
SM423	User timing clock No.3				M9023	
SM424	User timing clock No.4				M9024	
SM430	User timing clock No.5		• For use with SM420 to SM424 low speed programs	S (Every END processing)	New	Qn(H) QnPH
SM431	User timing clock No.6					
SM432	User timing clock No.7					
SM433	User timing clock No.8					
SM434	User timing clock No.9					

(5) Scan information

Table12.21 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9□□□	Corresponding CPU
SM510	Low speed program execution flag	OFF : Completed or not executed ON : Execution under way.	• Goes ON when low speed execution type program is executed.	S (Every END processing)	New	Qn(H) QnPH
SM551	Reads module service interval	OFF : Ignored ON : Read	• When this relay goes from OFF to ON, the module service interval designated by SD550 is read to SD551 to SD552.	U	New	Qn(H) QnPH QnPRH

(6) I/O refresh

Table12.22 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9□□□	Corresponding CPU
SM580	Program to program I/O refresh	OFF : Not refreshed ON : Refreshed	• When this special relay is turned ON, I/O refresh is performed after execution of the first program, and the next program is then executed. When a sequence program and an SFC program are to be executed, the sequence program is executed, I/O refresh is performed, and the SFC program is then executed.	U	New	Q00J/Q00/Q01*1

*1: This applies to the CPU of function version B or later.

(7) Memory cards

Table12.23 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9□□□	Corresponding CPU
SM600	Memory card usable flags	OFF : Unusable ON : Use enabled	• ON when memory card is ready for use by user	S (Status change)	New	Qn(H) QnPH QnPRH QnU*1
SM601	Memory card protect flag	OFF : No protect ON : Protect	• Goes ON when memory card protect switch is ON	S (Status change)	New	
SM602	Drive 1 flag	OFF : No drive 1 ON : Drive 1 present	• Turns ON when the mounted memory card is RAM	S (Status change)	New	
SM603	Drive 2 flag	OFF : No drive 2 ON : Drive 2 present	• Turns ON when the mounted memory card is ROM	S (Status change)	New	
SM604	Memory card in-use flag	OFF : Not used ON : In use	• Goes ON when memory card is in use	S (Status change)	New	
SM605	Memory card remove/ insert prohibit flag	OFF : Remove/insert enabled ON : Remove/insert prohibited	• Goes ON when memory card cannot be inserted or removed	U	New	
SM609	Memory card remove/ insert enable flag	OFF : Remove/insert prohibited ON : Remove/insert enabled	• Turned ON by user to enable the removal/insertion of memory card. • Turned OFF by the system after the memory card is removed. • This contact can be used only when SM604 and SM605 are OFF.	S/U	New	
SM620	Drive 3/4 usable flags	OFF : Unusable ON : Use enabled	• Always ON	S (Initial)	New	QCPU
SM622	Drive 3 flag	OFF : No drive 3 ON : Drive 3 present	• Always ON	S (Initial)	New	Q00J/Q00/Q01 Qn(H) QnPH QnPRH QnU*2
SM623	Drive 4 flag	OFF : No drive 4 ON : Drive 4 present	• Always ON	S (Initial)	New	QCPU
SM624	Drive 3/4 in-use flag	OFF : Not used ON : In use	• Goes ON when the file within Drive 3 (standard RAM) or Drive 4 (standard ROM) is used.	S (Status change)	New	Qn(H) QnPH QnPRH QnU
SM640	File register use	OFF : File register not used ON : File register in use	• Goes ON when file register is in use	S (Status change)	New	Q00J/Q00/Q01 Qn(H) QnPH QnPRH QnU*2

*1: The Universal model QCPU except the Q00UJCPU, Q00UCPU, and Q01UCPU.
*2: The Universal model QCPU except the Q00UJCPU.

Table12.23 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM650	Comment use	OFF : File register not used ON : File register in use	• Goes ON when comment file is in use	S (Status change)	New	Qn(H) QnPH QnPRH QnU
SM660	Boot operation	OFF : Internal memory execution ON : Boot operation in progress	• Goes ON while boot operation is in process • Goes OFF if boot designation switch is OFF	S (Status change)	New	Qn(H) QnPH QnPRH
		OFF : Program memory execution ON : Boot operation in progress	• Goes ON while boot operation is in process	S (Status change)	New	Q00J/Q00/Q01 QnU*1
SM671	Latch data backup to standard ROM completion flag	OFF : Not completed ON : Completed	• Turned ON when latch data backup to the standard ROM is completed. • Time when the latch data backup to the standard ROM was performed is stored in SD672 or later.	S (Status change)	New	QnU
SM672	Memory card file register access range flag	OFF : Within access range ON : Outside access range	• Goes ON when access is made to area outside the range of file register of memory card(Set within END processing.) • Reset at user program	S/U	New	Qn(H) QnPH QnPRH
SM675	Error completion of latch data backup to standard ROM	OFF : No Error ON : Error	• Turned ON when data cannot be backuped to the standard ROM by the latch data backup normally. • Turned OFF when data is backuped to the standard ROM by the latch data backup normally.	S	New	QnU
SM676	Specification of restration repeated execution	OFF : Not specified ON : Specified	• If latch data backup is performed when SM676 is ON, restore the data every time turning ON from OFF the power supply from the next power-on. • Delete the backuped latch data, or restore the data every time turning ON from OFF the power supply until the latch data backup operation will be executed again.	U	New	
SM680	Program memory write error	OFF : Write error ON : Write not executed/ normal	• Turns ON if a write error is detected at writing to program memory (flash ROM). Turns OFF by the write direction.	S (At write)	New	
SM681	Program memory writing flag	OFF : During writing ON : Write not executed	• Turns ON when writing to the program memory (flash ROM) is in progress, and turns OFF when writing is completed.	S (At write)	New	
SM682	Program memory overwrite count error flag	OFF : Overwrite count is 100,000 or more ON : Overwrite count is less than 100,000	• Turns ON when the overwrite count of program memory (flash ROM) reaches 100,000.	S (At write)	New	
SM685	Standard ROM write error	OFF : Write error ON : Write not executed/ normal	• Turns ON when write error is detected at writing to standard ROM (flash ROM). • Turns OFF by the write direction.	S (At write)	New	
SM686	Standard ROM writing flag	OFF : During overwriting ON : Overwrite not executed	• Turns ON when writing to the standard ROM (flash ROM) is in progress, and turns OFF when writing is completed.	S (At write)	New	
SM687	Standard ROM overwrite count error flag	OFF : Overwrite count is 100,000 or more ON : Overwrite count is less than 100,000	• Turns ON when the overwrite count of standard ROM (flash ROM) reaches 100,000. (It is necessary to change CPU module.)	S (At write)	New	
SM691	Backup start preparation status flag	OFF : Backup start preparation not completed ON : Backup start preparation completed	Turns on when the backup start preparation is completed.	S (Status change)	New	QnU*3
SM692	Restoration complete flag	OFF : Restoration not completed ON : Restoration completed	Turns on when restoration of the backup data in the memory card is completed.	S (Status change)	New	

*1: The Universal model QCPU except the Q00UJCPU, Q00UCPU, and Q01UCPU.
*3: The modules whose serial number (first five digits) is "10102" or later are the relevant models. (Except the Q00UJCPU, Q00UCPU, and Q01UCPU)

(8) Instruction-Related Special Relays

Table12.24 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM700	Carry flag	OFF : Carry OFF ON : Carry ON	• Carry flag used in application instruction	S (Instruction execution)	M9012	QCPU
SM701	Number of output characters selection	Switching the number of output characters and the output pattern	• Used for the PR, PRC, BINDA, DBINDA, BINHA, DBINHA, BCDDA, DBCDDA, or COMRD instruction	U	M9049	Qn(H) QnPH QnPRH QnU
SM702	Search method	OFF : Search next ON : 2-part search	• Designates method to be used by search instruction. • Data must be arranged for 2-part search.	U	New	QCPU
SM703	Sort order	OFF : Ascending order ON : Descending order	• The sort instruction is used to designate whether data should be sorted in ascending order or in descending order.	U	New	
SM704	Block comparison	OFF : Non-match found ON : All match	• Goes ON when all data conditions have been met for the BKCMP instruction.	S (Instruction execution)	New	
			• Goes ON when all data conditions have been met for the DBKCMP instruction.	S (Instruction execution)	New	QnU*2
SM709	DT/TM instruction improper data detection flag	OFF : Improper data not detected ON : Improper data detected	Turns on when the data to be compared by the DT or TM instruction is not recognized as date data or time data, or the device (3 words) to be compared exceeds the specified device range.	S (Instruction execution) or U	New	
SM710	CHK instruction priority ranking flag	OFF : Conditions priority ON : Pattern priority	• Remains as originally set when OFF. • CHK priorities updated when ON.	S (Instruction execution)	New	Qn(H) QnPH QnPRH
SM715	EI flag	OFF : During DI ON : During EI	• ON when EI instruction is being executed.	S (Instruction execution)	New	QCPU
SM716	Block comparison (Except an interrupt program)	OFF : Mismatch found ON : No mismatch	Turns on when all data conditions are confirmed that they are met by the DBKCMP instruction. (Initial execution type program, scan execution type program, stand-by type program executed from initial execution type program or scan execution type program)	S (Instruction execution)	New	QnU*2
SM717	Block comparison (Interrupt program)	OFF : Mismatch found ON : No mismatch	Turns on when all data conditions are confirmed that they are met by the DBKCMP instruction. (Interrupt program, fixed scan execution type program, stand-by type program executed from interrupt program or fixed scan execution type program)			
SM718	Block comparison (Interrupt program (I45))	OFF : Mismatch found ON : No mismatch	Turns on when all data conditions are confirmed that they are met by the DBKCMP instruction. (Interrupt program (I45) or Stand-by type program executed from interrupt program (I45))			QnU*3
SM720	Comment read completion flag	OFF : Comment read not completed ON : Comment read completed	• Turns on only during one scan when the processing of the COMRD or PRC instruction is completed.	S (Status change)	New	Qn(H) QnPH
			• Turns on only during one scan when the processing of the COMRD instruction is completed.			QnPRH QnU
SM721	File being accessed	OFF : File not accessed ON : File being accessed	• Switches ON while a file is being accessed by the SP. FWRITE, SP. FREAD, COMRD, PRC, or LEDC instruction.	S (Status change)	New	Qn(H) QnPH
			• Switches ON while a file is being accessed by the SP. FWRITE, SP. FREAD, COMRD or LEDC instruction.			Qn(H) QnPH QnPRH
			• Switches ON while a file is being accessed by the SP. FWRITE, SP. FREAD, COMRD or SP.DEVST instruction.			QnU
			• Turns ON while the ATA card or standard ROM is being accessed.			QnU*1
SM722	BIN/DBIN instruction error disabling flag	OFF : Error detection performed ON : Error detection not performed	• Turned ON when "OPERATION ERROR" is suppressed for BIN or DBIN instruction.	U	New	QCPU

*1: The module whose first 5 digits of serial No. is "09042" or later.
*2: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

*3: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UCPU, Q01UCPU

Table12.24 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM734	XCALL instruction execution condition designation	OFF : Not executed by execution condition risen ON : Executed by execution condition risen	• During OFF, XCALL instructions will not be executed even if execution condition is risen. • During ON, XCALL instructions will be executed when execution condition is risen.	U	New	Qn(H)*1
SM735	SFC comment readout instruction in execution flag	OFF : SFC comment readout instruction is inactivated. ON : SFC comment readout instruction is activating.	• Turns on the instructions, (S(P).SFCSCOMR) to read the SFC step comments and (S(P). SFCTCOMR) to read the SFC transition condition comments.	S (status change)	New	Qn(H)*2 QnPH*3 QnPRH*3
SM738	MSG instruction reception flag	OFF : Instruction not executed ON : Instruction execution	• Goes ON when MSG instruction is executed	S (Instruction execution)	New	Qn(H) QnPRH
SM750	Scaling instruction search method setting	OFF : Search next ON : 2-part search	Determines a search method when the scaling instruction is executed.	U	New	QnU*8
SM774	PID bumpless processing (for complete derivative)	OFF : Matched ON : Not matched	• Specifies whether to match the set value (SV) with the process value (PV) or not in the manual mode.	U	New	Q00J/Q00/Q01*4 Qn(H) QnPRH QnU
SM775	Selection of refresh processing during COM/CCOM instruction execution	OFF : Performs link refresh ON : Performs no link refresh	• Select whether link refresh processing will be performed or not when only communication with the CPU module is made at the execution of the COM instruction.	U	New	Q00J/Q00/Q01 Qn(H) QnPH
		OFF : Performs refresh processes other than an I/O refresh ON : Performs refresh set by SD778	• Select whether to perform refresh processes other than an I/O refresh set by SD778 when the COM or CCOM instruction is executed.	U	New	Q00J/Q00/Q01*4 Qn(H)*5 QnPH*3 QnPRH QnU
SM776	Enable/disable local device at CALL	OFF : Local device disabled ON : Local device enabled	• Set whether the local device of the subroutine program called at execution of the CALL instruction is valid or invalid.	U	New	Qn(H) QnPH QnPRH QnU*9
SM777	Enable/disable local device in interrupt program	OFF : Local device disabled ON : Local device enabled	• Set whether the local device at execution of the interrupt program is valid or invalid.	U	New	
SM794	PID bumpless processing(for incomplete derivative)	OFF : Matched ON : Not matched	• Specifies whether to match the set value (SV) with the process value (PV) or not in the manual mode.	U	New	Q00J/Q00/Q01*4 Qn(H)*6 QnPRH QnU

*1: The module whose first 5 digits of serial No. is "06082" or later.
*2: The module whose first 5 digits of serial No. is "07012" or later.
*3: The module whose first 5 digits of serial No. is "07032" or later.
*4: This applies to the CPU module of function version B or later.
*5: The module whose first 5 digits of serial No. is "04012" or later.
*6: The module whose first 5 digits of serial No. is "05032" or later.
*8: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

*9: The Universal model QCPU except the Q00UJCPU.

Table12.24 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9□□□	Corresponding CPU
SM796	Block information using multiple CPU high-speed transmission dedicated instruction (for CPU No.1)	OFF : Block is secured ON : Block set by SD796 cannot be secured	• Turns ON when the number of the remaining blocks of the dedicated instruction transmission area used for the multiple CPU high-speed transmission dedicated instruction(target CPU= CPU No.1) is less than the number of blocks specified by SD796. Turns ON at instruction execution. Turns OFF when the empty area exists at END processing.	S (When instruction/END processing executed)	New	QnU*7
SM797	Block information using multiple CPU high-speed transmission dedicated instruction (for CPU No.2)	OFF : Block is secured ON : Block set by SD797 cannot be secured	• Turns ON when the number of the remaining blocks of the dedicated instruction transmission area used for the multiple CPU high-speed transmission dedicated instruction (target CPU= CPU No.2) is less than the number of blocks specified by SD797. Turns ON at instruction execution. Turns OFF when the empty area exists at END processing.	S (When instruction/END processing executed)	New	
SM798	Block information using multiple CPU high-speed transmission dedicated instruction (for CPU No.3)	OFF : Block is secured ON : Block set by SD798 cannot be secured	• Turns ON when the number of the remaining blocks of the dedicated instruction transmission area used for the multiple CPU high-speed transmission dedicated instruction (target CPU= CPU No.3) is less than the number of blocks specified by SD798. Turns ON at instruction execution. Turns OFF when the empty area exists at END processing.	S (When instruction/END processing executed)	New	
SM799	Block information using multiple CPU high-speed transmission dedicated instruction (for CPU No.4)	OFF : Block is secured ON : Block set by SD799 cannot be secured	• Turns ON when the number of the remaining blocks of the dedicated instruction transmission area used for the multiple CPU high-speed transmission dedicated instruction(target CPU= CPU No.4) is less than the number of blocks specified by SD799. Turns ON at instruction execution. Turns OFF when the empty area exists at END processing.	S (When instruction/END processing executed)	New	

*7: The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

(9) Debug

Table12.25 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9□□□	Corresponding CPU
SM800	Trace preparation	OFF : Not ready ON : Ready	• Switches ON when the trace preparation is completed	S (Status change)	New	Qn(H) QnPH QnPRH QnU*1
SM801	Trace start	OFF : Suspend ON : Start	• Trace is started when this relay switches ON. • Trace is suspended when this relay switches OFF. (All related special Ms switches OFF.)	U	M9047	
SM802	Trace execution in progress	OFF : Suspend ON : Start	• Switches ON during execution of trace.	S (Status change)	M9046	
SM803	Trace trigger	OFF→ON: Start	• Trace is triggered when this relay switches from OFF to ON. (Identical to TRACE instruction execution status)	U	M9044	
SM804	After trace trigger	OFF : Not after trigger ON : After trigger	• Switches ON after trace is triggered.	S (Status change)	New	
SM805	Trace completed	OFF : Not completed ON : End	• Switches ON at completion of trace	S (Status change)	M9043	
SM826	Trace error	OFF : Normal ON : Errors	• Switches ON if error occurs during execution of trace	S (Status change)	New	
SM829	Forced registration specification of trace setting	ON : Forced registration enabled OFF : Forced registration disabled	• Even when the trace condition or the trigger condition is established, the sampling trace setting can be set to the CPU module by turning SM829 ON and registering the sampling trace setting by GX Developer.	U	New	QnU*1

*1: The Universal model QCPU except the Q00UJCPU.

(10) A to Q conversion correspondences

Special relays SM1000 to SM1255 are the relays which correspond to ACPU special relays M9000 to M9255 after A to Q conversion.
(However, the Basic model QCPU and Redundant CPU do not support the A to Q conversion.)
These special relays are all set by the system, and cannot be set by the user program.
To turn them ON/OFF by the user program, change the special relays in the program into those of QCPU.
However, some of SM1084 and SM1200 to SM1255 (corresponding to M9084 and M9200 to M9255 before conversion) can be turned ON/OFF by the user program, if they could be turned ON/OFF by the user program before conversion.For details on the ACPU special relays, see the user's manuals for the individual CPUs, and MELSECNET or MELSECNET/B Data Link System Reference Manuals

Point

Check "Use special relay/special register from SM/SD1000" for "A-PLC" on the PLC system tab of PLC parameter in GX Developer when the converted special relays are used with the High Performance model QCPU, Process CPU, and Universal model QCPU.
When not using the converted special relays, uncheck "Use special relay/special register from SM/SD1000" to save the time taken for processing special relays.

Remark

The following are additional explanations about the Special Relay for Modification column.

① When a special relay for modification is provided, the device number should be changed to the provided QCPU special relay.

② When ⊟ is provided, the converted special relay can be used for the device number.

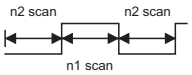
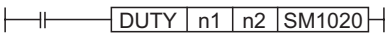
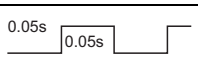
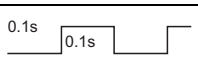
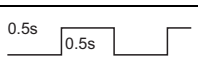
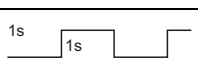
③ When ⊠ is provided, the device number does not work with QCPU.

Table12.26 Special relay

ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning	Details	Corresponding CPU
M9000	SM1000	–	Fuse blown	OFF : Normal ON : Module with blown fuse	• Turned on when there is one or more output modules of which fuse has been blown. • Remains ON if the condition is restored to normal thereafter. • Output modules of remote I/O stations are also checked fore fuse condition.	Qn(H) QnPH QnU*1
M9002	SM1002	–	I/O module verify error	OFF : Normal ON : Error	• Turned on if the status of I/O module is different form entered status when power is turned on. • Remains ON if the condition is restored to normal thereafter. • I/O module verification is done also to remote I/O station modules. • Reset is enabled only when special registers SD1116 to SD1123 are reset.	

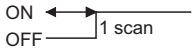
*1: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

Table12.27 Special relay

ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning	Details	Corresponding CPU
M9005	SM1005	–	AC DOWN detection	OFF : AC DOWN not detected ON : AC DOWN detected	• Turns ON if an instantaneous power failure of within 20ms occurs during use of the AC power supply module. • Reset when the power supply is switched OFF, then ON. • Turns ON if an instantaneous power failure of within 10ms occurs during use of the DC power supply module. • Reset when the power supply is switched OFF, then ON.	Qn(H) QnPH QnU*1
M9006	SM1006	–	Battery low	OFF : Normal ON : Battery low	• Turns ON when the battery voltage drops to or below the specified. • Turns OFF when the battery voltage returns to normal thereafter.	
M9007	SM1007	–	Battery low latch	OFF : Normal ON : Battery low	• Turns ON when the battery voltage drops to or below the specified. • Remains ON if the battery voltage returns to normal thereafter.	
M9008	SM1008	SM1	Self-diagnosis error	OFF : No error ON : Error	• Turned on when error is found as a result of self-diagnosis.	
M9009	SM1009	SM62	Annunciator detection	OFF : No F number detected ON : F number detected	• Turned on when OUT F of SET F instruction is executed. • Switched off when SD1124 data is cleared to zero.	
M9011	SM1011	SM56	Operation error flag	OFF : No error ON : Error	• Turned on when operation error occurs during execution of application instruction. • Remains ON if the condition is restored to normal thereafter.	
M9012	SM1012	SM700	Carry flag	OFF : Carry OFF ON : Carry ON	• Carry flag used in application instruction.	Qn(H) QnPH
M9016	SM1016	×	Data memory clear flag	OFF : Ignored ON : Output claered	• Clears the data memory including the latch range (other than special relays and special registers) in remote run mode from computer, etc. when SM1016 is on.	
M9017	SM1017	×	Data memory clear flag	OFF : Ignored ON : Output claered	• Clears the unlatched data memory (other than special relays and special registers) in remote run mode from computer, etc. when SM1017 is on.	
M9020	SM1020	–	User timing clock No.0		• Relay which repeats on/off at intervals of predetermined scan. • When power is turned on or reset is per-formed, the clock starts with off. Set the intervals of on/off by DUTY instruction.  n1: ON scan interval n2: OFF scan interval * : If DUTY instruction, which specified from SM 1020 to SM 1024 of User timing clock in programs other than a program for a Universal model QCPU, changes the programmable controller to the Universal model QCPU, the special relays SM 420 to 424 will be replaced. (Universal model QCPUs cannot specify the special relays from SM 1020 to SM1024.)	Qn(H) QnPH QnU*1
M9021	SM1021	–	User timing clock No.1			
M9022	SM1022	–	User timing clock No.2			
M9023	SM1023	–	User timing clock No.3			
M9024	SM1024	–	User timing clock No.4			
M9025	SM1025	–	Clock data set request	OFF : Ignored ON : Set request present used	• Writes the clock data stored in SD1025 to SD1028 to the CPU module after the END instruction is executed in the scan in which SM1025 turned from OFF to ON.	
M9026	SM1026	–	Clock data error	OFF : No error ON : Error	• Switched on by clock data (SD1025 to SD1028) error	
M9028	SM1028	–	Clock data read request	OFF : Ignored ON : Read request	• Reads clock data to SD1025 to SD1028 in BCD when SD1028 is on.	
M9029	SM1029	×	Batch processing of data communications requests	OFF : Batch processing not conducted ON : Batch processing conducted	• The SM1029 relay is turned on using a sequence program to process all data communication requests accepted during one scan in the END processing of that scan. • The batch processing of the data communication requests can be turned on and off during running. • The default is OFF (processed one at a time for each END processing in the order in which data communication requests are accepted).	Qn(H) QnPH
M9030	SM1030	–	0.1 second clock		• 0.1 second, 0.2 second, 1 second and 2 second, clocks are generated. • Not turned on or off per scan but turned on and off even during scan if corresponding time has elapsed. • Starts with off when Programmable Controller power supply is turned on or CPU module reset is performed.	Qn(H) QnPH QnU*1
M9031	SM1031	–	0.2 second clock			
M9032	SM1032	–	1 second clock			
M9033	SM1033	–	2 second clock			

*1: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

Table12.27 Special relay

ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning	Details	Corresponding CPU
M9034	SM1034	–	2n minute clock(1 minute clock)*2		• Alternates between ON and OFF according to the seconds specified at SD414. (Default: n = 30) • Not turned on or off per scan but turned on and off even during scan if corresponding time has elapsed. • Starts with off when Programmable Controller power supply is turned on or CPU module reset is performed.	Qn(H) QnPH QnU*1
M9036	SM1036	–	Always ON		• Used as dummy contacts of initialization and application instruction in sequence program. • SM1038 and SM1037 are turned on and off without regard to position of key switch on CPU module front. SM1038 and SM1039 are under the same condition as RUN status except when the key switch is at STOP position, and turned off and on. Switched off if the key switch is in STOP position. SM1038 is on for one scan only and SM1039 is off for one scan only if the key switch is not in STOP position.	
M9037	SM1037	–	Always OFF			
M9038	SM1038	–	ON for 1 scan only after RUN			
M9039	SM1039	–	RUN flag(After RUN, OFF for 1 scan only)			
M9040	SM1040	SM206	PAUSE enable coil	OFF : PAUSE disabled ON : PAUSE enabled	• When RUN key switch is at PAUSE position or pause contact has turned on and if SM1040 is on, PAUSE mode is set and SM1041 is turned on.	Qn(H) QnPH
M9041	SM1041	SM204	PAUSE status contact	OFF : PAUSE not in effect ON : PAUSE in effect		Qn(H) QnPH QnU*1
M9042	SM1042	SM203	STOP status contact	OFF : STOP not in effect ON : STOP in effect	• Switched on when the RUN key switch or RUN/STOP switch is in STOP position.	
M9043	SM1043	SM805	Sampling trace completed	OFF : Sampling trace in progress ON : Sampling trace completed	• Turned on upon completion of sampling trace performed the number of times preset by parameter after STRA instruction is executed. Reset when STRAR instruction is executed.	
M9044	SM1044	SM803	Sampling trace	OFF → ON Same as STRA instruction execution ON → OFF Same as STRAR instruction execution	• Turning on/off SM1044 can execute STRA/STRAR instruction. (SM1044 is forcibly turned on/off by a peripheral device.) When switched from OFF to ON: STRA instruction When switched from ON to OFF: STRAR instruction The value stored in SD1044 is used as the condition for the sampling trace. At scanning, at time → Time (10 ms unit)	Qn(H) QnPH
M9045	SM1045	×	Watchdog timer (WDT) reset	OFF : Does not reset WDT ON : Resets WDT	• The SM1045 relay is turned on to reset the WDT when the ZCOM instruction and data communication request batch processing are executed (used when the scan time exceeds 200 ms).	
M9046	SM1046	SM802	Sampling trace	OFF : Trace not in progress ON : Trace in progress	• Switched on during sampling trace.	Qn(H) QnPH QnU*1
M9047	SM1047	SM801	Sampling trace preparations	OFF : Sampling trace suspended ON : Sampling trace started	• Sampling trace is not executed unless SM1047 is turned ON. Sampling trace is suspended when SM1047 goes OFF.	Qn(H) QnPH
M9049	SM1049	SM701	Switching the number of output characters	OFF : Output until NULL code encountered ON : 16 characters output	• When SM1049 is OFF, characters up to NULL (00_H) code are output. • When SM1049 is ON, ASCII codes of 16 characters are output.	
M9051	SM1051	×	CHG instruction execution disable	OFF : Enabled ON : Disable	• Switched ON to disable the CHG instruction. • Switched ON when program transfer is requested. Automatically switched OFF when transfer is complete.	
M9052	SM1052	×	SEG instruction switch	OFF : 7SEG segment display ON : I/O partial refresh	• When SM1052 is ON, the SEG instruction is executed as an I/O partial refresh instruction. When SM1052 is OFF, the SEG instruction is executed as a 7-SEG display instruction.	

*1: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

*2: minute clock indicates the name of the special relay (M9034) of the ACPU.

Table12.27 Special relay

ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning	Details	Corresponding CPU
M9056	SM1056	×	Main side P, I set request	OFF : Other than when P, I set being requested ON : P, I set being requested	• Provides P, I set request after transfer of the other program (for example subprogram when main program is being run) is complete during run. Automatically switched off when P, I setting is complete.	Qn(H) QnPH
M9057	SM1057	×	Sub side P, I set request	OFF : Other than when P, I set being requested ON : P, I set being requested		
M9058	SM1058	×	Main side P, I set completion	Momentarily ON at P, I set completion	• Turned ON once when the P, I set has been completed, and then turned OFF again.	
M9059	SM1059	×	Sub program P, I set completion	Momentarily ON at P, I set completion		
M9060	SM1060	×	Sub program 2 P, I set request	OFF : Other than when P, I set being requested ON : P, I set being requested	• Provides P, I set request after transfer of the other program (for example subprogram when main program is being run) is complete during run. Automatically switched off when P, I setting is complete.	
M9061	SM1061	×	Sub program 3 P, I set request	OFF : Other than when P, I set being requested ON : P, I set being requested		
M9070	SM1070	×	A8UPU/ A8PUJrequired search time*3	OFF : Read time not shortened ON : Read time shortened	• Turned ON to shorten the search time in the A8UPU/ A8PUJ. (In this case, the scan time is extended by 10 %.)	
M9084	SM1084	×	Error check	OFF : Error check executed ON : No error check	It is set whether the error checks below are performed or not when the END instruction is processed (to set the END instruction processing time). • Check for fuse blown. • Check of battery • Collation check of I/O module	
M9091	SM1091	×	Operation error details flag	OFF : No error ON : Error	• Turns ON when the detail factor of the operation error is stored into SD1091. • Remains ON if the condition is restored to normal thereafter.	
M9100	SM1100	SM320	Presence/absence of SFC program	OFF : SFC programs not used ON : SFC programs used	• Turned on if the SFC program is registered. • Turned off if the SFC program is not registered.	
M9101	SM1101	SM321	Start/stop SFC program	OFF : SFC programs stop ON : SFC programs start	• The value in SM1100 is set as the initial value. (The relay automatically turns ON when the SFC program is present.) • When this relay turns from ON to OFF, execution of the SFC program stops. • When this relay turns from OFF to ON, execution of the SFC program resumes.	
M9102	SM1102	SM322	SFC program start status	OFF : Initial start ON : Resume start	• The SFC program start mode in the SFC setting of the PLC parameter dialog box is set as the initial value. At initial start: OFF At continue start: ON	

*3: The A8UPU/A8PUJ is not available for the QCPU/QnACPU.

Table12.27 Special relay

ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning	Details	Corresponding CPU
M9103	SM1103	SM323	Presence/absence of continuous transition	OFF : Continuous transition not effective ON : Continuous transition effective	• Set whether continuous transition will be performed for the block where the "continuous transition bit" of the SFC information device is not set.	Qn(H) QnPH
M9104	SM1104	SM324	Continuous transition suspension flag	OFF : When transition is completed ON : When no transition	• OFF during operation in the continuous transition mode or during continuous transition, and ON when continuous transition is not executed. • Always ON during operation in the no continuous transition mode.	
M9108	SM1108	SM90	Step transition monitoring timer start (equivalent of SD90)	OFF : Monitoring timer reset ON : Monitoring timer reset start	• Turns ON when the measurement of the step transition monitoring timer is started. Turning this relay OFF resets the step transition monitoring timer.	
M9109	SM1109	SM91	Step transition monitoring timer start (equivalent of SD91)			
M9110	SM1110	SM92	Step transition monitoring timer start (equivalent of SD92)			
M9111	SM1111	SM93	Step transition monitoring timer start (equivalent of SD93)			
M9112	SM1112	SM94	Step transition monitoring timer start (equivalent of SD94)			
M9113	SM1113	SM95	Step transition monitoring timer start (equivalent of SD95)			
M9114	SM1114	SM96	Step transition monitoring timer start (equivalent of SD96)			
M9196	SM1196	SM325	Operation output at block stop	OFF : Coil output OFF ON : Coil output ON	• Selects the operation output when block stop is executed. ON : Retains the ON/OFF status of the coil being used by using operation output of the step being executed at block stop. OFF : All coil outputs are turned off. (Operation output by the SET instruction is retained regardless of the ON/OFF status of SM1196.)	
M9197	SM1197	×	Switch between blown fuse and I/O verify error display	SM1197 / SM1198 / I/O numbers to be displayed OFF / OFF / X/Y0 to 7F0 ON / OFF / X/Y800 to FF0 OFF / ON / X/Y1000 to 17F0 ON / ON / X/Y1800 to 1FF0	Switches I/O numbers in the fuse blow module storage registers (SD1100 to SD1107) and I/O module verify error storage registers (SD1116 to SD1123) according to the combination of ON/OFF of the SM1197 and SM1198.	
M9198	SM1198	×				
M9199	SM1199	×	Data recovery of online sampling trace/status latch	OFF : Data recovery disabled ON : Data recovery enabled	• Recovers the setting data stored in the CPU module at restart when sampling trace/status latch is executed. • SM1199 should be ON to execute again. (Unnecessary when writing the data again from peripheral devices.)	

(11) QCPU with built-in Ethernet port

Table12.28 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM1270	Time setting function (SNTP client) execution	OFF : No time setting function (SNTP client) execution ON : Time setting function (SNTP client) execution	Set this to ON when executing the time setting function (SNTP client). (Only when the time setting function is in "Use" with the time setting parameter.)	U	New	QnU*1
SM1273	Remote password mismatch count clear	OFF : Normal ON : Clear	To clear the acumulated numeber (SD979 to 999) of mismatched remote passwords, the setting SM1273 is executed.	U	New	

* 1: This applies to the Built-in Ethernet port QCPU.

(12) Process control instructions

Table12.29 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9□□□	Corresponding CPU
SM1500	Hold mode	OFF : No-hold ON : Hold	• Specifies whether or not to hold the output value when a range over occurs for the S.IN instruction range check.	U	New	QnPH QnPRH
SM1501	Hold mode	OFF : No-hold ON : Hold	• Specifies whether or not the output value is held when a range over occurs for the S.OUT instruction range check.	U	New	

(13) For redundant systems (Host system CPU information *1)

SM1510 to SM1599 are only valid for redundant systems.

All off for standalone systems.

Table12.30 Special relay

<table>
<tr><th>Number</th><th>Name</th><th>Meaning</th><th>Explanation</th><th>Set by (When Set)</th><th>Corresponding ACPU M9□□□</th><th>Corresponding CPU</th></tr>
<tr><td>SM1510</td><td>Operation mode</td><td>OFF : Redundant system backup mode, stand-alone system
ON : Redundant system separate mode</td><td>• Turns on when the operating mode is redundant system separate.</td><td>S (Each END)</td><td>New</td><td rowspan="6">QnPRH</td></tr>
<tr><td>SM1511
SM1512</td><td>System A identification flag
System B identification flag</td><td colspan="2">• Distinguishes between system A and system B.
• The flag status does not change even if the tracking cable is disconnected.
<table>
<tr><th></th><th>System A</th><th>System B</th><th>When TRK. CABLE ERR. (error code: 6210) occurs (Unknown)</th></tr>
<tr><td>SM1511</td><td>ON</td><td>OFF</td><td>OFF</td></tr>
<tr><td>SM1512</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
</table></td><td>S (Initial)</td><td>New</td></tr>
<tr><td>SM1513</td><td>Debug mode status flag</td><td>OFF : Not in debug mode
ON : Debug mode</td><td>• Turns on when the redundant system operating mode is set to debug mode.</td><td>S (Initial)</td><td>New</td></tr>
<tr><td>SM1515
SM1516</td><td>Control system judgment flag
Standby system judgment flag</td><td colspan="2">• Indicates operation system status.
• The flag status does not change even if the tracking cable is disconnected.
<table>
<tr><th></th><th>Control system</th><th>Standby system</th><th>When TRK. CABLE ERR. (error code: 6210) occurs (Unknown)</th></tr>
<tr><td>SM1515</td><td>ON</td><td>OFF</td><td>OFF</td></tr>
<tr><td>SM1516</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
</table></td><td>S (Status change)</td><td>New</td></tr>
</table>

*1: The information of the host CPU module is stored.

Table12.29 Special relay

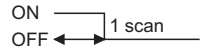
Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9□□□	Corresponding CPU
SM1517	CPU module startup status	OFF : Power supply on startup ON : Operation system switch start up	• Turns on when the CPU module is started up by the system switching (switching from the standby system to the control system). Remains OFF when the standby system is switched to the control system by a power-ON startup.	S (Status change)	New	
SM1518	Standby system to control system switching status flag		• Turns ON once switch between standby system to control system, (ON for 1 scan only) occurs. • This status flag can only be used for scan execution type programs.	S (Each END)	New	
SM1519	Previous Control System Identification Flag		• On the last operation Control System was System B,if power supply is supplied, or reset is released on both SYSTEM together,After RUN, ON for 1 scan only by System A side.	S (Each END)	New	
SM1520	Data tracking transfer trigger specification	OFF : No trigger ON : Trigger	SM1520 Block 1 SM1521 Block 2 SM1522 Block 3 SM1523 Block 4 SM1524 Block 5 SM1525 Block 6 SM1526 Block 7 SM1527 Block 8 SM1528 Block 9 SM1529 Block 10 SM1530 Block 11 SM1531 Block 12 SM1532 Block 13 SM1533 Block 14 SM1534 Block 15 SM1535 Block 16 SM1536 Block 17 SM1537 Block 18 SM1538 Block 19 SM1539 Block 20 SM1540 Block 21 SM1541 Block 22 SM1542 Block 23 SM1543 Block 24 SM1544 Block 25 SM1545 Block 26 SM1546 Block 27 SM1547 Block 28 SM1548 Block 29 • When data is transferred based on the tracking setting of the redundant parameter dialog box, the target block is specified as trigger. • When "Auto Tracking block No.1" is enabled in the tracking setting, SM1520 is turned ON by the system at power ON/ STOP to RUN. In other cases, SM1520 to SM1583 are turned ON by the user.	S (initial)/U	New	QnPRH
SM1521						
SM1522						
SM1523						
SM1524						
SM1525						
SM1526						
SM1527						
SM1528						
SM1529						
SM1530						
SM1531						
SM1532						
SM1533						
SM1534						
SM1535						
SM1536						
SM1537						
SM1538						
SM1539						
SM1540						
SM1541						
SM1542						
SM1543						
SM1544						
SM1545						
SM1546						
SM1547						
SM1548						

Table12.29 Special relay

Number	Name	Meaning	Explanation			Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM1549	Data tracking transfer trigger specification	OFF : No trigger ON : Trigger	SM1549	Block 30	• When data is transferred based on the tracking setting of the redundant parameter dialog box, the target block is specified as trigger. • When "Auto tracking block No. 1" is enabled in the tracking setting, SM1520 is turned ON by the system at power ON/ STOP to RUN. In other cases, SM1520 to SM1583 are turned ON by the user.	S (initial)/U	New	QnPRH
SM1550			SM1550	Block 31				
SM1551			SM1551	Block 32				
SM1552			SM1552	Block 33				
SM1553			SM1553	Block 34				
SM1554			SM1554	Block 35				
SM1555			SM1555	Block 36				
SM1556			SM1556	Block 37				
SM1557			SM1557	Block 38				
SM1558			SM1558	Block 39				
SM1559			SM1559	Block 40				
SM1560			SM1560	Block 41				
SM1561			SM1561	Block 42				
SM1562			SM1562	Block 43				
SM1563			SM1563	Block 44				
SM1564			SM1564	Block 45				
SM1565			SM1565	Block 46				
SM1566			SM1566	Block 47				
SM1567			SM1567	Block 48				
SM1568			SM1568	Block 49				
SM1569			SM1569	Block 50				
SM1570			SM1570	Block 51				
SM1571			SM1571	Block 52				
SM1572			SM1572	Block 53				
SM1573			SM1573	Block 54				
SM1574			SM1574	Block 55				
SM1575			SM1575	Block 56				
SM1576			SM1576	Block 57				
SM1577			SM1577	Block 58				
SM1578			SM1578	Block 59				
SM1579			SM1579	Block 60				
SM1580			SM1580	Block 61				
SM1581			SM1581	Block 62				
SM1582			SM1582	Block 63				
SM1583			SM1583	Block 64				
SM1590	System switching enable/disable flag from network module	OFF : System switching request issuing module absent ON : System switching request issuing module present	• Turns ON when a system switching request is issued from the network module. The module No. that issued system switching can be checked by SD1590. • Turns OFF when all bits of SD1590 are OFF.			S (Each END)	New	
SM1591	Standby system error detection disable flag at system switching	ON : Error is not detected by new standby system at system switching OFF : Error is detected by new standby system at system switching	This flag is used to determine if the new standby station detects 6210:STANDBY during system switching. This applies to the following switching methods: • System switching from GX Developer • System switching using dedicated instruction • System switching by the intelligent function module			U	New	
SM1592	Enable/disable user system switching	OFF : Disable user system switching ON : Enable user system switching	• This flag enables system switching by the user from GX Developer or by dedicated instruction. (SP.CONTSW).			U	New	

Table12.29 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM1593	Setting to access extension base unit of standby system CPU	OFF : Error ON : Ignored	Sets the operation for the case accessing buffer memory of the intelligent function module mounted on the extension base unit from the standby system CPU in separate mode. OFF : "OPERATION ERROR" (error code: 4112) will be returned when accessing buffer memory of the intelligent function module on the extension base unit from the standby system CPU. ON : No processing is performed when accessing buffer memory of intelligent function module on the extension base unit from the standby system CPU.	U	New	QnPRH*2
SM1595	Memory copy to other system start flag	OFF : Start memory copy ON : No memory copy initiated	• When SM1595 is turned from OFF to ON, memory copy from control system to standby system starts. Note that when SM1595 is turned from OFF to ON, memory copy does not start if the I/O No. of the copy destination (standby system CPU module: 3D1H) is not stored in SD1595.			QnPRH
SM1596	Memory copy to other system status flag	OFF : Memory copy not executed ON : Memory copy executed	• Turns on while memory is copied to other system. • Turns off when memory copy execution has completed.	S (Starting to copy/finish)		
SM1597	Memory copy to other system completion flag	OFF : Memory copy not completed ON : Memory copy completed	• Turns on once the memory copying to the other system has completed.	S (finish)/U	New	
SM1598	Copy contents of standard ROM during memory copy	OFF : Copy standard ROM data ON : Standard ROM data is not copied	• If set to on by user, the standard ROM data is not copied to the other system while memory copy is executing.	U		

*2: The module whose first 5 digits of serial No. is "09012" or later.

(14) For redundant system (Other system CPU information *1)

SM1600 to SM1650 only valid for the CPU redundant system backup mode, so they cannot be refreshed during the separate mode.

Either the backup mode or the separate mode is valid for the SM4651 to SM1699.

SM1600 to SM1699 are all turned off for stand-alone system.

Table12.30 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding Host SM□□ *2	Corresponding CPU
SM1600	Other system error flag	OFF : No error ON : Error	• Turns on when an error occurs during redundant system. Error check (Turns on single bit of SD1600.) • Is off when no errors are present	S (Each END)	–	QnPRH
SM1610	Other system diagnostics error	OFF : No error ON : Error	• Turns on when a diagnostics error occurs. (Includes error detection when annunciator is ON, and by CHK instruction) • Corresponds to status of SM0 at other system	S (Each END)	SM0	QnPRH
SM1611	Other systems self diagnostics error.	OFF : No self diagnostics error occurred ON : Self diagnostics error occurred	• Turns on when a self diagnostics error occurs. (Does not include error detection when annunciator is ON, and by CHK instruction) • Corresponds to status of SM1 at other system	S (Each END)	SM1	
SM1615	Other system common error information	OFF : No common error information present ON : Common error information present	• Turns on when there is common error information at other system • Corresponds to status of SM5 at other system	S (Each END)	SM5	
SM1626	Error individual information for other systems	OFF : No individual error information present ON : Individual error information present	• Turns on when there is individual error information at other system • Corresponds to status of SM16 at other system	S (Each END)	SM16	
SM1649	Standby system cancel error flag	OFF to ON: Cancels error of standby system	By turning this relay from OFF to ON, the continue error that occurred in the standby system CPU module can be canceled. Use SD1649 to specify the error code of the error to be canceled.	U	–	

*1 Stores other system CPU diagnostic information and system information.

*2 This shows the special relay(SM☐ ☐) for the host system CPU.

(15) For redundant system (tracking)

Either the backup mode or the second mode is valid for SM1700 to SM1799.

All is turned off for stand-alone system.

Table12.31 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM1700	Transfer trigger completion flag	OFF : Transfer not completed ON : Transfer completed	• Turns on for one scan, once transfer of block 1 to block 64 is completed.	S (status change)	New	QnPRH
SM1709	Manual system switching disable/ enable setting during online program change redundant tracking	ON : Manual system switching enabled (Disable canceled) OFF : Manual system switching disabled	(1) Turning this relay from OFF to ON enables manual system switching during online program change redundant tracking. After the manual system switching disable status is canceled, the system automatically turns off SM1709. (2) System switching due to any of the following conditions is executed even during online program change redundant tracking, regardless of the status of this relay. •Power off, reset, hardware failure, CPU stop error (3) In either of the following statuses, the system switching disable status can also be canceled by this relay. •Multiple-block online program change redundant tracking execution status •File batch online program change redundant tracking execution status	S (When executed)/U		
SM1710	Transfer tracking data during online program change enable flag	OFF : No device tracking ON : Transfer device memory	(1) Set whether the tracking of the following data will be executed or not during online program change redundant tracking. •Device memory (Including SM/SD that will automatically execute tracking) •PIDINIT information, S.PIDINIT information, SFC information (2) SM1710 can be also used to set whether tracking will be executed or not while online change of multiple program blocks or batch of files is being performed to ensure consistency of both systems. (3) This SM is also transferred form control system CPU module to standby system CPU module by tracking data.	U		

Table12.31 Special relay

Number	Name	Meaning	Explanation			Set by (When Set)	Corres-ponding ACPU M9□□□	Corresponding CPU
SM1712	Transfer trigger completion flag	OFF : Transfer uncompleted ON : Transfer completed	SM1712	Block 1	Turns ON only during one scan when the transmission of the corresponding block is completed.	S (status change)	New	QnPRH
SM1713			SM1713	Block 2				
SM1714			SM1714	Block 3				
SM1715			SM1715	Block 4				
SM1716			SM1716	Block 5				
SM1717			SM1717	Block 6				
SM1718			SM1718	Block 7				
SM1719			SM1719	Block 8				
SM1720			SM1720	Block 9				
SM1721			SM1721	Block 10				
SM1722			SM1722	Block 11				
SM1723			SM1723	Block 12				
SM1724			SM1724	Block 13				
SM1725			SM1725	Block 14				
SM1726			SM1726	Block 15				
SM1727			SM1727	Block 16				
SM1728			SM1728	Block 17				
SM1729			SM1729	Block 18				
SM1730			SM1730	Block 19				
SM1731			SM1731	Block 20				
SM1732			SM1732	Block 21				
SM1733			SM1733	Block 22				
SM1734			SM1734	Block 23				
SM1735			SM1735	Block 24				
SM1736			SM1736	Block 25				
SM1737			SM1737	Block 26				
SM1738			SM1738	Block 27				
SM1739			SM1739	Block 28				
SM1740			SM1740	Block 29				
SM1741			SM1741	Block 30				
SM1742			SM1742	Block 31				
SM1743			SM1743	Block 32				
SM1744			SM1744	Block 33				
SM1745			SM1745	Block 34				
SM1746			SM1746	Block 35				
SM1747			SM1747	Block 36				
SM1748			SM1748	Block 37				
SM1749			SM1749	Block 38				
SM1750			SM1750	Block 39				
SM1751			SM1751	Block 40				
SM1752			SM1752	Block 41				
SM1753			SM1753	Block 42				
SM1754			SM1754	Block 43				
SM1755			SM1755	Block 44				
SM1756			SM1756	Block 45				
SM1757			SM1757	Block 46				
SM1758			SM1758	Block 47				
SM1759			SM1759	Block 48				

Table12.31 Special relay

Number	Name	Meaning	Explanation			Set by (When Set)	Corresponding ACPU M9□□□	Corresponding CPU
SM1760	Transfer trigger completion flag	OFF : Transmission uncompleted ON : Transmission end	SM1760	Block 49	Turns ON only during one scan when the transmission of the corresponding block is completed.	S (status change)	New	QnPRH
SM1761			SM1761	Block 50				
SM1762			SM1762	Block 51				
SM1763			SM1763	Block 52				
SM1764			SM1764	Block 53				
SM1765			SM1765	Block 54				
SM1766			SM1766	Block 55				
SM1767			SM1767	Block 56				
SM1768			SM1768	Block 57				
SM1769			SM1769	Block 58				
SM1770			SM1770	Block 59				
SM1771			SM1771	Block 60				
SM1772			SM1772	Block 61				
SM1773			SM1773	Block 62				
SM1774			SM1774	Block 63				
SM1775			SM1775	Block 64				

(16) Redundant power supply module information

Table12.32 Special relay

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9□□□	Corresponding CPU
SM1780	Power supply off detection flag	OFF : No redundant power supply module with input power OFF detected ON : Redundant power supply module with input power OFF detected	• Turns ON when one or more redundant power supply modules with input power OFF are detected. • Turns on if any of SD1780 bits is on. • Turns off if all bits of SD1780 are off. • Turns OFF when the main base unit is not the redundant main base unit (Q38RB). • When the multiple CPU system is configured, the flags are stored only to the CPU No.1.	S (Each END)	New	Qn(H)*2 QnPH*2 QnPRH QnU*3
SM1781	Power supply failure detection flag	OFF : No faulty redundant power supply module detected ON : Faulty redundant power supply module detected	• Turns ON when one or more faulty redundant power supply modules are detected. • Turns on if any of SD1781 bits is on. • Turns off if all bits of SD1781 are off. • Turns OFF when the main base unit is not the redundant main base unit (Q38RB). • When the multiple CPU system is configured, the flags are stored only to the CPU No.1.	S (Each END)		
SM1782	Momentary power failure detection flag for power supply 1 *1	OFF : No momentary power failure detected ON : Momentary power failure detected	• Turns ON when a momentary power failure of the input power supply to the power supply 1 or 2 is detected one or more times. After turning ON, remains ON even if the power supply recovers from the momentary power failure. • Turns OFF the flag (SM1782, SM1783) of the power supply 1/2 when the CPU module starts. • When the input power to one of the redundant power supply modules turns OFF the corresponding flag turns OFF. • Turns OFF when the main base unit is not the redundant main base unit (Q38RB). • When the multiple CPU system is configured, the flags are stored only to the CPU No.1.	S (Each END)		
SM1783	Momentary power failure detection flag for power supply 2 *1					

*1: The "power supply 1" indicates the redundant power supply module mounted on the POWER 1 slot of the redundant base unit (Q38RB/Q68RB/Q65WRB).
The "power supply 2" indicates the redundant power supply module mounted on the POWER 2 slot of the redundant base unit (Q38RB/Q68RB/Q65WRB).
*2: The module whose first 5 digits of serial No. is "04012" or later.
However, for the multiple CPU system configuration, this applies to all CPU modules whose first 5 digits of serial No. are "07032" or later.
*3: The module whose first 5 digits of serial No. is "10042" or later.

12.8 SPECIAL REGISTER LIST

The special registers, SD, are internal registers with fixed applications in the Programmable Controller.

For this reason, it is not possible to use these registers in sequence programs in the same way that normal registers are used.

However, data can be written as needed in order to control the CPU modules.

Data stored in the special registers are stored as BIN values if no special designation has been made to the contrary.

The heading descriptions in the following special register lists are shown in 4.1.

Table12.33 Descriptions of the special register lists headings

Item	Function of Item
Number	• Indicates special register number
Name	• Indicates name of special register
Meaning	• Indicates contents of special register
Explanation	• Discusses contents of special register in more detail
Set by (When set)	• Indicates whether the relay is set by the system or user, and, if it is set by the system, when setting is performed. <Set by> S : Set by system U : Set by user (sequence programs or test operations from GX Developer) S/U : Set by both system and user <When set> Indicated only for registers set by system Each END : Set during each END processing Initial : Set only during initial processing (when power supply is turned ON, or when going from STOP to RUN) Status change : Set only when there is a change in status Error : Set when error occurs Instruction execution : Set when instruction is executed Request : Set only when there is a user request (through SM, etc.) System switching : Set when system switching is executed.
Corresponding ACPU M9□□□	• Indicates corresponding special register in ACPU (When the contents are changed, the special register is represented D9□ □ □ format change. Incompatible with the Q00J/Q00/Q01 and QnPRH.) • New indicates the special register newly added to the Q series CPU module.
Corresponding CPU	Indicates the relevant CPU module. QCPU : Indicates all the Q series CPU modules. Q00J/Q00/Q01 : Indicates the Basic model QCPU. Qn(H) : Indicates the High Performance model QCPU. QnPH : Indicates the Process CPU. QnPRH : Indicates the Redundant CPU. QnU : Indicates the Universal model QCPU Each CPU type name : Can be applied only to the specific CPU. (e.g. Q02U)

For details on the following items, refer to the following manuals:

- Networks → Manual of the corresponding network module
- SFC → QCPU(Q mode)/QnACPU Programming Manual (SFC)

Point

Do not change the values of special relays set by the system with user program or device test operations.
Doing so may result in system downtime or communication fault.

(1) Diagnostic Information

Table12.34 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD0	Diagnostic errors	Diagnosis error code	• Error codes for errors found by diagnosis are stored as BIN data. • Contents identical to latest fault history information.	S (Error)	D9008 format change	QCPU
SD1	Clock time for diagnosis error occurrence	Clock time for diagnosis error occurrence	• Year (last two digits) and month that SD0 data was updated is stored as BCD 2-digit code. b15 to b8 b7 to b0 Year (0 to 99) | Month (1 to 12) (Example) October, 1995 9510H	S (Error)	New	
SD2			• The day and hour that SD0 was updated is stored as BCD 2-digit code. b15 to b8 b7 to b0 Day (1 to 31) | Hour (0 to 23) (Example) 10 a.m. on 25th 2510H			
SD3			• The minute and second that SD0 data was updated is stored as BCD 2-digit code. b15 to b8 b7 to b0 Minutes (0 to 59) | Seconds (0 to 59) (Example) 35 min. 48 sec. 3548H			
SD4	Error information categories	Error information category code	Category codes which help indicate what type of information is being stored in the common information areas (SD5 through SD15) and the individual information areas (SD16 through SD26) are stored here. The category code for judging the error information type is stored. b15 to b8 b7 to b0 Individual information category codes | Common information category codes • The common information category codes store the following codes: 0 : No error 1: Unit/module No./ CPU No./Base No.* 2: File name/Drive name 3: Time (value set) 4: Program error location 5: System switching cause (for Redundant CPU only) 6: Reason(s) for tracking capacity excess error (specific to Redundant CPU) 7: Base No./Power supply No. (The first 5 digits of serial number 10072 or higer are chosen for Universal model QCPU.) 8: Tracking transmission data classification (specific to Redundant CPU) *: For a multiple CPU system that consists of the Basic model QCPU, High Performance model QCPU, Process CPU, Universal model QCPU the module number or CPU number is stored depending on the error that occurred. (Refer to the corresponding error code for which number has been stored.) CPU No. 1: 1, CPU No. 2: 2, CPU No. 3: 3, CPU No. 4: 4 • The individual information category codes store the following codes: 0: No error 1: (Empty) 2: File name/Drive name 3: Time (value actually measured) 4: Program error location 5: Parameter number 6: Annunciator number 7: CHK instruction failure No. (except for the Basic model QCPU and the Universal model QCPU) 8: Reason(s) for system switching failure (specific to Redundant CPU) 12: File diagnostic information (specific to the Universal model QCPU) 13: Parameter No./CPU No. (specific to the Universal model QCPU)	S (Error)	New	

Table12.34 Special register

<table>
<tr><th>Number</th><th>Name</th><th>Meaning</th><th>Explanation</th><th>Set by (When Set)</th><th>Corres-ponding ACPU D9□□□</th><th>Corresponding CPU</th></tr>
<tr><td>SD5
SD6
SD7
SD8
SD9
SD10
SD11
SD12
SD13
SD14
SD15</td><td>Error common information</td><td>Error common information</td><td>
• Common information corresponding to the error codes (SD0) is stored here.
• The following ten types of information are stored here:
• The error common information type can be judged by the "common information category code" in SD4. (The values of the "common information category code" stored in SD4 correspond to following 1) to 8).)
1) Slot No.
<table>
<tr><th>Number</th><th>Meaning</th></tr>
<tr><td>SD5</td><td>Slot No./CPU No./Base No.*1, *2, *3, *4</td></tr>
<tr><td>SD6</td><td>I/O No.*5</td></tr>
<tr><td>SD7
SD8
SD9
SD10
SD11
SD12
SD13
SD14
SD15</td><td>(Empty)</td></tr>
</table>
*1: For a multiple CPU system that consists of the Basic model QCPU, High Performance model QCPU, Process CPU, Universal model QCPU, the slot number or CPU number is stored depending on the error that occurred.
Slot 0 in the multiple CPU system is the one on the slot on the right of the rightmost CPU module.
(Refer to the corresponding error code for which number has been stored.)
No. 1 CPU: 1, No. 2 CPU: 2, No. 3 CPU: 3, No. 4 CPU: 4
*2: If a fuse blown or I/O verify error occurred in the module loaded in the MELSECNET/H remote I/O station, the network number is stored into the upper 8 bits and the station number into the lower 8 bits.
Use the I/O No. to check the module where the fuse blown or I/O verify error occurred.
*3: 255 is stored into SD5 of the Basic model QCPU when an instruction, etc. has been executed for the module later than the one on the last slot where a module can be mounted.
*4: Definitions of base No. and slot No.
<Base No.>
Value used to identify the base unit on which the CPU module has been mounted. The following shows the definition of the base No.
<table>
<tr><th>Base No.</th><th>Definition</th></tr>
<tr><td>0</td><td>Indicates the main base unit mounted with the CPU module.</td></tr>
<tr><td>1 to 7</td><td>Indicates the extension base unit. The stage number setting made by the stage number setting connector on the extension base unit is the base No.
When stage number setting is extension 1: Base No. = 1
when stage number setting is extension 7: Base No. = 7</td></tr>
</table>
<Slot No.>
Value used to identify the slot of each base unit and the module mounted on that slot.
•The I/O slot 0 (slot on the right side of the CPU slot) of the main base unit is defined as the slot of "Slot No. = 0".
•The slot Nos. are consecutively assigned to the slots of the base units in order of the main base unit and extension base units 1 to 7.
•When the number of base unit slots has been set in the I/O assignment setting of the PLC parameter dialog box, the slot Nos. are assigned for only the number of set slots.
*5: When 0FFFF_H is stored into SD6 (I/O No.), the I/O No. cannot be identified due to overlapping I/O No., etc. in the I/O assignment setting of the PLC parameter dialog box. Therefore, identify the error location using SD5.
2) File name/Drive name
<table>
<tr><th>Number</th><th colspan="2">Meaning</th></tr>
<tr><td>SD5</td><td colspan="2">Drive</td></tr>
<tr><td>SD6
SD7
SD8
SD9</td><td colspan="2">File name
(ASCII code: 8 characters)</td></tr>
<tr><td>SD10</td><td>Extension *6</td><td>2E_H(.)</td></tr>
<tr><td>SD11</td><td colspan="2">(ASCII code: 3 characters)</td></tr>
<tr><td>SD12
SD13
SD14
SD15</td><td colspan="2">(Empty)</td></tr>
</table>
(Example) File name = ABCDEFGH. IJK
<table>
<tr><th colspan="2">b15 to b8 b7 to b0</th></tr>
<tr><td>42_H(B)</td><td>41_H(A)</td></tr>
<tr><td>44_H(D)</td><td>43_H(C)</td></tr>
<tr><td>46_H(F)</td><td>45_H(E)</td></tr>
<tr><td>48_H(H)</td><td>47_H(G)</td></tr>
<tr><td>49_H(I)</td><td>2E_H(.)</td></tr>
<tr><td>4B_H(K)</td><td>4A_H(J)</td></tr>
</table>
</td><td>S (Error)</td><td>New</td><td>QCPU</td></tr>
</table>

Table12.34 Special register

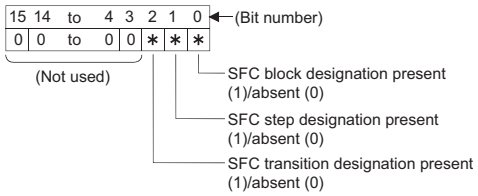
<table>
<tr><th>Number</th><th>Name</th><th>Meaning</th><th>Explanation</th><th>Set by
(When Set)</th><th>Corres-
ponding
ACPU
D9□□□</th><th>Corresponding
CPU</th></tr>
<tr><td>SD5</td><td rowspan="11">Error common information</td><td rowspan="11">Error common information</td><td rowspan="11">3) Time (value set)
<table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD5</td><td>Time : 1μs units (0 to 999μs)</td></tr><tr><td>SD6</td><td>Time : 1ms units (0 to 65535ms)</td></tr><tr><td>SD7</td><td rowspan="9">(Empty)</td></tr><tr><td>SD8</td></tr><tr><td>SD9</td></tr><tr><td>SD10</td></tr><tr><td>SD11</td></tr><tr><td>SD12</td></tr><tr><td>SD13</td></tr><tr><td>SD14</td></tr><tr><td>SD15</td></tr></table>4) Program error location
<table><tr><th>Number</th><th colspan="2">Meaning</th></tr><tr><td>SD5</td><td colspan="2" rowspan="4">File name
(ASCII code: 8 characters)</td></tr><tr><td>SD6</td></tr><tr><td>SD7</td></tr><tr><td>SD8</td></tr><tr><td>SD9</td><td>Extension *6</td><td>2EH(.)</td></tr><tr><td>SD10</td><td colspan="2">(ASCII code: 3 characters)</td></tr><tr><td>SD11</td><td colspan="2">Pattern *7</td></tr><tr><td>SD12</td><td colspan="2">Block No.</td></tr><tr><td>SD13</td><td colspan="2">Step No./transition condition</td></tr><tr><td>SD14</td><td colspan="2">Sequence step No. (L)</td></tr><tr><td>SD15</td><td colspan="2">Sequence step No. (H)</td></tr></table>*7 : Contents of pattern data
 
</td><td rowspan="11">S (Error)</td><td rowspan="11">New</td><td rowspan="11">QCPU</td></tr>
<tr><td>SD6</td></tr>
<tr><td>SD7</td></tr>
<tr><td>SD8</td></tr>
<tr><td>SD9</td></tr>
<tr><td>SD10</td></tr>
<tr><td>SD11</td></tr>
<tr><td>SD12</td></tr>
<tr><td>SD13</td></tr>
<tr><td>SD14</td></tr>
<tr><td>SD15</td></tr>
</table>

Table12.34 Special register

<table>
<tr><th>Number</th><th>Name</th><th>Meaning</th><th>Explanation</th><th>Set by (When Set)</th><th>Corres-ponding ACPU D9□□□</th><th>Corresponding CPU</th></tr>
<tr><td>SD5
SD6
SD7
SD8
SD9
SD10
SD11
SD12</td><td>Error common information</td><td>Error common information</td><td>5) Reason(s) for system switching
<table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD5</td><td>System switching condition *13</td></tr><tr><td>SD6</td><td>Control system switching instruction argument</td></tr><tr><td>SD7
SD8
SD9
SD10
SD11
SD12
SD13
SD14
SD15</td><td>(Empty)</td></tr></table>*13: Details of reason(s) for system switching
0 : No system switching condition (default)
1 : Power-OFF, reset, hardware failure, watchdog timer error
2 : Stop error (except watchdog timer error)
3 : System switching request by network module
16 : Control system switching instruction
17 : Control system switching request from GX Developer
6) Reason(s) for tracking capacity excess error
The block No. when the data amount that can be tracked (100k) is exceeded is indicated by the bit pattern of the corresponding special relay.
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SD5</td><td>1 (SM1535) (Block16)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1 (SM1528) (Block9)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1 (SM1520) (Block1)</td></tr><tr><td>SD6</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>SD7</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>SD8</td><td>1 (SM1583) (Block64)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1 (SM1568) (Block49)</td></tr><tr><td>SD9</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>SD15</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table></td><td>S (Error)</td><td>New</td><td>QnPRH</td></tr>
<tr><td>SD13
SD14
SD15</td><td></td><td></td><td>7) Power supply No.
<table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD5</td><td>Base No.</td></tr><tr><td>SD6</td><td>Power supply No.</td></tr><tr><td>SD7
SD8
SD9
SD10
SD11
SD12
SD13
SD14
SD15</td><td>(Empty)</td></tr></table>1: Power supply 1 fault
2: Power supply 2 fault
"Power supply module 1": Redundant power supply module mounted on POWER 1 slot of redundant base unit (Q38RB, Q68RB, Q65WRB)
"Power supply module 2": Redundant power supply module mounted on POWER 2 slot of redundant base unit (Q38RB, Q68RB, Q65WRB)</td><td>S (Error)</td><td>New</td><td>Qn(H)*1
QnPH*1
QnPRH
QnU*2</td></tr>
</table>

*1: The module whose first 5 digits of serial No. is "07032" or later.

*2: The module whose first 5 digits of serial No. is "10042" or later.

Table12.34 Special register

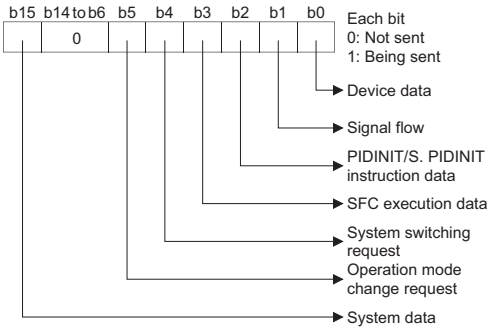
<table>
<tr><th>Number</th><th>Name</th><th>Meaning</th><th>Explanation</th><th>Set by
(When Set)</th><th>Corres-
ponding
ACPU
D9□□□</th><th>Corresponding
CPU</th></tr>
<tr><td>SD5</td><td rowspan="11">Error common information</td><td rowspan="11">Error common information</td><td rowspan="11">8) Tracking transmission data classification
Stores the data classification during tracking.
<table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD5</td><td>Data type *15</td></tr><tr><td>SD6</td><td rowspan="10">(Empty)</td></tr><tr><td>SD7</td></tr><tr><td>SD8</td></tr><tr><td>SD9</td></tr><tr><td>SD10</td></tr><tr><td>SD11</td></tr><tr><td>SD12</td></tr><tr><td>SD13</td></tr><tr><td>SD14</td></tr><tr><td>SD15</td></tr></table>*15: Details of data classification
  </td><td rowspan="11">S (Error)</td><td rowspan="11">New</td><td rowspan="11">QnPRH</td></tr>
<tr><td>SD6</td></tr>
<tr><td>SD7</td></tr>
<tr><td>SD8</td></tr>
<tr><td>SD9</td></tr>
<tr><td>SD10</td></tr>
<tr><td>SD11</td></tr>
<tr><td>SD12</td></tr>
<tr><td>SD13</td></tr>
<tr><td>SD14</td></tr>
<tr><td>SD15</td></tr>
</table>

Table12.34 Special register

<table>
<tr><th>Number</th><th>Name</th><th>Meaning</th><th>Explanation</th><th>Set by (When Set)</th><th>Corres-ponding ACPU D9□□□</th><th>Corresponding CPU</th></tr>
<tr><td>SD16
SD17
SD18
SD19
SD20
SD21
SD22
SD23
SD24
SD25
SD26</td><td>Error individual information</td><td>Error individual information</td><td>
• Individual information corresponding to error codes (SD0) is stored here.
• There are the following eight different types of information are stored.
• The error individual information type can be judged by the "individual information category code" in SD4. (The values of the "individual information category code" stored in SD4 correspond to following 1) to 8), 12), and 13).)

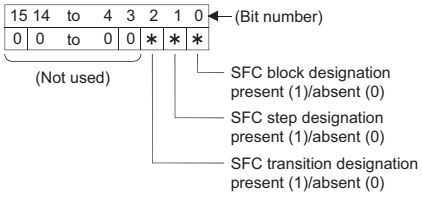
1) (Empty)

2) File name/Drive name

<table>
<tr><th>Number</th><th colspan="2">Meaning</th></tr>
<tr><td>SD16</td><td colspan="2">Drive</td></tr>
<tr><td>SD17</td><td rowspan="4">File name
(ASCII code: 8 characters)</td><td rowspan="4"></td></tr>
<tr><td>SD18</td></tr>
<tr><td>SD19</td></tr>
<tr><td>SD20</td></tr>
<tr><td>SD21</td><td>Extension *6</td><td>2EH(.)</td></tr>
<tr><td>SD22</td><td colspan="2">(ASCII code: 3 characters)</td></tr>
<tr><td>SD23</td><td colspan="2" rowspan="4">(Empty)</td></tr>
<tr><td>SD24</td></tr>
<tr><td>SD25</td></tr>
<tr><td>SD26</td></tr>
</table>
(Example) File name = ABCDEFGH. IJK
b15 to b8 b7 to b0
<table>
<tr><td>42H(B)</td><td>41H(A)</td></tr>
<tr><td>44H(D)</td><td>43H(C)</td></tr>
<tr><td>46H(F)</td><td>45H(E)</td></tr>
<tr><td>48H(H)</td><td>47H(G)</td></tr>
<tr><td>49H(I)</td><td>2EH(.)</td></tr>
<tr><td>4BH(K)</td><td>4AH(J)</td></tr>
</table>
3) Time (value actually measured)

<table>
<tr><th>Number</th><th>Meaning</th></tr>
<tr><td>SD16</td><td>Time : 1μs units (0 to 999μs)</td></tr>
<tr><td>SD17</td><td>Time : 1ms units (0 to 65535ms)</td></tr>
<tr><td>SD18
SD19
SD20
SD21
SD22
SD23
SD24
SD25
SD26</td><td>(Empty)</td></tr>
</table>
4) Program error location

<table>
<tr><th>Number</th><th colspan="2">Meaning</th></tr>
<tr><td>SD16
SD17
SD18
SD19</td><td colspan="2">File name
(ASCII code: 8 characters)</td></tr>
<tr><td>SD20</td><td>Extension *6</td><td>2EH(.)</td></tr>
<tr><td>SD21</td><td colspan="2">(ASCII code: 3 characters)</td></tr>
<tr><td>SD22</td><td colspan="2">Pattern *7</td></tr>
<tr><td>SD23</td><td colspan="2">Block No.</td></tr>
<tr><td>SD24</td><td colspan="2">Step No./transition No.</td></tr>
<tr><td>SD25</td><td colspan="2">Sequence step No. (L)</td></tr>
<tr><td>SD26</td><td colspan="2">Sequence step No. (H)</td></tr>
</table>
*7 : Contents of pattern data



5) Parameter No. 6) Annunciator number / 7) CHK instruction malfunction number

<table>
<tr><th>Number</th><th>Meaning</th></tr>
<tr><td>SD16</td><td>Parameter No. *16</td></tr>
<tr><td>SD17
SD18
SD19
SD20
SD21
SD22
SD23
SD24
SD25
SD26</td><td>(Empty)</td></tr>
</table>
<table>
<tr><th>Number</th><th>Meaning</th></tr>
<tr><td>SD16</td><td>No.</td></tr>
<tr><td>SD17
SD18
SD19
SD20
SD21
SD22
SD23
SD24
SD25
SD26</td><td>(Empty)</td></tr>
</table>
*16: For details of the parameter No., refer to the User's Manual (Function Explanation, Program Fundamentals) of the CPU module used.
</td><td>S (Error)</td><td>New</td><td>QCPU</td></tr>
</table>

*6 : Extensions are shown below.

Table12.35 Extension name

SDn	SDn+1		Extension	File Type
Higher 8 bits	Lower 8 bits	Higher 8 bits	Name	
51H	50H	41H	QPA	Parameters
51H	50H	47H	QPG	• Sequence program • SFC program
51H	43H	44H	QCD	Device comment
51H	44H	49H	QDI	Initial device value
51H	44H	52H	QDR	File register
51H	44H	4CH	QDL	Local device (Other than the Basic model QCPU)
51H	54H	44H	QTD	Sampling trace data (Other than the Basic model QCPU)
51H	46H	44H	QFD	Breakdown history data (Other than the Basic model QCPU and the Universal model QCPU)
51H	53H	54H	QST	SP.DEVST/S.DEVLD instruction file (For Universal model QCPU only)

Table12.34 Special register

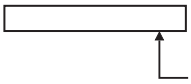
<table>
<tr><th>Number</th><th>Name</th><th>Meaning</th><th>Explanation</th><th>Set by
(When Set)</th><th>Corres-
ponding
ACPU
D9□□□</th><th>Corresponding
CPU</th></tr>
<tr><td rowspan="2">SD26</td><td rowspan="2">Error individual information</td><td rowspan="2">Error individual information</td><td>8) Reason(s) for system switching failure
<table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD16</td><td>System switching prohibition condition *14</td></tr><tr><td>SD17</td><td rowspan="10">(Empty)</td></tr><tr><td>SD18</td></tr><tr><td>SD19</td></tr><tr><td>SD20</td></tr><tr><td>SD21</td></tr><tr><td>SD22</td></tr><tr><td>SD23</td></tr><tr><td>SD24</td></tr><tr><td>SD25</td></tr><tr><td>SD26</td></tr></table>*14: Details of reason(s) for system switching failure
 
0 : Normal switching completion (default)
1 : Tracking cable fault (cable removal, cable fault, internal circuit fault, hardware fault)
2 : Hardware failure, power OFF, reset or watchdog timer error occurring in standby system
3 : Hardware failure, power OFF, reset or watchdog timer error occurring in control system
4 : Preparing for tracking
5 : Time limit exceeded
6 : Standby system is in stop error (except watchdog timer error)
7 : Operation differs between two systems (in backup mode only)
8 : During memory copy from control system to standby system
9 : Online program change
10 : Error detected by network module of standby system
11 : System switching being executed
12 : Online module change in progress</td><td rowspan="2">S (Error)</td><td rowspan="2">New</td><td>QnPRH</td></tr>
<tr><td>12) File diagnostic information
<table><tr><td>SD16</td><td>Failuer information (H)</td><td>drive No.(L)</td></tr><tr><td>SD17
SD18
SD19
SD20</td><td colspan="2">File name
(ASCII: 8 characters)</td></tr><tr><td>SD21</td><td>EXtension *6</td><td>2EH(.)</td></tr><tr><td>SD22</td><td colspan="2">(ASCII; 3 characters)</td></tr><tr><td>SD23
SD24</td><td colspan="2">Failure information 2
(CRC value that is read)</td></tr><tr><td>SD25
SD26</td><td colspan="2">Failure information 3
(CRC value that is calculated)</td></tr></table>13) Parameter No./CPU No.
<table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD16</td><td>Parameter No.*16</td></tr><tr><td>SD17</td><td>CPU No. (1 to 4)</td></tr><tr><td>SD18</td><td rowspan="10">(Empty)</td></tr><tr><td>SD19</td></tr><tr><td>SD20</td></tr><tr><td>SD21</td></tr><tr><td>SD22</td></tr><tr><td>SD23</td></tr><tr><td>SD24</td></tr><tr><td>SD25</td></tr><tr><td>SD26</td></tr></table></td><td>QnU</td></tr>
</table>

Table12.34 Special register

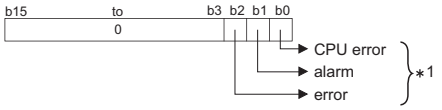
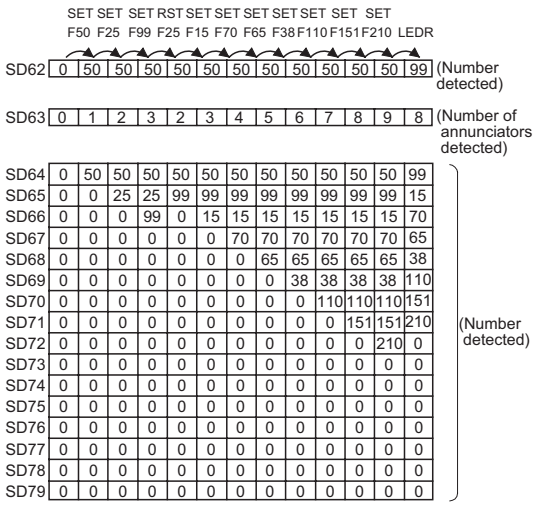
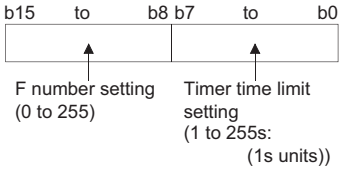
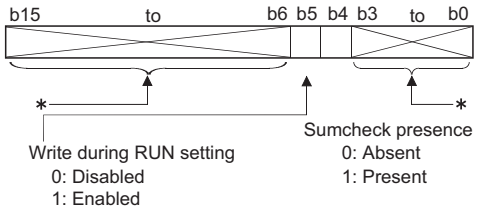
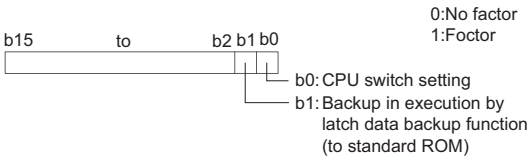
Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD50	Error reset	Error number that performs error reset	• Stores error number that performs error reset	U	New	QCPU
SD51	Battery low latch	Bit pattern indicating where battery voltage drop occurred	• All corresponding bits go 1(ON) when battery voltage drops. • Subsequently, these remain 1(ON) even after battery voltage has been returned to normal.  ∗1: This does not apply to Basic model QCPU. • In the alarm, data can be held within the time specified for battery low. • The error indicates the complete discharge of the battery.	S (Error)	New	
SD52	Battery low	Bit pattern indicating where battery voltage drop occurred	• Same configuration as SD51 above • After the alarm is detected (ON), the alarm turns OFF by error detection (ON). (For the Universal model QCPU only) • Turns to 0 (OFF) when the battery voltage returns to normal thereafter.	S (Error)	New	
SD53	AC/DC DOWN detection	Number of times for AC/DC DOWN detection	• Every time the input voltage falls to or below 85% (AC power)/65% (DC power) of the rating during operation of the CPU module, the value is incremented by 1 and stored in BIN code. • The counter repeats increment and decrement of the value ; 0 → 32767 → -32768 → 0	S (Error)	D9005	
SD60	Number of module with blown fuse	Number of module with blown fuse	• Value stored here is the lowest station I/O number of the module with the blown fuse.	S (Error)	D9000	
SD61	I/O module verify error number	I/O module verify error module number	• The lowest I/O number of the module where the I/O module verification number took place.	S (Error)	D9002	

Table12.34 Special register

<table>
<tr><th>Number</th><th>Name</th><th>Meaning</th><th>Explanation</th><th>Set by (When Set)</th><th>Corres-ponding ACPU D9□□□</th><th>Corresponding CPU</th></tr>
<tr><td>SD62</td><td>Annunciator number</td><td>Annunciator number</td><td>• The first annunciator number (F number) to be detected is stored here.</td><td>S (Instruction execution)</td><td>D9009</td><td rowspan="18">QCPU</td></tr>
<tr><td>SD63</td><td>Number of annunciators</td><td>Number of annunciators</td><td>• Stores the number of annunciators searched.</td><td>S (Instruction execution)</td><td>D9124</td></tr>
<tr><td>SD64</td><td rowspan="16">Table of detected annunciator numbers</td><td rowspan="16">Annunciator detection number</td><td rowspan="16">When F goes ON due to OUT F or SET F instruction, the F numbers which go progressively ON from SD64 through SD79 are registered.
The F numbers turned OFF by RST F instruction are deleted from SD64 - SD79, and the F numbers stored after the deleted F numbers are shifted to the preceding registers.
Execution of the LEDR instruction shifts the contents of SD64 to SD79 up by one.
After 16 annunciators have been detected, detection of the 17th will not be stored from SD64 through SD79.
 
</td><td rowspan="16">S (Instruction execution)</td><td>D9125</td></tr>
<tr><td>SD65</td><td>D9126</td></tr>
<tr><td>SD66</td><td>D9127</td></tr>
<tr><td>SD67</td><td>D9128</td></tr>
<tr><td>SD68</td><td>D9129</td></tr>
<tr><td>SD69</td><td>D9130</td></tr>
<tr><td>SD70</td><td>D9131</td></tr>
<tr><td>SD71</td><td>D9132</td></tr>
<tr><td>SD72</td><td>New</td></tr>
<tr><td>SD73</td><td>New</td></tr>
<tr><td>SD74</td><td>New</td></tr>
<tr><td>SD75</td><td>New</td></tr>
<tr><td>SD76</td><td>New</td></tr>
<tr><td>SD77</td><td>New</td></tr>
<tr><td>SD78</td><td>New</td></tr>
<tr><td>SD79</td><td>New</td></tr>
<tr><td>SD80</td><td>CHK number</td><td>CHK number</td><td colspan="2">• Error codes detected by the CHK instruction are stored as BCD code.</td><td>S (Instruction execution)</td><td>New</td><td rowspan="11">Qn(H)
QnPH
QnPRH</td></tr>
<tr><td>SD90</td><td rowspan="10">Step transition monitoring timer setting value (Enabled only when SFC program exists)</td><td rowspan="10">F number for timer set value and time over error</td><td>Corresponds to SM90</td><td rowspan="10">• Set the annunciator number (F number) that will be turned ON when the step transition monitoring timer setting or monitoring timeout occurs.
 

• Turning ON any of SM90 to SM99 during an active step starts the timer, and if the transition condition next to the corresponding step is not met within the timer time limit, the set annunciator (F) turns ON.</td><td rowspan="10">U</td><td>D9108</td></tr>
<tr><td>SD91</td><td>Corresponds to SM91</td><td>D9109</td></tr>
<tr><td>SD92</td><td>Corresponds to SM92</td><td>D9110</td></tr>
<tr><td>SD93</td><td>Corresponds to SM93</td><td>D9111</td></tr>
<tr><td>SD94</td><td>Corresponds to SM94</td><td>D9112</td></tr>
<tr><td>SD95</td><td>Corresponds to SM95</td><td>D9113</td></tr>
<tr><td>SD96</td><td>Corresponds to SM96</td><td>D9114</td></tr>
<tr><td>SD97</td><td>Corresponds to SM97</td><td>New</td></tr>
<tr><td>SD98</td><td>Corresponds to SM98</td><td>New</td></tr>
<tr><td>SD99</td><td>Corresponds to SM99</td><td>New</td></tr>
</table>

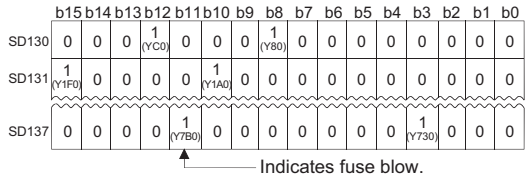
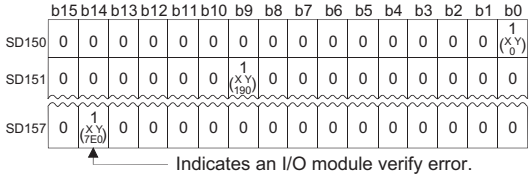
Table12.34 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD100	Transmission speed storage area	Stores the transmission speed specified in the serial communication setting.	96 : 9.6kbps, 192 : 19.2kbps, 384 : 38.4kbps, 576 : 57.6kbps, 1152 : 115.2kbps	S (Power-ON or reset)	New	Q00/Q01 Q00UJ Q00U Q01U Q02U*4
SD101	Communication setting storage area	Stores the communication setting specified in the serial communication setting.	 * : Since the data is used by the system, it is undefined.	S (Power-ON or reset)	New	
SD102	Transmission wait time storage area	Stores the transmission wait time specifed in the serial communication setting.	0 : No waiting time 10 to 150 : Waiting time (unit: ms) Defaults to 0.	S (Power-ON or reset)	New	
SD105	CH1 transmission speed setting (RS-232)	Stores the preset transmission speed when GX Developer is used.	96 : 9600bps, 192 : 19.2kbps, 384 : 38.4kbps, 576 : 57.6kbps, 1152 : 115.2kbps *: Other than RS-232 connection holds the data at RS-232 connection. (When disconnected, the default value is 1152.)	S	New	Qn(H) QnPH QnPRH QnU*3
SD110	Data sending result storage area	Stores the data sending result when the serial communication function is used.	Stores the error code at the timeout sending data.	S (Error)	New	Q00/Q01 Q00UJ Q00U Q01U Q02U*4
SD111	Data receiving result storage area	Stores the data receiving result when the serial communication function is used.	Stores the error code at the time of receiving data.	S (Error)		
SD118	Amount of battery consumption	Amount of battery consumption	Displays the current amount of battery consumption. The value range:1 to 2(Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UD(E)CPU, Q04UD(E)HCPU) 1 to 3(Q06UD(E)HCPU) 1 to 4(Q10UD(E)HCPU, Q20UD(E)HCPU, Q13UD(E)HCPU, Q26UD(E)HCPU)	S (Status change)	New	QnU*4
SD119	Battery life-prolonging factor	Battery life-prolonging factor	Stores the factor which makes the battery life-prolonging function valid. When SD119 is other than 0, the battery life-prolonging function is valid. 	S (Status change)	New	QnU

*3: This applies to Universal model QCPUs except for the Built-in Ethernet port QCPU.

*4: The module whose first 5 digits of serial No. is "10102" or later.

Table12.34 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD130 SD131 SD132 SD133 SD134 SD135 SD136 SD137	Fuse blown module	Bit pattern in units of 16 points, indicating the modules whose fuses have blown 0: No blown fuse 1: Blown fuse present	• The numbers of output modules whose fuses have blown are input as a bit pattern (in units of 16 points). (If the module numbers are set by parameter, the parameter-set numbers are stored.)  • Not cleared even if the blown fuse is replaced with a new one. This flag is cleared by error resetting operation	S (Error)	New	Q00J/Q00/Q01
SD150 SD151 SD152 SD153 SD154 SD155 SD156 SD157	I/O module verify error	Bit pattern, in units of 16 points, indicating the modules with verify errors. 0: No I/O verify errors 1: I/O verify error present	• When I/O modules, of which data are different from those entered at power-ON, have been detected, the I/O module numbers (in units of 16 points) are entered in bit pattern. (Preset I/O module numbers set in parmeters when parameter setting has been performed.)  • Not cleared even if the blown fuse is replaced with a new one. This flag is cleared by error resetting operation.			

(2) System information

Table12.36 Special register

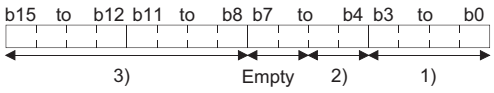
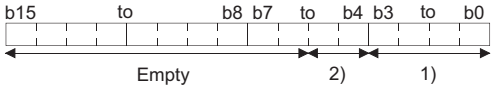
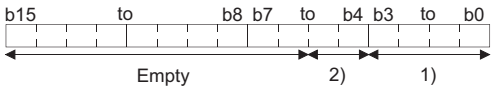
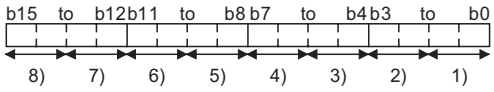
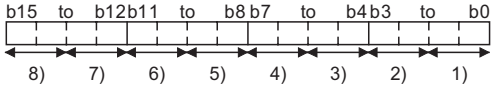
Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD200	Status of switch	Status of CPU switch	• The CPU switch status is stored in the following format:  1): CPU switch status — 0: RUN 1: STOP 2: L.CLR 2): Memory card switch — Always OFF 3): DIP switch — b8 through b12 correspond to SW1 through SW5 of system setting switch 1. 0: OFF, 1: ON. b13 through b15 are empty.	S (Every END processing)	New	Qn(H) QnPH QnPRH
			• The CPU switch status is stored in the following format:  1): CPU switch status — 0: RUN 1: STOP 2): Memory card switch — Always OFF	S (Every END processing)	New	Q00J/Q00/Q01
			• The CPU switch status is stored in the following format:  1): CPU switch status — 0: RUN 1: STOP 2): Memory card switch — Always OFF	S (when RUN/ STOP/RESET switch changed)	New	QnU
SD201	LED status	Status of CPU-LED	• The following bit patterns store the status of the LEDs on the CPU module: • 0 is off, 1 is on, and 2 is flicker.  1): RUN 5): BOOT 2): ERR. 6): Empty Mode bit pattern 3): USER 7): Empty 0: OFF 1: Green 4): BAT. 8): MODE 2: Orange (The Basic model QCPU does not include 3) to 8).)	S (Status change)	New	Q00J/Q00/Q01 Qn(H) QnPH QnPRH
			• The following bit patterns store the status of the LEDs on the CPU module: • 0 is off, 1 is on, and 2 is flicker.  1): RUN 5): BOOT 2): ERROR 6): Empty 3): USER 7): Empty 4): BAT. 8): MODE (The Q00UJCPU, Q00UCPU, and Q01UCPU do not include 5).)	S (Status change)	New	QnU

Table12.36 Special register

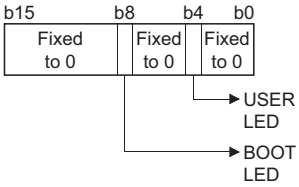
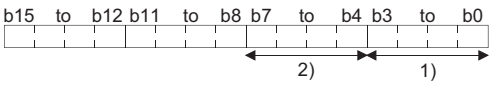
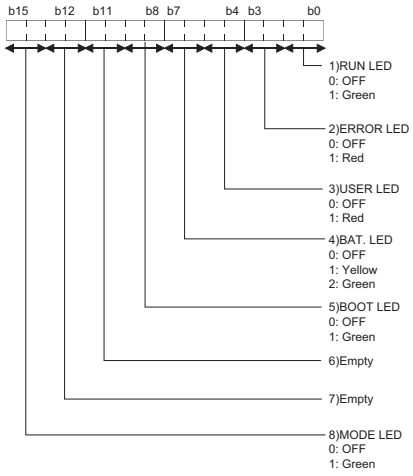
Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD202	LED off command	Bit pattern of LED that is turned off	• Specify the LEDs to be turned off using this register, and turn SM202 from OFF to ON to turn off the specified LEDs. USER and BOOT can be specified as the LEDs to be turned off. • Specify the LEDs to be turned off in the following bit pattern. (Turned off at 1, not be turned off at 0.)  (The Q00UJCPU, Q00UCPU, and Q01UCPU cannot specify the BOOT LED.)	U	New	Qn(H) QnPH QnPRH QnU
SD203	Operating status of CPU	Operating status of CPU	• The CPU operating status is stored as indicated in the following figure:  1): Operating status of CPU — 0: RUN; 1: STEP-RUN (For the QnACPU only); 2: STOP; 3: PAUSE 2): STOP/PAUSE cause — 0: Instruction in remote operation program from RUN/STOP switch ("RUN/STOP/RESET switch" for Basic model QCPU); 1: Remote contact; 2: Remote operation from GX Developer/serial communication, etc.; 3: Internal program instruction Note: Priority is earliest first — 4: Error	S (Every END processing)	D9015 format change	QCPU
SD204	LED display color	CPU-LED display color	• The LED display color of the LED status shown in SD201 1) to 8).  (The Q00UJCPU, Q00UCPU, and Q01UCPU do not include 5).)	S (status change)	New	QnU

Table12.36 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD207	LED display priority ranking	Priorities 1 to 4	• When error is generated, the LED display (flicker) is made according to the error number setting priorities. (The Basic model QCPU supports only the annunciator (error item No. 7). • The Universal model QCPU sets execution/non-execution of LED display of the error corresponding to the each priority ranking when the error occurs. • The setting areas for priorities are as follows: b15 to b12 b11 to b8 b7 to b4 b3 to b0 SD207: Priority 4 | Priority 3 | Priority 2 | Priority 1 SD208: Priority 8 | Priority 7 | Priority 6 | Priority 5 SD209: Priority 11 | Priority 10 | Priority 9 (Priority 11 is valid when Redundant CPU is used.) Default Value SD207 = 4321H(0000H for Basic model QCPU) SD208 = 8765H(0700H for Basic model QCPU) (0765H for Redundant CPU) SD209 = 00A9H(0000H for Basic model QCPU) (0B09H for Redundant CPU) • No display is made if "0" is set. • In case of the Basic model QCPU, the ERR. LED turns ON when the annunciator turns ON, if "7" has been set to either of priorities 1 to 11. • In case of the Basic model QCPU, the ERR. LED does not turn ON when the annumciator turns ON, if "7" has not been set to either of priorities 1 to 11. However, even if "0" has been set, information concerning CPU module operation stop (including parameter settings) errors will be indicated by the LEDs without conditions.	U	D9038	Q00J/ Q00/Q01*9 Qn(H) QnPH QnPRH QnU
SD208		Priorities 5 to 8			D9039 format change	
SD209		Priorities 9 to 11			New	
SD210	Clock data	Clock data (year, month)	• The year (last two digits) and month are stored as BCD code as shown below: b15 to b12 b11 to b8 b7 to b4 b3 to b0 Example: July, 1993 9307H Year Month	S (Request)/U	D9025	QCPU
SD211	Clock data	Clock data (day, hour)	• The day and hour are stored as BCD code as shown below: b15 to b12 b11 to b8 b7 to b4 b3 to b0 Example: 31st, 10 a.m. 3110H Day Hour		D9026	
SD212	Clock data	Clock data (minute, second)	• The minutes and seconds (after the hour) are stored as BCD code as shown below: b15 to b12 b11 to b8 b7 to b4 b3 to b0 Example: 35 min, 48 s 3548H Minute Second		D9027	

*9: Function version is B or later.

Table12.36 Special register

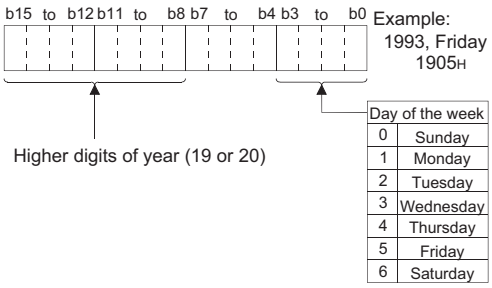
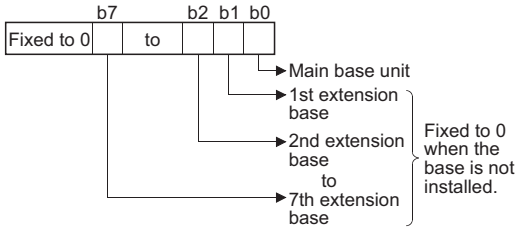
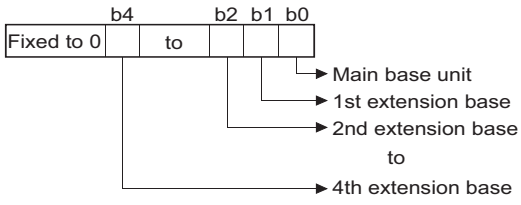
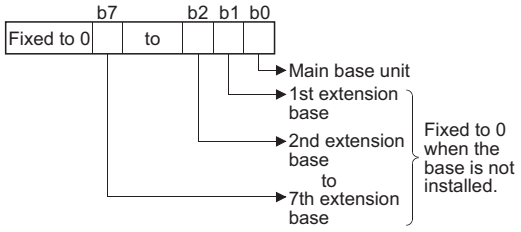
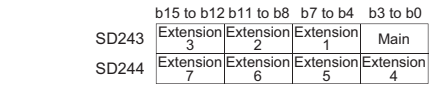
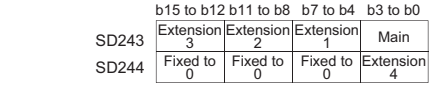
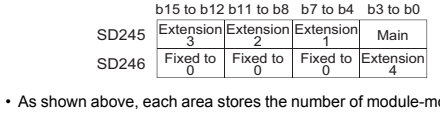
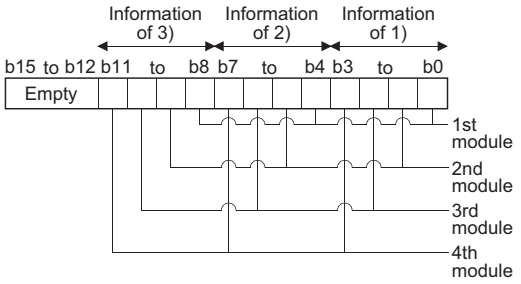
<table>
<tr><th>Number</th><th>Name</th><th>Meaning</th><th>Explanation</th><th>Set by (When Set)</th><th>Corres-ponding ACPU D9□□□</th><th>Corresponding CPU</th></tr>
<tr><td>SD213</td><td>Clock data</td><td>Clock data (higher digits of year, day of week)</td><td>• The year (first two digits) and the day of the week are stored as BCD code as shown below.
  </td><td>S (Request)/U</td><td>D9028</td><td rowspan="10">QCPU</td></tr>
<tr><td>SD220</td><td rowspan="8">LED display data</td><td rowspan="8">LED display data</td><td rowspan="8">• LED display ASCII data (16 characters) stored here.
(On the Basic model QCPU, the registers store the message (16 characters of ASCII data) at error occurrence (including annunciator ON).
<table><tr><th></th><th>b15 to b8</th><th>b7 to b0</th></tr><tr><td>SD220</td><td>15th character from the right</td><td>16th character from the right</td></tr><tr><td>SD221</td><td>13th character from the right</td><td>14th character from the right</td></tr><tr><td>SD222</td><td>11th character from the right</td><td>12th character from the right</td></tr><tr><td>SD223</td><td>9th character from the right</td><td>10th character from the right</td></tr><tr><td>SD224</td><td>7th character from the right</td><td>8th character from the right</td></tr><tr><td>SD225</td><td>5th character from the right</td><td>6th character from the right</td></tr><tr><td>SD226</td><td>3rd character from the right</td><td>4th character from the right</td></tr><tr><td>SD227</td><td>1st character from the right</td><td>2nd character from the right</td></tr></table>• The LED display device data at the time of CHK is not stored in the Basic model QCPU and the Universal model QCPU.</td><td rowspan="8">S (When changed)</td><td rowspan="8">New</td></tr>
<tr><td>SD221</td></tr>
<tr><td>SD222</td></tr>
<tr><td>SD223</td></tr>
<tr><td>SD224</td></tr>
<tr><td>SD225</td></tr>
<tr><td>SD226</td></tr>
<tr><td>SD227</td></tr>
<tr><td>SD235</td><td>Module to which online module change is being performed</td><td>The header I/O number of the module to which online module change is being performed /10H</td><td>• 10H is added to the value of the header I/O number of which the online module change is being performed.</td><td>S (During online module change)</td><td>New</td><td>QnPH
QnPRH</td></tr>
<tr><td>SD240</td><td>Base mode</td><td>0: Automatic mode
1: Detail mode</td><td>• Stores the base mode.</td><td>S (Initial)</td><td>New</td><td rowspan="2">QCPU</td></tr>
<tr><td>SD241</td><td>Extension stage number</td><td>0: Main base only
1 to 7: Extension stage number</td><td>• Stores the maximum number of the extension bases being installed.</td><td>S (Initial)</td><td>New</td></tr>
</table>

Table12.36 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD242	A/Q base differentiation	Base type differentiation 0: QA**B is installed (A mode) 1: Q**B is installed (Q mode)		S (Initial)	New	Qn(H) QnPH QnPRH
	Installed Q base presence/ absence	Base type differentiation 0: Base not installed 1: Q**B is installed		S (Initial)	New	Q00J/Q00/Q01
	Installed Q base presence/ absence	Base type differentiation 0: Base not installed 1: Q**B is installed	 • The bits from the third extension stage to the seventh extension stage are fixed to "0" in the Q00UJCPU. • The bits from the fifth extension stage to the seventh extension stage are fixed to "0" in the Q00UCPU, Q01UCPU, and Q02UCPU.	S (Initial)	New	QnU
SD243 SD244	No. of base slots	No. of base slots	 • As shown above, each area stores the number of slots being installed. • The bits from the third extension stage to the seventh extension stage are fixed to "0" in the Q00UJCPU. • The bits from the fifth extension stage to the seventh extension stage are fixed to "0" in the Q00UCPU, Q01UCPU, and Q02UCPU.	S (Initial)	New	Qn(H) QnPH QnPRH QnU
SD243 SD244	No. of base slots (Operation status)	No. of base slots	 • As shown above, each area stores the number of slots being installed. (Number of set slots when parameter setting has been made)	S (Initial)	New	Q00J/Q00/Q01
SD245 SD246	No. of base slots (Mounting status)	No. of base slots	 • As shown above, each area stores the number of module-mounted slots of the base unit (actual number of slots of the installed base unit).	S (Initial)		Q00J/Q00/Q01*9
SD250	Loaded maximum I/O	Loaded maximum I/O No.	• When SM250 goes from OFF to ON, the upper 2 digits of the final I/O number plus 1 of the modules loaded are stored as BIN values.	S (Request END)	New	Qn(H) QnPH QnPRH
			• The upper 2 digits of the final I/O number plus 1 of the modules loaded are stored as BIN values.	S (Initial)	New	Q00J/Q00/Q01 QnU

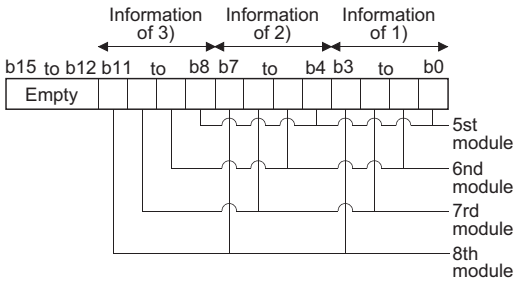
*9: Function version is B or later.

Table12.36 Special register

Number	Name	Meaning		Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD254	MELSECNET/10. MELSECNET/H information	Number of modules installed		• Indicates the number of mounted MELSECNET/10 modules or MELSECNET/H modules.	S (Initial)	New	QCPU
SD255		Information from 1st module	I/O No.	• Indicates I/O number of mounted MELSECNET/10 module or MELSECNET/H module			
SD256			Network No.	• Indicates network No. of mounted MELSECNET/10 module or MELSECNET/H module			
SD257			Group number	• Indicates group No. of mounted MELSECNET/10 module or MELSECNET/H module			
SD258			Station No.	• Indicates station No. of mounted MELSECNET/10 module or MELSECNET/H module			
SD259			Standby informa-tion	• In the case of standby stations, the module number of the standby station is stored. (1 to 4)			Qn(H) QnPH QnPRH QnU*10
SD260 to SD264		Information from 2nd module		• Configuration is identical to that for the first module.			
SD265 to SD269		Information from 3rd module		• Configuration is identical to that for the first module.			Qn(H) QnPH QnPRH QnU*11
SD270 to SD274		Information from 4th module		• Configuration is identical to that for the first module.			
SD280	CC-Link error	Error detection status		1) When Xn0 of the mounted CC-Link module turns ON, the bit of the corresponding station turns to 1 (ON). 2) When either Xn1 or XnF of the mounted CC-Link module turns OFF, the bit of the corresponding station turns to 1 (ON). 3) Turns to 1 (ON) when communication between the mounted CC-Link module and CPU module cannot be made.  The above module Nos. n are in order of the head I/O numbers. (However, the one where parameter setting has not been made is not counted.)	S (Error)	New	Qn(H) QnPH QnPRH

*10: The Universal model QCPU except the Q00UJCPU, Q00UCPU, and Q01UCPU.
*11: The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

Table12.36 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD281	CC-Link error	Error detection status	1) When Xn0 of the mounted CC-Link module turns ON, the bit of the corresponding station turns to 1 (ON). 2) When either Xn1 or XnF of the mounted CC-Link module turns OFF, the bit of the corresponding station turns to 1 (ON). 3) Turns to 1 (ON) when communication between the mounted CC-Link module and CPU module cannot be made.  The above module Nos. n are in order of the head I/O numbers. (However, the one where parameter setting has not been made is not counted.)	S (Error)	New	Qn(H)*14 QnPH*14 QnPRH*15
SD286	Device assignment	Points assigned to M (for extension)	• The number of points assigned to M is stored with 32 bits. • Even if the points assigned to M are 32k points or less, the points are stored.	S (Initial)	New	QnU*16
SD287						
SD288		Points assigned to B (for extension)	• The number of points assigned to B is stored with 32 bits. • Even if the points assigned to B are 32k points or less, the points are stored.			
SD289						
SD290	Device assignment (Same as parameter contents)	Number of points assigned for X	• Stores the number of points currently set for X devices	S (Initial)	New	QCPU
SD291		Number of points assigned for Y	• Stores the number of points currently set for Y devices			
SD292		Number of points assigned for M	• Stores the number of points currently set for M devices			
SD293		Number of points assigned for L	• Stores the number of points currently set for L devices			
SD294		Number of points assigned for B	• Stores the number of points currently set for B devices			
SD295		Number of points assigned for F	• Stores the number of points currently set for F devices			
SD296		Number of points assigned for SB	• Stores the number of points currently set for SB devices			
SD297	Device assignment (Same as parameter contents)	Number of points assigned for V	• Stores the number of points currently set for V devices	S (Initial)	New	
SD298		Number of points assigned for S	• Stores the number of points currently set for S devices			
SD299		Number of points assigned for T	• Stores the number of points currently set for T device			
SD300		Number of points assigned for ST	• Stores the number of points currently set for ST devices			
SD301		Number of points assigned for C	• Stores the number of points currently set for C devices			
SD302		Number of points assigned for D	• Stores the number of points currently set for D devices			
SD303		Number of points assigned for W	• Stores the number of points currently set for W devices			
SD304		Number of points assigned for SW	• Stores the number of points currently set for SW devices			

*14: The module whose first 5 digits of serial No. is "08032" or later.
*15: The module whose first 5 digits of serial No. is "09012" or later.
*16: The module whose first 5 digits of serial No. is "10042" or later.

Table12.36 Special register

Number	Name	Meaning		Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD305	Device assignment (Index register)	16 bit modification Number of points assigned for Z		• Stores the number of points of index register (Z) to be modified in the range of 16 bits. (The assignment is set by the ZR device index modification setting parameter.)	S (Initial)	New	QnU
SD306	Device assignment (Same as parameter contents)	Number of points assigned for ZR (for extension)		• Stores the number of ZR device points (except the number of points of extended data register (D) and extended link register (W)). The number of assignment points of ZR device is stored into this SD only when 1k point or more is set to the extended data register (D) and extended link register (W).	S (Initial)	New	QnU*17
SD307							
SD308	Device assignment (assignment including the number of points set to the extended data register (D) and extended link register (W))	Number of points assigned for D (for inside + for extension)		• Stores the total number of points of the extended data register (D) and data register in internal device memory area (stores the value in 32-bit binary).			
SD309							
SD310		Number of points assigned for W (for inside + for extension)		• Stores the total number of points of the extended link register (W) and link register in internal device memory area (stores the value in 32-bit binary).			
SD311							
SD315	Time reserved for communication processing	Time reserved for communication processing		• Reserves the designated time for communication processing with GX Developer or other units. • The greater the value is designated, the shorter the response time for communication with other devices (GX Developer, serial communication units) becomes. • If the designated value is out of the range above, it is processed that no setting is made. • Setting range: 1 to 100 ms • Note that the scan time becomes longer by the designated time.	U	New	Q00J/Q00/Q01 Qn(H) QnPH QnPRH
SD340	Ethernet information	No. of modules installed		• Indicates the number of mounted Ethernet module.	S (Initial)	New	QCPU
SD341		Information of 1st module	I/O No.	• Indicates I/O No. of mounted Ethernet module			
SD342			Network No.	• Indicates network No. of mounted Ethernet module			
SD343			Group No.	• Indicates group No. of mounted Ethernet module			
SD344			Station No.	• Indicates station No. of mounted Ethernet module			
SD345 to SD346			Empty	• Empty (With QCPU, the Ethernet module IP address of the 1st module is stored in buffer memory.)			Qn(H) QnPH QnPRH QnU*10
SD347			Empty	• Empty (With QCPU, the Ethernet module error code of the 1st module is read with the ERRRD instruction.)			
SD348 to SD354	Ethernet information	Information from 2nd module		• Configuration is identical to that for the first module.	S (Initial)	New	Qn(H) QnPH QnPRH QnU*11
SD355 to SD361		Information from 3rd module		• Configuration is identical to that for the first module.			
SD362 to SD368		Information from 4th module		• Configuration is identical to that for the first module.			

*10: The Universal model QCPU except the Q00UJCPU, Q00UCPU, and Q01UCPU.
*11: The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.
*17: The Universal model QCPU except the Q00UJCPU.

Table12.36 Special register

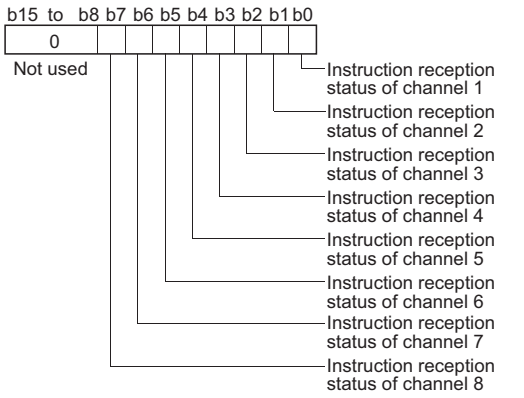
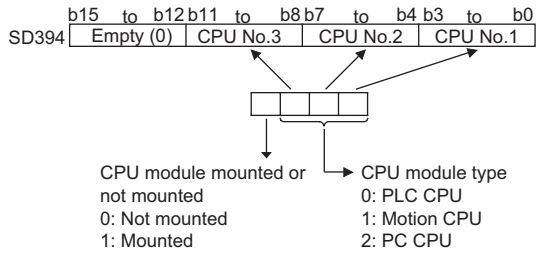
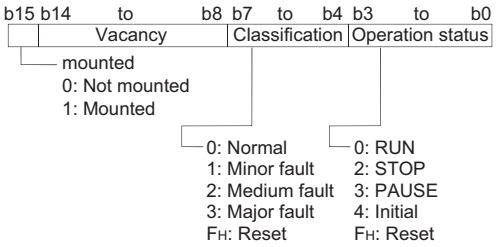
Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD380	Ethernet instruction reception status	Instruction reception status of 1st module	 ON: Received (Channel is being used.) OFF: Not received (Channel is not used.)	S (Instruction execution)	New	QnPRH
SD381	Ethernet instruction reception status	Instruction reception status of 2nd module	• Configuration is identical to that for the first module.			
SD382		Instruction reception status of 3rd module	• Configuration is identical to that for the first module.			
SD383		Instruction reception status of 4th module	• Configuration is identical to that for the first module.			

Table12.36 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD393	Multiple CPU system information	Number of multiple CPUs	• The number of CPU modules that comprise the multiple CPU system is stored. (1 to 3, Empty also included)	S (Initial)	New	Q00/Q01*9 QnU
SD394		CPU mounting information	• The CPU module types of No. 1 CPU to 3 and whether the CPU modules are mounted or not are stored. 			Q00/Q01*9
SD395		Multiple CPU number	• In a multiple CPU system configuration, the CPU number of the host CPU is stored. CPU No. 1: 1, CPU No. 2: 2, CPU No. 3: 3, CPU No. 4: 4	S (Initial)	New	Q00/Q01*9 Qn(H)*9 QnPH QnU
SD396		No. 1 CPU operation status	The operation information of each CPU No. is stored. (The information on the number of multiple CPUs indicated in SD393 is stored.) 	S (END processing error)	New	Q00/Q01*9 QnU*17
SD397		No. 2 CPU operation status				
SD398		No. 3 CPU operation status				
SD399		No. 4 CPU operation statu				QnU*11

*9: Function version is B or later.
*11: The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.
*17: The Universal model QCPU except the Q00UJCPU.

(3) System clocks/counters

Table12.37 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD412	1 second counter	Number of counts in 1-second units	• Following programmable controller CPU module RUN, 1 is added each second • Count repeats from 0 to 32767 to -32768 to 0	S (Status change)	D9022	QCPU
SD414	2n second clock setting	2n second clock units	• Stores value n of 2n second clock (Default is 30) • Setting can be made between 1 and 32767	U	New	
SD415	2nms clock setting	2nms clock units	• Stores value n of 2nms clock (Default is 30) • Setting can be made between 1 and 32767	U	New	Qn(H) QnPH QnPRH QnU
SD420	Scan counter	Number of counts in each scan	• Incremented by 1 for each scan execution after the CPU module is set to RUN. (Not counted by the scan in an initial execution type program.) • Count repeats from 0 to 32767 to -32768 to 0	S (Every END processing)	New	
			• Incremented by 1 for each scan execution after the CPU module is set to RUN. • Count repeats from 0 to 32767 to -32768 to 0	S (Every END processing)	New	Q00J/Q00/Q01
SD430	Low speed scan counter	Number of counts in each scan	• Incremented by 1 for each scan execution after the CPU module is set to RUN. • Count repeats from 0 to 32767 to -32768 to 0 • Used only for low speed execution type programs	S (Every END processing)	New	Qn(H) QnPH

(4) Scan information

Table12.38 Special register

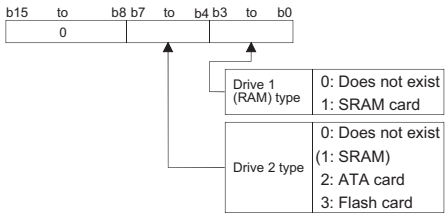
Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD500	Execution program No.	Program No. in execution	• Program number of program currently being executed is stored as BIN value.	S (Status change)	New	Qn(H) QnPH QnPRH QnU
SD510	Low speed excution type program No.	Low speed execution type program No. in execution	• Program number of low speed excution type program No. currently being executed is stored as BIN value. • Enabled only when SM510 is ON.	S (Every END processing)	New	Qn(H) QnPH
SD520	Current scan time	Current scan time (in 1 ms units)	• The current scan time is stored into SD520 and SD521. (Measurement is made in 100 μs units. (For the Universal model QCPU, in 1μs units.)) SD520: Stores the ms place. (Storage range: 0 to 65535) SD521: Stores the μs place. (Storage range: 0 to 900 (For the Universal model QCPU, storage range is 0 to 999)) (Example) When the current scan time is 23.6ms, the following values are stored. SD520 = 23 SD521 = 600	S (Every END processing)	D9018 format change	QCPU
SD521		Current scan time (in 100 μs units)		S (Every END processing)	New	
SD522	Initial scan time	Initial scan time (in 1 ms units)	• Stores the scan time of an initial execution type program into SD522 and SD523. (Measurement is made in 100 μs units. (For the Universal model QCPU, in 1μs units.)) SD522: Stores the ms place. (Storage range: 0 to 65535) SD523: Stores the μs place. (Storage range: 0 to 900 (For the Universal model QCPU, storage range is 0 to 999))	S (First END processing)	New	Qn(H) QnPH QnPRH QnU
SD523		Initial scan time (in 100 μs units)				
SD524	Minimum scan time	Minimum scan time (in 1 ms units)	• Stores the minimum value of the scan time except that of an initial execution type program into SD524 and SD525. (Measurement is made in 100 μs units. (For the Universal model QCPU, in 1μs units.)) SD524: Stores the ms place. (Storage range: 0 to 65535) SD525: Stores the μs place. (Storage range: 0 to 900 (For the Universal model QCPU, storage range is 0 to 999))	S (Every END processing)	D9017 format change	
SD525		Minimum scan time (in 100 μs units)		S (Every END processing)	New	
SD526	Maximum scan time	Maximum scan time (in 1 ms units)	• Stores the maximum value of the scan time except that of an initial execution type program into SD526 and SD527. (Measurement is made in 100 μs units. (For the Universal model QCPU, in 1μs units.)) SD526: Stores the ms place. (Storage range: 0 to 65535) SD527: Stores the μs place. (Storage range: 0 to 900 (For the Universal model QCPU, storage range is 0 to 999))	S (Every END processing)	D9019 format change	
SD527		Maximum scan time (in 100 μs units)			New	
SD528	Current scan time for low speed execution type programs	Current scan time (in 1 ms units)	• Stores the current scan time of a low speed execution type program into SD528 and SD529. (Measurement is made in 100 μs units.) SD528: Stores the ms place. (Storage range: 0 to 65535) SD529: Stores the μs place. (Storage range: 0 to 900)	S (Every END processing)	New	Qn(H) QnPH
SD529		Current scan time (in 100 μs units)				
SD532	Minimum scan time for low speed execution type programs	Minimum scan time (in 1 ms units)	• Stores the minimum value of the scan time of a low speed execution type program into SD532 and SD533. (Measurement is made in 100 μs units.) SD532: Stores the ms place. (Storage range: 0 to 65535) SD533: Stores the μs place. (Storage range: 0 to 900)	S (Every END processing)	New	
SD533		Minimum scan time (in 100 μs units)				
SD534	Maximum scan time for low speed execution type programs	Maximum scan time (in 1 ms units)	• Stores the maximum value of the scan time except that of the first scan of a low speed execution type program into SD534 and SD535. (Measurement is made in 100 μs units.) SD534: Stores the ms place. (Storage range: 0 to 65535) SD535: Stores the μs place. (Storage range: 0 to 900)	S (Every END processing)	New	
SD535		Maximum scan time (in 100 μs units)				
SD540	END processing time	END processing time (in 1 ms units)	• Stores the time from the end of a scan execution type program to the start of the next scan into SD540 and SD541. (Measurement is made in 100 μs units.(For the Universal model QCPU, in 1μs units.)) SD540: Stores the ms place. (Storage range: 0 to 65535) SD541: Stores the μs place. (Storage range: 0 to 900) (Storage range: 0 to 900 (For the Universal model QCPU, storage range is 0 to 999))	S (Every END processing)	New	Qn(H) QnPH QnPRH QnU
SD541		END processing time (in 100 μs units)				

Table12.38 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD524	Minimum scan time	Minimum scan time (in 1 ms units)	• Stores the minimum value of the scan time into SD524 and SD525. (Measurement is made in 100 μs units.) SD524: Stores the ms place. (Storage range: 0 to 65535) SD525: Stores the μs place. (Storage range: 0 to 900)	S (Every END processing)	New	Q00J/Q00/Q01
SD525		Minimum scan time (in 100 μs units)				
SD526	Maximum scan time	Maximum scan time (in 1 ms units)	• Stores the maximum value of the scan time into SD526 and SD527. (Measurement is made in 100 μs units.) SD526: Stores the ms place. (Storage range: 0 to 65535) SD527: Stores the μs place. (Storage range: 0 to 900)	S (Every END processing)		
SD527		Maximum scan time (in 100 μs units)				
SD540	END processing time	END processing time (in 1 ms units)	• Stores the time from when the scan program ends until the next scan starts into SD540 and SD541. (Measurement is made in 100 μs units.) SD540: Stores the ms place. (Storage range: 0 to 65535) SD541: Stores the μs place. (Storage range: 0 to 900)	S (Every END processing)	New	
SD541		END processing time (in 100 μs units)				
SD542	Constant scan wait time	Constant scan wait time (in 1 ms units)	• Stores the wait time for constant scan setting into SD542 and SD543. (Measurement is made in 100 μs units. (For the Universal model QCPU, in 1μs units.)) SD542: Stores the ms place. (Storage range: 0 to 65535) SD543: Stores the μs place. (Storage range: 0 to 900 (For the Universal model QCPU, storage range is 0 to 999))	S (Every END processing)	New	QCPU
SD543		Constant scan wait time (in 100 μs units)				
SD544	Cumulative execution time for low speed execution type programs	Cumulative execution time for low speed execution type programs (in 1 ms units)	• Stores the cumulative execution time of a low speed execution type program into SD544 and SD545. (Measurement is made in 100 μs units.) SD544: Stores the ms place. (Storage range: 0 to 65535) SD545: Stores the μs place. (Storage range: 0 to 900) • Cleared to 0 after the end of one low speed scan.	S (Every END processing)	New	Qn(H) QnPH
SD545		Cumulative execution time for low speed execution type programs (in 100 μs units)				
SD546	Execution time for low speed execution type programs	Execution time for low speed execution type programs (in 1 ms units)	• Stores the execution time of a low speed execution type program during one scan into SD546 and SD547. (Measurement is made in 100 μs units.) SD546: Stores the ms place. (Storage range: 0 to 65535) SD547: Stores the μs place. (Storage range: 0 to 900) • Stored every scan.	S (Every END processing)	New	
SD547		Execution time for low speed execution type programs (in 100 μs units)				
SD548	Scan execution type program execution time	Scan execution type program execution time (in 1 ms units)	• Stores the execution time of a scan execution type program during one scan into SD548 and SD549. (Measurement is made in 100 μs units.) SD548: Stores the ms place. (Storage range: 0 to 65535) SD549: Stores the μs place. (Storage range: 0 to 900) • Stored every scan.	S (Every END processing)	New	Qn(H) QnPH QnPRH
SD549		Scan execution type program execution time (in 100 μs units)				
SD548	Scan program execution time	Scan program execution time (in 1 ms units)	• Stores the execution time of a scan program during one scan into SD548 and SD549. (Measurement is made in 100 μs units. (For the Universal model QCPU, in 1μs units.)) SD548: Stores the ms place. (Storage range: 0 to 65535) SD549: Stores the μs place. (Storage range: 0 to 900 (For the Universal model QCPU, storage range is 0 to 999)) • Stored every scan.	S (Every END processing)	New	Q00J/Q00/Q01 QnU
SD549		Scan program execution time (in 100 μs units)				
SD550	Service interval measurement module	Unit/module No.	• Sets I/O number for module that measures service interval.	U	New	Qn(H) QnPH QnPRH
SD551	Service interval time	Module service interval (in 1 ms units)	• Stores the service interval for the module specified in SD550 into SD551 and SD552 when SM551 is turned ON. (Measurement is made in 100 μs units.) SD551: Stores the ms place. (Storage range: 0 to 65535) SD552: Stores the μs place. (Storage range: 0 to 900)	S (Request)	New	
SD552		Module service interval (in 100 μs units)				

(5) Memory card

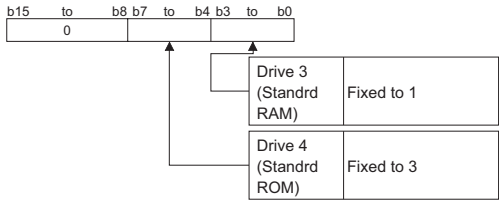
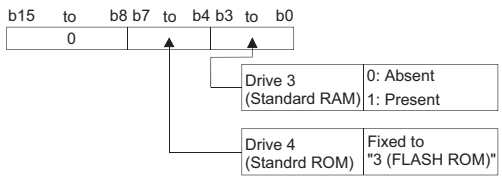
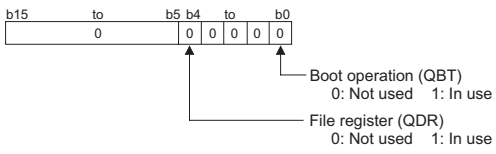
Table12.39 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD600	Memory card typs	Memory card typs	• Indicates the type of the memory card installed.  (The bits for the drive 1 (RAM) type and drive 2 (ROM) type are fixed to "0" in the Q00UJCPU, Q00UCPU, and Q01UCPU.)	S (Initial and card removal)	New	Qn(H) QnPH QnPRH QnU
SD602	Drive 1 (Memory card RAM) capacity	Drive 1 capacity	• Drive 1 capacity is stored in 1 k byte units. • (Empty capacity after format is stored.)	S (Initial and card removal)	New	Qn(H) QnPH QnPRH QnU*2
SD603	Drive 2 (Memory card ROM) capacity	Drive 2 capacity	• Drive 2 capacity is stored in 1 k byte units.*1	S (Initial and card removal)	New	
SD604	Memory card use conditions	Memory card use conditions	• The use conditions for memory card are stored as bit patterns . (In use when ON) • The significance of these bit patterns is indicated below: b0 : Boot operation (QBT) b1 : Parameters (QPA) b2 : Device comments (QCD) b3 : Device initial value (QDI) b4 : File register R (QDR) b5 : Sampling trace (QTD) b6 : Not used b7 : Not used b8 : Not used b9 : CPU fault history (QFD) b10 : Not used b11 : Local device (QDL) b12 : Not used b13 : Not used b14 : Not used b15 : Not used	S (Status change)	New	Qn(H) QnPH QnPRH
	Memory card use conditions	Memory card use conditions	• The use conditions for memory card are stored as bit patterns . (In use when ON) • The significance of these bit patterns is indicated below: b0 : Boot operation (QBT)*1 b1 : Parameters (QPA) b2 : Device comments (QCD) b3 : Device initial value (QDI)*2 b4 : File register R (QDR) b5 : Sampling trace (QTD) b6 : Not used b7 : Backup data (QBP)*3 b8 : Not used b9 : Not used b10 : Not used b11 : Local device (QDL) b12 : Not used b13 : Not used b14 : Not used b15 : Not used *1: Turned ON at boot start and OFF at boot completion. *2: Turned ON when reflection of device initial value is started and OFF when reflection of device initial value is completed. *3: The module whose first 5 digits of serial No. is "10102" or later.	S (Status change)	New	QnU*2

*1: When the Q2MEM-8MBA is used, value stored in the special register SD603 differs depending on the combination of the serial number of the High Performance model QCPU and the manufacture control number of the ATA card.
For details, refer to Section 7.1.2.

*2: The Universal model QCPU except the Q00UJCPU, Q00UCPU, and Q01UCPU.

Table12.39 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD620	Drive 3/4 typs	Drive 3/4 typs	• Indicates the drive 3/4 type.  (The bits for the drive 3 (standard RAM) type is fixed to "0" in the Q00UJCPU.)	S (Initial)	New	Qn(H) QnPH QnPRH QnU
			• Indicates the drive 3/4 type. 	S (Initial)	New	Q00J/Q00/Q01
SD622	Drive 3 (Standard RAM) capacity	Drive 3 capacity	• Drive 3 capacity is stored in 1 k byte units. (Empty capacity after format is stored.)	S (Initial)	New	Qn(H) QnPH QnPRH QnU
			• Drive 3 capacity is stored in 1k byte units.	S (Initial)	New	Q00J/Q00/Q01
SD623	Drive 4 (Standard ROM) capacity	Drive 4 capacity	• Drive 4 capacity is stored in 1 k byte units. (Empty capacity after format is stored.)	S (Initial)	New	Qn(H) QnPH QnPRH QnU
			• Drive 4 capacity is stored in 1k byte units.	S (Initial)	New	Q00J/Q00/Q01
SD624	Drive 3/4 use conditions	Drive 3/4 use conditions	• The conditions for usage for drive 3/4 are stored as bit patterns. (In use when ON) • The significance of these bit patterns is indicated below: b0 : Boot operation (QBT) b1 : Parameters (QPA) b2 : Device comments (QCD) b3 : Device initial value (QDI) b4 : File register (QDR) b5 : Sampling trace (QTD) b6 : Not used b7 : Not used b8 : Not used b9 : CPU fault history (QFD) b10 : SFC trace (QTS) b11 : Local device (QDL) b12 : Not used b13 : Not used b14 : Not used b15 : Not used	S (Status change)	New	Qn(H) QnPH QnPRH
	Drive 3/4 use conditions	Drive 3/4 use conditions	• The conditions for usage for drive 3/4 are stored as bit patterns. (In use when ON) • The significance of these bit patterns is indicated below: b0 : Not used b1 : Parameters (QPA) b2 : Device comments (QCD) b3 : Device initial value (QDI)*1 b4 : File register (QDR) b5 : Sampling trace (QTD) b6 : Not used b7 : Not used b8 : Module error log*2 b9 : Not used b10 : Not used b11 : Local device (QDL) b12 : Not used b13 : Not used b14 : Not used b15 : Not used *1: Turned ON at boot start and OFF at boot completion. *2: The modules whose first 5 digits of serial No. is "11043" or later.	S (Status change)	New	QnU
SD624	Drive 3/4 use conditions	Drive 3/4 use conditions	• The conditions for usage for drive 3/4 are stored as bit patterns. 	S (Status change)	New	Q00J/Q00/Q01
SD640	File register drive	Drive number:	• Stores drive number being used by file register	S (Status change) *10	New	Q00J/Q00/Q01 Qn(H) QnPH QnPRH QnU*3

*3: The Universal model QCPU except the Q00UJCPU.

*10: On the Basic model QCPU, data is set at STOP to RUN or RSET instruction execution after parameter execution.

Table12.39 Special register

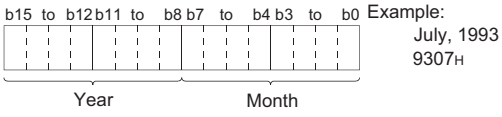
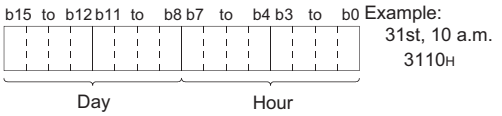
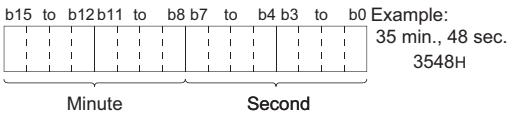
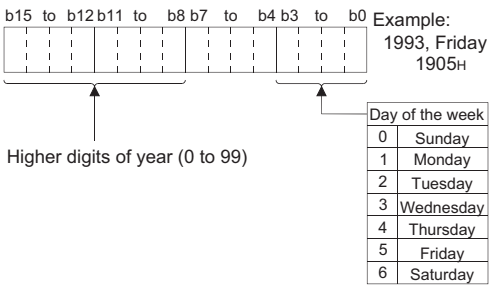
Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD641 SD642 SD643 SD644 SD645 SD646	File register file name	File register file name	• Stores file register file name (with extension) selected at parameters or by use of QDRSET instruction as ASCII code. b15 to b8 / b7 to b0 SD641: 2nd character / 1st character SD642: 4th character / 3rd character SD643: 6th character / 5th character SD644: 8th character / 7th character SD645: 1st character of extension / 2EH(.) SD646: 3rd character of the extension / 2nd character of the extension	S (Status change)	New	Qn(H) QnPH QnPRH QnU*3
			• Stores file register file name (MAIN.QDR) selected at parameters as ASCII code. b15 to b8 / b7 to b0 SD641: 2nd character (A) / 1st character (M) SD642: 4th character (N) / 3rd character (I) SD643: 6th character ( ) / 5th character ( ) SD644: 8th character ( ) / 7th character ( ) SD645: 1st character of the extension (Q) / 2EH(.) SD646: 3rd character of the extension (R) / 2nd character of the extension (D)	S (Initial)	New	Q00J/Q00/Q01
SD647	File register capacity	File register capacity	• Stores the data capacity of the currently selected file register in 1 k word units.	S (Status change)	New	Qn(H) QnPH QnPRH QnU*3
				S (Initial)		Q00J/Q00/Q01
SD648	File register block number	File register block number	• Stores the currently selected file register block number.	S (Status change) *10	D9035	Q00J/Q00/Q01 Qn(H) QnPH QnPRH QnU*3
SD650	Comment drive	Comment drive number	• Stores the comment drive number selected at the parameters or by the QCDSET instruction.	S (Status change)	New	Qn(H) QnPH QnPRH QnU
SD651 SD652 SD653 SD654 SD655 SD656	Comment file name	Comment file name	• Stores the comment file name (with extension) selected at the parameters or by the QCDSET instruction in ASCII code. b15 to b8 / b7 to b0 SD651: 2nd character / 1st character SD652: 4th character / 3rd character SD653: 6th character / 5th character SD654: 8th character / 7th character SD655: 1st character of the extension / 2EH(.) SD656: 3rd character of the extension / 2nd character of the extension	S (Status change)	New	
SD660	Boot operation designation file	Boot designation file drive number	• Stores the drive number where the boot designation file (*.QBT) is being stored.	S (Initial)	New	Qn(H) QnPH QnPRH QnU*4
SD661 SD662 SD663 SD664 SD665 SD666		File name of boot designation file	• Stores the file name of the boot designation file (*.QBT). b15 to b8 / b7 to b0 SD661: 2nd character / 1st character SD662: 4th character / 3rd character SD663: 6th character / 5th character SD664: 8th character / 7th character SD665: 1st character of the extension / 2EH(.) SD666: 3rd character of the extension / 2nd character of the extension	S (Initial)	New	

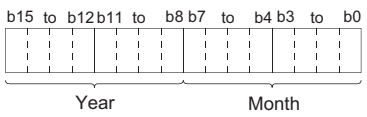
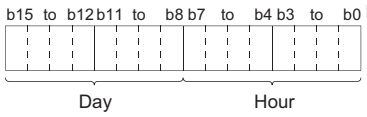
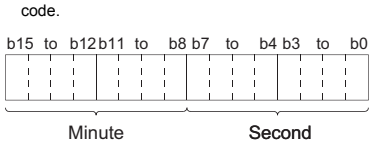
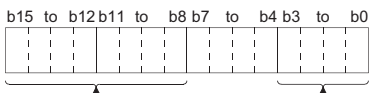
*3: The Universal model QCPU except the Q00UJCPU.

*4: The Universal model QCPU except the Q00UJCPU, Q00UCPU, and Q01UCPU.

*10: On the Basic model QCPU, data is set at STOP to RUN or RSET instruction execution after parameter execution.

Table12.39 Special register

<table>
<tr><th>Number</th><th>Name</th><th>Meaning</th><th>Explanation</th><th>Set by (When Set)</th><th>Corres-ponding ACPU D9□□□</th><th>Corresponding CPU</th></tr>
<tr><td>SD670</td><td>Parameter enable drive information</td><td>Parameter enable drive No.</td><td>• Stores information of parameter storage destination drive which is enabled.
0: Drive 0 (Program memory)
1: Drive 1 (SRAM card)
2: Drive 2 (Flash card/ATA card)
4: Drive 4 (Standard ROM)
(Only drive 0 and drive 4 are valid in the Q00UJCPU, Q00UCPU, and Q01UCPU.)</td><td>S (Initial)</td><td>New</td><td rowspan="6"></td></tr>
<tr><td>SD671</td><td>Status of latch data backup function</td><td>Status display</td><td>Indicates the status of the latch data backup function.
<table>
<tr><th colspan="2">Status</th><th>Presence/ absence of backup data</th><th>Restore operation at turning power supply ON from OFF</th></tr>
<tr><td>0</td><td>No backup data</td><td>Absent</td><td>Restoring not executed</td></tr>
<tr><td>1</td><td>Restore ready completion</td><td rowspan="4">Present</td><td>Restoring executed when turning power supply ON from OFF the following time</td></tr>
<tr><td>2</td><td>Restore execution completion</td><td>Restoring not executed</td></tr>
<tr><td>3</td><td>Backup execution wait</td><td>Restoring not executed</td></tr>
<tr><td>4</td><td>Restore repeated execution ready completion</td><td>Restoring executed when turning power supply ON from OFF</td></tr>
</table>
• "2 Restore ready completion" is a status immediately after restoring data.
"3 Backup execution wait" is a status after turning power supply ON from OFF at "2 Restore ready completion".</td><td>S (Status change)</td><td>New</td></tr>
<tr><td>SD672</td><td rowspan="4">Backup information</td><td>Backup time (Year and month)</td><td>• Stores the last 2 digits of year and month when backup is performed in 2-digit BCD code.
 
</td><td rowspan="4">S (At write)</td><td rowspan="4">New</td><td rowspan="4">QnU</td></tr>
<tr><td>SD673</td><td>Backup time (Day and hour)</td><td>• Stores the day and hour when backup is performed in 2-digit BCD code.
 
</td></tr>
<tr><td>SD674</td><td>Backup time (Minute and second)</td><td>• Stores the minute and second when backup is performed in 2-digit BCD code.
 
</td></tr>
<tr><td>SD675</td><td>Backup time (Year and day of week)</td><td>• Stores the first 2 digits of year and day of week when backup is performed in BCD code.
 
</td></tr>
</table>

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD676	Backup data restration information	Restore time (Year and month)	• Stores the last 2 digits of year and month when data is restored in 2-digit BCD code.  Example: July, 1993 9307H	S (Initial)	New	QnU
SD677		Restore time (Day and time)	• Stores the day and time when data is restored in 2-digit BCD code.  Example: 31st, 10 a.m. 3110H			
SD678		Restore time (Minute and second)	• Stores the minute and second when data is restored in 2-digit BCD code.  Example: 35 min., 48 sec. 3548H			
SD679		Restore time (Year and day of week)	• Stores the first 2 digits of year and day of week when data is restored in BCD code.  Example: 1993, Friday 1905H Higher digits of year (0 to 99) Day of the week: 0 Sunday, 1 Monday, 2 Tuesday, 3 Wednesday, 4 Thursday, 5 Friday, 6 Saturday			
SD681	Program memory write (transfer) status	Write (transfer) status display (percentage)	Displays the status of writing (transferring) the program memory (flash ROM) in percentage. (0 to 100%) "0" is set when the write direction is set.	S (At write)	New	
SD682 SD683	Program memory write count index	Write count index up to present	• Stores the index value for the number of write operations to the program memory (flash ROM) up to the present in BIN 32-bit value. When the index value exceeds 100 thousand times, "FLASH ROM ERROR" (error code: 1610) occurs. (The index value is calculated even when exceeding 100 thousand times.) Note) The write count does not equal to the index value.(Since a flash ROM write life is prolonged by the system, 1 is added to the write count index when writing is performed twice or so.).	S (At write)	New	
SD686	Standard ROM write (transfer) status	Write (transfer) status display (percentage)	Displays the status of writing (transferring) the standard ROM (flash ROM) in percentage. (0 to 100%) "0" is set when the write direction is set.	S (At write)	New	
SD687 SD688	Standard ROM write count index	Write count index up to present	• Stores the index value for the number of write operations to the standard ROM (flash ROM) up to the present in BIN 32-bit value. When the index value exceeds 100 thousand times, "FLASH ROM ERROR" (error code: 1610) occurs. (The index value is calculated even when exceeding 100 thousand times.) Note) The write count does not equal to the index value. (Since a flash ROM write life is prolonged by the system, 1 is added to the write count index when the total write capacity after the previous count up reaches about 1M byte.)	S (At write)	New	
SD689	Backup error factor	Backup error factor	Stores the factor of the error that occurred in the backup. 0H : No error 100H: Memory card not inserted 200H: Size of backup target data exceeded 300H: Memory card write inhibit setting 400H: Memory card write error 500H: Backup target data read error (from program memory) 503H: Backup target data read error (from standard RAM) 504H: Backup target data read error (from standard ROM) 510H: Backup target data read error (from system data)	S (Backup error occurrence)	New	QnU*1
SD690	Backup status	Backup status	Stores the current backup status. 0 : Before backup start 1 : Backup start prepared 2 : Backup start preparation completed 3 : Backup in execution 4 : Backup completed FF: Backup error	S (Status change)	New	

*1: The module whose first 5 digits of serial No. is "10102" or later. (Except the Q00UJCPU, Q00UCPU, and Q01UCPU)

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD691	Backup execution status	Backup execution status display (Percentage)	• Displays the execution status of data backup to the memory card in percentage (0 to 100%). • "0" is set when the backup starts.	S (Status change)	New	QnU*1
SD692	Restoration error factor	Factor of error occurred in the restoration	Stores the factor of an error that occurred in the restoration. Each error factor is as follows: 800H: The CPU module model name is not matched. 801H: The file password is set only for the restoration destination data or is not matched. 810H: The verified backup data file is not matched or the backup data read failed.	S (Error occurrence)	New	
SD693	Restoration status	Current restoration status	Stores the current restoration execution status. Each error factor is as follows: 0 : Before restoration start 1 : Restoration in execution 2 : Restoration completed FF: Restoration error Sets "0" (Before restoring), however, when the restoration is completed only during the automatic restoration.	S (Status change)	New	
SD694	Restoration execution status	Restoration execution status display (Percentage)	• Displays the execution status of restoration to the CPU module in percentage (0 to 100%). • "0" is set before the restoration. Sets "0" (Before restoring), however, when the restoration is completed only during the automatic restoration.	S (Status change)	New	
SD695	Specification of writing to standard ROM instruction count	Specification of writing to standard ROM instruction count	• Specifies the maximum number of executions of the writing to standard ROM instruction (SP.DEVST) to write to the standard ROM per day. • When the number of executions of the writing to standard ROM instruction exceeds the number of times set by SD695, “OPERATION ERROR” (error code: 4113) occurs. • The setting range for SD695 is 1 to 32767. If 0 or value outside the range is set, “OPERATION ERROR” (error code: 4113) occurs at execution of the writing to standard ROM instruction.	U	New	QnU
SD696	Available memory in memory card	Available memory in memory card	Stores the available memory in memory card. (Stores the value in 32-bit binary.)	S (Backup in operation)	New	QnU*1
SD697						
SD698	Backup data capacity	Backup data capacity	Stores the backup data capacity. (Stores the value in 32-bit binary.)			
SD699						

*1: The module whose first 5 digits of serial No. is "10102" or later. (Except the Q00UJCPU, Q00UCPU, and Q01UCPU)

(6) Instruction-Related Registers

Table12.40 Special register

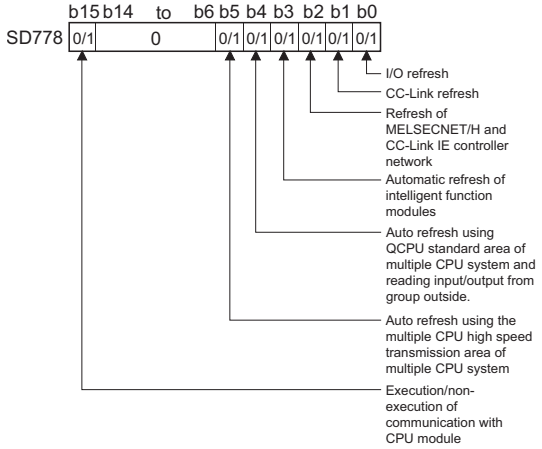
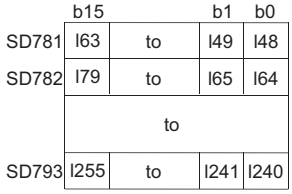
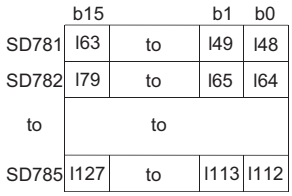
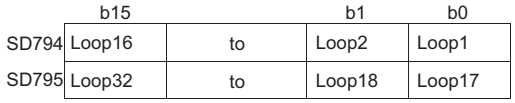
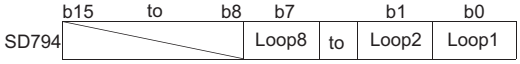
<table>
<tr><th>Number</th><th>Name</th><th>Meaning</th><th>Explanation</th><th>Set by (When Set)</th><th>Corres-ponding ACPU D9□□□</th><th>Corresponding CPU</th></tr>
<tr><td>SD705
SD706</td><td>Mask pattern</td><td>Mask pattern</td><td>• During block operations, turning SM705 ON makes it possible to use the mask pattern being stored at SD705 (or at SD705 and SD706 if double words are being used) to operate on all data in the block with the masked values.</td><td>U</td><td>New</td><td>Q00J/Q00/Q01
Qn(H)
QnPH
QnPRH</td></tr>
<tr><td>SD715
SD716
SD717</td><td>IMASK instruction mask pattern</td><td>Mask pattern</td><td>• Patterns masked by use of the IMASK instruction are stored in the following manner:
<table><tr><th></th><th>b15</th><th></th><th>b1</th><th>b0</th></tr><tr><td>SD715</td><td>I15</td><td>to</td><td>I1</td><td>I0</td></tr><tr><td>SD716</td><td>I31</td><td>to</td><td>I17</td><td>I16</td></tr><tr><td>SD717</td><td>I47</td><td>to</td><td>I33</td><td>I32</td></tr></table></td><td>S (During execution)</td><td>New</td><td rowspan="3">QCPU</td></tr>
<tr><td>SD718
SD719</td><td>Accumulator</td><td>Accumulator</td><td>• For use as replacement for accumulators used in A series programs.</td><td>S/U</td><td>New</td></tr>
<tr><td>SD720</td><td>Program No. designation for PLOADP instruction</td><td>Program No. designation for PLOADP instruction</td><td>Stores the program number of the program to be loaded by the PLOADP instruction when designated.
Designation range: 1 to 124</td><td>U</td><td>New</td><td>Qn(H)
QnPH</td></tr>
<tr><td>SD738
SD739
SD740
SD741
SD742
SD743
SD744
SD745
SD746
SD747
SD748
SD749
SD750
SD751
SD752
SD753
SD754
SD755
SD756
SD757
SD758
SD759
SD760
SD761
SD762
SD763
SD764
SD765
SD766
SD767
SD768
SD769</td><td>Message storage</td><td>Message storage</td><td>• Stores the message designated by the MSG instruction.
<table><tr><th></th><th>b15 to b8</th><th>b7 to b0</th></tr><tr><td>SD738</td><td>2nd character</td><td>1st character</td></tr><tr><td>SD739</td><td>4th character</td><td>3rd character</td></tr><tr><td>SD740</td><td>6th character</td><td>5th character</td></tr><tr><td>SD741</td><td>8th character</td><td>7th character</td></tr><tr><td>SD742</td><td>10th character</td><td>9th character</td></tr><tr><td>SD743</td><td>12th character</td><td>11th character</td></tr><tr><td>SD744</td><td>14th character</td><td>13th character</td></tr><tr><td>SD745</td><td>16th character</td><td>15th character</td></tr><tr><td>SD746</td><td>18th character</td><td>17th character</td></tr><tr><td>SD747</td><td>20th character</td><td>19th character</td></tr><tr><td>SD748</td><td>22nd character</td><td>21st character</td></tr><tr><td>SD749</td><td>24th character</td><td>23rd character</td></tr><tr><td>SD750</td><td>26th character</td><td>25th character</td></tr><tr><td>SD751</td><td>28th character</td><td>27th character</td></tr><tr><td>SD752</td><td>30th character</td><td>29th character</td></tr><tr><td>SD753</td><td>32nd character</td><td>31st character</td></tr><tr><td>SD754</td><td>34th character</td><td>33rd character</td></tr><tr><td>SD755</td><td>36th character</td><td>35th character</td></tr><tr><td>SD756</td><td>38th character</td><td>37th character</td></tr><tr><td>SD757</td><td>40th character</td><td>39th character</td></tr><tr><td>SD758</td><td>42nd character</td><td>41st character</td></tr><tr><td>SD759</td><td>44th character</td><td>43rd character</td></tr><tr><td>SD760</td><td>46th character</td><td>45th character</td></tr><tr><td>SD761</td><td>48th character</td><td>47th character</td></tr><tr><td>SD762</td><td>50th character</td><td>49th character</td></tr><tr><td>SD763</td><td>52nd character</td><td>51st character</td></tr><tr><td>SD764</td><td>54th character</td><td>53rd character</td></tr><tr><td>SD765</td><td>56th character</td><td>55th character</td></tr><tr><td>SD766</td><td>58th character</td><td>57th character</td></tr><tr><td>SD767</td><td>60th character</td><td>59th character</td></tr><tr><td>SD768</td><td>62nd character</td><td>61st character</td></tr><tr><td>SD769</td><td>64th character</td><td>63rd character</td></tr></table></td><td>S (During execution)</td><td>New</td><td>QCPU</td></tr>
</table>

Table12.40 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD774 to SD775	PID limit setting (for complete derivative)	0: With limit 1: Without limit	• Specify the limit of each PID loop as shown below. b15 … b1 b0 SD774: Loop16 to Loop2 Loop1 SD775: Loop32 to Loop18 Loop17	U	New	Qn(H) QnPRH QnU
SD774	PID limit setting (for complete derivative)	0: With limit 1: Without limit	• Specify the limit of each PID loop as shown below. b15 to b8 b7 to b1 b0 SD774: Loop8 to Loop2 Loop1	U	New	Q00J/Q00/Q01*9
SD778	Refresh processing selection when the COM/ CCOM instruction is executed	b0 to b14: 0: Do not refresh 1: Refresh b15 bit 0: Communication with CPU module is executed 1: Communication withCPU module is nonexecuted	• Selects whether or not the data is refreshed when the COM instruction is executed. • Designation of SD778 is made valid when SM775 turns ON. b15 b14 to b5 b4 b3 b2 b1 b0 SD778: 0/1 0 0/1 0/1 0/1 0/1 0/1 b4: I/O refresh b3: CC-Link refresh b2: MELSECNET/H refresh b1: Automatic refresh of intelligent function modules b0: Automatic refresh of CPU shared memory (Fixed to "0" for Redundant CPU) b15: Execution/non-execution of communication with CPU module • Refresh between multiple CPUs by COM instruction is performed under the following occasion. Receiving operation from other device: b4 of SD778(refresh in the CPU shared memory) is turned to 1. Sending operation from host CPU : b15 of SD778(communication with peripheral device is executed/nonexecuted) is turned to 0.	U	New	Q00J/Q00/Q01*9 Qn(H)*11
			• Selects whether or not the data is refreshed when the COM instruction is executed. • Designation of SD778 is made valid when SM775 turns ON. b15 b14 to b6 b5 b4 b3 b2 b1 b0 SD778: 0/1 0 0/1 0/1 0/1 0/1 0/1 0/1 b5: I/O refresh b4: CC-Link refresh b3: CC-Link IE controller network or MELSECNET/H refresh b2: Automatic refresh of intelligent function modules b1: Reading input/output from group outside multiple CPU system b0: Auto refresh using the multiple CPU high speed transmission area of multiple CPU system b15: Execution/non-execution of communication with CPU module • Refresh between multiple CPUs by COM instruction is performed under the following occasion. Receiving operation from other device: b4 of SD778(refresh in the CPU shared memory) is turned to 1. Sending operation from host CPU : b15 of SD778(communication with peripheral device is executed/nonexecuted) is turned to 0. • When b2 (refresh of the CC-Link IE controller network and MELSECNET/H) of SD778 is 1, the CC-Link IE controller network and MELSECNET/H perform refresh. Therefore, if there are many refresh points, processing time for the COM instruction will be extended.	U	New	Qn(H)*13 QnPH*12 QnPRH

*9: Function version is B or later.
*11: The module whose first 5 digits of serial No. is "04012" or later.
*12: The module whose first 5 digits of serial No. is "07032" or later.
*13: The module whose first 5 digits of serial No. is "09012" or later.

Table12.40 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD778	Refresh processing selection when the COM/ CCOM instruction is executed	b0 to b14: 0: Do not refresh 1: Refresh b15 bit 0: communication with peripheral device is executed 1: communication with peripheral device is nonexecuted	• Selects whether or not the data is refreshed when the COM, CCOM instruction is executed. • Designation of SD778 is made valid when SM775 turns ON. 	U	New	QnU
SD781 to SD793	Mask pattern of IMASK instruction	Mask pattern	• Stores the mask patterns masked by the IMASK instruction as follows:  (The Q00UJCPU, Q00UCPU, and Q01UCPU cannot use the special registers SD786 to SD793.)	S (During execution)	New	Qn(H) QnPH QnPRH QnU
SD781 to SD785	Mask pattern of IMASK instruction	Mask pattern	• Stores the mask patterns masked by the IMASK instruction as follows: 	S (During execution)	New	Q00J/Q00/Q01
SD794 to SD795	PID limit setting (for incomplete derivative)	0: With limit 1: Without limit	• Specify the limit of each PID loop as shown below. 	U	New	Qn(H)*13 QnPRH QnU
SD794	PID limit setting (for incomplete derivative)	0: With limit 1: Without limit	• Specify the limit of each PID loop as shown below. 	U	New	Q00J/Q00/Q01*9

*9: Function version is B or later.
*13: The module whose first 5 digits of serial No. is "09012" or later.

Table12.40 Special register

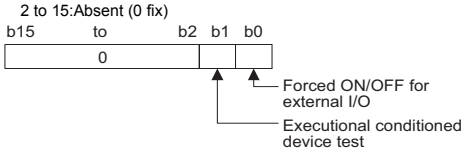
Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD796	Maximum number of blocks used for the multiple CPU high-speed transmission dedicated instruction setting (for CPU No.1)	Maximum number of blocks range for dedicated instructions Range: 1 to 7 (Default: 2 Or when setting other than 1 to 7, the register operates as 7).	• Specifies the maximum number of blocks used for the multiple CPU high-speed transmission dedicated instruction (target CPU=CPU No.1). When the dedicated instruction of Multiple CPU transmission is executed to the CPU No.1, and the number of empty blocks of the dedicated instruction transmission area is less than the setting value of this register, SM796 is turned ON, which is used as the interlock signal for consecutive execution of the dedicated instruction of Multiple CPU transmission.	U (At 1 scan after RUN)	New	QnU*14*15
SD797	Maximum number of blocks used for the multiple CPU high-speed transmission dedicated instruction setting (for CPU No.2)		• Specifies the maximum number of blocks used for the multiple CPU high-speed transmission dedicated instruction (target CPU=CPU No.2). When the dedicated instruction of Multiple CPU transmission is executed to the CPU No.2, and the number of empty blocks of the dedicated instruction transmission area is less than the setting value of this register, SM797 is turned ON, which is used as the interlock signal for consecutive execution of the dedicated instruction of Multiple CPU transmission.	U (At 1 scan after RUN)	New	
SD798	Maximum number of blocks used for the multiple CPU high-speed transmission dedicated instruction setting (for CPU No.3)		• Specifies the maximum number of blocks used for the multiple CPU high-speed transmission dedicated instruction (target CPU=CPU No.3). When the dedicated instruction of Multiple CPU transmission is executed to the CPU No.3, and the number of empty blocks of the dedicated instruction transmission area is less than the setting value of this register, SM798 is turned ON, which is used as the interlock signal for consecutive execution of the dedicated instruction of Multiple CPU transmission.	U (At 1 scan after RUN)	New	
SD799	Maximum number of blocks used for the multiple CPU high-speed transmission dedicated instruction setting (for CPU No.4)		• Specifies the maximum number of blocks used for the multiple CPU high-speed transmission dedicated instruction (target CPU=CPU No.4). When the dedicated instruction of Multiple CPU transmission is executed to the CPU No.4, and the number of empty blocks of the dedicated instruction transmission area is less than the setting value of this register, SM799 is turned ON, which is used as the interlock signal for consecutive execution of the dedicated instruction of Multiple CPU transmission.	U (At 1 scan after RUN)	New	

*14: The Universal model QCPU except the Q00UJCPU, Q00UCPU, Q01UCPU, and Q02UCPU.

*15: The range is from 1 to 9 for the Q03UDCPU, Q04UDCPU, and Q06UDHCP whose first 5 digits of serial number is "10012" or earlier.
(Default: 2 Or when setting other than 1 to 9, the register operates as 9).

(7) Debug

Table12.41 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD840	Debug function usage	Debug function usage	Stores the status of the debug function usage as shown below. 0: Forced ON/OFF for external I/O 1: Executional conditioned device test 2 to 15:Absent (0 fix)  (0: Not used, 1: Used)	S (Status change)	New	QnU*1

*1: The module whose first 5 digits of serial No. is "10042" or later.

(8) Redundant CPU information (host system CPU information*1)

Table12.42 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD952	History of memory copy from control system to standby system	Latest status of memory copy from control system to standby system	Stores the completion status of the memory copy from control system to standby system executed last. 1) Stores the same value as stored into SD1596 at normal completion/ abnormal completion of the memory copy from control system to standby system. 2) Backed up for a power failure, this special register holds the status of memory copy from control system to standby system executed last. 3) Cleared to 0 by latch clear operation.	S (Status change)	New	QnPRH

*1: The host system CPU information is stored.

(9) Remote password count

Table12.43 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD979	Direct MELSOFT connection	Count of unlock processing failures	Stores the count of unlock processing failures. Range: 0 to FFFEH (FFFFH when the limit is exceeded)	S(Status change)	New	QnU*1
SD980 to SD995	Connection 1 to 16					
SD998	MELSOFT connection using TCP port					
SD999	FTP communi cation port					

*1: This applies to the Built-in Ethernet port QCPU.

(10) A to Q conversion

ACPU special registers D9000 to D9255 correspond to Q special registers SD1000 to SD1255 after A to Q/QnA conversion.
(However, the Basic model QCPU and Redundant CPU do not support the A to Q conversion.)
These special registers are all set by the system, and cannot be set by the user program. To set data by the user program, correct the program for use of the QCPU special registers. However, some of SD1200 to SD1255 (corresponding to D9200 to 9255 before conversion) can be set by the user program if they could be set by the user program before conversion. For details on the ACPU special registers, refer to the user's manual for the corresponding CPU, and MELSECNET or MELSECNET/B Data Link System Reference Manuals.

Point

Check "Use special relay/special register from SM/SD1000" for "A-PLC" on the PLC system tab of PLC parameter in GX Developer when the converted special registers are used with the High Performance model QCPU, Process CPU, and Universal model QCPU.
When not using the converted special registers, uncheck "Use special relay/special registers from SM/SD1000" to save the time taken for processing special registers.

Remark

Supplemental explanation on "Special Register for Modification" column

① For the device numbers for which a special register for modification is specified, modify it to the special register for QCPU.

② For the device numbers for which [–] is specified, special register after conversion can be used.

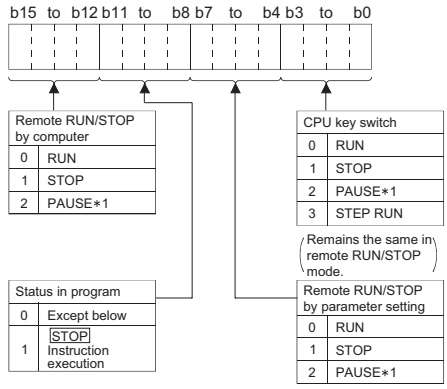
③ Device numbers for which [×] is specified do not function for QCPU.

Table12.44 Special register

<table>
<tr><th>ACPU Special Register</th><th>Special Register after Conversion</th><th>Special Register for Modification</th><th>Name</th><th>Meaning</th><th>Details</th><th>Corresponding CPU</th></tr>
<tr><td>D9000</td><td>SD1000</td><td>–</td><td>Fuse blown</td><td>Number of module with blown fuse</td><td>• When fuse blown modules are detected, the first I/O number of the lowest number of the detected modules is stored in hexadecimal. (Example: When fuses of Y50 to 6F output modules have blown, "50" is stored in hexadecimal)
To monitor the number by peripheral devices, perform monitor operation given in hexadecimal.
(Cleared when all contents of SD1100 to SD1107 are reset to 0.)
• Fuse blow check is executed also to the output modules of remote I/O stations.</td><td>Qn(H)
QnPH
QnU*1</td></tr>
<tr><td>D9001</td><td>SD1001</td><td>–</td><td>Fuse blown</td><td>Number of module with blown fuse</td><td>• Stores the module numbers corresponding to setting switch numbers or base slot numbers when fuse blow occurred.
<table><tr><th colspan="2">AJ02 I/O module</th><th colspan="2">Extension base unit</th></tr><tr><th>Setting switch</th><th>Stored data</th><th>Base unit slot No.</th><th>Stored data</th></tr><tr><td>0</td><td>0</td><td>0</td><td>4</td></tr><tr><td>1</td><td>1</td><td>1</td><td>5</td></tr><tr><td>2</td><td>2</td><td>2</td><td>6</td></tr><tr><td>3</td><td>3</td><td>3</td><td>7</td></tr><tr><td>4</td><td>4</td><td></td><td></td></tr><tr><td>5</td><td>5</td><td></td><td></td></tr><tr><td>6</td><td>6</td><td></td><td></td></tr><tr><td>7</td><td>7</td><td></td><td></td></tr></table>• For the remote I/O station, the value of (module I/O No./10H) + 1 is stored.</td><td>Qn(H)
QnPH</td></tr>
<tr><td>D9002</td><td>SD1002</td><td>–</td><td>I/O module verify error</td><td>I/O module verify error module number</td><td>• If I/O modules, of which data are different from data entered, are detected when the power is turned on, the first I/O number of the lowest number unit among the detected units is stored in hexadecimal. (Storing method is the same as that of SD1000.)
To monitor the number by peripheral devices, perform monitor operation given in hexadecimal.
(Cleared when all contents of SD1116 to SD1123 are reset to 0.)
• I/O module verify check is executed also to the modules of remote I/O terminals.</td><td>Qn(H)
QnPH
QnU*1</td></tr>
<tr><td rowspan="2">D9005</td><td rowspan="2">SD1005</td><td rowspan="2">–</td><td rowspan="2">AC DOWN counter</td><td rowspan="2">Number of times for AC DOWN</td><td>• When the AC power supply module is used, 1 is added at occurrence of an instantaneous power failure of within 20ms. (The value is stored in BIN code.) It is reset when the power supply is switched from OFF to ON.</td><td>Qn(H)
QnPH
QnU*1</td></tr>
<tr><td>• When the DC power supply module is used, 1 is added at occurrence of an instantaneous power failure of within 10ms. (The value is stored in BIN code.) It is reset when the power supply is switched from OFF to ON.</td><td>Qn(H)
QnPH
QnU*1</td></tr>
<tr><td>D9008</td><td>SD1008</td><td>SD0</td><td>Self-diagnostic error</td><td>Self-diagnostic error number</td><td>• When error is found as a result of self-diagnosis, error number is stored in BIN code.</td><td>Qn(H)
QnPH
QnU*1</td></tr>
</table>

*1: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

Table12.44 Special register

ACPU Special Register	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU
D9009	SD1009	SD62	Annunciator detection	F number at which external failure has occurred	• When one of F0 to 2047 is turned on by OUT F or SET F instruction, the F number, which has been detected earliest among the F numbers which have turned on, is stored in BIN code. • SD1009 can be cleared by RST F or LEDR instruction. If another F number has been detected, the clearing of SD1009 causes the next number to be stored in SD1009.	Qn(H) QnPH QnU*1
D9010	SD1010	×	Error step	Step number at which operation error has occurred.	• When operation error has occurred during execution of application instruction, the step number, at which the error has occurred, is stored in BIN code. Thereafter, each time operation error occurs, the contents of SD1010 are renewed.	Qn(H) QnPH
D9011	SD1011	×	Error step	Step number at which operation error has occurred.	• When operation error has occurred during execution of application instruction, the step number, at which the error has occurred, is stored in BIN code. Since the step number is stored into SD1011 when SM1011 turns from OFF to ON, the data of SD1011 is not updated unless SM1011 is cleared by a user program.	
D9014	SD1014	×	I/O control mode	I/O control mode number	• The I/O control mode set is returned in any of the following numbers: 0: Both input and output in direct mode 1: Input in refresh mode, output in direct mode 3: Both input and output in refresh mode	
D9015	SD1015	SD203	Operating status of CPU	Operating status of CPU	• The operation status of CPU as shown below are stored in SD1015.  *1: When the CPU mdoule is in RUN mode and SM1040 is off, the CPU module remains in RUN mode if changed to PAUSE mode.	Qn(H) QnPH QnU*1

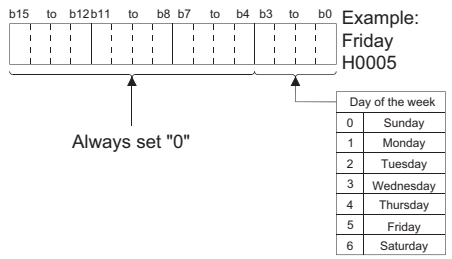
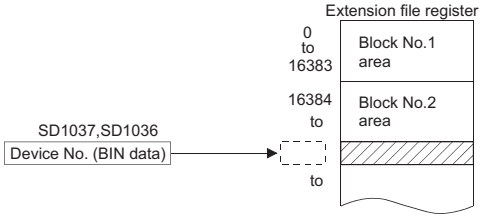
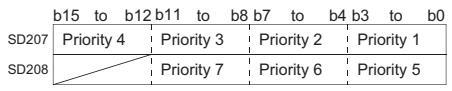
*1: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

Table12.44 Special register

ACPU Special Register	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU
D9016	SD1016	×	Program number	0: Main program (ROM) 1: Main program (RAM) 2: Subprogram 1 (RAM) 3: Subprogram 2 (RAM) 4: Subprogram 3 (RAM) 5: Subprogram 1 (ROM) 6: Subprogram 2 (ROM) 7: Subprogram 3 (ROM) 8: Main program (E^2PROM) 9: Subprogram 1 (E^2PROM) A: Subprogram 2 (E^2PROM) B: Subprogram 3 (E^2PROM)	• Indicates which sequence program is run presently. One value of 0 to B is stored in BIN code.	Qn(H) QnPH
D9017	SD1017	SD524	Scan time	Minimum scan time (10 ms units)	• If scan time is smaller than the content of SD1017, the value is newly stored at each END. Namely, the minimum value of scan time is stored into SD1017 in BIN code.	Qn(H) QnPH QnU*1
D9018	SD1018	SD520	Scan time	Scan time (10 ms units)	• At every END, the scan time is stored in BIN code and always rewritten.	
D9019	SD1019	SD526	Scan time	Maximum scan time (10 ms units)	• If scan time is larger than the content of SD1019, the value is newly stored at each END. Namely, the maximum value of scan time is stored into SD1019 in BIN code.	
D9020	SD1020	×	Constant scan	Constant scan time (User sets in 10 ms units)	• Sets the interval between consecutive program starts in multiples of 10 ms. 0 : No setting 1 to 200 : Set. Program is executed at intervals of (set value)× 10 ms.	Qn(H) QnPH
D9021	SD1021	–	Scan time	Scan time (1 ms units)	• At every END, the scan time is stored in BIN code and always rewritten.	Qn(H) QnPH QnU*1
D9022	SD1022	SD412	1 second counter	Count in units of 1s.	• When the PC CPU starts running, it starts counting 1 every second. • It starts counting up from 0 to 32767, then down to -32768 and then again up to 0. Counting repeats this routine.	
D9025	SD1025	–	Clock data	Clock data (year, month)	• The year (last two digits) and month are stored as BCD code as shown below. b15 to b12 b11 to b8 b7 to b4 b3 to b0 Example: 1987, July H8707 Year Month	
D9026	SD1026	–	Clock data	Clock data (day, hour)	• The day and hour are stored as BCD code as shown below. b15 to b12 b11 to b8 b7 to b4 b3 to b0 Example: 31st, 10 a.m. H3110 Day Hour	
D9027	SD1027	–	Clock data	Clock data (minute, second)	• The minute and second are stored as BCD code as shown below. b15 to b12 b11 to b8 b7 to b4 b3 to b0 Example: 35 min, 48 sec. H3548 Minute Second	

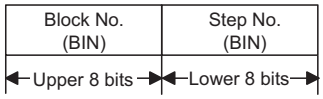
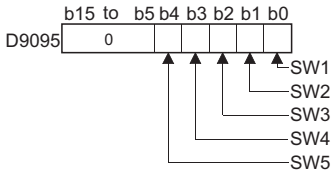
*1: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

Table12.44 Special register

ACPU Special Register	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU
D9028	SD1028	–	Clock data	Clock data (day of week)	• The day of the week is stored as BCD code as shown below. 	Qn(H) QnPH QnU*1
D9035	SD1035	SD648	Extension file register	Use block No.	• Stores the block No. of the extension file register being used in BCD code.	
D9036	SD1036	×	Extension file registerfor designation of device number	Device number when individual devices from extension file register are directly accessed	• Designate the device number for the extension file register for direct read and write in 2 words at SD1036 and SD1037 in BIN data. Use consecutive numbers beginning with R0 of block No. 1 to designate device numbers. 	Qn(H) QnPH
D9037	SD1037	×				
D9038	SD1038	SD207	LED display priority ranking	Priorities 1 to 4	• Sets priority of ERROR LEDs which illuminate (or flicker) to indicate errors with error code numbers. • Configuration of the priority setting areas is as shown below.  • For details, refer to the applicable CPUs User's Manual and the ACPU Programming manual (Fundamentals).	
D9039	SD1039	SD208		Priorities 5 to 7		
D9044	SD1044	×	For sampling trace	Step or time during sampling trace	• Turned on/off with a peripheral device. When STRA or STRAR instruction is executed, the value stored in SD1044 is used as the sampling trace condition. At scanning--------0 At time----------Time (10 msec unit) The value is stored into SD1044 in BIN code.	
D9049	SD1049	×	Work area for SFC	Block number of extension file register	• Stores the block number of the expansion file register which is used as the work area for the execution of a SFC program in a binary value. • Stores "0" if an empty area of 16K bytes or smaller, which cannot be expansion file register No. 1, is used or if SM320 is OFF.	
D9050	SD1050	×	SFC program error number	Error code generated by SFC program	• Stores error code of errors occurred in the SFC program in BIN code. 0 : No error 80: SFC program parameter error 81: SFC code error 82: Number of steps of simultaneous execution exceeded 83: Block start error 84: SFC program operation error	
D9051	SD1051	×	Error block	Block number where error occurred	• Stores the block number in which an error occurred in the SFC program in BIN code. In the case of error 83 the starting block number is stored.	
D9052	SD1052	×	Error step	Step number where error occurred	• Stores the step number, where error code 84 occurred in an SFC program, in BIN value. • Stores "0" when error code 80, 81 or 82 occurred. • Stores the block stating step number when error code 83 occurs.	

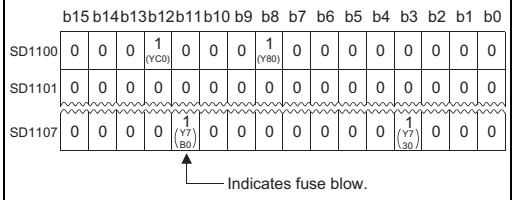
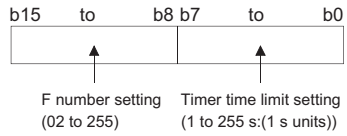
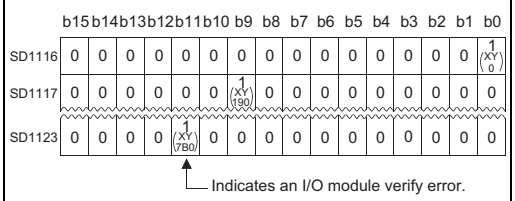
*1: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

Table12.44 Special register

ACPU Special Register	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU
D9053	SD1053	×	Error transition	Transition condition number where error occurred	• Stores the transition condition number, where error code 84 occurred in an SFC program, in BIN value. Stores "0" when error code 80, 81, 82 or 83 occurred.	Qn(H) QnPH
D9054	SD1054	×	Error sequence step	Sequence step number where error occurred	• Stores the sequence step number of transfer condition and operation output in which error 84 occurred in the SFC program in BIN code.	
D9055	SD1055	SD812	Status latch execution step number	Status latch step	• Stores the step number when status latch is executed. • Stores the step number in a binary value if status latch is executed in a main sequence program. • Stores the block number and the step number if status latch is executed in a SFC program. 	
D9072	SD1072	×	PLC communication check	Data check of serial communication module	• In the self-loopback test of the serial communication module, the serial communication module writes/reads data automatically to make communication checks.	Qn(H) QnPH
D9085	SD1085	×	Register for setting time check value	1 s to 65535 s	• Sets the time check time of the data link instructions (ZNRD, ZNWR) for the MELSECNET/10. • Setting range : 1 s to 65535 s (1 to 65535) • Setting unit : 1 s • Default value : 10 s (If 0 has been set, default 10 s is applied)	Qn(H) QnPH
D9090	SD1090	×	Number of special functions modules over	Number of special functions modules over	• For details, refer to the manual of each microcomputer program package.	
D9091	SD1091	×	Detailed error code	Self-diagnosis detailed error code	• Stores the detail code of cause of an instruction error.	Qn(H) QnPH QnU*1
D9094	SD1094	SD251	Head I/O number of I/O module to be replaced	Head I/O number of I/O module to be replaced	• Stores the first two digits of the head I/O number of the I/O module, which will be dismounted/mounted online (with power on), in BIN value. Example) Input module X2F0 → H2F	Qn(H) QnPH
D9095	SD1095	SD200	DIP switch information	DIP switch information	• The DIP switch information of the CPU module is stored in the following format. 0: OFF 1: ON 	Qn(H) QnPH

*1: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

Table12.44 Special register

ACPU Special Register	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU
D9100	SD1100	–	Fuse blown module	Bit pattern in units of 16 points, indicating the modules whose fuses have blown	• Output module numbers (in units of 16 points), of which fuses have blown, are entered in bit pattern. (Preset output module numbers when parameter setting has been performed.)  • Fuse blow check is executed also to the output module of remote I/O station. (If normal status is restored, clear is not performed. Therefore, it is required to perform clear by user program.)	Qn(H) QnPH QnU*1
D9101	SD1101					
D9102	SD1102					
D9103	SD1103					
D9104	SD1104					
D9105	SD1105					
D9106	SD1106					
D9107	SD1107					
D9108	SD1108	–	Step transfer monitoring timer setting	Timer setting valve and the F number at time out	• Set the value of the step transition monitoring timer and the annunciator number (F number) that will be turned ON when the monitoring timer times out.  • By turning ON any of SM1108 to SM1114, the monitoring timer starts. If the transition condition following a step which corresponds to the timer is not established within set time, set annunciator (F) is turned on.)	Qn(H) QnPH
D9109	SD1109					
D9110	SD1110					
D9111	SD1111					
D9112	SD1112					
D9113	SD1113					
D9114	SD1114					
D9116	SD1116	–	I/O module verification error	Bit pattern, in units of 16 points, indicating the modules with verification errors.	• When I/O modules, of which data are different from those entered at power-ON, have been detected, the I/O module numbers (in units of 16 points) are entered in bit pattern. (Preset I/O module numbers set in parmeters when parameter setting has been performed.)  • I/O module verify check is executed also to remote I/O station modules. (If normal status is restored, clear is not performed. Therefore, it is required to perform clear by user program.)	Qn(H) QnPH QnU*1
D9117	SD1117					
D9118	SD1118					
D9119	SD1119					
D9120	SD1120					
D9121	SD1121					
D9122	SD1122					
D9123	SD1123					
D9124	SD1124	SD63	Number of annuciator detections	Number of annuciator detections	• When one of F0 to 255 (F0 to 2047 for AuA and AnU) is turned on by SET F instruction 1 is added to the contents of SD63. When RST F or LEDR instruction is executed, 1 is subtracted from the contents of SD63. • Quantity, which has been turned on by SET F instruction is stored into SD63 in BIN code. The value of SD63 is maximum 16.	

*1: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

Table12.44 Special register

ACPU Special Register	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU
D9125	SD1125	SD64	Annunciator detection number	Annunciator detection number	• When any of F0 to 2047 is turned on by SET F instruction, the annunciator numbers (F numbers) that are turned on in order are registered into SD1125 to SD1132. • The F number turned off by RST F instruction is erased from any of SD1125 to SD1132, and the F numbers stored after the erased F number are shifted to the preceding registerers. By executing LEDR instruction, the contents of SD1125 to SD1132 are shifted upward by one. When there are 8 annunciator detections, the 9th one is not stored into SD1125 to SD1132 even if detected.	Qn(H) QnPH QnU*1
D9126	SD1126	SD65				
D9127	SD1127	SD66				
D9128	SD1128	SD67				
D9129	SD1129	SD68				
D9130	SD1130	SD69				
D9131	SD1131	SD70				
D9132	SD1132	SD71				

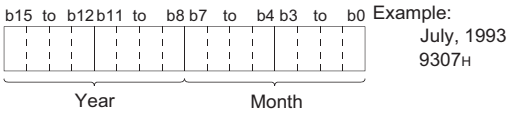
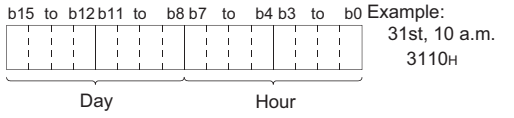
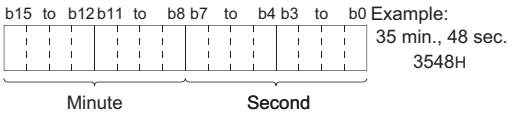
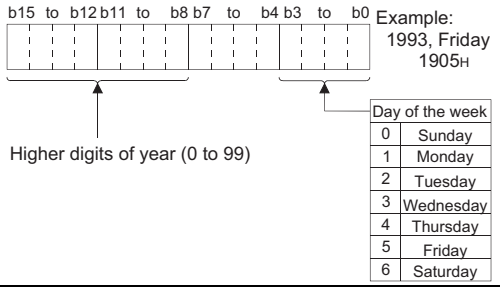
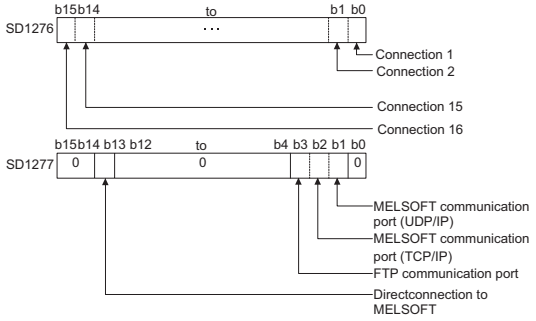
SET F50, SET F25, SET F99, RST F25, SET F15, SET F70, SET F65, SET F38, SET F110, SET F151, SET F210, LEDR

SD1009	0	50	50	50	50	50	50	50	50	50	50	50	99
SD1124	0	1	2	3	2	3	4	5	6	7	8	8	8
SD1125	0	50	50	50	50	50	50	50	50	50	50	50	99
SD1126	0	0	25	25	99	99	99	99	99	99	99	99	15
SD1127	0	0	0	99	0	15	15	15	15	15	15	15	70
SD1128	0	0	0	0	0	0	70	70	70	70	70	70	65
SD1129	0	0	0	0	0	0	0	65	65	65	65	65	38
SD1130	0	0	0	0	0	0	0	0	38	38	38	38	110
SD1131	0	0	0	0	0	0	0	0	0	110	110	110	151
SD1132	0	0	0	0	0	0	0	0	0	0	151	151	210

*1: The relevant modules are as follows:
- The Universal model QCPU whose serial number (first five digits) is "10102" or later.
- Q00UJCPU, Q00UCPU, Q01UCPU

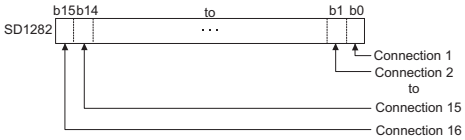
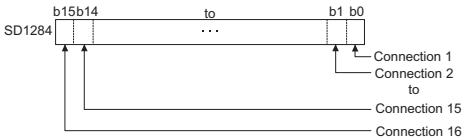
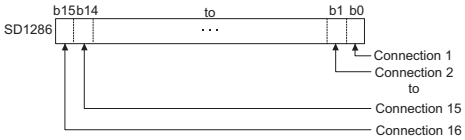
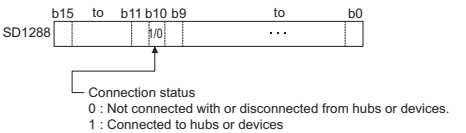
(11) QCPU with built-in Ethernet port

Table12.45 Special register

Number	Name		Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD1270	Time setting function	Operation result	Stores operationresult.	Stores the operation result of the time setting function. 0: Not executed 1: Success FFFFH: Failure	S (status change)	New	QnU*1
SD1271		Execution time	Stores time acquired with time setting function.	Stores years (last two digits of the Christian Era) and monthes by two digits of BCD code.  Example: July, 1993 9307H			
SD1272				Stores dates and hours acquired with time setting function by two digits of BCD code.  Example: 31st, 10 a.m. 3110H			
SD1273				Stores minutes and seconds acquired with time setting function by two digits of BCD code.  Example: 35 min., 48 sec. 3548H			
SD1274				Stores years (first two digits of the Christian Era) and days acquierd with time setting function.  Example: 1993, Friday 1905H Day of the week 0 Sunday 1 Monday 2 Tuesday 3 Wednesday 4 Thursday 5 Friday 6 Saturday			
SD1275		Required response time	Stores time required for clock time aquisition.	Stores time taken from transmission to SNTP server to clook time setup at CPU. Range: 0 to FFFEH (Unit: ms) FFFFH when the above limit is exceeded.			
SD1276	Forced connection invalidation		Specifies forced connection invalidation.	Specify this when a connection is to be invalidated forcibly on the user program. If invalidation is specified for a connection, it stops communication and does not respond. (When a remote password is used and frequent unlock processing errors have occurred on a connection, this is useful for temporarily inhibiting access to the connection.)  0: Valid (default) 1: Invalid This register is to be invalidated if a socket communication is used as an open system.	U		
SD1277							

*1: This applies to the Built-in Ethernet port QCPU.

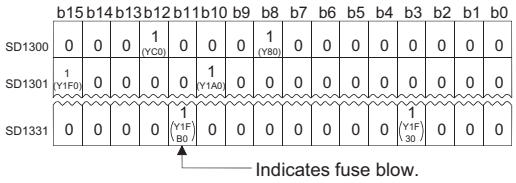
Table12.46 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD1282	Open completion signal	Stores open completion status	Open completion status of connections (whose open system is socket communication) using socket communication functions is stored. All bits corresponding to connections using any communications other than the socket communication are fixed to "0".  0 : Open processing is not completed. 1 : Open processing is completed.	S (Status change)	New	QnU*2
SD1284	Open request signal	Stores open request status	Open request status of connections using socket communication functions is stored. All bits corresponding to connections using any communications other than the socket communication are fixed to "0".  0 : No open requests 1 : In open request	S (Status change)	New	QnU*2
SD1286	Reception status signal	Stores reception status	Reception status of connections using socket communication functions is stored. All bits corresponding to connections using any communications other than the socket communication are fixed to "0".  For TCP (Normal reception mode) 0 : Data have not been received. 1 : Data have been received. For TCP (Fixed length reception mode) 0 : Data have not been received ,or received data size has not been reached to valid buffer size. 1 : Received data size has been reached to valid buffer size. For UDP 0 : Data have not been received. 1 : Data have been received.	S (Status change)	New	QnU*2
SD1288	Built-in Ethernet port connection status	Stores connection status of built-in Ethernet port	Connection status of built-in Ethernet port is stored.  It may take several seconds for the QCPU to determine whether to connect or disconnect a built-in Ethernet port.	S (Status change)	New	QnU*2

*2: The built-in Ethernet port QCPU whose serial number (first five digits) is "11012" or later is targeted.

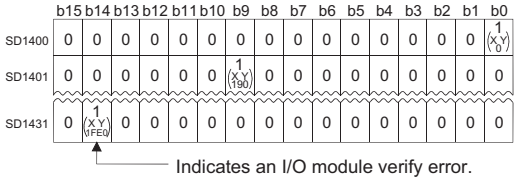
(12) Fuse blown module

Table12.47 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD1300	Fuse blown module	Bit pattern in units of 16 points, indicating the modules whose fuses have blown 0 : No blown fuse 1 : Blown fuse present	• The numbers of output modules whose fuses have blown are input as a bit pattern (in units of 16 points). (If the module numbers are set by parameter, the parameter-set numbers are stored.) • Also detects blown fuse condition at remote station output modules  • Not cleared even if the blown fuse is replaced with a new one. This flag is cleared by error resetting operation.	S (Error)	D9100	Qn(H) QnPH QnPRH QnU
SD1301					D9101	
SD1302					D9102	
SD1303					D9103	
SD1304					D9104	
SD1305					D9105	
SD1306					D9106	
SD1307					D9107	
SD1308					New	
SD1309 to SD1330					New	
SD1331					New	

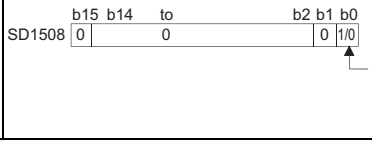
(13) I/O module verification

Table12.48 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD1400	I/O module verify error	Bit pattern, in units of 16 points, indicating the modules with verification errors. 0 : No I/O verification errors 1 : I/O verification error present	• When the I/O modules whose I/O module information differs from that registered at power-ON are detected, the numbers of those I/O modules are entered in bit pattern. (If the I/O numbers are set by parameter, the parameter-set numbers are stored.) • Also detects I/O module information.  • Not cleared even if the blown fuse is replaced with a new one. This flag is cleared by error resetting operation.	S (Error)	D9116	Qn(H) QnPH QnPRH QnU
SD1401					D9117	
SD1402					D9118	
SD1403					D9119	
SD1404					D9120	
SD1405					D9121	
SD1406					D9122	
SD1407					D9123	
SD1408					New	
SD1409 to SD1430					New	
SD1431					New	

(14) Process control instructions

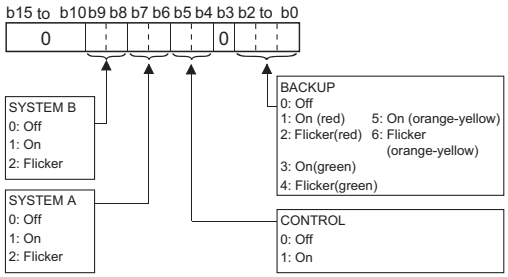
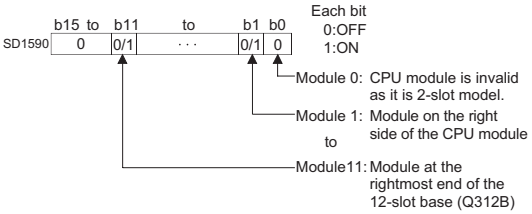
Table12.49 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU D9□□□	Corresponding CPU
SD1500 SD1501	Basic period	Basic period tome	• Set the basic period (1 second units) use for the process control instruction using floating point data. Floating point data = SD1501 SD1500	U	New	QnPH
SD1502	Process control instruction detail error code	Process control instruction detail error code	• Shows the detailed error contents for the error that occurred in the process control instruction.	S (Error)	New	
SD1503	Process control instruction generated error location	Process control instruction generated error location	• Shows the error process block that occurred in the process control instruction.	S (Error)	New	
SD1506 SD1507	Dummy device	Dummy device	• Used to specify dummy devices by a process control instruction.	U	New	QnPH QnPRH
SD1508	Function availability selection for process control instruction	b0 Bumpless function availability setting for the S.PIDP instrunction 0: Enabled 1: Disabled (Default: 0)	• Selects the availability (enabled/disabled) of the function for process control instructions.  	U	New	QnPH QnPRH

(15) For redundant systems (Host system CPU information *1)

SD1510 to SD1599 are only valid for redundant systems.
They are all set to 0 for stand-alone systems.

Table12.50 Special register

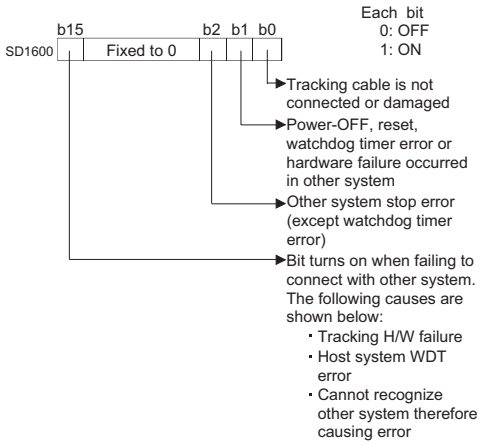
Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD1585	Redundant system LED status	4 LED states • BACKUP • CONTROL • SYSTEM A • SYSTEM B	The LED status for BACKUP, CONTROL, SYSTEM A, SYSTEM B is stored in the following format: 	S (status change)	New	QnPRH
SD1588	Reason(s) for system switch-ing	Reason(s) for system switching that occurred in host station	Stores the reason(s) for system switching on the host system. The following values are stored corresponding to the methods for system switching: Initialized to 0 when the power supply is switched off and then on or the RESET switch is set to the RESET position and then to the neutral position. 0: Initial value (control system has not been switched) 1: Power off, Reset, H/W failure, WDT error, 2: CPU stop error (except WDT) 3: System switching request from network module 16: System switching dedicated instruction 17: System switching request from GX Developer	S (when condition occurs)	○	
SD1589	Reason(s) for system switching failure conditions	Reason(s) for system switching failure No.	• Stores the reason(s) for system switching failure. 0: System switching normal (default) 1: Tracking cable is not connected , tracking cable error, FPGA circuit failure. 2: H/W failure, power-OFF, Reset, WDT error on the standby system 3: H/W failure, power-OFF, Reset, WDT error on the Control system 4: Tracking data transfer initialization 5: Communication timeout 6: Serious error(except WDT error) on the Standby system 7: There is difference between both systems (detected as Backup mode only) 8: During memory copy from control system to standby system 9: During online program change 10: During detection of intelligent function module failure on the standby system 11: System switching being executed • Resets to "0" when host system is powered on. • Resets to "0" once system has been switched successfully.	S(when system is switched)	○	QnPRH
SD1590	Network module head address, which requested system switching	Network module head address, which requested system switching	• Stores head address of network module which a system switch request was initiated. • Turns off automatically by system, after network error is reset by user.  • Please refer to SD1690 which stores the corresponding head address of network module on other system.	S (Error/Status change)	New	QnPRH
SD1595	Memory copy target I/O number	Memory copy target I/O number	• Stores the memory copy target I/O No.(Standby system CPU module: 3D1H) of before SM1595 is turned from OFF to ON.	U	New	
SD1596	Memory copy status	Memory copy status	• Stores the execution result of Memory copy function. 0 : Memory copy successfully completed 4241H : Standby system power supply off 4242H : Tracking cable is disconnected or is damaged 4247H : Memory copy function is being executed 4248H : Unsupported memory copy destination I/O Number	S (Status change)	New	

*1: The information of the host CPU module is stored.

(16) For redundant systems (Other system CPU information [*1])

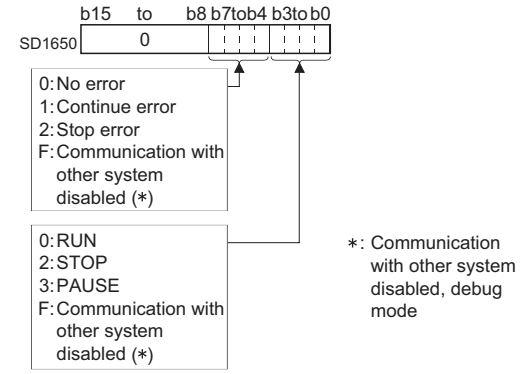
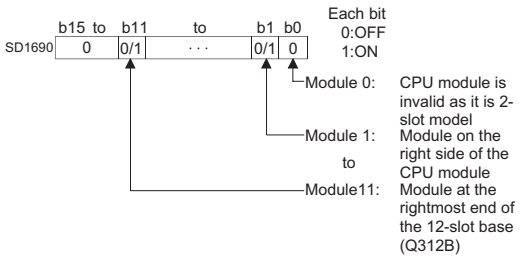
SD1600 to SD1659 is only valid during the back up mode for redundant systems, and refresh cannot be done when in the separate mode.
SD1651 to SD1699 are valid in either the backup mode or separate mode.
When a stand-alone system SD1600 to SD1699 are all 0.

Table12.51 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU SD□□*2	Corresponding CPU
SD1600	System error information	System error information	• If an error is detected by the error check for redundant system, the corresponding bit shown below turns ON. That bit turns OFF when the error is cleared after that.  • If any of b0, b1, b2 and b15 is ON, the other bits are all OFF. • In the debug mode, b0, b1, b2 and b15 are all OFF.	S(Every END)	–	QnPRH
SD1601	System switching results	System switching results	Stores the reasons for system switching. • Stores the reasons for system switching into SD1601 of both systems when system switching occarred. • Initialized to 0 at power OFF to ON/reset to unreset. • The following shows values stored into this register. 0: Initial value (System switching has not occurred) 1: Power-OFF, Reset, H/W failure, WDT error,(*) 2: CPU stop error (except WDT) 3: System switching request by network module 16: System switching dedicated instruction 17: System switching request from GX Developer *: When the system is switched by the power OFF/reset of the control system, "1" is not stored into SD1601 of the new standby system.	S(when system is switched)		
SD1602	System switching dedicated instruction parameter	System switching dedicated instruction parameter	• Stores the parameters for system switching dedicated instruction SP.CONTSW. (The parameters (SD1602) for SP.CONTSW are stored in both systems A&B) • SD1602 is only valid when "16" is stored in SD1601. • This SD1602 is updated once system switch instruction SP.CONTSW is activated.	S(when system is switched)		
SD1610	Other system diagnostic error	Diagnostic error code	• The error value sorted in BIN code. • Stores SD0 of the other system CPU module	S(Every END)	SD0	
SD1611 SD1612 SD1613	Other system diagnostic error occurrence time	Diagnostic error occurrence time	• Stores the date and time when diagnostics error occurred corresponding to error code stored in SD1610. • Data format is the same as SD1 to SD3. • Also, stores the value to SD1 to SD3.	S(Every END)	SD1 to SD3	
SD1614	Other system error information category	Error information category code	• Stores the category code corresponding to the error comment information/individual information code. • Data format is the same as SD4. • Also, stores the value to SD4.	S(Every END)	SD4	
SD1615 to SD1625	Other system error common information	Error common information	• Stores the common information corresponding to the error code stored in this system CPU. • Data composition is the same as SD5 to SD15. • Also, stores the value to SD5 to SD15.	S(Every END)	SD5 to SD15	
SD1626 to SD1636	Other system error individual information	Error individual information	• Stores the individual information corresponding to the error code stored in this system CPU. • Data composition is the same as SD16 to SD26. • Also, stores the value to SD16 to SD26.	S(Every END)	SD16 to SD26	

*2: Shows the special register (SD□ □) for the host system CPU module.

Table12.51 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU SD□□*2	Corresponding CPU
SD1649	Standby system error cancel command	Error code of error to be cleared	• Stores the error code of the error to be cleared by clearing a standby system error. • Stores the error code of the error to be cleared into this register and turn SM1649 from OFF to ON to clear the standby system error. • The value in the lowest digit (1 place) of the error code is ignored when stored into this register. (By storing 4100 in this register and resetting the error, errors 4100 to 4109 can be cleared.)	S(Every END)	–	QnPRH
SD1650	Other system operating information	Other system operating information	Stores the operation information of the other system CPU module in the following format. "00FFH" I stored when a communication error occurs, or when in debug mode.  Note : A communication error is caused by the following:. • When the power supply is switched off, or when the other system is reset. • H/W error occurs on either of system A or B. • WDT error occurs. • Tracking cable is not connected. • Tracking cable is disconnected or damaged.	S(Every END)		
SD1690	Network module head address, which requested system switching on host (control) system	Network module head address, which requested system switching on host (control) system	• Stores head address of network module which a system switch request was initiated, using the following format. • Turns off automatically by system, after network error is reset by user.  • Please refer to SD1590 which stores the corresponding head address of network module on host system.	S(Every END)		

*2 : Shows the special register (SD□ □) for the host system CPU.

(17) For redundant systems (Trucking)

SD1700 to SD1779 is valid only for redundant systems.

These are all 0 for stand-alone systems.

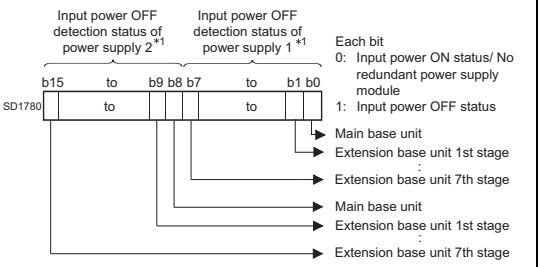
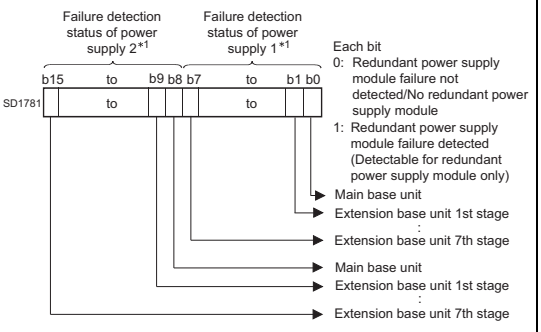
Table12.52 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD1700	Tracking error detection count	Tracking error detection count	• When the tracking error is detected, count is added by one. • The counter repeats an increment and decrement of the value; 0 → 32767 → - 32768 → 0	S(Error)		QnPRH
SD1710	Waiting time for online program change (standby system)	Waiting time for online program change (standby system)	• Set in seconds the waiting time of the standby system CPU module from when online program change to the control system CPU module is completed by the online program change for redundancy function until the online program change to the standby system CPU module starts. • If no online program change request is issued to the standby system CPU module within the preset time after completion of the online program change to the control system CPU module, both system CPU modules judge it as the failure of the online program change for redundancy. In this case, both system CPU modules resume the consistency check between system A & B suspended during the online program change. Also, the control system CPU module is set to accept a new request of online program change for redundancy. • When both systems are powered on, 90 seconds are set to SD1710 as the default value. • Set the value within the range 90 to 3600 seconds. When the setting is 0 to 89 seconds, it is regarded as 90 seconds for operation. If the setting is outside the allowed range, it is regarded other than 0 to 3600 seconds for operation. • The waiting time for a start of online program change to the standby system CPU module is checked according to the SD1710 setting during online change of multiple blocks and online change of batch of files for redundancy.	U/ S (Initial)	New	QnPRH

(18) Redundant power supply module information

SD1780 to SD1789 are valid only for a redundant power supply system.
The bits are all 0 for a singular power supply system.

Table12.53 Special register

Number	Name	Meaning	Explanation	Set by (When Set)	Corres-ponding ACPU D9□□□	Corresponding CPU
SD1780	Power supply off detection status	Power supply off detection status	• Stores the status of the redundant power supply module with input power OFF in the following bit pattern. • Stores 0 when the main base unit is not the redundant power main base unit (Q38RB).  • When configuring multiple CPU, the status is stored to 1st CPU module.	S(Every END)	New	Qn(H)*2 QnPH*2 QnPRH QnU*3
SD1781	Power supply failure detection status	Power supply failure detection status	• Stores the failure detection status of the redundant power supply module in the following bit pattern. (The corresponding bit is cleared to 0 when the input power to the faulty redundant power supply module is switched OFF after detection of the redundant power supply module failure.) • Stores 0 when the main base unit is not the redundant power main base unit (Q38RB).  • When configuring multiple CPU, the status is stored to 1st CPU module.	S(Every END)	New	
SD1782	Momentary power failure detection counter for power supply 1*1	Momentary power failure detection count for power supply 1	• Counts the number of times of momentary power failure of the power supply 1/2. • Monitors the status of the power supply 1/ 2 mounted on the redundant power main base unit (Q38RB) and counts the number of times of momentary power failure. Status of power supply 1/power supply 2 mounted on the redundant extension base unit is not monitored. • When the CPU module starts, the counter of the power supply 1/ 2 is cleared to 0. • If the input power to one of the redundant power supply modules is turned OFF, the corresponding counter is cleared to 0.	S(Every END)	New	
SD1783	Momentary power failure detection counter for power supply 2*1	Momentary power failure detection count for power supply 2	The counter is incremented by 1 every time the momentary power failure of the power supply 1/ 2 is detected.(The counter repeats increment and decrement of the value; 0 → 32767 → – 32768 → 0 (The system monitor of GX Developer shows the counter within the range between 0 and 65535. • Stores 0 when the main base unit is not the redundant power main base unit (Q38RB). • When configuring multiple CPU, the status is stored to 1st CPU module. • The counter repeats increment and decrement of the value, 0 → 32767 → – 32768 → 0 (The system monitor of GX Developer shows the counter within the range between 0 and 65535.	S(Every END)	New	

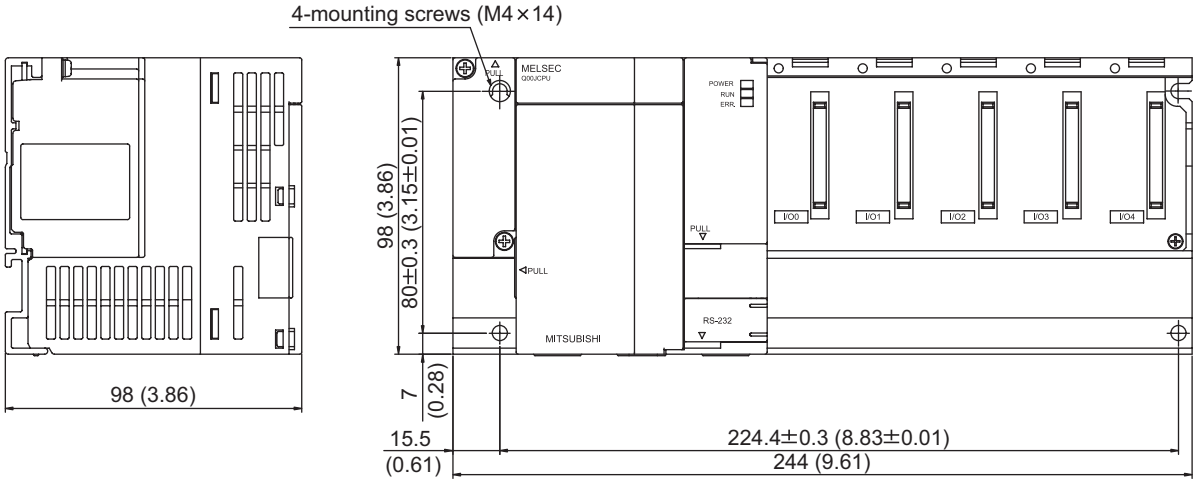
*1: The "power supply 1" in dicates the redundant power supply module mounted on the POWER 1 slot of the redundant base unit (Q38RB/68RB/Q65WRB).
The "power supply 2" indicates the redundant power supply module mounted on the POWER 2 slot of the redundant base unit (Q38RB/68RB/Q65WRB).
*2: The module whose first 5 digits of serial No. is "07032" or later.
However, for the multiple CPU system configuration, this applies to all CPU modules whose first 5 digits of serial No. are "07032" or later.
*3: The module whose first 5 digits of serial No. is "10042" or later.

APPENDICES

Appendix 1 External Dimensions

Appendix 1.1 CPU Module

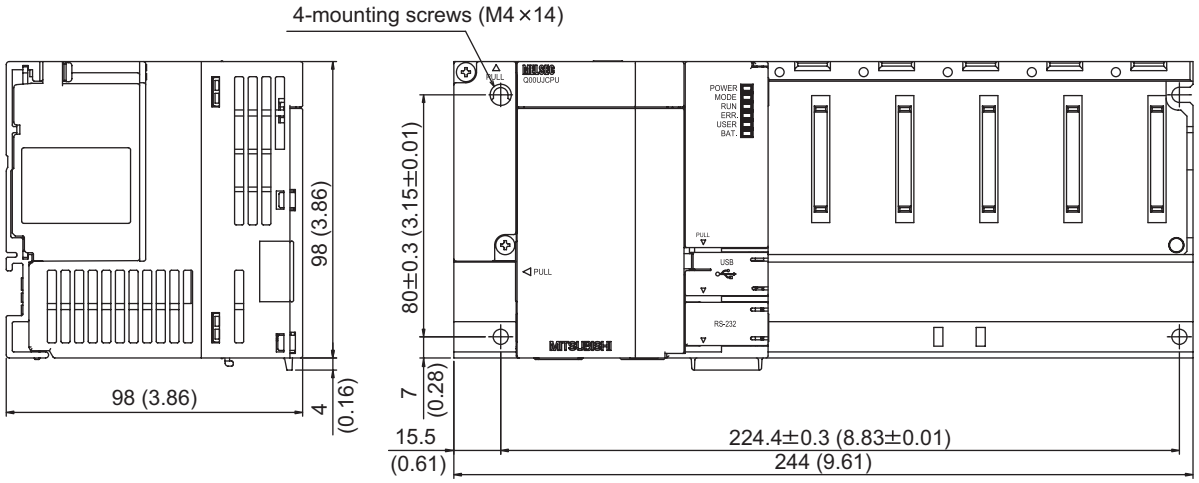
(1) Q00JCPU



Unit : mm (inches)

Figure App.1 Q00JCPU

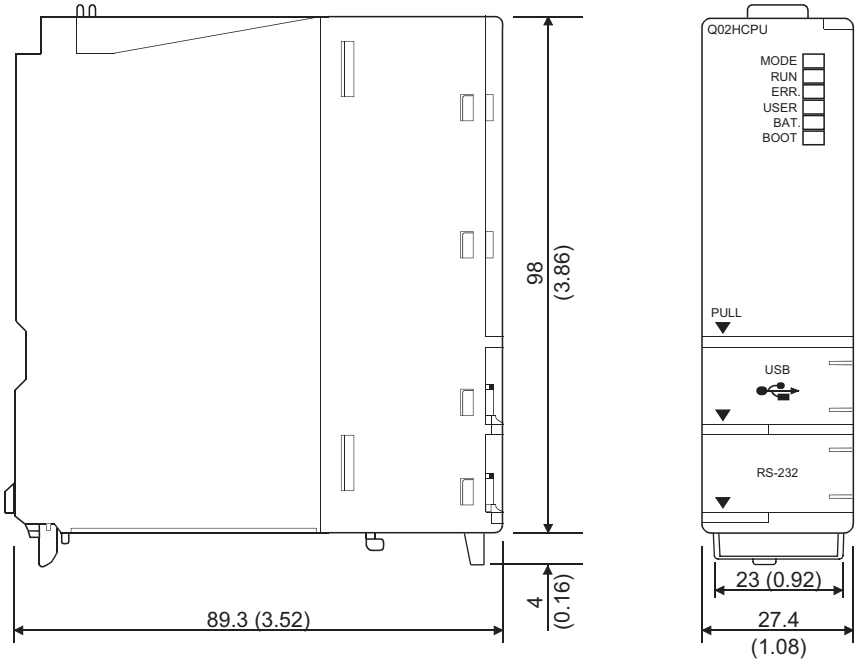
(2) Q00UJCPU



Unit : mm (inches)

Figure App.2 Q00UJCPU

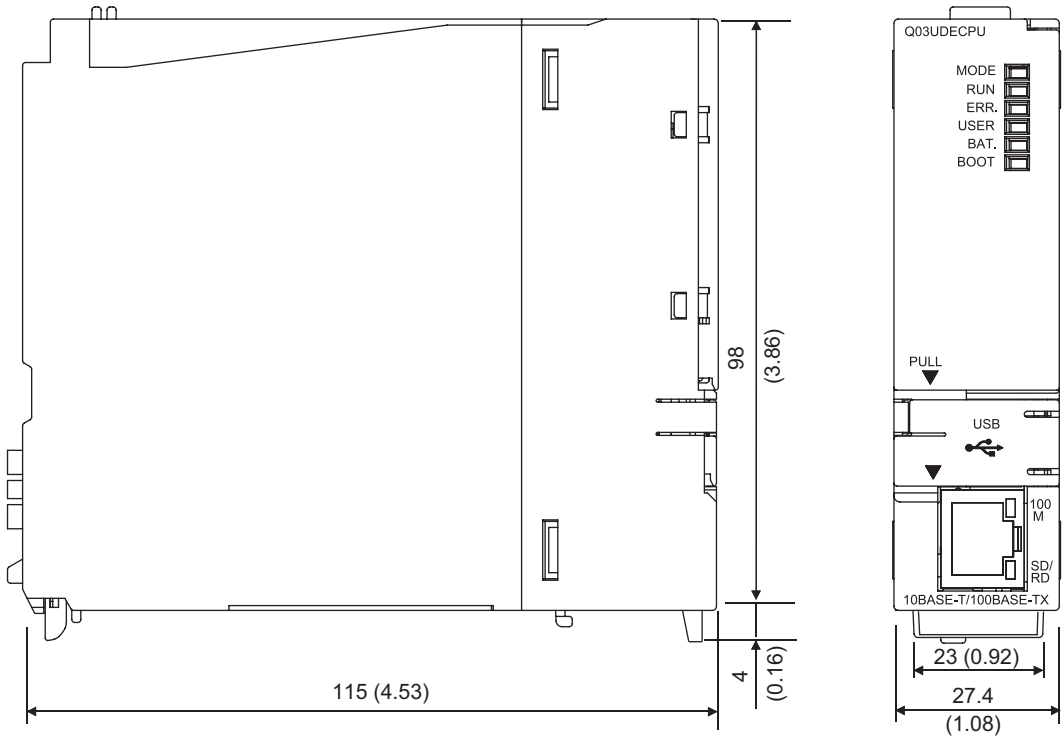
(3) Q00CPU,Q01CPU,Q02CPU,Q02HCPU,Q06HCPU,Q12HCPU,Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU,Q25PHCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU



Unit : mm (inches)

Figure App.3 Q00CPU,Q01CPU,Q02CPU,Q02HCPU,Q06HCPU,Q12HCPU,Q25HCPU,Q02PHCPU,Q06PHCPU, Q12PHCPU,Q25PHCPU,Q00UCPU, Q01UCPU,Q02UCPU,Q03UDCPU,Q04UDHCPU,Q06UDHCPU, Q10UDHCPU,Q13UDHCPU,Q20UDHCPU,Q26UDHCPU

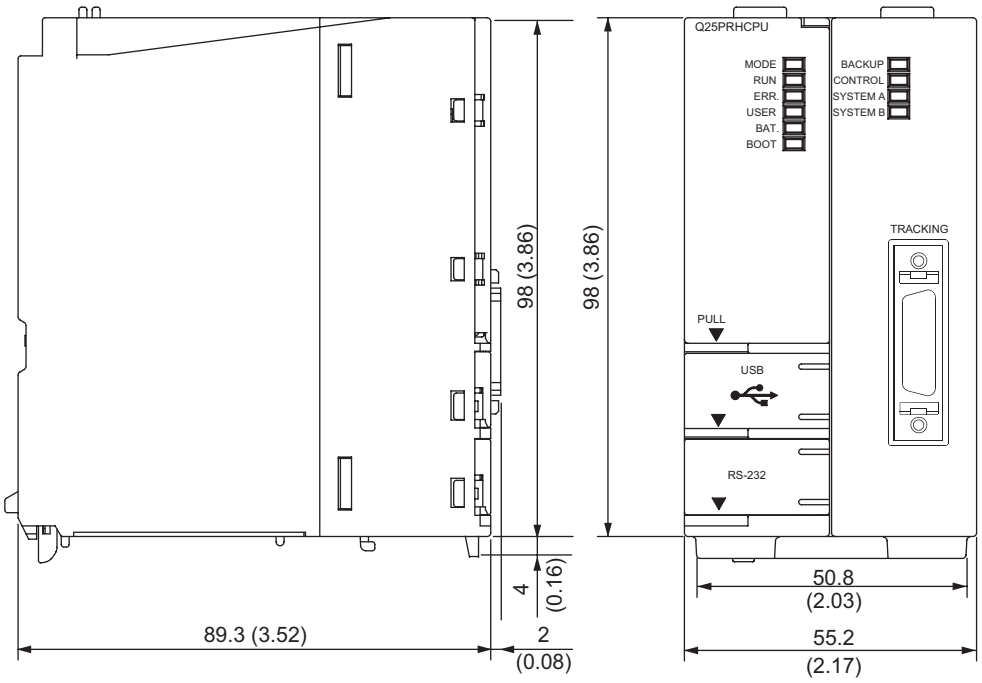
(4) Q03UDECPU,Q04UDEHCPU,Q06UDEHCPU,Q10UDEHCPU,Q13UDEHCPU,Q20UDEHCPU,Q26UDEHCPU



Unit : mm (inches)

Figure App.4 Q03UDECPU,Q04UDEHCPU,Q06UDEHCPU,Q10UDEHCPU,Q13UDEHCPU,Q20UDEHCPU, Q26UDEHCPU

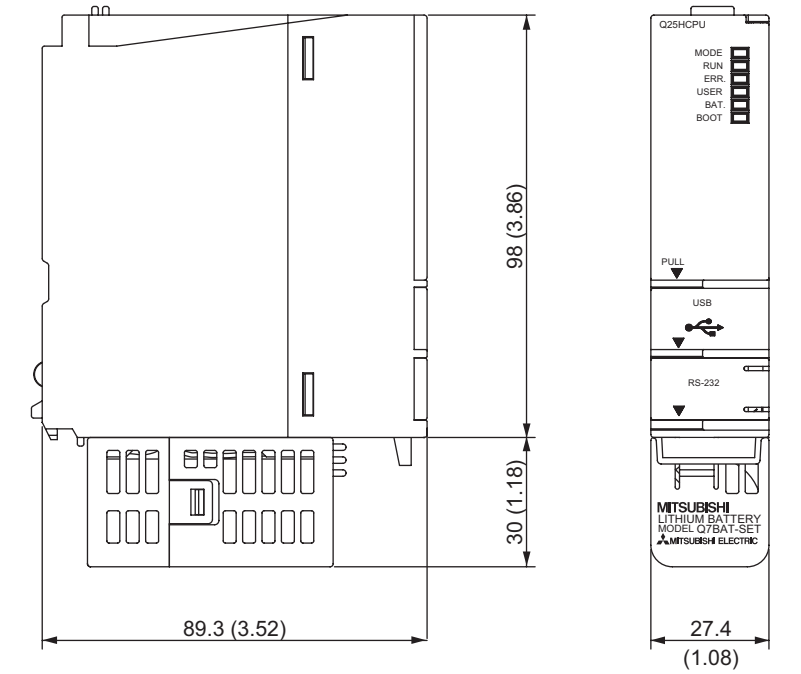
(5) Q12PRHCPU,Q25PRHCPU



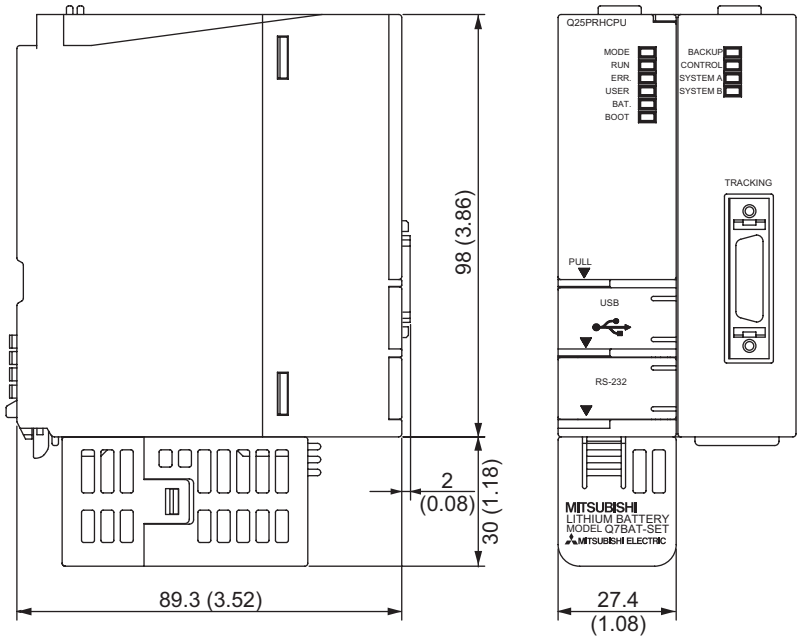
Unit : mm (inches)

Figure App.5 Q12PRHCPU,Q25PRHCPU

(6) When Q7BAT-SET is mounted on the CPU module



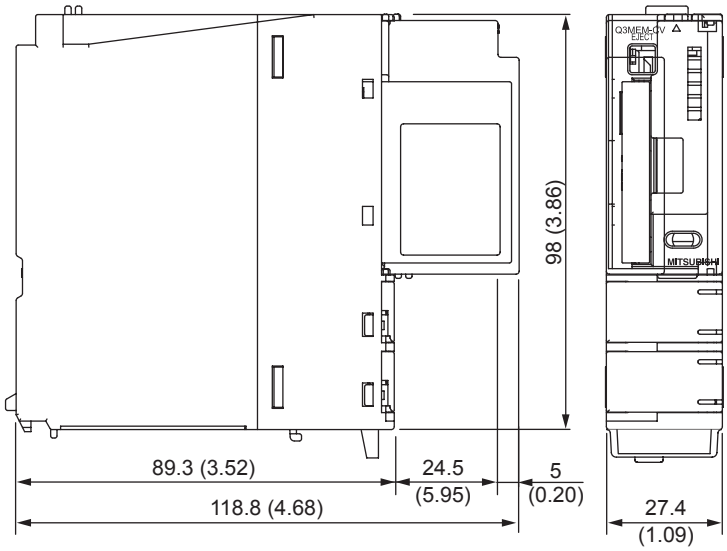
Unit : mm (inches)



Unit : mm (inches)

Figure App.6 When Q7BAT-SET is mounted on the CPU module

(7) When Q3MEM-4MBS or Q3MEM-8MBS is mounted on the CPU module

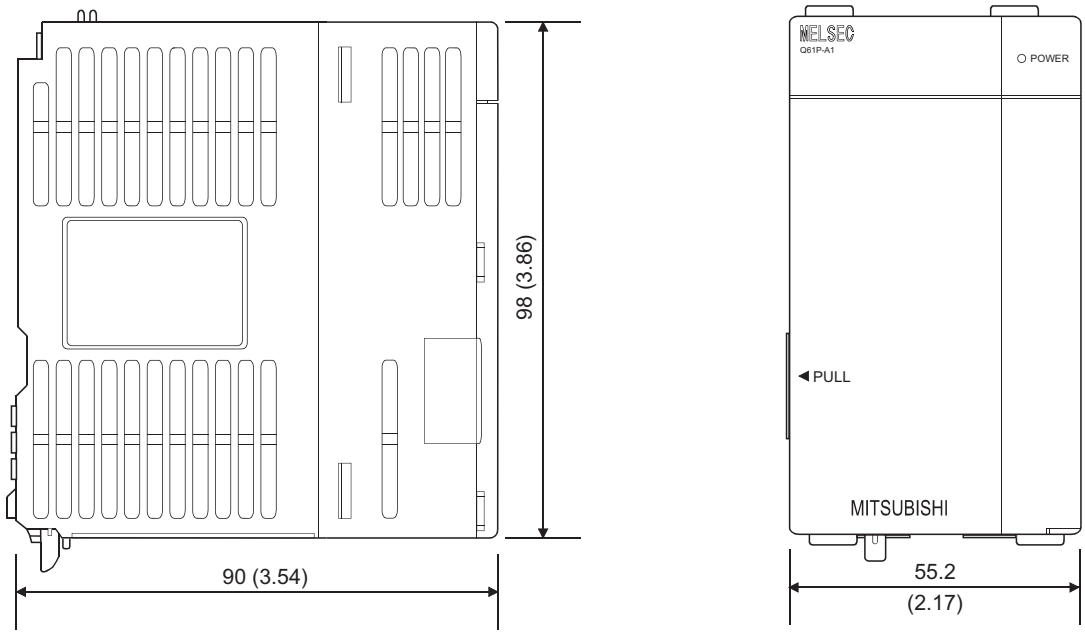


Unit : mm (inches)

Figure App.7 When Q3MEM-4MBS, Q3MEM-8MBS is mounted on the CPU module

Appendix 1.2 Power Supply Module

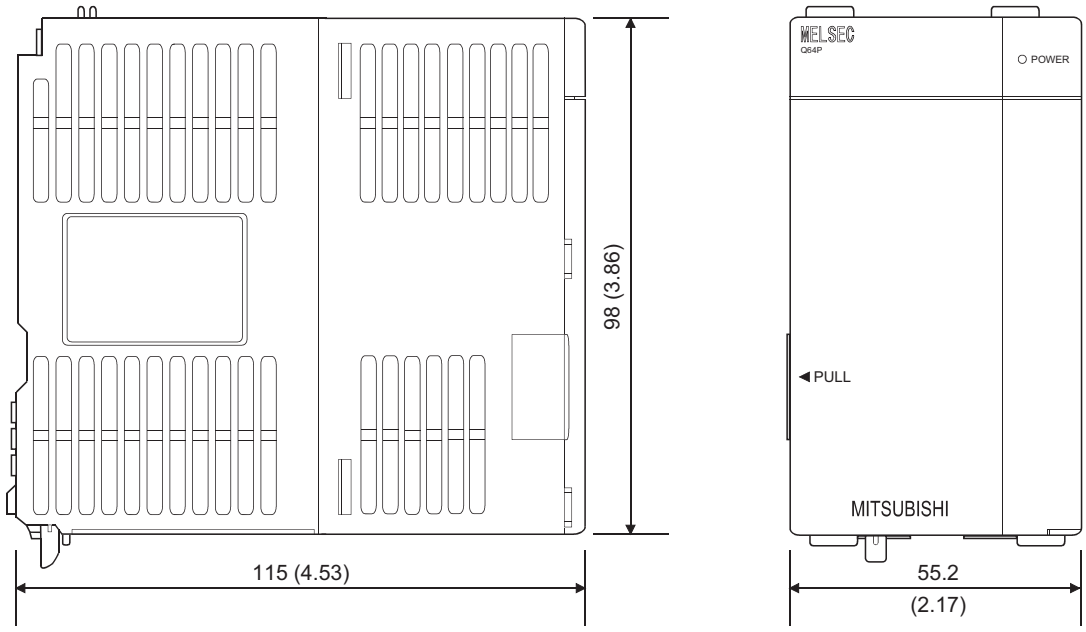
(1) Q61P-A1,Q61P-A2,Q61P,Q61P-D,Q62P,Q63P



Unit : mm (inches)

Figure App.8 Q61P-A1,Q61P-A2,Q61P,Q61P-D,Q62P,Q63P

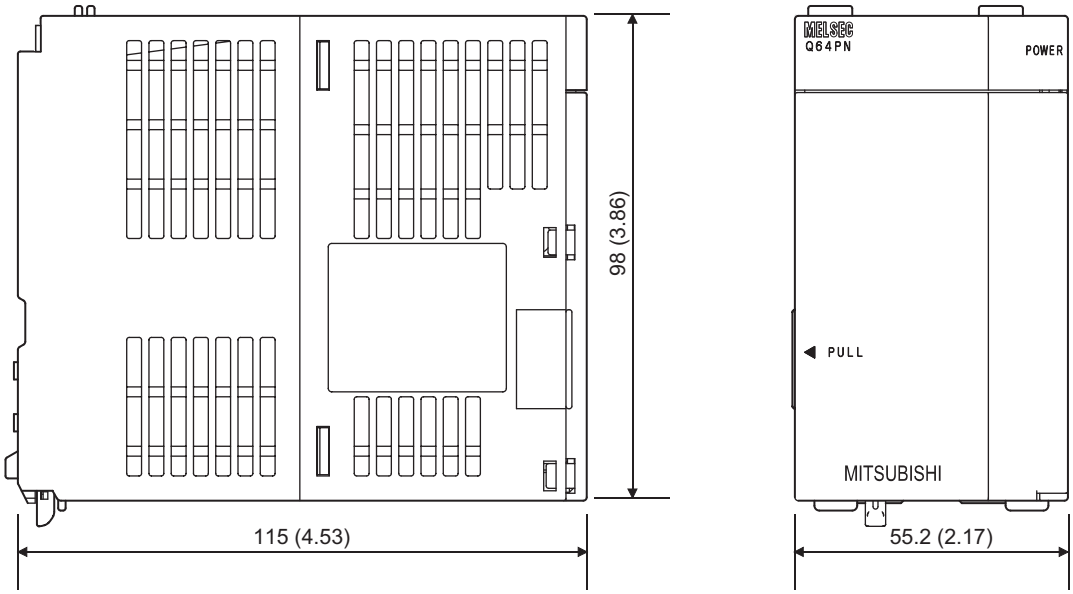
(2) Q64P



Unit : mm (incases)

Figure App.9 Q64P

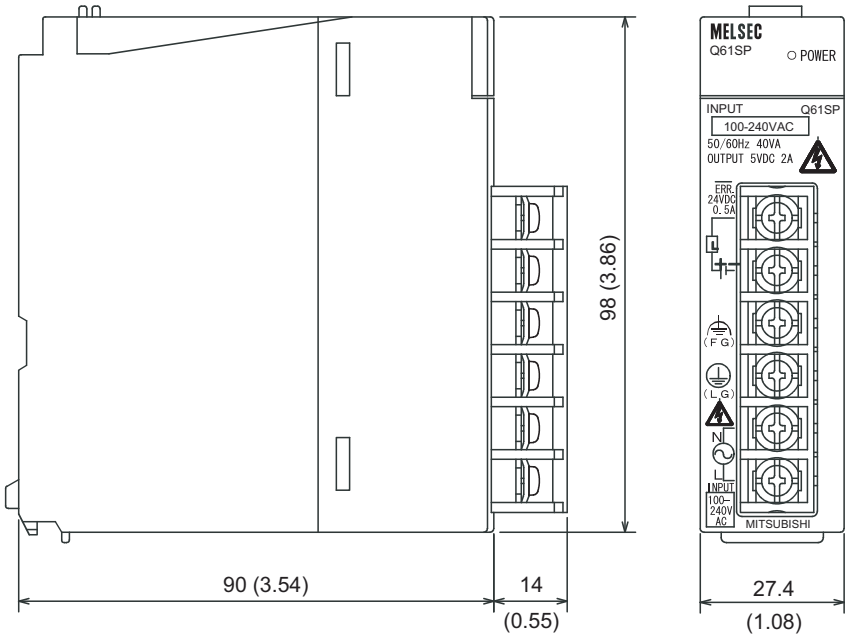
(3) Q64PN



Unit : mm (inches)

Figure App.10 Q64PN

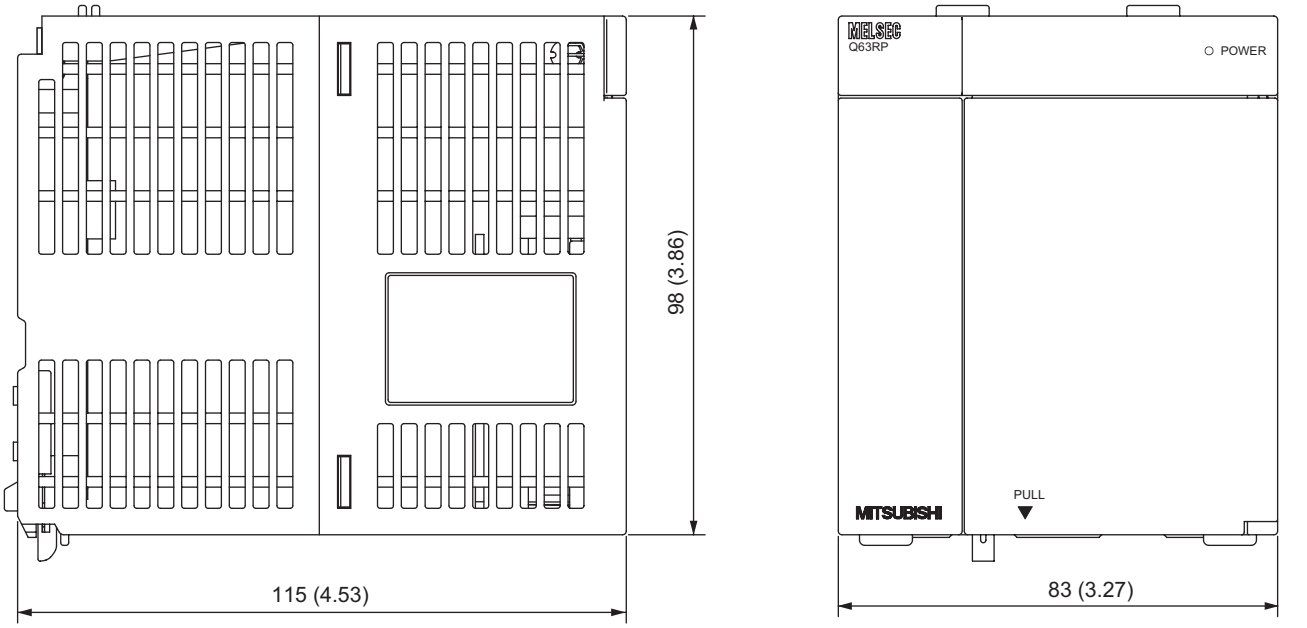
(4) Q61SP



Unit : mm (inches)

Figure App.11 Q61SP

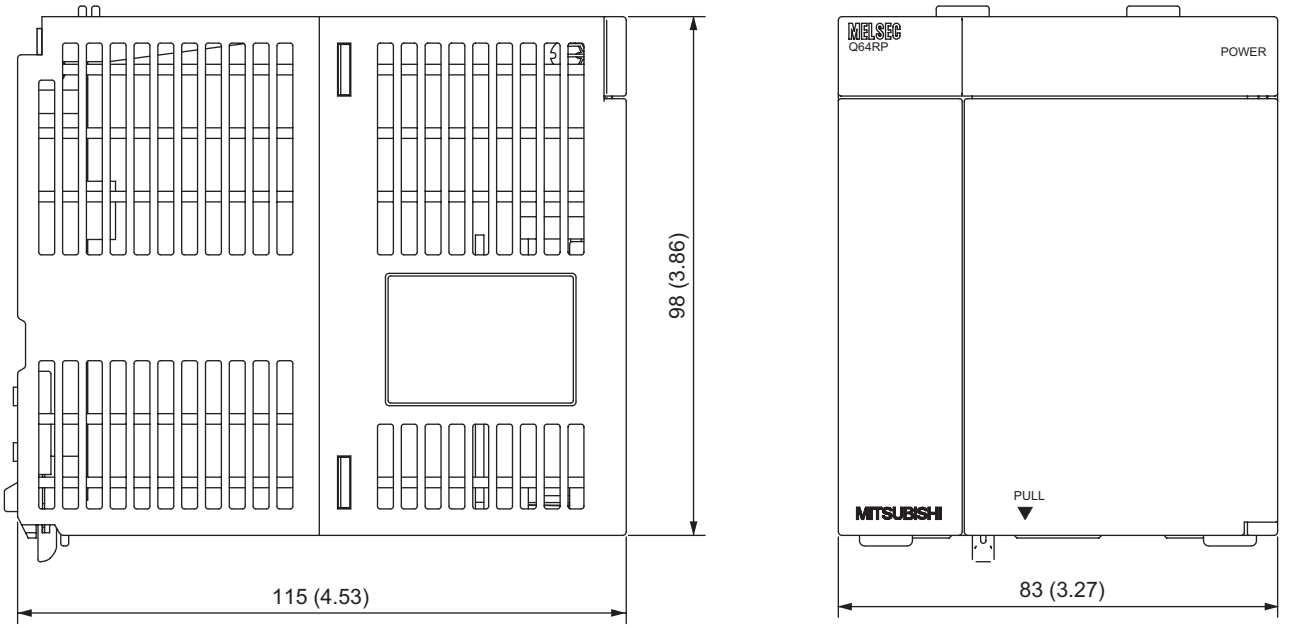
(5) Q63RP



Unit : mm (inches)

Figure App.12 Q63RP

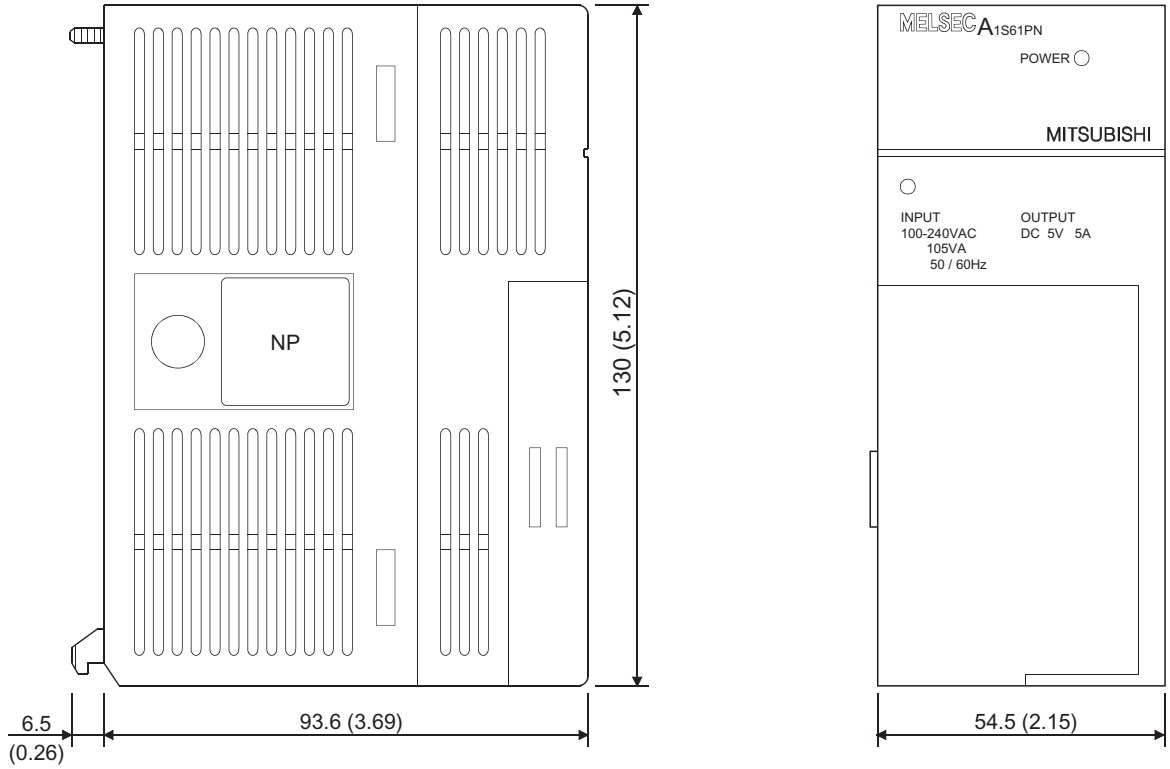
(6) Q64RP



Unit : mm (inches)

Figure App.13 Q64RP

(7) A1S61PN,A1S62PN,A1S63P

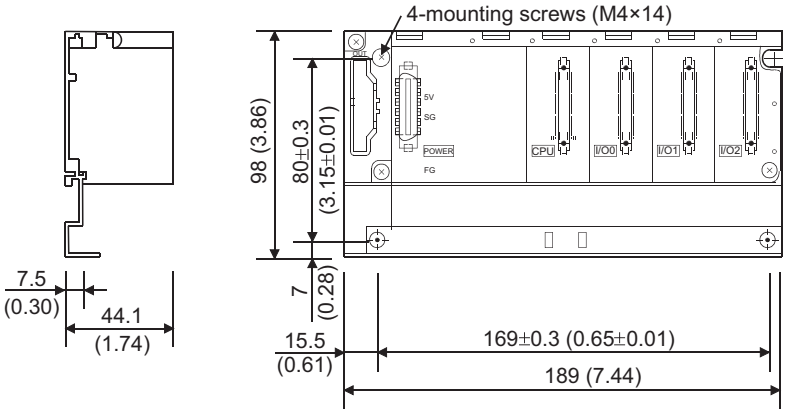


Unit : mm (inches)

Figure App.14 A1S61PN,A1S62PN,A1S63P

Appendix 1.3 Main Base Unit

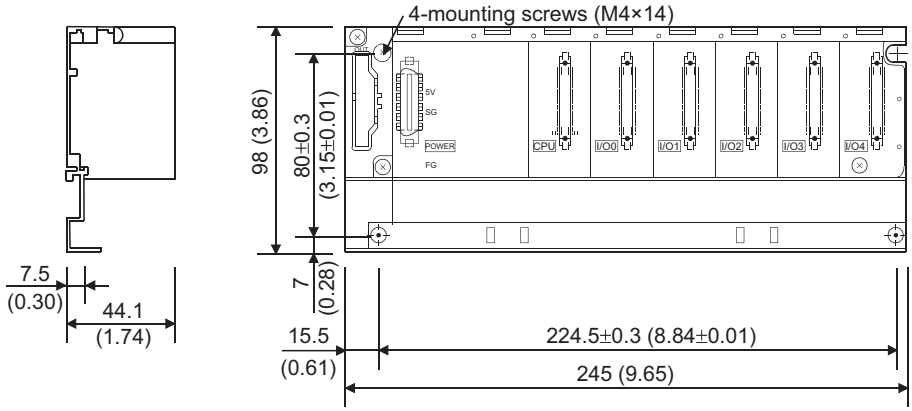
(1) Q33B



Unit : mm (inches)

Figure App.15 Q33B

(2) Q35B

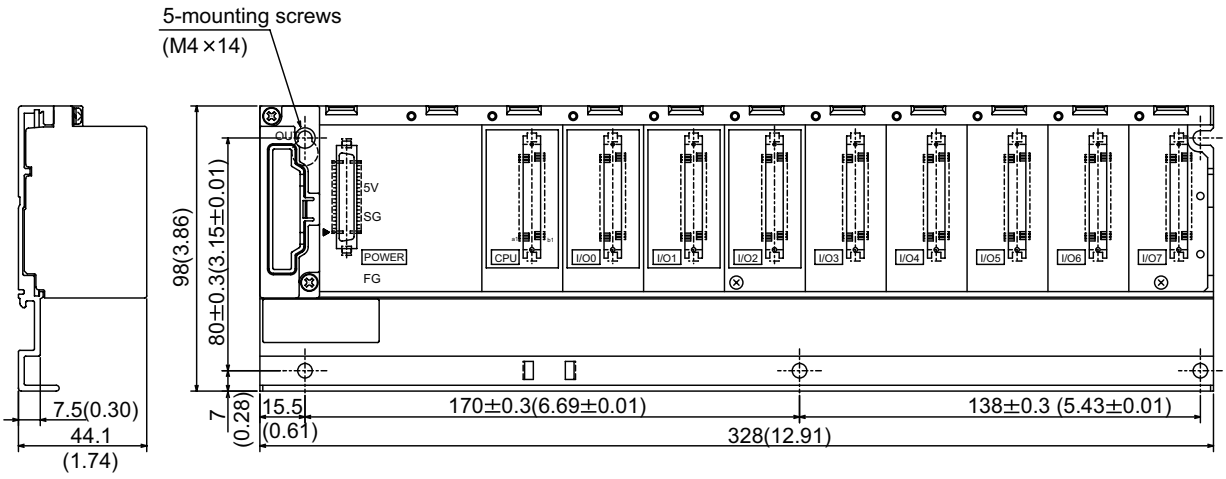


Unit : mm (inches)

Figure App.16 Q35B

(3) Q38B

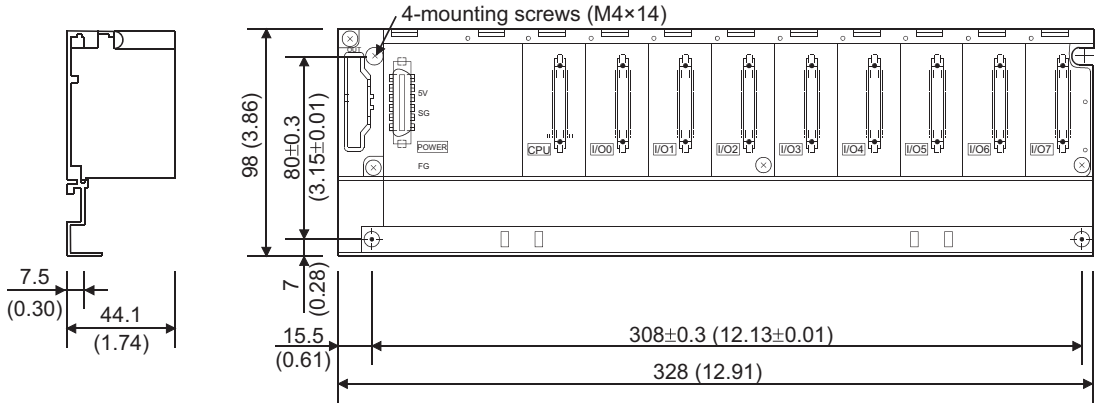
(a) Q38B with 5 base mounting holes



Unit : mm (inches)

Figure App.17 Q38B (5 base mounting holes)

(b) Q38B with 4 base mounting holes

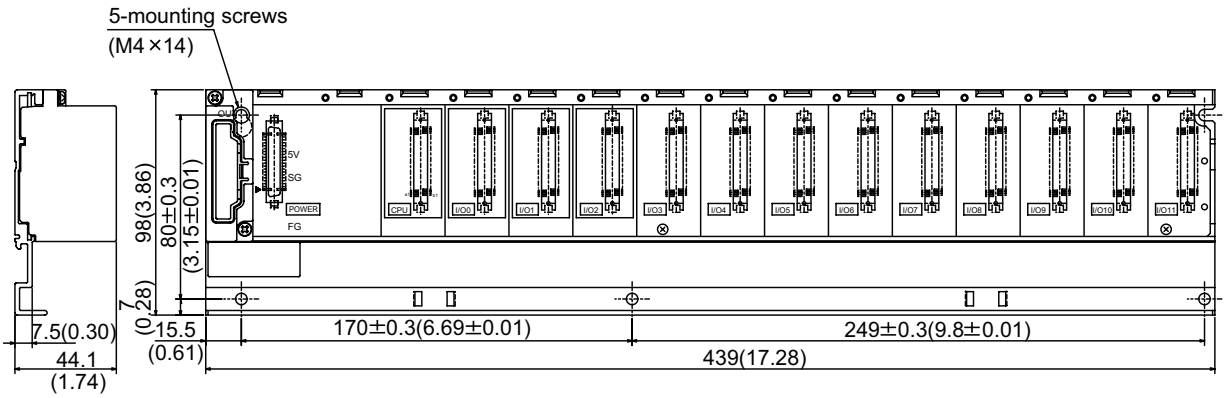


Unit : mm (inches)

Figure App.18 Q38B (4 base mounting holes)

(4) Q312B

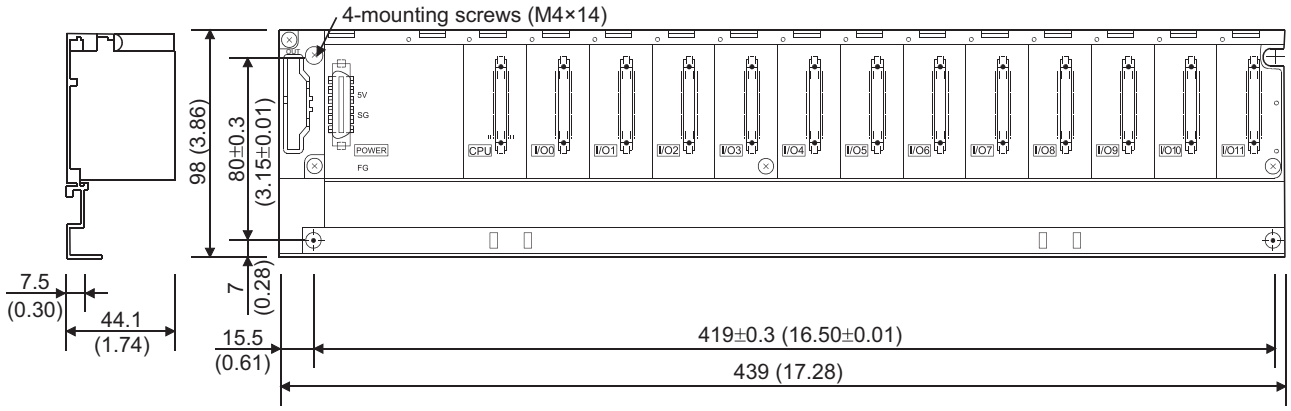
(a) Q312B with 5 base mounting holes



Unit : mm (inches)

Figure App.19 Q312B (5 base mounting holes)

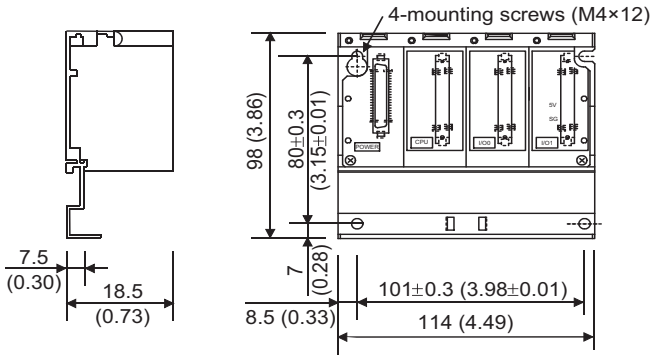
(b) Q312B with 4 base mounting holes



Unit : mm (inches)

Figure App.20 Q312B (4 base mounting holes)

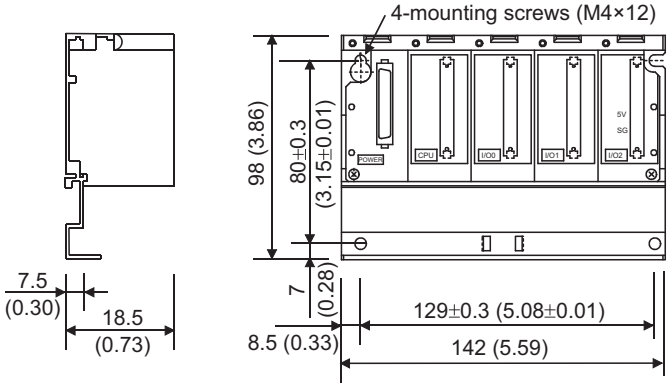
(5) Q32SB



Unit : mm (inches)

Figure App.21 Q32SB

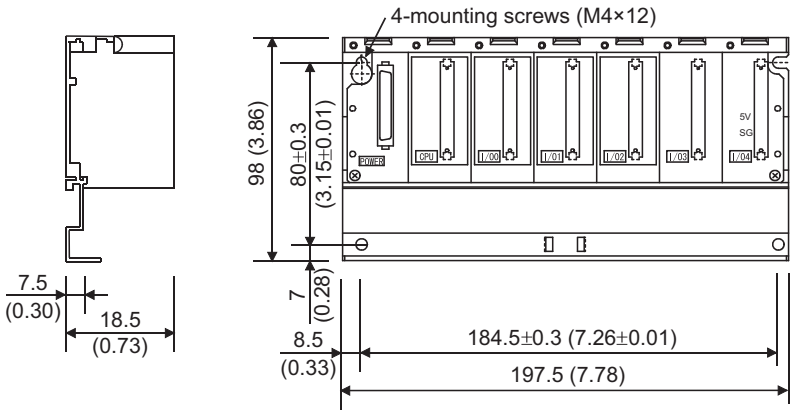
(6) Q33SB



Unit : mm (inches)

Figure App.22 Q33SB

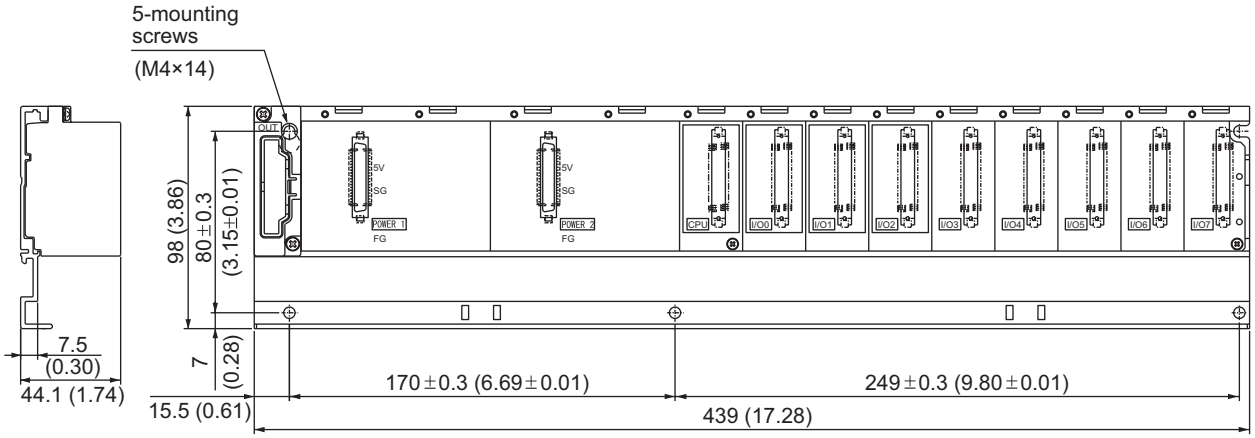
(7) Q35SB



Unit : mm (inches)

Figure App.23 Q35SB

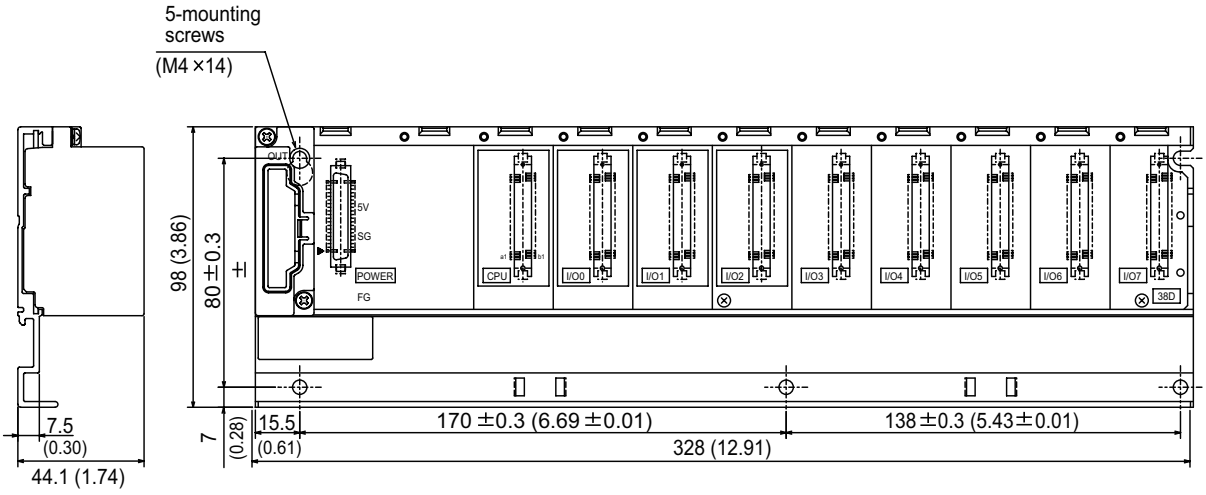
(8) Q38RB



Unit : mm (inches)

Figure App.24 Q38RB

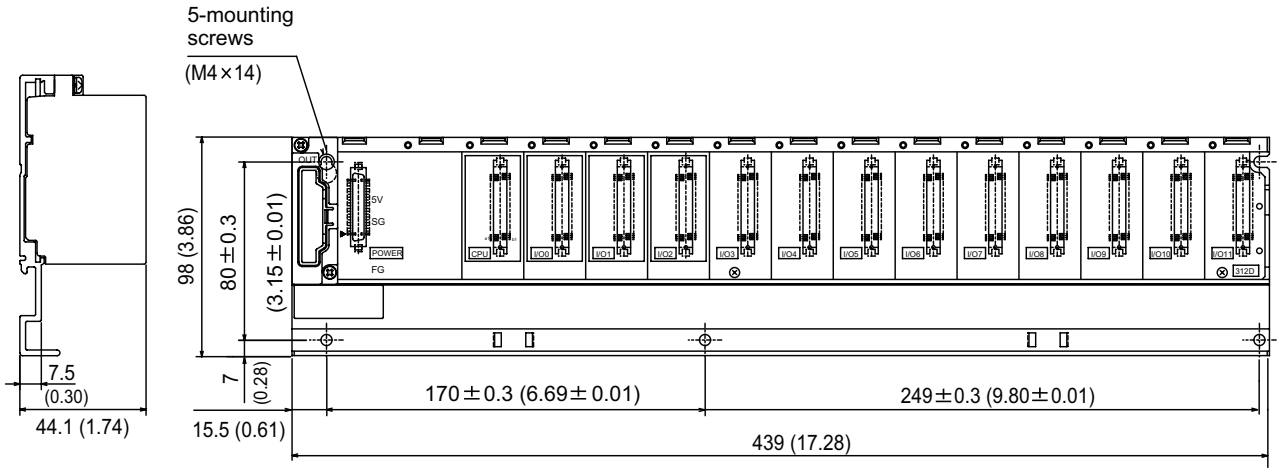
(9) Q38DB



Unit : mm (inches)

Figure App.25 Q38DB

(10)Q312DB

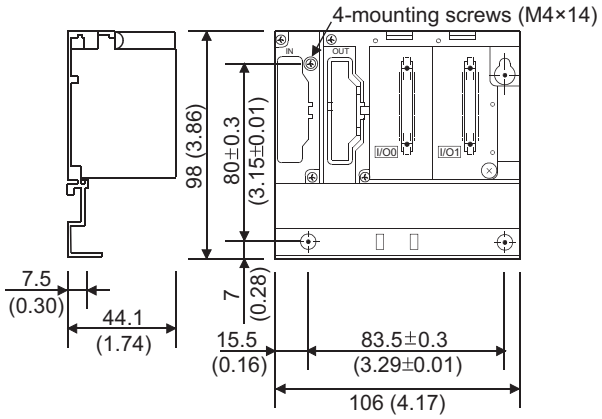


Unit : mm (inches)

Figure App.26 Q312DB

Appendix 1.4 Extension Base Unit

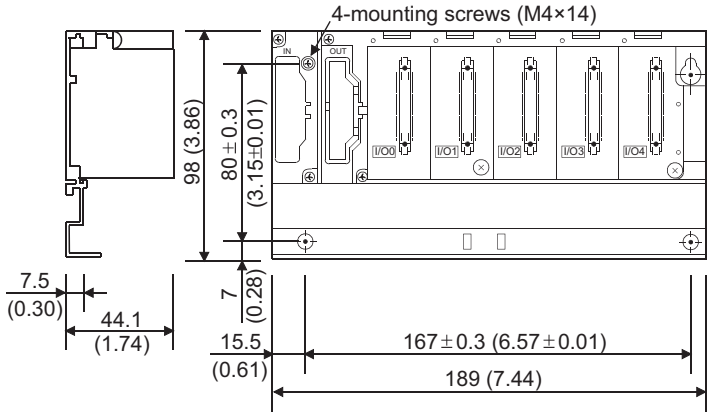
(1) Q52B



Unit : mm (inches)

Figure App.27 Q52B

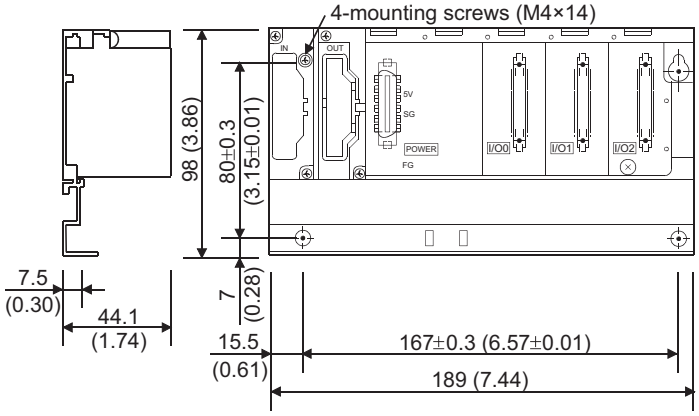
(2) Q55B



Unit : mm (inches)

Figure App.28 Q55B

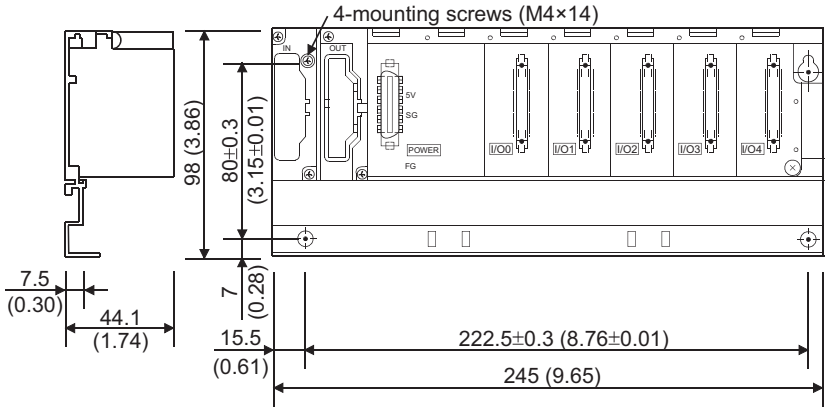
(3) Q63B



Unit : mm (inches)

Figure App.29 Q63B

(4) Q65B

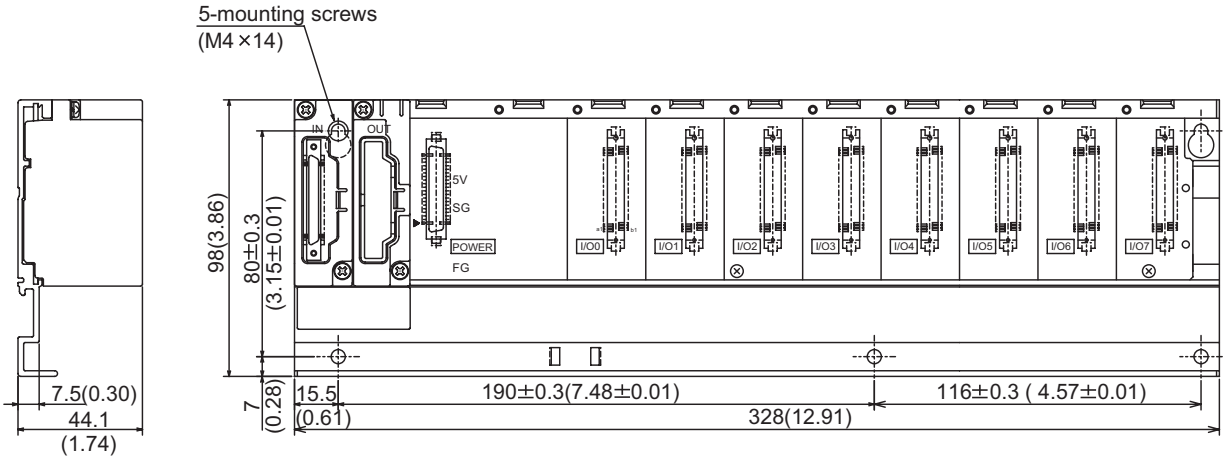


Unit : mm (inches)

Figure App.30 Q65B

(5) Q68B

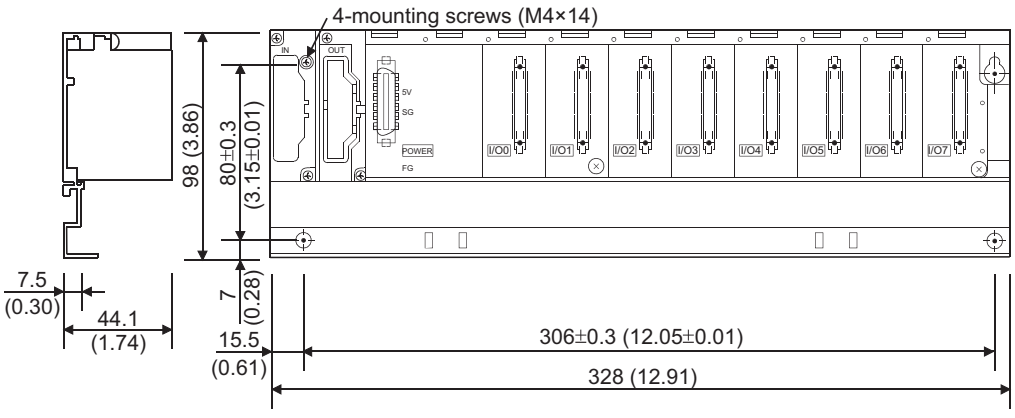
(a) Q68 with 5 base mounting holes



Unit : mm (inches)

Figure App.31 Q68B (5 base mounting holes)

(b) Q68 with 4 base mounting holes

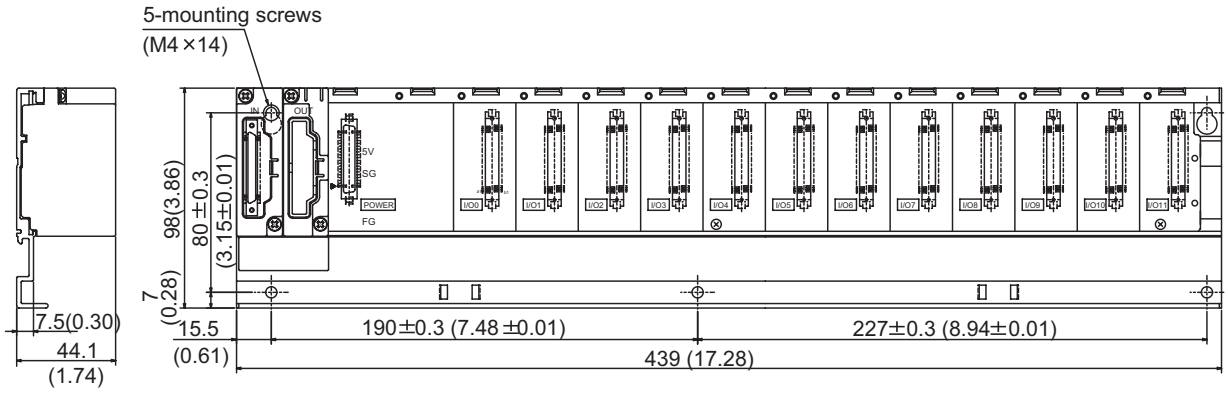


Unit : mm (inches)

Figure App.32 Q68B (4 base mounting holes)

(6) Q612B

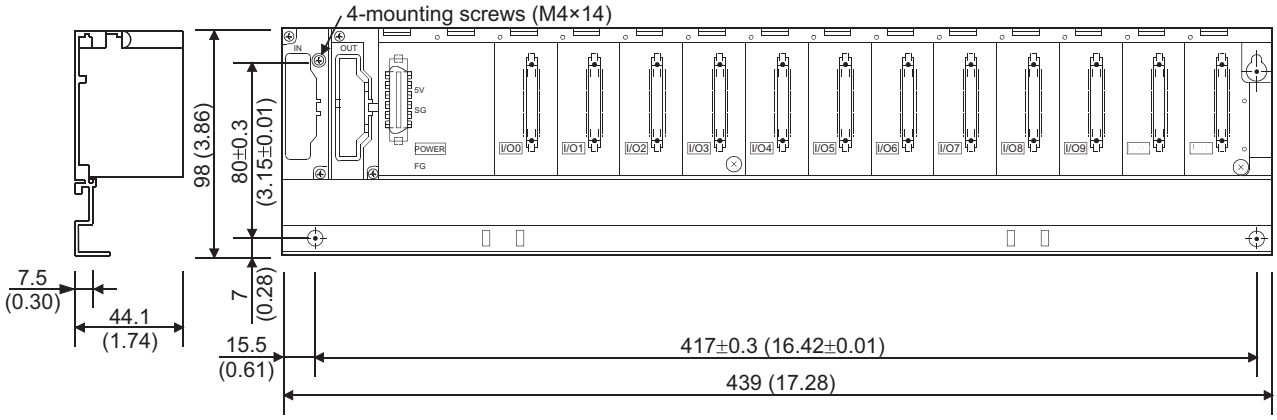
(a) Q612B with 5 base mounting holes



Unit : mm (inches)

Figure App.33 Q612B (5 base mounting holes)

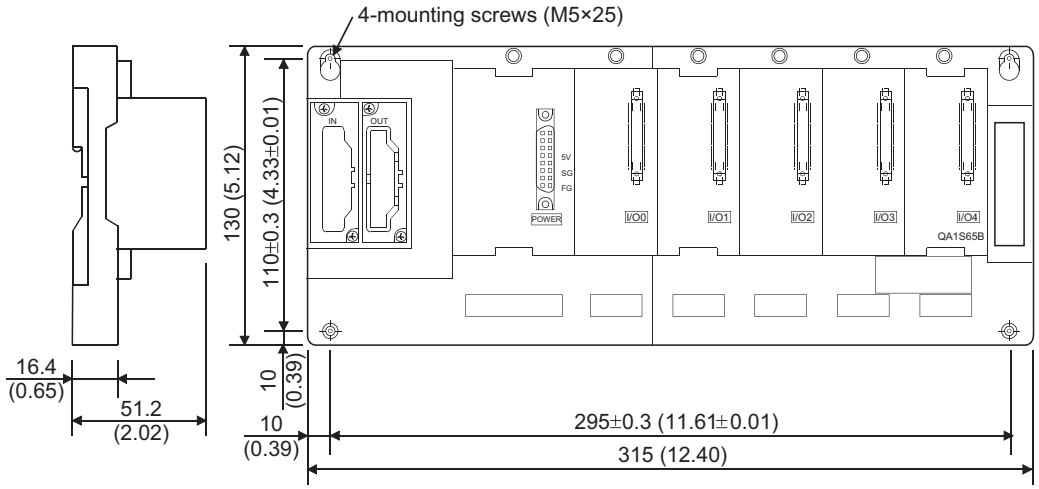
(b) Q612B with 4 base mounting holes



Unit : mm (inches)

Figure App.34 Q612B (4 base mounting holes)

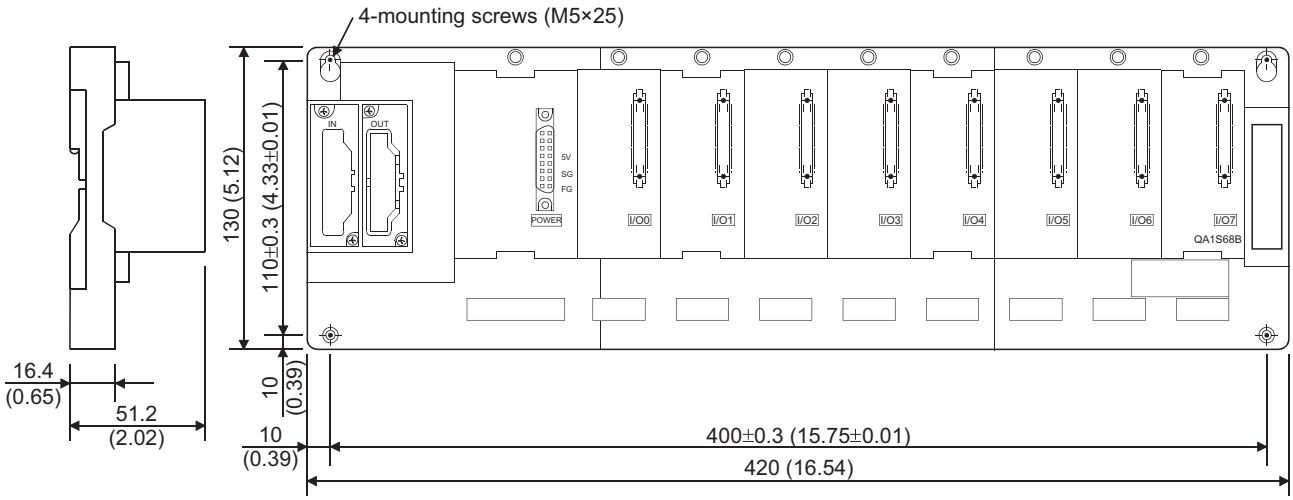
(7) QA1S65B



Unit : mm (inches)

Figure App.35 QA1S65B

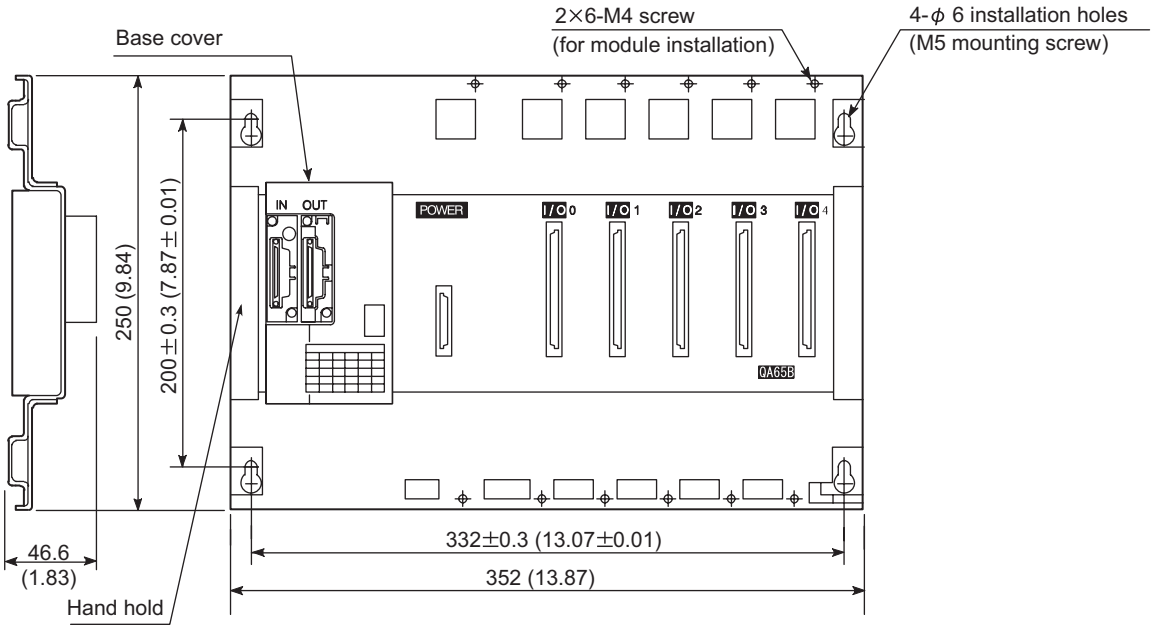
(8) QA1S68B



Unit : mm (inches)

Figure App.36 QA1S68B

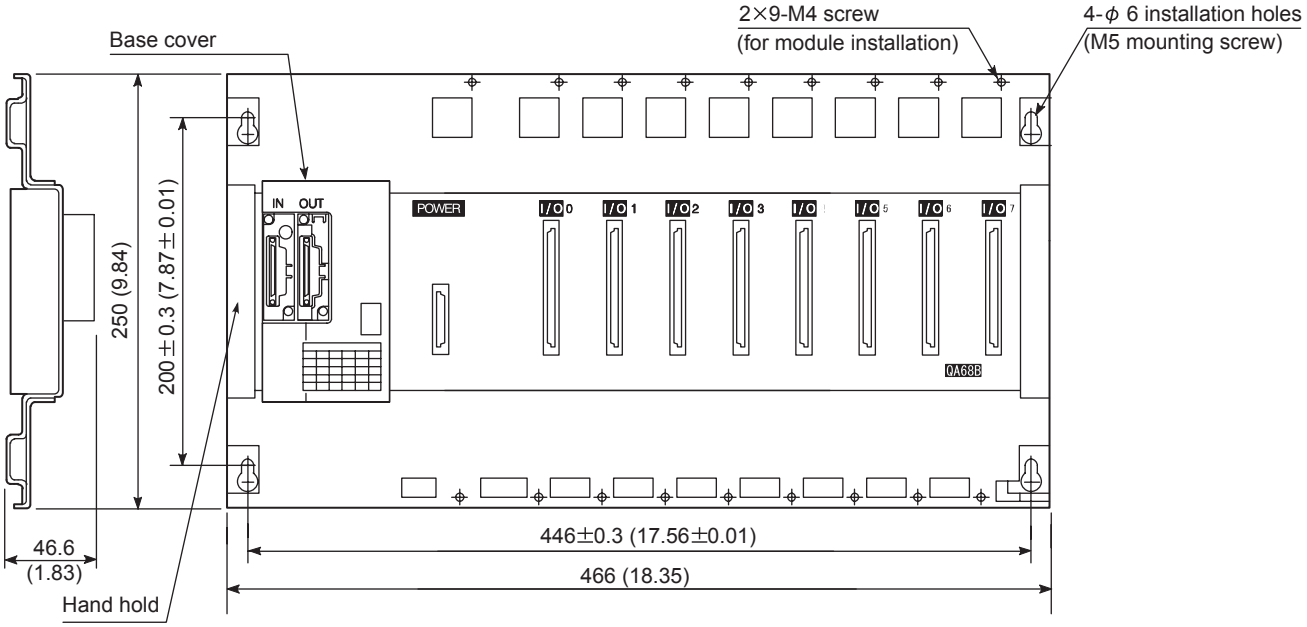
(9) QA65B



Unit : mm (inches)

Figure App.37 QA65B

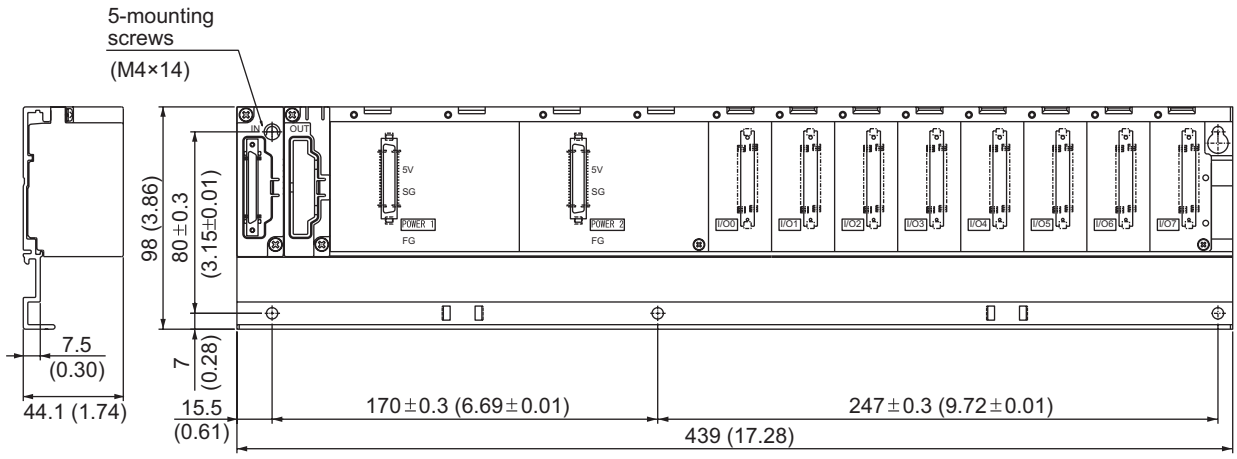
(10) QA68B



Unit : mm (inches)

Figure App.38 QA68B

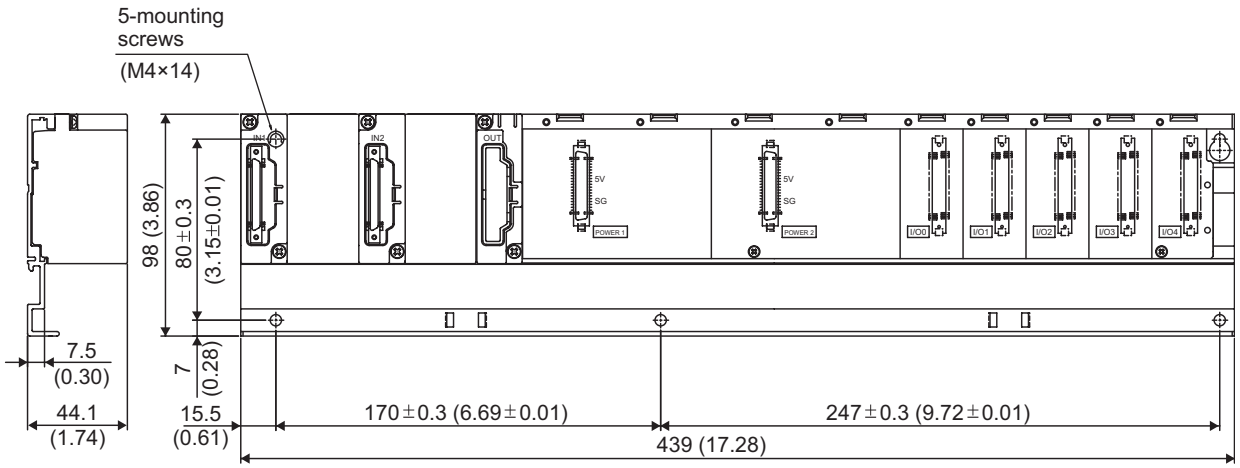
(11) Q68RB



Unit : mm (inches)

Figure App.39 Q68RB

(12) Q65WRB

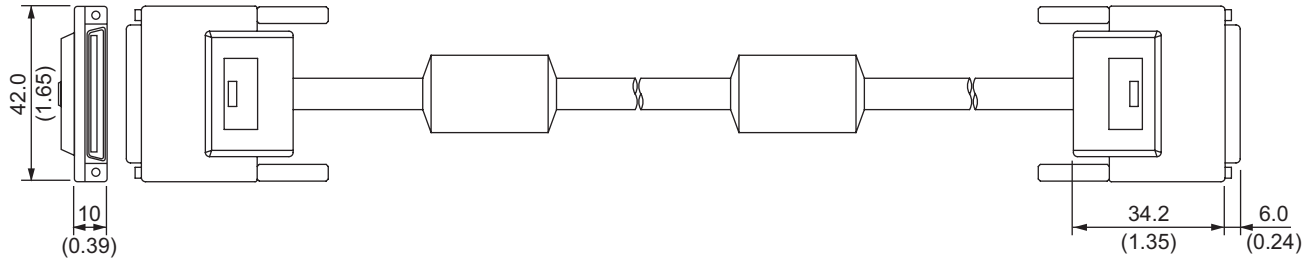


Unit : mm (inches)

Figure App.40 Q65WRB

Appendix 1.5 Extension Cable

QC05B,QC06B,QC12B,QC30B,QC50B,QC100B

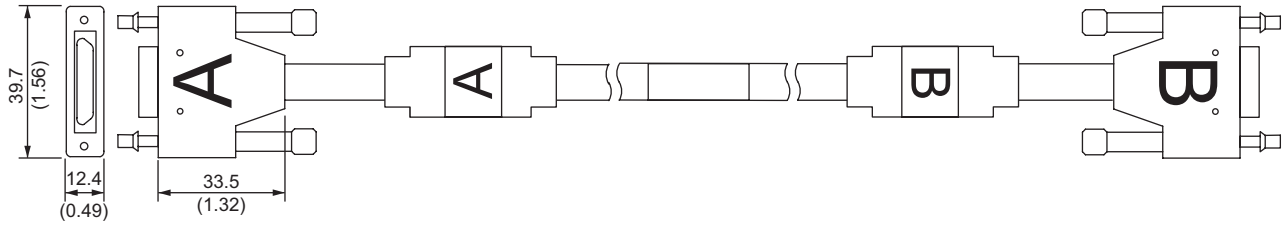


Unit : mm (inches)

Figure App.41 QC05B,QC06B,QC12B,QC30B,QC50B,QC100B

Appendix 1.6 Tracking cable

QC10TR,QC30TR

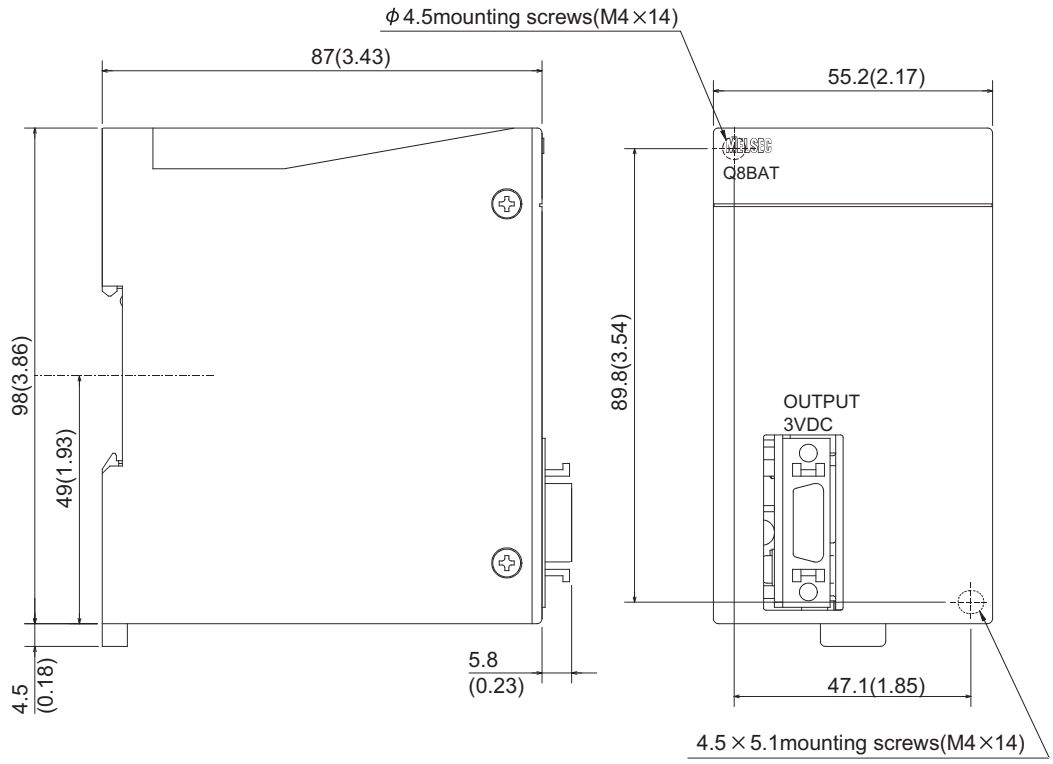


Unit : mm (inches)

Figure App.42 QC10TR,QC30TR

Appendix 1.7 Q8BAT-SET

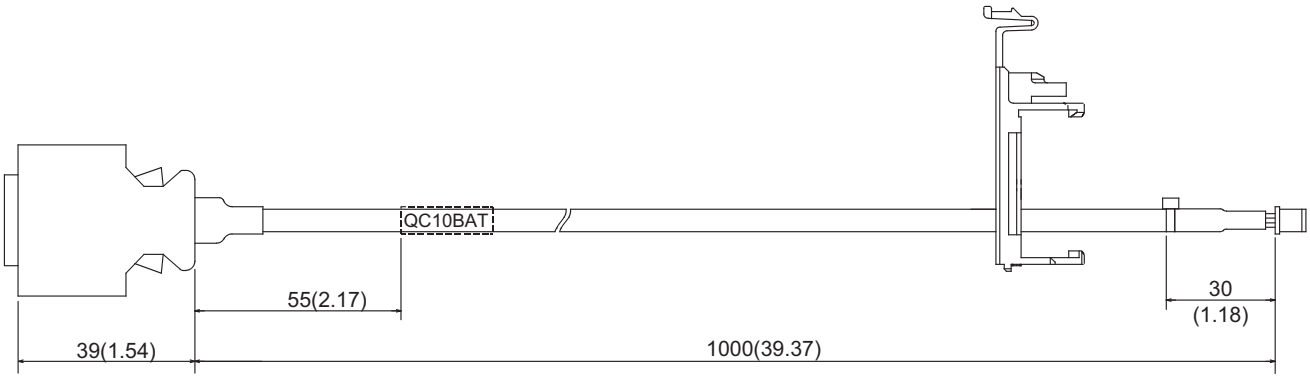
Q8BAT



Unit : mm (inches)

Figure App.43 Q8BAT

QC10BAT



Unit : mm (inches)

Figure App.44 QC10BAT

Appendix 2 Functions Added or Changed by Version Upgrade

Q series CPU module is updated to add functions and change the specifications.
The functions and specifications that can be used by the CPU module change depending on the function version.

Appendix 2.1 Basic Model QCPU Upgrade

(1) Specification comparison

TableApp.1 Specification comparison

Specifications		Function Version of CPU Module	
		Function Version A	Function Version B
		"04121" or earlier	"04122" or later
Standard RAM capacity	Q00JCPU	×	
	Q00CPU	64K bytes	128K bytes
	Q01CPU	64K bytes	128K bytes
CPU shared memory	Q00JCPU	×	
	Q00CPU	×	○
	Q01CPU	×	○

○: Usable/compatible, ×: Unusable/incompatible

(2) Function comparisons and supported GX Developer versions

TableApp.2 Function comparisons and supported GX Developer versions

Function	Function version	First 5 digits of serial No.	Supported GX Developer
Function block (☞ GX Developer Operating Manual (Function Block))	A	"04121" of earlier	Version 8.00A or later -
Structured text (ST) language (☞ QCPU (Q Mode) Programming Manual (Structured Text))			
MELSAP3 (☞ QCPU (Q Mode)/QnACPU Programming Manual (SFC))	B	"04122" or later	
PID operation function*1 (☞ QCPU (Q Mode)/QnACPU Programming Manual (PID Control Instructions))			
Real number operation*1 *3			
Intelligent function module event interruption *3			
Device initial value automatic setting function *3			
Remote password setting function *3			
E-mail parameter (☞ Manual of the module that includes e-mail function)			
Online change using pointer *3			
Increased file register capacity (32K points to 64K points)*2 *3			
Multiple CPU System compatibility (☞ QCPU User's Manual (Multiple CPU System))			Version 8.00A or later
Multiple-block online change *3			
CC-Link Remote network additional mode (☞ CC-Link System Master/Local Module User's Manual)	B	"06112" or later	Version 8.03D or later

- : Not related to GX Developer * : Incompatible with Q00JCPU

*1: When the CPU instruction installed by GX Developer Version 8 is read by GX Developer of Version 7 or earlier, it is processed as an "instruction code error" by GX Developer.

*2: Unsupported by the Q00JCPU.

*3: For details of the functions, refer to the following.

☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

Appendix 2.2 High Performance Model QCPU Upgrade

(1) Specification comparison

TableApp.3 Specification comparison

Specifications		First 5 digits of serial number of the CPU Module				
		Function Version A		Function Version B		
		"02091" or earlier	"02092" or later	"02112" or later	"03051" or later	"04012" or later
Standard RAM capacity	Q02CPU	64K bytes				
	Q02HCPU	64K bytes				128K bytes
	Q06HCPU	64K bytes				128K bytes
	Q12HCPU	64K bytes	256K bytes			
	Q25HCPU	64K bytes	256K bytes			
CPU shared memory		×	×	○	○	○
Extended life battery SRAM card *1		×	×	×	×	○
Compatibility with 2Mbyte SRAM card		×	×	×	×	○

○: Usable/compatible, ×: Unusable/incompatible

*1: For details of the SRAM card battery life, refer to Section 11.3.4.

(2) Function comparisons and supported GX Developer versions

TableApp.4 Function comparisons and supported GX Developer versions

Function	Function version	First 5 digits of serial No.	Supported GX Developer
Automatic write to standard ROM *2	A	"02092" or later	Version 6 or later
Enforced ON/OFF for external I/O *2			
Remote password setting *2			
Compatibility with MELSECNET/H remote I/O network *2			
Interrupt module (QI60) compatibility *2			
Programming module compatibility (☞ Section 2.1.5)			-

Function	Function version	First 5 digits of serial No.	Supported GX Developer
Compatibility with the multiple CPU system *5	B	"02122" or later	Version 7 or later
Installation of PC CPU module into the multiple CPU system *3		"03051" or later	Version 7.10L or later
High speed interrupt *2		"04012" or later	Version 8 or later
Compatibility with index modification for module designation of dedicated instruction			-
Selection of refresh item for COM instruction QCPU Programing Manual (Comon Instructions)			-
SFC program online batch change *2		"04122" or later	Version 8 or later
File memory capacity change*2			
CC-Link remote network additional mode (☞ CC-Link Manual)		"05032" or later	Version 8.03D or later
Incomplete derivative PID operation function *4			
Floating-point comparison instruction speedup			-
Read of the SFC activity step comment compatible (☞ QCPU (Q mode)/ QnACPU programming manual (SFC))		"07012" or later	
Error detection in the redundant power supply system *2		"07032" or later	Version 8.23Z or later
Clock data in 1/1000 sec. units compatible *2			-
Storage of sampling trace files in standard RAM *2			Version 8.23Z or later
Individual setting of refresh device on multiple CPU system *3			
Selection of trailing edge instruction execution/non-execution at online change *2		"07092" or later	Version 8.27D or later
Block assurance function of CC-Link cyclic data per station (☞ CC-Link System Master/Local Module User's Manual (Details))		"08032" or later	Version 8.32J or later
CC-Link network parameter can be set up to 8 modules. (☞ CC-Link System Master/Local Module User's Manual (Details))			
Compatibility with MELSECNET/G network (☞ MELSECNET/G Network System Reference Manual (Controller Network))	B	"09012" or later	Version 8.45X or later
Compatibility with ATA card (☞ Section 7.1.2)			-

- : Not related to GX Developer

*2: For details of the functions, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

*3: For details of the functions, refer to the following.
☞ QCPU User's Manual (Multiple CPU System)

*4: For details of the functions, refer to the following.
☞ QCPU (Q Mode) / QnACPU Programming Manual (PID Control Instructions)

Appendix 2.3 Precautions for Using the High Performance Model QCPU of Older Versions

(1) Q6BAT/Q7BAT battery life when the serial number (first five digits) of the QCPU is "05010" or earlier

TableApp.5 Q6BAT/Q7BAT Battery life

CPU module model	Power-on time ratio	Battery life					
		Q6BAT			Q7BAT		
		Guaranteed value (70℃)	Actual service value (Reference value) (40℃)	After SM52 turned on (Backup power time after an alarm)	Guaranteed value (70℃)	Actual service value (Reference value) (40℃)	After SM52 turned on (Backup power time after an alarm)
Q02CPU	0%	5,433 hours 0.62 years	43,800 hours 5.00 years	120 hours 5 days	13,000 hours 1.48 years	43,800 hours 5.00 years	240 hours 10 days
	30%	7,761 hours. 0.88 years	43,800 hours 5.00 years	120 hours 5 days	18,571 hours. 2.11 years	43,800 hours 5.00 years	240 hours 10 days
	50%	10,866 hours 1.24 years	43,800 hours 5.00 years	120 hours 5 days	26,000 hours 2.96 years	43,800 hours 5.00 years	240 hours 10 days
	70%	18,110 hours 2.06 years	43,800 hours 5.00 years	120 hours 5 days	43,333 hours 4.94 years	43,800 hours 5.00 years	240 hours 10 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	120 hours 5 days	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
Q02HCPU Q06HCPU	0%	2,341 hours 0.26 years	14,550 hours 1.66 years	120 hours 5 days	5,000 hours 0.57 years	38,881 hours 4.43 years	240 hours 10 days
	30%	3,344 hours 0.38 years	20,786 hours 2.37 years	120 hours 5 days	7,142 hours 0.81 years	43,800 hours 5.00 years	240 hours 10 days
	50%	4,682 hours 0.53 years	29,100 hours 3.32 years	120 hours 5 days	10,000 hours 1.14 years	43,800 hours 5.00 years	240 hours 10 days
	70%	7,803 hours 0.89 years	43,800 hours 5.00 years	120 hours 5 days	16,666 hours 1.90 years	43,800 hours 5.00 years	240 hours 10 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	120 hours 5 days	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days
Q12HCPU Q25HCPU	0%	1,260 hours 0.14 years	6,096 hours 0.69 years	48 hours 2 days	2,900 hours 0.33 years	16,711 hours 1.90 years	96 hours 4 days
	30%	1,800 hours 0.20 years	8,709 hours 0.99 years	48 hours 2 days	4,142 hours 0.47 years	23,873 hours 2.72 years	96 hours 4 days
	50%	2,520 hours 0.28 years	12,192 hours 1.39 years	48 hours 2 days	5,800 hours 0.66 years	33,422 hours 3.81 years	96 hours 4 days
	70%	4,200 hours 0.47 years	20,320 hours 2.31 years	48 hours 2 days	9,666 hours 1.10 years	43,800 hours 5.00 years	96 hours 4 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	48 hours 2 days	43,800 hours 5.00 years	43,800 hours 5.00 years	96 hours 4 days

TableApp.6 Q6BAT/Q7BAT Battery life

CPU module model	Power-on time ratio	Battery life		
		Q6BAT		
		Guaranteed value (70℃)	Actual service value (Reference value) (40℃)	After SM52 turned on (Backup power time after an alarm)
Q02CPU	0%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	30%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	50%	43,800 hours 5.00 years	43,800 hours 5.00years	600 hours 25 days
	70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
Q02HCPU Q06HCPU	0%	20,498 hours 2.34 years	43,800 hours 5.00 years	600 hours 25 days
	30%	29,959 hours 3.42 years	43,800 hours 5.00 years	600 hours 25 days
	50%	41,785 hours 4.77 years	43,800 hours 5.00 years	600 hours 25 days
	70%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	600 hours 25 days
Q12HCPU Q25HCPU	0%	11,038 hours 1.26 years	43,800 hours 5.00 years	240 hours 10 days
	30%	16,200 hours 1.80 years	43,800 hours 5.00 years	240 hours 10 days
	50%	22,075 hours 2.52 years	43,800 hours 5.00 years	240 hours 10 days
	70%	37,055 hours 4.23 years	43,800 hours 5.00 years	240 hours 10 days
	100%	43,800 hours 5.00 years	43,800 hours 5.00 years	240 hours 10 days

(2) SRAM card battery life when the serial number (first five digits) of the QCPU is "04011" or earlier

TableApp.7 SRAM card Battery life

SRAM card	Power-on time ratio	Battery life		
		Guaranteed value (MIN)	Actual service value (Reference Value)	After SM52 turned on (Backup power time after an alarm)
Q2MEM-1MBS Q2MEM-2MBS	0%	690 hours 0.07 years	6,336 hours 0.72 years	8 hours
	100%	11,784 hours 1.34 years	13,872 hours 1.58 years	8 hours

(3) Number of file register points according to the serial number (first five digits)

TableApp.8 File register points

CPU module model name		Number of file register points
Q02CPU		32K points
Q02HCPU Q06HCPU	Serial number (first five digits) is "04011" or earlier	32K points
	Serial number (first five digits) is "04012" or later	64K points
Q12HCPU Q25HCPU	Serial number (first five digits) is "02091" or earlier	32K points
	Serial number (first five digits) is "02092" or later	128K points

Appendix 2.4 Process CPU Upgrade

(1) Function comparisons and supported GX Developer versions

TableApp.9 Function comparisons and supported GX Developer versions

Function	Function version	First 5 digits of serial No.	Supported GX Developer
Compatibility with index modification for module designation of dedicated instruction Manual of the intelligent function module that can use the dedicated instructions	C	"07032" or later	-
Selection of refresh item for COM instruction (☞ QCPU Programming manual (Common Instructions))			
SFC program online batch change*1			Version 8 (Version 8.22Y or earlier)
File memory capacity change*1			
CC-Link remote network additional mode (☞ CC-Link System Master/Local Module User's Manual)			
Program memory check function*1			Version 8.23Z or later
Read of the SFC activity step comment compatible (☞ QCPU (Q mode)/ QnACPU programming manual (SFC Manual))			-
Error detection in the redundant power supply system *1			Version 8.23Z or later
Clock data in 1/1000 sec. units compatible *1			-
Storage of sampling trace files in standard RAM *1			Version 8.23Z or later
Individual setting of refresh device on multiple CPU system (☞ QCPU User's Manual (Multiple CPU System))			
Selection of trailing edge instruction execution/non-execution at online change*1		"07092" or later	Version 8.27D or later
Block assurance function of CC-Link cyclic data per station (☞ CC-Link System Master/Local Module User's Manual)		"08032" or later	Version 8.32J or later
CC-Link network parameter can be set up to 8 modules. (☞ CC-Link System Master/Local Module User's Manual)			
Compatibility with CC-Link IE controller network (☞ CC-Link IE Controller Network Reference Manual)		"10042" or later	Version 8.68W or later

- : Not related to GX Developer

*1: For details of the functions, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

Appendix 2.5 Redundant CPU Upgrade

(1) Function comparisons and supported GX Developer versions

TableApp.10 Function comparisons and supported GX Developer versions

Function	Function version	First 5 digits of serial No.	Supported GX Developer
Read of the SFC activity step comment compatible (☞ QCPU (Q mode)/ QnACPU programming manual (SFC))	D	"07032" or later	-
Clock data in 1/1000 sec. units compatible *1			
Storage of sampling trace files in standard RAM *1			Version 8.23Z or later
Selection of trailing edge instruction execution/non-execution at online change *1		"07092" or later	Version 8.27D or later
Extension base unit compatible (☞ QnPRHCPU User's Manual (Redundant System))		"09012" or later	Version 8.45X or later
Settingí8í for the number of modules in Network parameter for CC-Link (☞ CC-Link System Master/Local Module User's Manual)		"09012" or later	Version 8.58L or later
Compatibility with CC-Link IE controller network (☞ CC-Link IE Controller Network Reference Manual)		"10042" or later	Version 8.68W or later

- : Not related to GX Developer

*1: For details of the functions, refer to the following.
☞ Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)

Appendix 2.6 Universal Model QCPU Upgrade

(1) Function comparisons and supported GX Developer versions

TableApp.11 Function comparisons and supported GX Developer versions

Function	Function version	First 5 digits of serial No.	Supported GX Developer
Use of the PC CPU module*2 (☞ QCPU User's manual (Multiple CPU System))	B	"09072" or later	-
Setting whether to use the local devices per program*1		"10012" or later	Version 8.62Q or later
Program memory batch transfer status check function (SM165)-compatible*1			-
The multiple CPU high-speed transmission dedicated instruction-compatible*2 (☞ QCPU Programming manual (Common Instructions))			
Display of the amount of battery consumption (☞ Section 11.3.1)			
Bit device extension*1		"10042" or later	Version 8.68W or later
Execution conditioned device test*1			
Sampling trace auto start function*1 *2			
CC-Link IE group cyclic communication function (☞ CC-Link IE Controller Network Reference Manual)			
Scan time measurement*1			
Forced ON/OFF of external I/O*1			
Monitoring condition setting*1 *2			
Redundant power supply system compatible*1 *2			
32-bit indexing with "ZZ" specification (☞ QCPU Programming manual (Common Instructions))			

- : Not related to GX Developer

*1: For details of the functions, refer to the following.
☞ QnUCPU User's Manual (Function Explanation, Program Fundamentals)

*2: Some models do not support the function. For details, refer to the corresponding reference.

*3: Data of the extended data register (D) and extended link register (W) can be retained in the standard ROM by using the latch data backup function (Section 6.29) if the serial number (first five digits) of the Universal model QCPU is "10042" or later.

*4: Communication using A-compatible 1E frame is available only via the Ethernet module.
If the module is connected to the Ethernet port built in the CPU, this function is not available.

TableApp.11 Function comparisons and supported GX Developer versions

Function	Function version	First 5 digits of serial No.	Supported GX Developer
Extended data register (D) and extended link register (W)*1 *2	B	"09042" or later*3	Version 8.70Y or later
Serial communication function*1 *2		"10102" or later	Version 8.78G or later
CPU module change function with memory card*1 *2			
Local device setting of the index register*1 *2			
Communication using the A-compatible 1C/1E frame (MC protocol)*4 *5 (☞ Q Corresponding MELSEC Communication Protocol Reference Manual)			
Socket communication function *2 (☞ QnUCPU User's Manual (Communication via Built-in Ethernet Port))		"11012" or later	
Module model name read		"11043" or later	Version 8.82L or later
Module error log function			----*6

- : Not related to GX Developer

*1: For details of the functions, refer to the following.
☞ QnUCPU User's Manual (Function Explanation, Program Fundamentals)

*2: Some models do not support the function. For details, refer to the corresponding reference.

*3: Data of the extended data register (D) and extended link register (W) can be retained in the standard ROM by using the latch data backup function (Section 6.29) if the serial number (first five digits) of the Universal model QCPU is "10042" or later.

*4: Communication using A-compatible 1E frame is available only via the Ethernet module.
If the module is connected to the Ethernet port built in the CPU, this function is not available.

*5: Communication using the A-compatible 1C frame is available only via any serial communication module.
If the module is connected to the built-in RS-232 interface of the CPU module, this function is not available.

*6: Use GX Works2 of version 1.10L or later.

Appendix 3 Precautions for Battery Transportation

When transporting lithium batteries, follow the transportation regulations.

(1) Regulated models

The batteries for the Q Series CPU module (including memory cards) are classified as shown in TableApp.12

TableApp.12 Models subject to transportation regulations

Product name	Model	Product supply status	Classification for transportation
Battery	Q8BAT	Lithium battery (assembled battery)	Dangerous goods
Battery	Q8BAT-SET	Lithium battery (assembled battery) + Q8BAT connection cable	
Battery	Q7BAT	Lithium battery	
Battery	Q7BAT-SET	Lithium battery with holder	
Battery	Q6BAT	Lithium battery	Non-dangerous goods
SRAM card battery	Q2MEM-BAT Q3MEM-BAT	Lithium coin battery	
Memory card	Q2MEM-1MBS Q2MEM-2MBS	Packed with lithium coin battery (Q2MEM-BAT)	
	Q3MEM-4MBS Q3MEM-8MBS	Packed with lithium coin battery (Q3MEM-BAT)	
	Q3MEM-4MBS-SET Q3MEM- 8MBS-SET	Packed with lithium coin battery (Q3MEM-BAT) + Memory card protective cover	

(2) Transport guidelines

Comply with IATA Dangerous Goods Regulations, IMDG code and the local transport regulations when transporting products after unpacking or repacking, while Mitsubishi ships products with packages to comply with the transport regulations.

Also, consult with the shipping carrier.

Appendix 4 Handling of Batteries and Devices with Built-in Batteries in EU Member States

This section describes the precautions for disposing of waste batteries in EU member states and exporting batteries and/or devices with built-in batteries to EU member states.

Appendix 4.1 Disposal precautions

In EU member states, there is a separate collection system for waste batteries. Dispose of batteries properly at the local community waste collection/recycling center.

The symbol shown in Figure App.45 is printed on the batteries and packaging of batteries and devices with built-in batteries used for Mitsubishi programmable controllers.

Figure App.45 Symbol

Note: This symbol is for EU member states only.
The symbol is specified in the new EU Battery Directive (2006/66/EC) Article 20 “Information for end-users” and Annex II.

The symbol indicates that batteries need to be disposed of separately from other wastes.

Appendix 4.2 Exportation precautions

The new EU Battery Directive (2006/66/EC) requires the follwoing when marketing or exporting batteries and/or devices with built-in batteries to EU member states.

- To print the symbol on batteries, devices, or their packaging
- To explain the symbol in the manuals of the products

(1) Labelling

To market or export batteries and/or devices with built-in batteries, which have no symbol, to EU member states on September 26, 2008 or later, print the symbol shown in Figure App.45 on the batteries, devices, or their packaging.

(2) Explaining the symbol in the manuals

To export devices incorporating Mitsubishi programmable controller to EU member states on September 26, 2008 or later, provide the latest manuals that include the explanation of the symbol.
If no Mitsubishi manuals or any old manuals without the explanation of the symbol are provided, separately attach an explanatory note regarding the symbol to each manual of the devices.

Point

The requirements apply to batteries and/or devices with built-in batteries manufactured before the enforcement date of the new EU Battery Directive(2006/66/EC).

INDEX

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Warranty

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.

Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.

Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

6. Product application

(1) In using the Mitsubishi MELSEC programmable controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.

(2) The Mitsubishi programmable controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or Public service purposes shall be excluded from the programmable controller applications.

In addition, applications in which human life or property that could be greatly affected, such as in aircraft, medical applications, incineration and fuel devices, manned transportation, equipment for recreation and amusement, and safety devices, shall also be excluded from the programmable controller range of applications.

However, in certain cases, some applications may be possible, providing the user consults their local Mitsubishi representative outlining the special requirements of the project, and providing that all parties concerned agree to the special circumstances, solely at the users discretion.

SH(NA)-080483ENG-P

QCPU

User's Manual (Hardware Design, Maintenance and Inspection)

MODEL	QCPU-U-HH-E
MODEL CODE	13JR73
SH(NA)-080483ENG-P(0907)MEE	

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