MITSUBISHI ELECTRIC

Programmable Controller

MELSEC iQ-R series

MELSEC iQ-R PROFINET IO Controller Module User's Manual (Application)

-RJ71PN92

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.

The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, refer to the MELSEC iQ-R Module Configuration Manual.

In this manual, the safety precautions are classified into two levels: " ⚠ WARNING" and " ⚠ CAUTION".

⚠ **WARNING**	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]

⚠WARNING

● 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) Emergency stop circuits, protection circuits, and protective interlock circuits for conflicting operations (such as forward/reverse rotations or upper/lower limit positioning) must be configured external to the programmable controller.

   (2) When the programmable controller detects an abnormal condition, it stops the operation and all outputs are:

      • Turned off if the overcurrent or overvoltage protection of the power supply module is activated.

      • Held or turned off according to the parameter setting if the self-diagnostic function of the CPU module detects an error such as a watchdog timer error.

   (3) All outputs may be turned on if an error occurs in a part, such as an 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 "General Safety Requirements" in the MELSEC iQ-R Module Configuration Manual.

   (4) Outputs may remain on or off due to a failure of a component such as a relay and transistor in an output circuit. Configure an external circuit for monitoring output signals that could cause a serious accident.

● In an output circuit, 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.

● Configure a circuit so that the external power supply is turned off first and then the programmable controller. If the programmable controller is turned off 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 manuals for the network used. For the manuals, please consult your local Mitsubishi representative. Incorrect output or malfunction due to a communication failure may result in an accident.

● When connecting an external device with a CPU module or intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents. When a Safety CPU is used, data cannot be modified while the Safety CPU is in SAFETY MODE.

[Design Precautions]

⚠WARNING

- Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
- Do not write any data to the "system area" and "write-protect area" of the buffer memory in the module. Also, do not use any "use prohibited" signals as an output signal from the CPU module to each module. Doing so may cause malfunction of the programmable controller system. For the "system area", "write-protect area", and the "use prohibited" signals, refer to the user's manual for the module used. For areas used for safety communications, they are protected from being written by users, and thus safety communications failure caused by data writing does not occur.
- If a communication cable is disconnected, the network may be unstable, resulting in a communication failure of multiple stations. Configure an interlock circuit in the program to ensure that the entire system will always operate safely even if communications fail. Incorrect output or malfunction due to a communication failure may result in an accident. When safety communications are used, an interlock by the safety station interlock function protects the system from an incorrect output or malfunction.
- For the operating status of each IO device after a communication failure, refer to Page 127 TROUBLESHOOTING in this manual. Incorrect output or malfunction due to a communication failure may result in an accident.
- Configure an interlock circuit in the program to ensure that the entire system will always operate safely even if communications fail in multiple IO devices. Incorrect output or malfunction due to a communication failure may result in an accident.

[Design Precautions]

⚠CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Doing so may result in malfunction due to electromagnetic interference. Keep a distance of 100mm or more between those cables.
- During control of an inductive load such as a lamp, heater, or solenoid valve, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on. Therefore, use a module that has a sufficient current rating.
- After the CPU module is powered on or is reset, the time taken to enter the RUN status varies depending on the system configuration, parameter settings, and/or program size. Design circuits so that the entire system will always operate safely, regardless of the time.
- Do not power off the programmable controller or reset the CPU module while the settings are being written. Doing so will make the data in the flash ROM and SD memory card undefined. The values need to be set in the buffer memory and written to the flash ROM and SD memory card again. Doing so also may cause malfunction or failure of the module.
- When changing the operating status of the CPU module from external devices (such as the remote RUN/STOP functions), select "Do Not Open by Program" for "Opening Method" of "Module Parameter". If "Open by Program" is selected, an execution of the remote STOP function causes the communication line to close. Consequently, the CPU module cannot reopen the line, and external devices cannot execute the remote RUN function.

[Security Precautions]

⚠WARNING

● To maintain the security (confidentiality, integrity, and availability) of the programmable controller and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

[Installation Precautions]

⚠WARNING

● Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may result in electric shock or cause the module to fail or malfunction.

[Installation Precautions]

⚠CAUTION

● Use the programmable controller in an environment that meets the general specifications in the Safety Guidelines included with the base unit. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.

● To mount a module, place the concave part(s) located at the bottom onto the guide(s) of the base unit, and push in the module until the hook(s) located at the top snaps into place. Incorrect interconnection may cause malfunction, failure, or drop of the module.

● To mount a module with no module fixing hook, place the concave part(s) located at the bottom onto the guide(s) of the base unit, push in the module, and fix it with screw(s). Incorrect interconnection 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 screws within the specified torque range. Undertightening can cause drop of the component or wire, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction. For the specified torque range, refer to the MELSEC iQ-R Module Configuration Manual.

● 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 malfunction.

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

● Securely insert an extended SRAM cassette or a battery-less option cassette into the cassette connector of the CPU module. After insertion, close the cassette cover and check that the cassette is inserted completely. Poor contact may cause malfunction.

● Do not directly touch any conductive parts and electronic components of the module, SD memory card, extended SRAM cassette, battery-less option cassette, or connector. Doing so can cause malfunction or failure of the module.

[Wiring Precautions]

⚠WARNING

● Shut off the external power supply (all phases) used in the system before installation and wiring. Failure to do so may result in electric shock or cause the module to fail or malfunction.

● After installation and wiring, attach a blank cover module (RG60) to each empty slot before powering on the system for operation. Also, attach an extension connector protective cover[1] to each unused extension cable connector as necessary. Directly touching any conductive parts of the connectors while power is on may result in electric shock.

*1 For details, please consult your local Mitsubishi Electric representative.

[Wiring Precautions]

⚠CAUTION

- Individually ground the FG and LG terminals of the programmable controller with a ground resistance of 100 ohms or less. 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 signal 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 fire or failure.
- Connectors for external devices must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered. Incomplete connections may cause short circuit, fire, or malfunction.
- Securely connect the connector to the module. Poor contact may cause malfunction.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Doing so may result in malfunction due to noise. Keep a distance of 100mm or more between those cables.
- Place the cables in a duct or clamp them. If not, dangling cables may swing or inadvertently be pulled, resulting in malfunction or damage to modules or cables.
  In addition, the weight of the cables may put stress on modules in an environment of strong vibrations and shocks.
  Do not clamp the extension cables with the jacket stripped. Doing so may change the characteristics of the cables, resulting in malfunction.
- Check the interface type and correctly connect the cable. Incorrect wiring (connecting the cable to an incorrect interface) may cause failure of the module and external device.
- Tighten the terminal screws or connector screws within the specified torque range. Undertightening can cause drop of the screw, short circuit, fire, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, fire, or malfunction.
- When disconnecting the cable from the module, do not pull the cable by the cable part. For the cable with connector, hold the connector part of the cable. For the cable connected to the terminal block, loosen the terminal screw. Pulling the cable connected to the module may result in malfunction or damage to the module or cable.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- When a protective film is attached to the top of the module, remove it before system operation. If not, inadequate heat dissipation of the module may cause a fire, failure, or malfunction.
- 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 qualified maintenance personnel with knowledge of protection against electric shock. For wiring, refer to the MELSEC iQ-R Module Configuration Manual.
- For Ethernet cables to be used in the system, select the ones that meet the specifications in the user's manual for the module used. If not, normal data transmission is not guaranteed.

[Startup and Maintenance Precautions]

⚠WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Correctly connect the battery connector. Do not charge, disassemble, heat, short-circuit, solder, or throw the battery into the fire. Also, do not expose it to liquid or strong shock. Doing so will cause the battery to produce heat, explode, ignite, or leak, resulting in injury and fire.
- Shut off the external power supply (all phases) used in the system before cleaning the module or retightening the terminal screws, connector screws, or module fixing screws. Failure to do so may result in electric shock.

[Startup and Maintenance Precautions]

⚠ CAUTION

- When connecting an external device with a CPU module or intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.

- Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.

- 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) 25cm or more away in all directions from the programmable controller. Failure to do so may cause malfunction.

- Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may cause the module to fail or malfunction.

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

- After the first use of the product, do not perform each of the following operations more than 50 times (IEC 61131-2/JIS B 3502 compliant).
  Exceeding the limit may cause malfunction.
  - Mounting/removing the module to/from the base unit
  - Inserting/removing the extended SRAM cassette or battery-less option cassette to/from the CPU module
  - Mounting/removing the terminal block to/from the module

- After the first use of the product, do not insert/remove the SD memory card to/from the CPU module more than 500 times. Exceeding the limit may cause malfunction.

- Do not touch the metal terminals on the back side of the SD memory card. Doing so may cause malfunction or failure of the module.

- Do not touch the integrated circuits on the circuit board of an extended SRAM cassette or a battery-less option cassette. Doing so may cause malfunction or failure of the module.

- 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.

[Startup and Maintenance Precautions]

⚠ CAUTION

- Startup and maintenance of a control panel must be performed by qualified maintenance personnel with knowledge of protection against electric shock. Lock the control panel so that only qualified maintenance personnel can operate it.
- Before handling the module, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause the module to fail or malfunction.
- After unpacking, eliminate static electricity from the module to prevent electrostatic discharge from affecting the module. If an electrostatically charged module comes in contact with a grounded metal object, a sudden electrostatic discharge of the module may cause failure. For details on how to eliminate static electricity from the module, refer to the following.
  Antistatic Precautions Before Using MELSEC iQ-R Series Products (FA-A-0368)
- Use a clean and dry cloth to wipe off dirt on the module.

[Operating Precautions]

⚠ CAUTION

- When changing data and operating status, and modifying program of the running programmable controller from an external device such as a personal computer connected to an intelligent function module, read relevant manuals carefully and ensure the safety before operation. Incorrect change or modification may cause system malfunction, damage to the machines, or accidents.
- Do not power off the programmable controller or reset the CPU module while the setting values in the buffer memory are being written to the flash ROM in the module. Doing so will make the data in the flash ROM and SD memory card undefined. The values need to be set in the buffer memory and written to the flash ROM and SD memory card again. Doing so can cause malfunction or failure of the module.

[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 on battery regulations in EU member states, refer to the MELSEC iQ-R Module Configuration Manual.

[Transportation Precautions]

⚠CAUTION

● When transporting lithium batteries, follow the transportation regulations. For details on the regulated models, refer to the MELSEC iQ-R Module Configuration Manual.

● The halogens (such as fluorine, chlorine, bromine, and iodine), which are contained in a fumigant used for disinfection and pest control of wood packaging materials, may cause failure of the product. Prevent the entry of fumigant residues into the product or consider other methods (such as heat treatment) instead of fumigation. The disinfection and pest control measures must be applied to unprocessed raw wood.

CONDITIONS OF USE FOR THE PRODUCT

(1) MELSEC programmable controller ("the PRODUCT") shall be used in conditions;

    i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and

    ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI ELECTRIC SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI ELECTRIC USER'S, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in;

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above restrictions, Mitsubishi Electric may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi Electric and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi Electric representative in your region.

(3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INTRODUCTION

Thank you for purchasing the Mitsubishi Electric MELSEC iQ-R series programmable controllers.

This manual describes the functions, parameter settings, programming, and troubleshooting of the relevant product listed below.

Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of the MELSEC iQ-R series programmable controller to handle the product correctly.

When applying the program examples provided in this manual to an actual system, ensure the applicability and confirm that it will not cause system control problems.

Please make sure that the end users read this manual.

Relevant product

RJ71PN92

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RELEVANT MANUALS

Manual name [manual number]	Description	Available form
MELSEC iQ-R PROFINET IO Controller Module User's Manual (Application) [SH-081680ENG] (this manual)	Functions, parameter settings, operation methods of GX Configurator-PN, programming, troubleshooting, I/O signals, and buffer memory of the PROFINET IO controller module	Print book
		e-Manual PDF
MELSEC iQ-R Module Configuration Manual [SH-081262ENG]	The combination of the MELSEC iQ-R series modules, common information on the installation/wiring in the system, and specifications of the power supply module, base unit, SD memory card, and battery	Print book
		e-Manual PDF
MELSEC iQ-R PROFINET IO Controller Module User's Manual (Startup) [SH-081679ENG]	Specifications, procedures before operation, system configuration, wiring, and communication examples of the PROFINET IO controller module	Print book
		e-Manual PDF
MELSEC iQ-R PROFINET IO Controller Module Function Block Reference [BCN-P5999-0740]	Specifications of the MELSEC iQ-R PROFINET IO controller module FBs	e-Manual PDF
GX Works3 Operating Manual [SH-081215ENG]	System configuration, parameter settings, and online operations of GX Works3	e-Manual PDF

Point

e-Manual refers to the Mitsubishi Electric FA electronic book manuals that can be browsed using a dedicated tool.

e-Manual has the following features:

 • Required information can be cross-searched in multiple manuals.
 • Other manuals can be accessed from the links in the manual.
 • The hardware specifications of each part can be found from the product figures.
 • Pages that users often browse can be bookmarked.
 • Sample programs can be copied to an engineering tool.

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Acyclic communications	Acyclic data communications. Data are read/written from/to an IO device at the desired timing.
Buffer memory	Memory in an intelligent function module to store data such as setting values and monitor values. For CPU modules, it refers to memory to store data such as setting values and monitor values of the Ethernet function, or data used for data communication of the multiple CPU system function.
Cycle time	Time required for one cycle of I/O data exchange between the RJ71PN92 and each IO device
Device	A memory of a CPU module to store data. Devices such as X, Y, M, D, and others are provided depending on the intended use.
Engineering tool	A tool used for setting up programmable controllers, programming, debugging, and maintenance.
Global label	A label that is valid for all the program data when multiple program data are created in the project. There are two types of global label: a module specific label (module label), which is generated automatically by GX Works3, and an optional label, which can be created for any specified device.
GSDML file	A file based on XML for PROFINET. The file contains information required for PROFINET configuration, such as an IO device attribute, module types, setting data of modules, and error messages.
Intelligent function module	A module that has functions other than an input or output, such as an A/D converter module and D/A converter module
Item	Items are used for setting parameters such as I/O data for each module of the IO device.
Module	A component of an IO device, which can be easily added or replaced
Order number	A product number assigned to each IO device or module
PROFINET	An industrial Ethernet protocol offered by PROFIBUS & PROFINET International

GENERIC TERMS AND ABBREVIATIONS

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

Generic term/abbreviation	Description
ACK	An abbreviation for ACKnowledgement. This signal is sent to inform the sending side that the data transfer has been normally completed.
DCP	An abbreviation for Discovery and Configuration Protocol. A protocol used for setting and reading parameters, such as a name and IP address.
DHCP	An abbreviation for Dynamic Host Configuration Protocol. A protocol used for automatically assigning the information required for the network such as an IP address.
External device	A generic term for devices connected by PROFINET for data exchange, such as a personal computer and IO devices
IO device	An abbreviation for the PROFINET IO devices
RPC	An abbreviation for Remote Procedure Call. This protocol is used in the Acyclic communication of PROFINET.
RTA	An abbreviation for Real Time Acyclic. This protocol is used to send alarm information.

1 FUNCTIONS

1.1 Data Exchange Function

This function performs data exchange between the RJ71PN92 and IO devices in a specified period.

Flow of I/O data
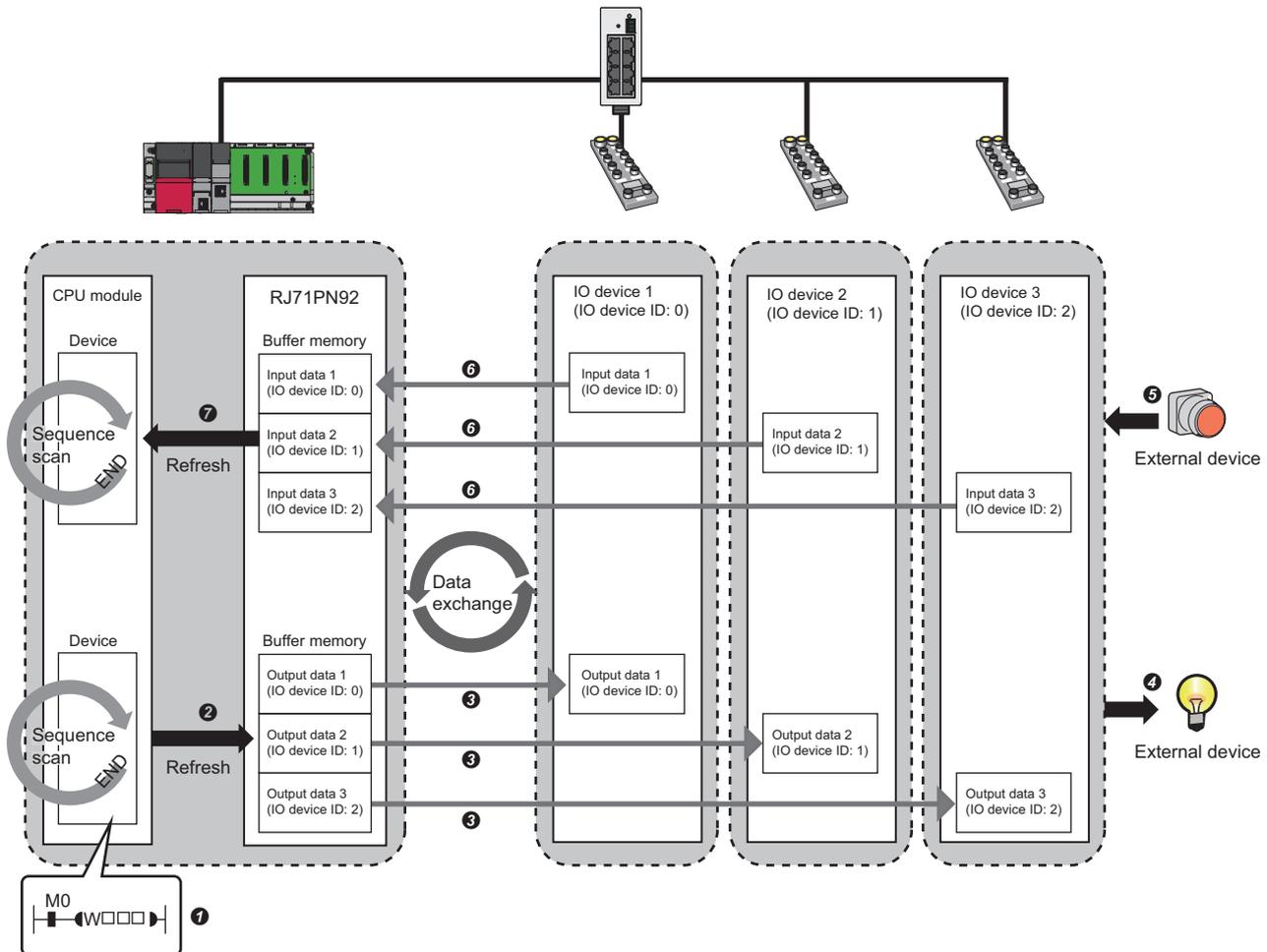
- When data is output from the RJ71PN92
❶ The device of the CPU module turns on.
❷ The device status of the CPU module is stored in 'Output data area' (Un\G31000 to Un\G35095) of the RJ71PN92 by refresh.
❸ The status of 'Output data area' (Un\G31000 to Un\G35095) of the RJ71PN92 is sent to an IO device by the I/O data exchange.
❹ The status stored in the IO device is output to an external device.

- When data is input from an IO device
❺ The status of the external device is stored in an IO device.
❻ The status stored in the IO device is sent to the RJ71PN92 and stored in 'Input data area' (Un\G36000 to Un\G40095) of the RJ71PN92 by the I/O data exchange.
❼ The status of 'Input data area' (Un\G36000 to Un\G40095) of the RJ71PN92 is stored in the device of the CPU module by refresh.

> **Point**
>
> Set the IO device ID for each IO device on GX Configurator-PN. For I/O data exchange, specify a bit corresponding to an IO device ID to distinguish IO device IDs when using the buffer memory areas.
> For IO device IDs, refer to the following.
> ☞ Page 87 [General Configuration] tab

Setting method

Refresh

Input data and output data of the I/O data exchange are automatically refreshed to the devices of the CPU module by using the refresh settings.
Set the refresh as follows.

🖑 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ Right-click ⇨ [Autorefresh Settings]
For details, refer to the following.

Selecting a method of starting the IO device data exchange

Set one of the methods of starting the IO device data exchange to the IO devices that exchanges I/O data with the RJ71PN92.
Select the automatic start or manual start as the method of starting the IO device data exchange.
Set the method of starting the IO device data exchange in 'IO device data exchange start method setting area' (Un\G17001 to Un\G17008).

Item	Description
Automatic start	Automatically starts the I/O data exchange with IO devices. (Recommended setting)
Manual start	Manually establishes communications with IO devices. Select this method when starting and stopping data communications are required for each IO device. Users can start and stop data communications with each IO device individually by operating the following areas. • 'IO device data exchange management setting area' (Un\G17009 to Un\G17016) • 'IO device data exchange management execution request' (Un\G17017 to Un\G17024)

Operating procedure

The following describes the procedure before starting the I/O data exchange.

When the automatic start is selected

1. Set the automatic start as the method of starting the IO device data exchange.

Turn off the bit of 'IO device data exchange start method setting area' (Un\G17001 to Un\G17008) corresponding to the IO device that exchanges the I/O data. (Default: OFF)

2. Check the status of 'Parameter setting status' (Un\G17118.0).

When it is on, the start of the I/O data exchange can be requested.

3. Request the start of the I/O data exchange.

Turn on 'Data exchange start request' (Un\G17000.0).

4. The I/O data exchange with the IO device starts automatically.

■Checking the communication status of the IO device

Check the communication status of the IO device in 'IO device communication status' (Un\G17153 to Un\G17160). When the bit corresponding to the IO device that exchanges I/O data is on, the data exchange is in progress.

■Checking the error status of the IO device

Check if an error has occurred in the IO device in 'IO device error' (Un\G17161 to Un\G17168). When the bit corresponding to the IO device that exchanges I/O data is on, an error has occurred. Check the error details in 'IO device error details' (Un\G21858 to Un\G21921) and take actions. (☞ Page 158 IO device error details)

When the manual start is selected

1. Set the manual start as the method of starting the IO device data exchange.

Turn on the bit of 'IO device data exchange start method setting area' (Un\G17001 to Un\G17008) corresponding to the IO device that exchanges the I/O data.

2. Check the status of 'Parameter setting status' (Un\G17118.0).

When it is on, the start of the I/O data exchange can be requested.

3. Request the start of the I/O data exchange.

Turn on 'Data exchange start request' (Un\G17000.0).

4. Set the start request of the I/O data exchange for each IO device.

Turn on the bit of 'IO device data exchange management setting area' (Un\G17009 to Un\G17016) corresponding to the IO device that exchanges the I/O data.

5. Set the execution request of the I/O data exchange for each IO device.

Turn on the bit of 'IO device data exchange management execution request' (Un\G17017 to Un\G17024) corresponding to the IO device that exchanges the I/O data.

6. When the bit of 'IO device data exchange management execution completion' (Un\G17120 to Un\G17127) corresponding to the IO device that exchanges the I/O data is on, the start request of the IO device has successfully been completed.

7. The I/O data exchange with the specified IO device starts.

■Checking the communication status of the IO device

Check the communication status of the IO device in 'IO device communication status' (Un\G17153 to Un\G17160). When the bit corresponding to the IO device that exchanges I/O data is on, the data exchange is in progress.

■Checking the error status of the IO device

Check if an error has occurred in the IO device in 'IO device error' (Un\G17161 to Un\G17168). When the bit corresponding to the IO device that exchanges I/O data is on, an error has occurred. Check the error details in 'IO device error details' (Un\G21858 to Un\G21921) and take actions. (☞ Page 158 IO device error details)

Timing to start the I/O data exchange

When the automatic start is selected

The following figure shows the timing chart of the I/O data exchange start with the IO device set to the automatic start.
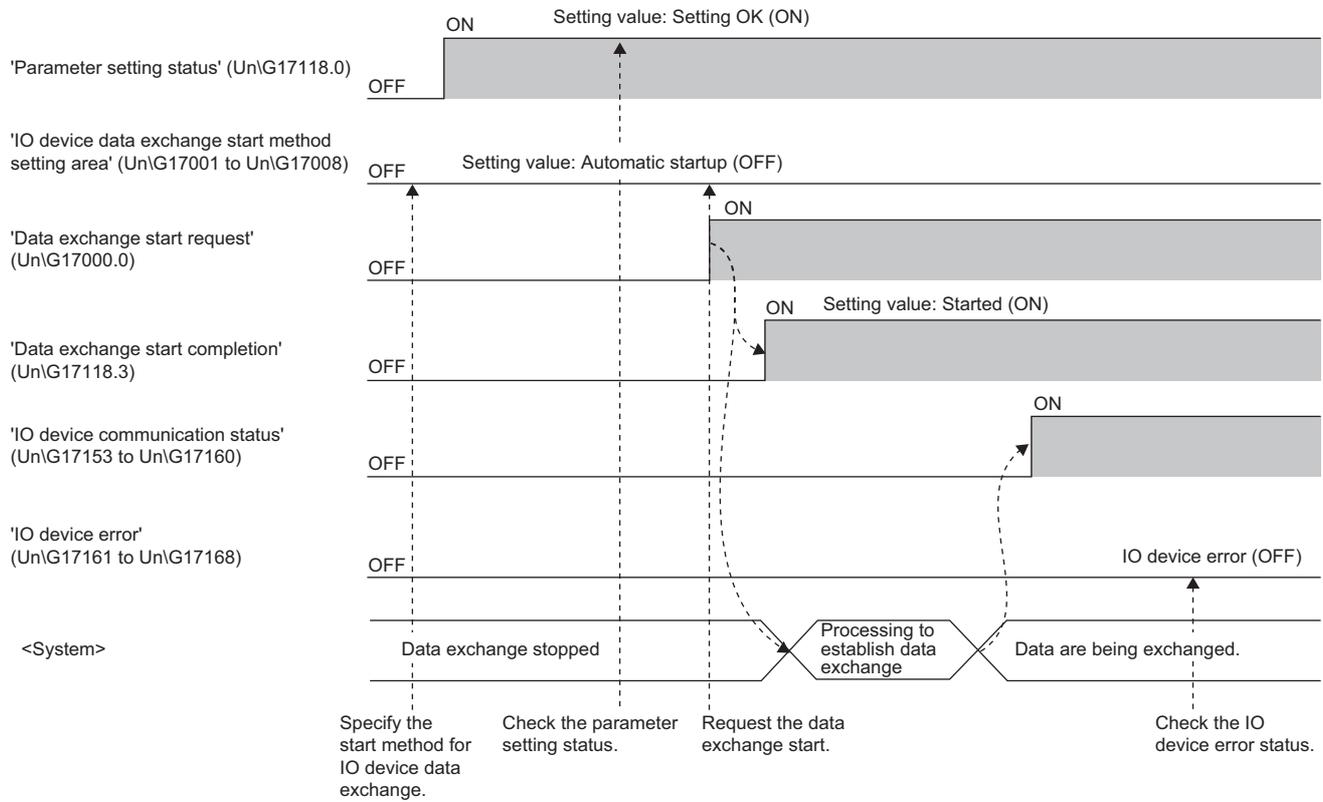
When the manual start is selected

The following figure shows the timing chart of the I/O data exchange start with the IO device set to the manual start.
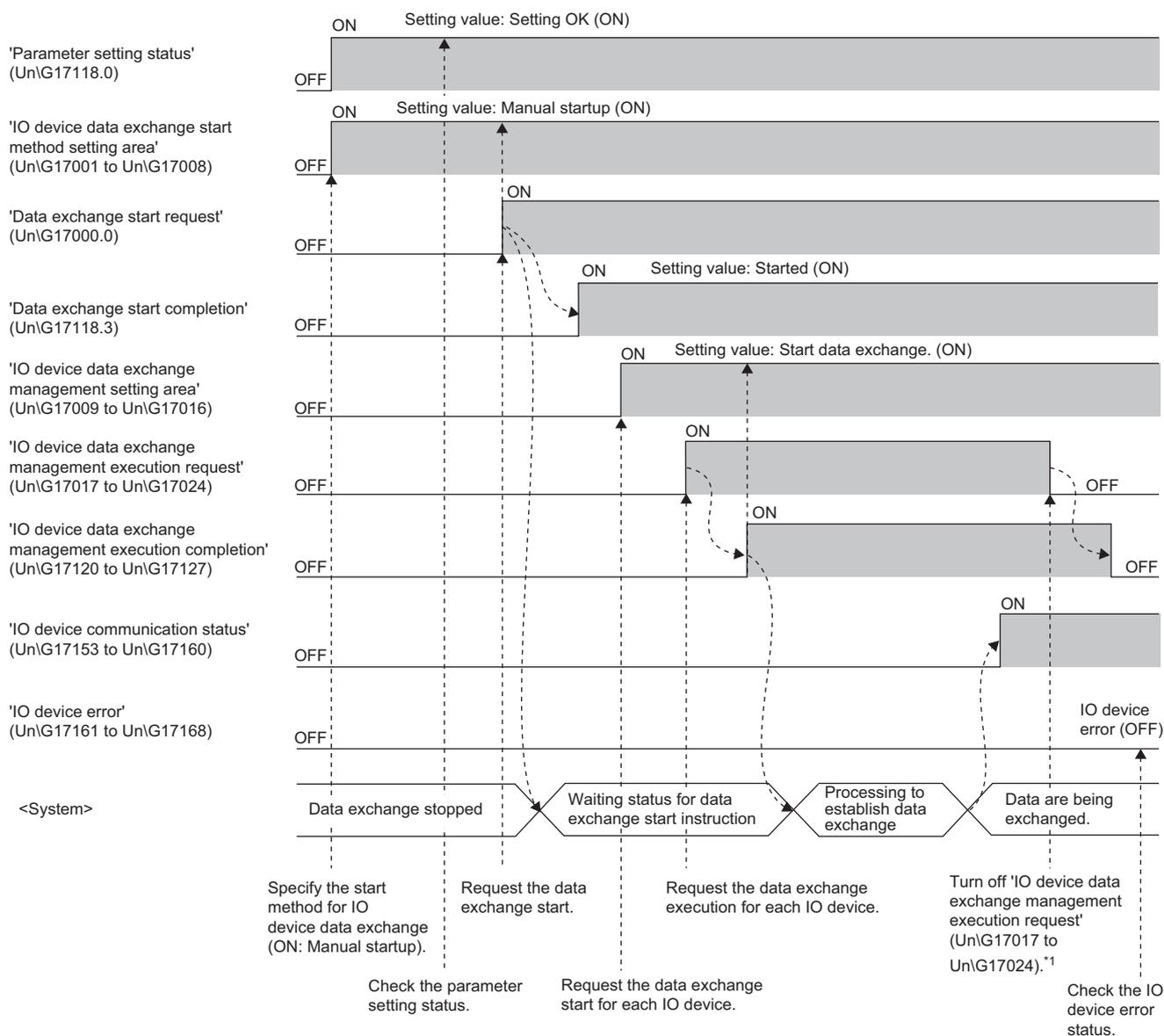
*1   After the signal of 'IO device data exchange management execution completion' (Un\G17120 to Un\G17127) has turned on, the signal of 'IO device data exchange management execution request' (Un\G17017 to Un\G17024) can be turned off.

Precautions

Communication with a different segment

The RJ71PN92 cannot exchange the I/O data with IO devices on a different network segment.

Set the same IP address segment as the RJ71PN92. (☞ Page 80 "Devices on the Network" window)

1.2 Data Consistency Function

This function ensures the consistency of input data and output data to be transferred by the I/O data exchange for each IO device.

Data inconsistency is prevented by using the buffer memory and performing interlocks on the access to the input areas or output areas between the CPU module and the RJ71PN92.

Setting method

Enable the bit of 'Data consistency setting area' (Un\G17033 to Un\G17040) corresponding to the IO device that exchanges the I/O data to use this function.

☞ Page 152 Data consistency setting area

Access control on input data areas

For the access control on input data areas, use the following buffer memory areas and perform interlocks.
 • 'CPU to PN handshake flag (data consistency setting input area)' (Un\G17041 to Un\G17048)
 • 'PN to CPU handshake flag (data consistency setting input area)' (Un\G17128 to Un\G17135)

Combinations of handshake flags

When the data consistency function is enabled, whether or not to read input data areas is determined depending on the combination of the settings of the buffer memory areas.

The following table lists the combinations of the settings of the buffer memory areas.

'CPU to PN handshake flag (data consistency setting input area)' (Un\G17041 to Un\G17048)	'PN to CPU handshake flag (data consistency setting input area)' (Un\G17128 to Un\G17135)	Read inhibited/ enabled	Operation of the RJ71PN92	Control by programs
OFF	OFF	Read inhibited	• The values in the input data area of the specified IO device are updated to the values in the internal memory of the RJ71PN92. • After the data is updated, the bit of 'PN to CPU handshake flag (data consistency setting input area)' (Un\G17128 to Un\G17135) corresponding to the IO device that exchanges the I/O data turns on.	—
OFF	ON	Read enabled	—	☞ Page 23 Control by programs
ON	ON	Read inhibited	• The values in the input data area of the specified IO device are updated to the values in the internal memory of the RJ71PN92. • After the data is updated, the bit of 'PN to CPU handshake flag (data consistency setting input area)' (Un\G17128 to Un\G17135) corresponding to the IO device that exchanges the I/O data turns off.	—
ON	OFF	Read enabled	—	☞ Page 23 Control by programs

Control by programs

Create a program to control data in the following order.

1. Compare the bits of 'CPU to PN handshake flag (data consistency setting input area)' (Un\G17041 to Un\G17048) and 'PN to CPU handshake flag (data consistency setting input area)' (Un\G17128 to Un\G17135) corresponding to the IO device that exchanges the I/O data.

2. Read data from the input data area of the specified IO device when one of the bits is in the off state and the other is in the on state.

3. After the data is read, reverse the on/off state of the bit of 'CPU to PN handshake flag (data consistency setting input area)' (Un\G17041 to Un\G17048) corresponding to the IO device that exchanges the I/O data. (Off → On or On → Off)

Timing to perform the access control

The following figure shows the timing chart of the access control on input data areas.

'PN to CPU handshake flag (data consistency setting input area)' (Un\G17128 to Un\G17135) — ON / OFF

'CPU to PN handshake flag (data consistency setting input area)' (Un\G17041 to Un\G17048) — ON / OFF

Reading out input data by the CPU module: Prohibited | Allowed | Prohibited | Allowed | Prohibited

Input data area: 0 | 1 | 2 | 3

Control by the RJ71PN92: Update OFF→ON | Update ON→OFF | Update OFF→ON

Control by a program: Comparing the status | Read out OFF→ON | Comparing the status | Read out ON→OFF

Precautions

When creating a program to read input data, follow the precautions below.

- When the bits of 'CPU to PN handshake flag (data consistency setting input area)' (Un\G17041 to Un\G17048) and 'PN to CPU handshake flag (data consistency setting input area)' (Un\G17128 to Un\G17135) corresponding to the IO device that exchanges the I/O data are both off or on, the consistency of input data is not ensured. When input data is read while the bits are both off or on, the input data before the update may be read.
- After data is read from the input data areas, reverse the on/off state of the bit of 'CPU to PN handshake flag (data consistency setting input area)' (Un\G17041 to Un\G17048) corresponding to the IO device that exchanges the I/O data. (On → Off or Off → On) If the on/off state of this bit is not reversed, the input data areas are not updated.

Access control on output data areas

For the access control on output data areas, use the following buffer memory areas and perform interlocks.
- 'CPU to PN handshake flag (data consistency setting output area)' (Un\G17049 to Un\G17056)
- 'PN to CPU handshake flag (data consistency setting output area)' (Un\G17136 to Un\G17143)

Combinations of handshake flags

When the data consistency function is enabled, whether or not to write output data areas is determined depending on the combination of the settings of the buffer memory areas.

The following table lists the combinations of the settings of the buffer memory areas.

'CPU to PN handshake flag (data consistency setting output area)' (Un\G17049 to Un\G17056)	'PN to CPU handshake flag (data consistency setting output area)' (Un\G17136 to Un\G17143)	Write inhibited/ enabled	Operation of the RJ71PN92	Control by programs
OFF	OFF	Write enabled	—	☞ Page 25 Control by programs
ON	OFF	Write inhibited	• The values in the internal memory of the RJ71PN92 are updated to the values in the output data area of the specified IO device. • After the data is updated, the bit of 'PN to CPU handshake flag (data consistency setting output area)' (Un\G17136 to Un\G17143) corresponding to the IO device that exchanges the I/O data turns on.	—
ON	ON	Write enabled	—	☞ Page 25 Control by programs
OFF	ON	Write inhibited	• The values in the internal memory of the RJ71PN92 are updated to the values in the output data area of the specified IO device. • After the data is updated, the bit of 'PN to CPU handshake flag (data consistency setting output area)' (Un\G17136 to Un\G17143) corresponding to the IO device that exchanges the I/O data turns off.	—

Control by programs

Create a program to control data in the following order.

1. Compare the bits of 'CPU to PN handshake flag (data consistency setting output area)' (Un\G17049 to Un\G17056) and 'PN to CPU handshake flag (data consistency setting output area)' (Un\G17136 to Un\G17143) corresponding to the IO device that exchanges the I/O data.

2. Write data to the output data area of the specified IO device when the bits are both in the off state or the on state.

3. After the data is written, reverse the on/off state of the bit of 'CPU to PN handshake flag (data consistency setting output area)' (Un\G17049 to Un\G17056) corresponding to the IO device that exchanges the I/O data. (Off → On or On → Off)

Timing to perform the access control

The following figure shows the timing chart for the access control on output data areas.

Precautions

When creating a program to write output data, follow the precautions below.

- When one of the bits of 'CPU to PN handshake flag (data consistency setting output area)' (Un\G17049 to Un\G17056) and 'PN to CPU handshake flag (data consistency setting output area)' (Un\G17136 to Un\G17143) cor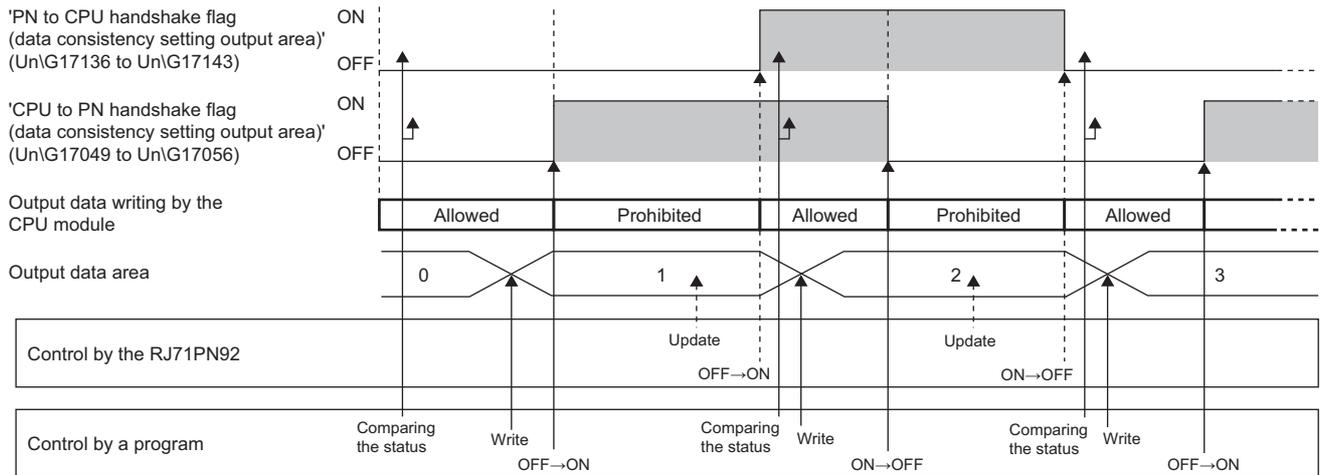responding to the IO device that exchanges the I/O data is in the on state and the other is in the off state, the consistency of output data is not ensured. When output data is written while one of the bits is in the on state and the other is in the off state, the output data before the update may be output to the IO device.
- After data is written to the output data area, reverse the on/off state of the bit of 'CPU to PN handshake flag (data consistency setting output area)' (Un\G17049 to Un\G17056) corresponding to the IO device that exchanges the I/O data. (On → Off or Off → On) If the on/off state of this bit is not reversed, the output data areas are not updated.

1.3 Service Interface Function

This function performs each of the following services at a timing different from that of the I/O data exchange.

The following table lists the available services for the RJ71PN92.

Service name	Description	Reference
Network detection	Detects IO devices on the same network as the RJ71PN92 and obtains the number of connected IO devices.	Page 31 Network detection (ServiceID: 0001H)
IO device detection	Obtains detailed information of the IO device that has been detected by the network detection.	Page 33 IO device detection (ServiceID: 0002H)
Acyclic communication - Implicit read data record	Reads the specified data from the IO device where the PROFINET module has not been set in the RJ71PN92.	Page 35 Acyclic communication - Implicit read data record (ServiceID: 0003H)
Acyclic communication - Explicit write data record	Writes the specified data to the IO device where the PROFINET module has been set in the RJ71PN92.	Page 37 Acyclic communication - Explicit write data record (ServiceID: 0004H)
Acyclic communication - Explicit read data record	Reads the specified data from the IO device where the PROFINET module has been set in the RJ71PN92.	Page 39 Acyclic communication - Explicit read data record (ServiceID: 0005H)
Alarm request	Reads information of an alarm that has currently occurred in the specific IO device.	Page 41 Alarm request (ServiceID: 0006H)
Alarm ACK	Sends the alarm ACK to the specific IO device.	Page 44 Alarm ACK (ServiceID: 0007H)
IO device information acquisition	This service reads the IO device information of the specific IO device.	Page 46 IO device information acquisition (ServiceID: 0008H)
Alarm log acquisition	Reads the alarm log stored in the RJ71PN92.	Page 49 Alarm log acquisition (ServiceID: 0009H)

Setting method

Use the following buffer memory areas to execute the services.
- 'Service request area 1' (Un\G50000 to Un\G52087) or 'Service request area 2' (Un\G52250 to Un\G54337)
- 'Service execution request 1, Service execution request 2' (Un\G17057)
- 'Service execution status' (Un\G17144)
- 'Service response area 1' (Un\G57000 to Un\G59087) or 'Service response area 2' (Un\G59250 to Un\G61337)

Operating procedure

The following describes the procedure before starting a service.

For an example, the following describes the procedure for using Service request area 1.

1. Set a setting value specified for each service in 'Service request area 1' (Un\G50000 to Un\G52087).

2. Turn on 'Service request area 1 execution request bit' (Un\G17057.0).

3. After the system has turned on 'Service request area 1 execution request acceptance bit' (Un\G17144.8), 'Service request area 1 execution request completion bit' (Un\G17144.0) turns on.

4. Read the data stored in 'Service response area 1' (Un\G57000 to Un\G59087).

5. Turn off 'Service request area 1 execution request bit' (Un\G17057.0).

6. After the system has turned off 'Service request area 1 execution request acceptance bit' (Un\G17144.8), 'Service request area 1 execution request completion bit' (Un\G17144.0) turns off.

Service execution timing

The following describes the execution timing of a service.

For an example, the following figure shows a timing chart of when Service request area 1 is used.
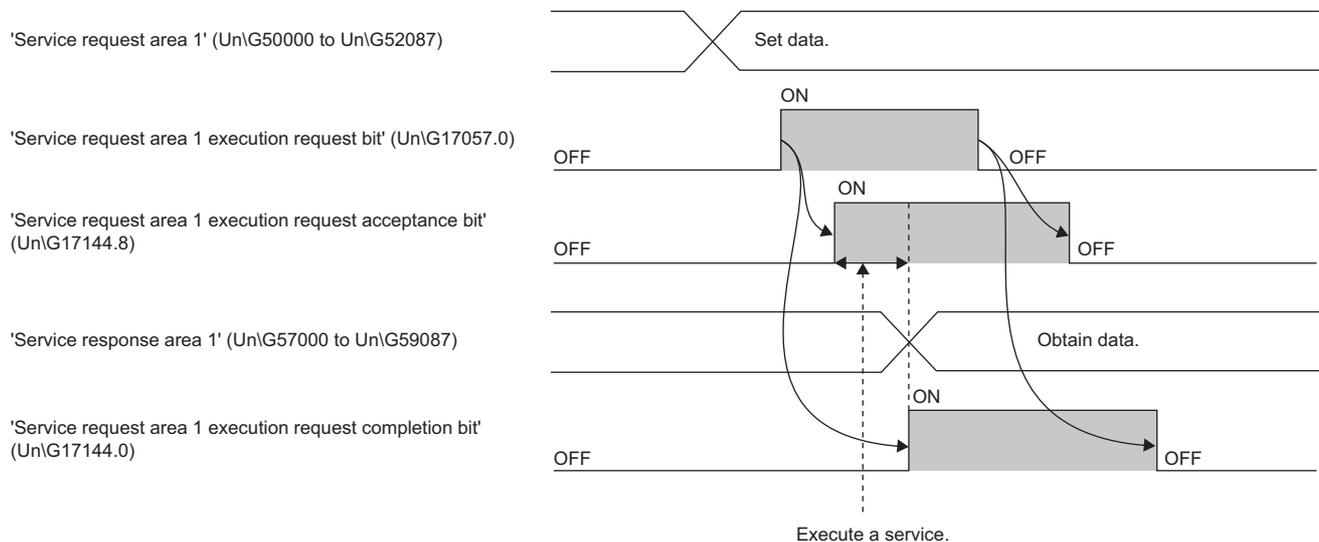
Service request area format

Set a setting value specified for each service in Service request area to execute each service.

The following table lists Service request area formats.

Classification	Buffer memory address (decimal)		Item name	Description	Setting range
	Service request area 1	Service request area 2			
Header	50000 to 50001	52250 to 52251	RequestID	Specifies a number to relate a request and a response.[1] For example, when 1H is set in RequestID of Service request area and a request is issued, 1H is stored in RequestID of Service response area of the response corresponding to the request.	00000000H to FFFFFFFFH
	50002	52252	ServiceID	Specifies a ServiceID corresponding to each service.	0001H to 0009H
	50003	52253	Status	Status of a request (Fixed to 0055H)	0055H
	50004 to 50005	52254 to 52255	DeviceID	Specifies an IO device ID. Set the IO device ID on GX Configurator-PN. (☞ Page 87 IO device setting window)	0 to 127
	50006 to 50007	52256 to 52257	API	Specifies the API number of the IO device.	00000000H to FFFFFFFFH
	50008	52258	SlotNumber	Specifies the slot number of the IO device.	0000H to FFFFH[2]
	50009	52259	SubslotNumber	Specifies the sub slot number of the IO device.	0000H to FFFFH[3]
	50010	52260	Index	Specifies the index number of the slot or sub slot of the IO device.	0000H to FFFFH
	50011	52261	Data length(byte)	Stores the size of the write target data in units of bytes.	0 to 4116
	50012	52262	PnDeviceID	Specifies DeviceID of the IO device. (This ID has been specified by the IO device manufacturer.) Specify 0000H when executing a service other than Acyclic communication - Implicit read data record.	—
	50013	52263	PNVendorID	Specifies VendorID of the IO device. (This ID has been specified by the IO device manufacturer.) Specify 0000H when executing a service other than Acyclic communication - Implicit read data record.	—
	50014 to 50021	52264 to 52271	ARUUID	Specify the value stored in "ObjectUUID_LocalIndex" of the GSDML file.	—
Data	50030 to 52087	52280 to 54337	Data	Specifies data to be written to the IO device.	—

*1 Control and use the RequestID with a program. (For example, before issuing each request, create a program that increments RequestID.)
*2 The valid range of SlotNumber is 0000H to 7FFFH.
*3 The effective range of SubslotNumber is 0001H to 9FFFH.

Service response area format

A response corresponding to the executed service is stored in Service response area.

The following table lists Service response area formats.

Classification	Buffer memory address (decimal)		Item name	Description
	Service response area 1	Service response area 2		
Header	57000 to 57001	59250 to 59251	RequestID	Stores the RequestID that has been specified with the issued request.
	57002	59252	ServiceID	Stores the ServiceID that has been specified with the issued request.
	57003	59253	Status	Stores the execution result of the request. ■When a request is successfully completed 0000H is stored. ■When a request is completed with an error The cause of the error is stored.
	57004 to 57005	59254 to 59255	DeviceID	Stores an IO device ID. Set the IO device ID on GX Configurator-PN. (☞ Page 87 [General Configuration] tab)
	57006	59256	Data length(byte)	Stores the size of the read data in units of bytes.
	57007	59257	ErrorDecode	Stores a value other than 0000H when a request is completed with an error.[1]
	57008	59258	ErrorCode1	Stores a value other than 0000H when a request is completed with an error.[1]
	57009	59259	ErrorCode2	Stores a value other than 0000H when a request is completed with an error.[1]
Data	57020 to 59087	59270 to 61337	Data	Stores the data read from the IO device.

*1 Error details can be checked from combinations of ErrorDecode, ErrorCode1, and ErrorCode2. For details, refer to the manuals of the IO device.

Details of each service

The following describes the request format and response format of each service.

Network detection (ServiceID: 0001H)

This service detects IO devices on the same network as the RJ71PN92 and acquires the number of connected IO devices (up to 128 devices).

Note that this service acquires only the number of connected IO devices. To acquire detailed information of the IO devices, execute the IO device detection. (Page 33 IO device detection (ServiceID: 0002H))

■Request format

The following table lists the request formats of this service.

Buffer memory address (decimal)		Item name	Setting value
Service request area 1	Service request area 2		
50000 to 50001	52250 to 52251	RequestID	00000000H to FFFFFFFFH
50002	52252	ServiceID	0001H
50003	52253	Status	0055H
50004 to 50005	52254 to 52255	DeviceID	0
50006 to 50007	52256 to 52257	API	00000000H
50008	52258	SlotNumber	0000H
50009	52259	SubslotNumber	0000H
50010	52260	Index	0000H
50011	52261	Data length(byte)	0
50012	52262	PnDeviceID	0000H
50013	52263	PNVendorID	0000H

■Response format

The following table lists the response formats for when the request of this service has been completed successfully.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0001H
57003	59253	Status	0000H
57004 to 57005	59254 to 59255	DeviceID	0
57006	59256	Data length(byte)	1
57007	59257	ErrorDecode	0000H
57008	59258	ErrorCode1	0000H
57009	59259	ErrorCode2	0000H
57020 to 57021	59270 to 59271	Nr IO-Devices	Number of detected IO devices 00000000H to 00000080H

The following table lists the response format for when the request of this service has been completed with an error.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0001H
57003	59253	Status	The cause of the error is stored. The values are as follows. • 0001H: Module not started • 0002H: Not connected to network • 0003H: IO device not detected • 0008H: PROFINET error Check ErrorDecode, ErrorCode1, and ErrorCode2. • 000BH: Incorrect parameter
57004 to 57005	59254 to 59255	DeviceID	0
57006	59256	Data length(byte)	0
57007	59257	ErrorDecode	Value other than 0000H[*1]
57008	59258	ErrorCode1	Value other than 0000H[*1]
57009	59259	ErrorCode2	Value other than 0000H[*1]

*1 Error details can be checked from combinations of ErrorDecode, ErrorCode1, and ErrorCode2. For details, refer to the manuals of the IO device.

IO device detection (ServiceID: 0002H)

Obtains detailed information of the IO device that has been detected by the network detection.

Executing this service once obtains the information of one IO device.

Thus, execute this service for the number of IO devices detected in "Network detection" service.

■Request format

The following table lists the request formats of this service.

Buffer memory address (decimal)		Item name	Setting value
Service request area 1	Service request area 2		
50000 to 50001	52250 to 52251	RequestID	00000000H to FFFFFFFFH
50002	52252	ServiceID	0002H
50003	52253	Status	0055H
50004 to 50005	52254 to 52255	DeviceID	0
50006 to 50007	52256 to 52257	API	00000000H
50008	52258	SlotNumber	0000H
50009	52259	SubslotNumber	0000H
50010	52260	Index	0000H
50011	52261	Data length(byte)	0
50012	52262	PnDeviceID	0000H
50013	52263	PNVendorID	0000H

■Response format

The following table lists the response formats for when the request of this service has been completed successfully.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0002H
57003	59253	Status	0000H
57004 to 57005	59254 to 59255	DeviceID	0
57006	59256	Data length(byte)	Number of bytes stored in Service response area
57007	59257	ErrorDecode	0000H
57008	59258	ErrorCode1	0000H
57009	59259	ErrorCode2	0000H
57020	59270	VendorID	VendorID of the IO device (This ID has been specified by the IO device manufacturer.)
57021	59271	DeviceID	DeviceID of the IO device (This ID has been specified by the IO device manufacturer.)
57022 to 57023	59272 to 59273	IP address	IP address of the IO device 01000000H to DFFFFFFFH The IP addresses are stored in the following order. • 1st word lower byte: 4th octet • 1st word upper byte: 3rd octet • 2nd word lower byte: 2nd octet • 2nd word upper byte: 1st octet
57024 to 57025	59274 to 59275	Subnet mask	Subnet mask of the IO device 00000000H to FFFFFF00H The subnet masks are stored in the following order. • 1st word lower byte: 4th octet • 1st word upper byte: 3rd octet • 2nd word lower byte: 2nd octet • 2nd word upper byte: 1st octet
57026 to 57027	59276 to 59277	Gateway	Gateway IP address of the IO device 00000000H to FFFFFFFFH The gateway IP addresses are stored in the following order. • 1st word lower byte: 4th octet • 1st word upper byte: 3rd octet • 2nd word lower byte: 2nd octet • 2nd word upper byte: 1st octet

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
27028 to 57030	59278 to 59280	MAC address	MAC address of the IO device 000000000000H to FFFFFFFFFFFFH The MAC addresses are stored in the following order. • 1st word lower byte: 6th octet • 1st word upper byte: 5th octet • 2nd word lower byte: 4th octet • 2nd word upper byte: 3rd octet • 3rd word lower byte: 2nd octet • 3rd word upper byte: 1st octet
57031	59281	SizeName	Number of characters in the IO device name (max. 240 bytes)
57032 to (57032+SizeName-1)	59282 to (59282+SizeName-1)	DeviceName	IO device name
57032+SizeName	59282+SizeName	SizeType	Type filed size (Max. 25 bytes)
(57032+SizeName+1) to (57032+SizeName+1+SizeType)	(59282+SizeName+1) to (59282+SizeName+1+SizeType)	Type	IO device type

The following table lists the response format for when the request of this service has been completed with an error.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0002H
57003	59253	Status	The cause of the error is stored. The values are as follows. • 0001H: Module not started • 0004H: Incorrect data size • 0005H: Not because of IO device • 0006H: Not called "Network detection" service • 000BH: Incorrect parameter
57004 to 57005	59254 to 59255	DeviceID	0
57006	59256	Data length(byte)	0
57007	59257	ErrorDecode	Value other than 0000H[1]
57008	59258	ErrorCode1	Value other than 0000H[1]
57009	59259	ErrorCode2	Value other than 0000H[1]

*1 Error details can be checked from combinations of ErrorDecode, ErrorCode1, and ErrorCode2. For details, refer to the manuals of the IO device.

Acyclic communication - Implicit read data record (ServiceID: 0003H)

This service reads the specified data from the IO device where the PROFINET module has not been set in the RJ71PN92.

■Request format

The following table lists the request formats of this service.

Buffer memory address (decimal)		Item name	Setting value
Service request area 1	Service request area 2		
50000 to 50001	52250 to 52251	RequestID	00000000H to FFFFFFFFH
50002	52252	ServiceID	0003H
50003	52253	Status	0055H
50004 to 50005	52254 to 52255	DeviceID	IP address of the target IO device The IP addresses are stored in the following order. • 1st word lower byte: 4th octet • 1st word upper byte: 3rd octet • 2nd word lower byte: 2nd octet • 2nd word upper byte: 1st octet
50006 to 50007	52256 to 52257	API	API number of the IO device[1]
50008	52258	SlotNumber	Slot number of the IO device[1]
50009	52259	SubslotNumber	Sub slot number of the IO device[1]
50010	52260	Index	Index number of the IO device[1]
50011	52261	Data length(byte)	0
50012	52262	PnDeviceID	DeviceID of the IO device (This ID has been specified by the IO device manufacturer.)
50013	52263	PNVendorID	VendorID of the IO device (This ID has been specified by the IO device manufacturer.)
50014 to 50021	52264 to 52271	ARUUID	The value stored in "ObjectUUID_LocalIndex" of the GSDML file

*1   For the setting value, refer to the manuals of the IO device.

■Response format

The following table lists the response formats for when the request of this service has been completed successfully.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0003H
57003	59253	Status	0000H
57004 to 57005	59254 to 59255	DeviceID	Value set in the request format
57006	59256	Data length(byte)	Size of read data 0 to 4116
57007	59257	ErrorDecode	0000H
57008	59258	ErrorCode1	0000H
57009	59259	ErrorCode2	0000H
57020 to 59087	59270 to 61337	Data	Read data

The following table lists the response format for when the request of this service has been completed with an error.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0003H
57003	59253	Status	The cause of the error is stored. The values are as follows. • 0001H: Module not started • 0002H: Not connected to network • 0003H: IO device not detected • 0004H: Incorrect data size • 0006H: IO device not connected • 0007H: IO device not set • 0008H: PROFINET error Check ErrorDecode, ErrorCode1, and ErrorCode2. • 000BH: Incorrect parameter
57004 to 57005	59254 to 59255	DeviceID	0
57006	59256	Data length(byte)	0
57007	59257	ErrorDecode	Value other than 0000H[1]
57008	59258	ErrorCode1	Value other than 0000H[1]
57009	59259	ErrorCode2	Value other than 0000H[1]

*1 Error details can be checked from combinations of ErrorDecode, ErrorCode1, and ErrorCode2. For details, refer to the manuals of the IO device.

Acyclic communication - Explicit write data record (ServiceID: 0004H)

This service writes the specified data to the IO device where the PROFINET module has been set in the RJ71PN92.

■Request format

The following table lists the request formats of this service.

Buffer memory address (decimal)		Item name	Setting value
Service request area 1	Service request area 2		
50000 to 50001	52250 to 52251	RequestID	00000000H to FFFFFFFFH
50002	52252	ServiceID	0004H
50003	52253	Status	0055H
50004 to 50005	52254 to 52255	DeviceID	Target IO device ID
50006 to 50007	52256 to 52257	API	API number of the IO device[1]
50008	52258	SlotNumber	Slot number of the IO device[1]
50009	52259	SubslotNumber	Sub slot number of the IO device[1]
50010	52260	Index	Index number of the IO device[1]
50011	52261	Data length(byte)	Size of write target data
50012	52262	PnDeviceID	0000H
50013	52263	PNVendorID	0000H
50030 to 52087	52280 to 54337	Data	Write target data

*1 For the setting value, refer to the manuals of the IO device.

■Response format

The following table lists the response formats for when the request of this service has been completed successfully.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0004H
57003	59253	Status	0000H
57004 to 57005	59254 to 59255	DeviceID	Value set in the request format
57006	59256	Data length(byte)	0
57007	59257	ErrorDecode	0000H
57008	59258	ErrorCode1	0000H
57009	59259	ErrorCode2	0000H

The following table lists the response format for when the request of this service has been completed with an error.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	**Service response area 2**		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0004H
57003	59253	Status	The cause of the error is stored. The values are as follows. • 0001H: Module not started • 0002H: Not connected to network • 0003H: IO device not detected • 0004H: Incorrect data size • 0006H: IO device not connected • 0007H: IO device not set • 0008H: PROFINET error Check ErrorDecode, ErrorCode1, and ErrorCode2. • 000BH: Incorrect parameter
57004 to 57005	59254 to 59255	DeviceID	0
57006	59256	Data length(byte)	0
57007	59257	ErrorDecode	Value other than 0000H[*1]
57008	59258	ErrorCode1	Value other than 0000H[*1]
57009	59259	ErrorCode2	Value other than 0000H[*1]

*1 Error details can be checked from combinations of ErrorDecode, ErrorCode1, and ErrorCode2. For details, refer to the manuals of the IO device.

Acyclic communication - Explicit read data record (ServiceID: 0005H)

This service reads the specified data from the IO device where the PROFINET module has been set in the RJ71PN92.

■Request format

The following table lists the request formats of this service.

Buffer memory address (decimal)		Item name	Setting value
Service request area 1	Service request area 2		
50000 to 50001	52250 to 52251	RequestID	00000000H to FFFFFFFFH
50002	52252	ServiceID	0005H
50003	52253	Status	0055H
50004 to 50005	52254 to 52255	DeviceID	Target IO device ID
50006 to 50007	52256 to 52257	API	API number of the IO device[1]
50008	52258	SlotNumber	Slot number of the IO device[1]
50009	52259	SubslotNumber	Sub slot number of the IO device[1]
50010	52260	Index	Index number of the IO device[1]
50011	52261	Data length(byte)	0
50012	52262	PnDeviceID	0000H
50013	52263	PNVendorID	0000H

[1] For the setting value, refer to the manuals of the IO device.

■Response format

The following table lists the response formats for when the request of this service has been completed successfully.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0005H
57003	59253	Status	0000H
57004 to 57005	59254 to 59255	DeviceID	Value set in the request format
57006	59256	Data length(byte)	Size of read data 0 to 4116
57007	59257	ErrorDecode	0000H
57008	59258	ErrorCode1	0000H
57009	59259	ErrorCode2	0000H
57020 to 59087	59270 to 61337	Data	Read data

The following table lists the response format for when the request of this service has been completed with an error.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0005H
57003	59253	Status	The cause of the error is stored. The values are as follows. • 0001H: Module not started • 0002H: Not connected to network • 0003H: IO device not detected • 0004H: Incorrect data size • 0007H: IO device not set • 0008H: PROFINET error Check ErrorDecode, ErrorCode1, and ErrorCode2. • 000BH: Incorrect parameter
57004 to 57005	59254 to 59255	DeviceID	0
57006	59256	Data length(byte)	0
57007	59257	ErrorDecode	Value other than 0000H[*1]
57008	59258	ErrorCode1	Value other than 0000H[*1]
57009	59259	ErrorCode2	Value other than 0000H[*1]

*1 Error details can be checked from combinations of ErrorDecode, ErrorCode1, and ErrorCode2. For details, refer to the manuals of the IO device.

Alarm request (ServiceID: 0006H)

This service reads information of an alarm that has currently occurred in the specific IO device.

Use this service with 'IO device alarm management area' (Un\G17025 to Un\G17032) and 'IO device alarm indication area' (Un\17145 to Un\17152).

■Request format

The following table lists the request formats of this service.

Buffer memory address (decimal)		Item name	Setting value
Service request area 1	Service request area 2		
50000 to 50001	52250 to 52251	RequestID	00000000H to FFFFFFFFH
50002	52252	ServiceID	0006H
50003	52253	Status	0055H
50004 to 50005	52254 to 52255	DeviceID	Target IO device ID
50006 to 50007	52256 to 52257	API	00000000H
50008	52258	SlotNumber	0000H
50009	52259	SubslotNumber	0000H
50010	52260	Index	0000H
50011	52261	Data length(byte)	0
50012	52262	PnDeviceID	0000H
50013	52263	PNVendorID	0000H

■Response format

The following table lists the response formats for when the request of this service has been completed successfully.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0006H
57003	59253	Status	0000H
57004 to 57005	59254 to 59255	DeviceID	Value set in the request format
57006	59256	Data length(byte)	Number of bytes stored in Service response area 0 to 1456
57007	59257	ErrorDecode	0000H
57008	59258	ErrorCode1	0000H
57009	59259	ErrorCode2	0000H
57020 to 57021	59270 to 59271	API	API number of the IO device[1]
57022	59272	Priority	Alarm priority • 0006H: High-priority alarm • 0005H: Low-priority alarm

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57023	59273	Type	Stores an alarm type. The values are as follows. • 0001H: Diagnostics • 0002H: Process • 0003H: Drawing • 0004H: Insertion • 0005H: Status • 0006H: Update • 0007H: Redundancy • 0008H: Controlled by supervisor • 0009H: Release • 000AH: Sub module mounted incorrectly • 000BH: Sub module restored • 000CH: Diagnostics disappearance • 000DH: Multicast communication mismatch notification • 000EH: Port data change notification • 000FH: Synchronous data change notification • 0010H: Isochronous mode problem notification • 0011H: Network device problem notification • 0012H: Time data change notification • 0013H: Dynamic Frame Packing problem notification • 0014H: MRPD (Media Redundancy for Planned Duplication) problem notification • 0015H: Redundancy system • 001EH: Upload and search notification • 001FH: Module drawing • 0020H to 007FH: Manufacturer-specific part • 0080H to 00FFH: Reserved values for profile
57024	59274	SlotNumber	Slot number of the IO device[1]
57025	59275	SubslotNumber	Sub slot number of the IO device[1]
57026	59276	Specifier	Alarm specifier • b0 to 10: Sequence number (The value increments before each request. The value range is 0 to 2047.) • b11: Path diagnostics (0: Not diagnosable, 1: Diagnosable) • b12: Special diagnostics (0: Not diagnosable, 1: Diagnosable) • b13: Submodule diagnostics (0: Not diagnosable, 1: Diagnosable) • b14: System area • b15: AR diagnostics (0: Not diagnosable, 1: Diagnosable)
57027 to 57028	59277 to 59278	Module Ident number	Module ID (This ID has been specified by the IO device manufacturer.)
57029 to 57030	59279 to 59280	Submodule Ident number	Submodule ID (This ID has been specified by the IO device manufacturer.)
57031	59281	Data length(byte)	Size of read data 0 to 1432
57032 to (57032 + Data - 1)	59282 to (59282 + Data - 1)	Data	Read data (Max. 1432 bytes)

*1   For the stored value, refer to the manuals of the IO device.

The following table lists the response format for when the request of this service has been completed with an error.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0006H
57003	59253	Status	The cause of the error is stored. The values are as follows. • 0001H: Module not started • 0007H: IO device not set • 0008H: PROFINET error Check ErrorDecode, ErrorCode1, and ErrorCode2. • 0009H: No alarm occurred in the target IO device • 000BH: Incorrect parameter
57004 to 57005	59254 to 59255	DeviceID	0
57006	59256	Data length(byte)	0
57007	59257	ErrorDecode	Value other than 0000H[*2]
57008	59258	ErrorCode1	Value other than 0000H[*2]
57009	59259	ErrorCode2	Value other than 0000H[*2]

*2 Error details can be checked from combinations of ErrorDecode, ErrorCode1, and ErrorCode2. For details, refer to the manuals of the IO device.

Alarm ACK (ServiceID: 0007H)

This service sends the alarm ACK to the specific IO device.

Use this service with 'IO device alarm management area' (Un\G17025 to Un\G17032) and 'IO device alarm indication area' (Un\G17145 to Un\G17152).

■Request format

The following table lists the request formats of this service.

Buffer memory address (decimal)		Item name	Setting value
Service request area 1	Service request area 2		
50000 to 50001	52250 to 52251	RequestID	00000000H to FFFFFFFFH
50002	52252	ServiceID	0007H
50003	52253	Status	0055H
50004 to 50005	52254 to 52255	DeviceID	Target IO device ID
50006 to 50007	52256 to 52257	API	API number of the IO device[1]
50008	52258	SlotNumber	Slot number of the IO device[1]
50009	52259	SubslotNumber	Sub slot number of the IO device[1]
50010	52260	Index	Alarm priority • 0006H: High-priority alarm • 0005H: Low-priority alarm
50011	52261	Data length(byte)	0
50012	52262	PnDeviceID	0000H
50013	52263	PNVendorID	0000H

[1] For the setting value, refer to the manuals of the IO device.

■Response format

The following table lists the response formats for when the request of this service has been completed successfully.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0007H
57003	59253	Status	0000H
57004 to 57005	59254 to 59255	DeviceID	Value set in the request format
57006	59256	Data length(byte)	0
57007	59257	ErrorDecode	0000H
57008	59258	ErrorCode1	0000H
57009	59259	ErrorCode2	0000H

The following table lists the response format for when the request of this service has been completed with an error.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0007H
57003	59253	Status	The cause of the error is stored. The values are as follows. • 0001H: Module not started • 0007H: IO device not set • 0008H: PROFINET error Check ErrorDecode, ErrorCode1, and ErrorCode2. • 0009H: No alarm occurred in the target IO device • 000BH: Incorrect parameter
57004 to 57005	59254 to 59255	DeviceID	0
57006	59256	Data length(byte)	0
57007	59257	ErrorDecode	Value other than 0000H[1]
57008	59258	ErrorCode1	Value other than 0000H[1]
57009	59259	ErrorCode2	Value other than 0000H[1]

*1 Error details can be checked from combinations of ErrorDecode, ErrorCode1, and ErrorCode2. For details, refer to the manuals of the IO device.

IO device information acquisition (ServiceID: 0008H)

This service reads the IO device information of the specific IO device.

■**Request format**

The following table lists the request formats of this service.

Buffer memory address (decimal)		Item name	Setting value
Service request area 1	Service request area 2		
50000 to 50001	52250 to 52251	RequestID	00000000H to FFFFFFFFH
50002	52252	ServiceID	0008H
50003	52253	Status	0055H
50004 to 50005	52254 to 52255	DeviceID	Target IO device ID
50006 to 50007	52256 to 52257	API	00000000H
50008	52258	SlotNumber	0000H
50009	52259	SubslotNumber	0000H
50010	52260	Index	0000H
50011	52261	Data length(byte)	0
50012	52262	PnDeviceID	0000H
50013	52263	PNVendorID	0000H

■Response format

The following table lists the response formats for when the request of this service has been completed successfully.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0008H
57003	59253	Status	0000H
57004 to 57005	59254 to 59255	DeviceID	Value set in the request format
57006	59256	Data length(byte)	Size of read data 0 to 36
57007	59257	ErrorDecode	0000H
57008	59258	ErrorCode1	0000H
57009	59259	ErrorCode2	0000H
57020 to 57022	59270 to 59272	MAC address	MAC address of the IO device 000000000000H to FFFFFFFFFFFFH The MAC addresses are stored in the following order. • 1st word lower byte: 6th octet • 1st word upper byte: 5th octet • 2nd word lower byte: 4th octet • 2nd word upper byte: 3rd octet • 3rd word lower byte: 2nd octet • 3rd word upper byte: 1st octet
57023 to 57024	59273 to 59274	IP address	IP address of the IO device 01000000H to DFFFFFFFH The IP addresses are stored in the following order. • 1st word lower byte: 4th octet • 1st word upper byte: 3rd octet • 2nd word lower byte: 2nd octet • 2nd word upper byte: 1st octet
57025 to 57026	59275 to 59276	Input data area address	Address of Input data area
57027 to 57028	59277 to 59278	Output data area address	Address of Output data area
57029	59279	Input data length	Input data length of the I/O data exchange 0 to 8192 (bytes)
57030	59280	Output data length	Output data length of the I/O data exchange 0 to 8192 (bytes)
57031	59281	Refresh period	Refresh interval Value range: 1, 2, 4, 8, 16, ..., 512 (power of 2)
57032	59282	Number of successful connection	Number of established connection 0 to 65535
57033	59283	Number of disconnections	Number of disconnected connection 0 to 65535
57034	59284	Connection status	Connection status Connected: 1 Not connected: 0
57035	59285	Data exchange start method	Data exchange start method Manual start: 1 Automatic start: 0
57036 to 57037	59286 to 59287	Current PROFINET status	Current PROFINET status (Depending on the PROFINET specifications)

The following table lists the response format for when the request of this service has been completed with an error.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0008H
57003	59253	Status	The cause of the error is stored. The values are as follows. • 0001H: Module not started • 0007H: IO device not set • 000BH: Incorrect parameter
57004 to 57005	59254 to 59255	DeviceID	0
57006	59256	Data length(byte)	0
57007	59257	ErrorDecode	Value other than 0000H[*1]
57008	59258	ErrorCode1	Value other than 0000H[*1]
57009	59259	ErrorCode2	Value other than 0000H[*1]

*1   Error details can be checked from combinations of ErrorDecode, ErrorCode1, and ErrorCode2. For details, refer to the manuals of the IO device.

Alarm log acquisition (ServiceID: 0009H)

This service reads the alarm log stored in the RJ71PN92. To read multiple alarm logs, execute this service multiple times. This service acquires alarm logs in order from the oldest one.

■Request format

The following table lists the request formats of this service.

Buffer memory address (decimal)		Item name	Setting value
Service request area 1	Service request area 2		
50000 to 50001	52250 to 52251	RequestID	00000000H to FFFFFFFFH
50002	52252	ServiceID	0009H
50003	52253	Status	0055H
50004 to 50005	52254 to 52255	DeviceID	Target IO device ID
50006 to 50007	52256 to 52257	API	00000000H
50008	52258	SlotNumber	0000H
50009	52259	SubslotNumber	0000H
50010	52260	Index	0000H
50011	52261	Data length(byte)	0
50012	52262	PnDeviceID	0000H
50013	52263	PNVendorID	0000H

■Response format

The following table lists the response formats for when the request of this service has been completed successfully.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0009H
57003	59253	Status	0000H
57004 to 57005	59254 to 59255	DeviceID	Value set in the request format
57006	59256	Data length(byte)	Size of read data 0 to 30
57007	59257	ErrorDecode	0000H
57008	59258	ErrorCode1	0000H
57009	59259	ErrorCode2	0000H
57020 to 57021	59270 to 59271	Date	Alarm acquisition date[*2][*4]
57022 to 57023	59272 to 59273	Time	Alarm acquisition time[*3][*4]

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57024	59274	Type	Stores an alarm type. The values are as follows. • 0001H: Diagnostics • 0002H: Process • 0003H: Drawing • 0004H: Insertion • 0005H: Status • 0006H: Update • 0007H: Redundancy • 0008H: Controlled by supervisor • 0009H: Release • 000AH: Sub module mounted incorrectly • 000BH: Sub module restored • 000CH: Diagnostics disappearance • 000DH: Multicast communication mismatch notification • 000EH: Port data change notification • 000FH: Synchronous data change notification • 0010H: Isochronous mode problem notification • 0011H: Network device problem notification • 0012H: Time data change notification • 0013H: Dynamic Frame Packing problem notification • 0014H: MRPD (Media Redundancy for Planned Duplication) problem notification • 0015H: Redundancy system • 001EH: Upload and search notification • 001FH: Module drawing • 0020H to 007FH: Manufacturer-specific part • 0080H to 00FFH: Reserved values for profile
57025 to 57026	59275 to 59276	API	API number of the IO device[1]
57027	59277	Priority	Alarm priority • 0006H: High-priority alarm • 0005H: Low-priority alarm
57028 to 57029	59278 to 59279	Module Ident number	Module ID (This ID has been specified by the IO device manufacturer.)
57030 to 57031	59280 to 59281	Submodule Ident number	Submodule ID (This ID has been specified by the IO device manufacturer.)
57032	59282	SlotNumber	Slot number of the IO device[1]
57033	59283	SubslotNumber	Sub slot number of the IO device[1]
57034	59284	Specifier	Alarm specifier • b0 to 10: Sequence number (The value increments before each request. The value range is 0 to 2047.) • b11: Path diagnostics (0: Not diagnosable, 1: Diagnosable) • b12: Special diagnostics (0: Not diagnosable, 1: Diagnosable) • b13: Submodule diagnostics (0: Not diagnosable, 1: Diagnosable) • b14: System area • b15: AR diagnostics (0: Not diagnosable, 1: Diagnosable)

[1] For the stored value, refer to the manuals of the IO device.
[2] The number of days elapsed from January 1st, 1970 (UTC) is stored in units of seconds for the alarm acquisition date.
[3] The time elapsed from 0:00:00 (UTC) is stored in units of seconds for the alarm acquisition time.
[4] A value obtained by adding Date area and Time area is treated as UNIX time and the alarm acquisition date and time can be calculated with this value.

The following table lists the response format for when the request of this service has been completed with an error.

Buffer memory address (decimal)		Item name	Stored value
Service response area 1	Service response area 2		
57000 to 57001	59250 to 59251	RequestID	Value set in the request format
57002	59252	ServiceID	0009H
57003	59253	Status	The cause of the error is stored. The values are as follows. • 0001H: Module not started • 0002H: Not connected to network • 0007H: IO device not set • 0008H: PROFINET error Check ErrorDecode, ErrorCode1, and ErrorCode2. • 0009H: No alarm occurred in the target IO device • 000BH: Incorrect parameter
57004 to 57005	59254 to 59255	DeviceID	0
57006	59256	Data length(byte)	0
57007	59257	ErrorDecode	Value other than 0000H[5]
57008	59258	ErrorCode1	Value other than 0000H[5]
57009	59259	ErrorCode2	Value other than 0000H[5]

[5] Error details can be checked from combinations of ErrorDecode, ErrorCode1, and ErrorCode2. For details, refer to the manuals of the IO device.

1.4 Alarm Acquisition Function

The RJ71PN92 acquires an alarm that has occurred in the IO device.

When the RJ71PN92 receives an alarm of the IO device, it acquires the alarm information and returns the alarm ACK to the IO device.

> *Point*
>
> - When an alarm has occurred in the IO device, the alarm information is sent from the IO device to the RJ71PN92. Alarms are classified into high-priority alarms and low-priority alarms. The RJ71PN92 can receive both alarms simultaneously. (The alarm priority varies depending on the IO device.)
> - After the RJ71PN92 has received an alarm, the IO device cannot send the next alarm unless the IO device receives the alarm ACK from the RJ71PN92.

Controlling alarms

As the methods of controlling the alarm of each IO device, the alarm automatic processing and alarm manual processing are provided.

Set one of the methods in 'IO device alarm management area' (Un\G17025 to Un\G17032).

Item	Description
Alarm automatic processing (Default)	Automatically returns the alarm ACK to the alarm that has been received from each IO device.
Alarm manual processing	Stores alarm information in 'IO device alarm indication area' (Un\G17145 to Un\G17152) when the RJ71PN92 has received an alarm from each IO device. This processing uses the service interface function to execute the alarm request and alarm ACK.

Processing details

Alarm automatic processing

This processing automatically returns the alarm ACK to the alarm that has been received from each IO device.

In the alarm automatic processing, even after the RJ71PN92 has received an alarm from the IO device, the status of 'IO device alarm indication area' (Un\G17145 to Un\G17152) does not change.

Set the alarm automatic processing at the system start-up or when the alarm needs to be disabled. Set the alarm manual processing after the system has started.

Alarm manual processing

This processing stores alarm information in 'IO device alarm indication area' (Un\G17145 to Un\G17152) when the RJ71PN92 has received an alarm from each IO device.

The RJ71PN92 acquires alarm information of the IO device and returns the alarm ACK to the IO device by using the alarm request and alarm ACK of the service interface functions.

The following describes the operation of the alarm manual processing.
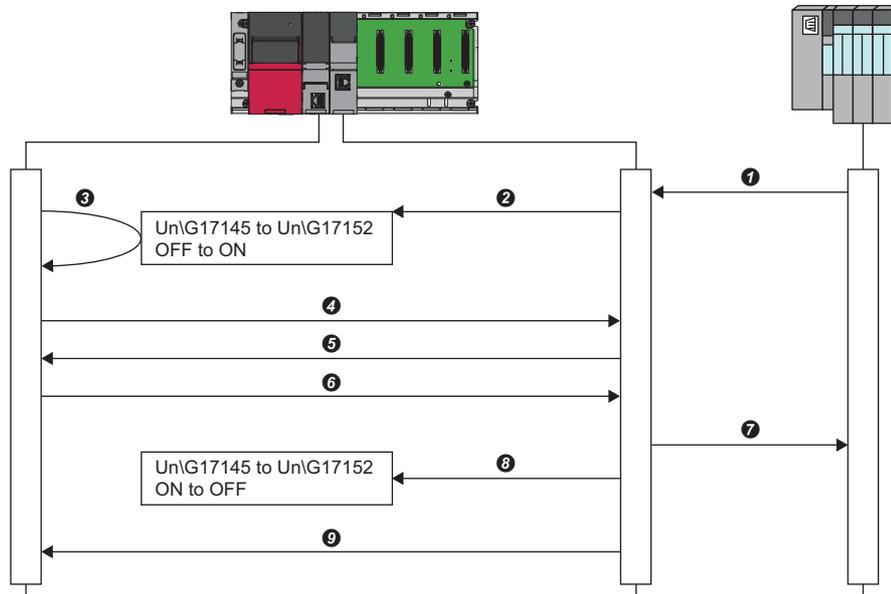
❶ Each IO device sends an alarm to the RJ71PN92.

❷ 'IO device alarm indication area' (Un\G17145 to Un\G17152) turns on.

❸ Check that 'IO device alarm indication area' (Un\G17145 to Un\G17152) turns on in the program.

❹ Execute the alarm request of the service interface function in the program.

❺ Read the response to the alarm request of the service interface function that has been executed at step ❹ in the program.

❻ Execute the alarm ACK of the service interface function in the program.

❼ The RJ71PN92 sends the alarm ACK to the IO device.

❽ 'IO device alarm indication area' (Un\G17145 to Un\G17152) turns off.

❾ Read the response to the alarm ACK of the service interface function that has been executed at step ❻ in the program.

For details on the alarm request and alarm ACK of the service interface function, refer to the following.

☞ Page 41 Alarm request (ServiceID: 0006H)

☞ Page 44 Alarm ACK (ServiceID: 0007H)

> **Point**
>
> When the RJ71PN92 has received both high-priority alarms and low-priority alarms from IO devices and the alarm request of the service interface function is executed, the high-priority alarms will respond.

Alarm log acquisition

When an alarm has occurred in the IO device, the RJ71PN92 stores the alarm information of the IO device in the alarm log.

The alarm log can store up to seven alarms.

Use the alarm log acquisition of the service interface function to check the alarm log details.

For details, refer to the following.

☞ Page 49 Alarm log acquisition (ServiceID: 0009H)

> **Point**
>
> When the alarm log has stored seven alarms and a new alarm occurs, the alarms will be deleted in order from the oldest one.

1.5 Communication Stop at CPU STOP

This function stops communications with an IO device when the CPU module is in the STOP state.

By stopping communications with the IO device, the operation status of the IO device can be changed into safe state while the CPU module is in the STOP state. (The operation status of the IO device at communication stop depends on the specifications or the parameters of the IO device. For details, refer to the manual for the IO device.)

To use this function, set the corresponding buffer memory area of the RJ71PN92.

The following table lists the setting values of the buffer memory area and how the communication status will change according to each set value.

Setting value	Communication status when the CPU module is in the STOP state
Disable	The communications with an IO device continue even if the CPU module is in the STOP state.
Enable	The communications with an IO device stop if the CPU module is in the STOP state.

> **Point**
>
> When a CPU stop error occurs, the communications stop regardless of the buffer memory setting of the RJ71PN92.

Setting method

The communication stop at CPU STOP is enabled by setting 1 for 'Communication stop at CPU STOP setting area' (Un\G2097130).

> **Restriction**
>
> To use the communication stop at CPU STOP, check the version of the module and GX Configurator-PN.

2 PARAMETER SETTINGS

This chapter describes the parameter settings required for communications between the RJ71PN92 and IO devices.

2.1 Setting Parameters

1. Add the RJ71PN92 in the engineering tool.

✑ [Navigation window] ➪ [Parameter] ➪ [Module Information] ➪ Right-click ➪ [Add New Module]

2. The basic settings and refresh settings are included in the module parameter. Select the settings from the tree in the following window and configure them. Set the refresh timing in the refresh settings.

✑ [Navigation window] ➪ [Parameter] ➪ [Module Information] ➪ [RJ71PN92] ➪ [Module Parameter]

3. Start GX Configurator-PN to set PROFINET communication parameters.

✑ [Navigation window] ➪ [Parameter] ➪ [Module Information] ➪ [RJ71PN92] ➪ [PROFINET Module Setting]

4. Set the refresh settings related to the I/O data exchange of the RJ71PN92. In the refresh settings, assign buffer memory areas and devices of the CPU module.

✑ [Navigation window] ➪ [Parameter] ➪ [Module Information] ➪ [RJ71PN92] ➪ Right-click ➪ [Autorefresh Settings]

5. Update global labels and structure related to the RJ71PN92 and register them in the engineering tool.

✑ [Navigation window] ➪ [Parameter] ➪ [Module Information] ➪ [RJ71PN92] ➪ Right-click ➪ [Update PROFINET Label]

6. Covert or rebuild programs.

✑ [Convert] ➪ [Convert] or [Rebuild All]

7. Write the settings configured in step 2 to 5 to the CPU module and the RJ71PN92 by using the engineering tool.

✑ [Online] ➪ [Write to PLC]

8. The settings are reflected by powering off and on or resetting the CPU module.

2.2 Basic Setting

Set the operation mode, IP address, and other items of the RJ71PN92.
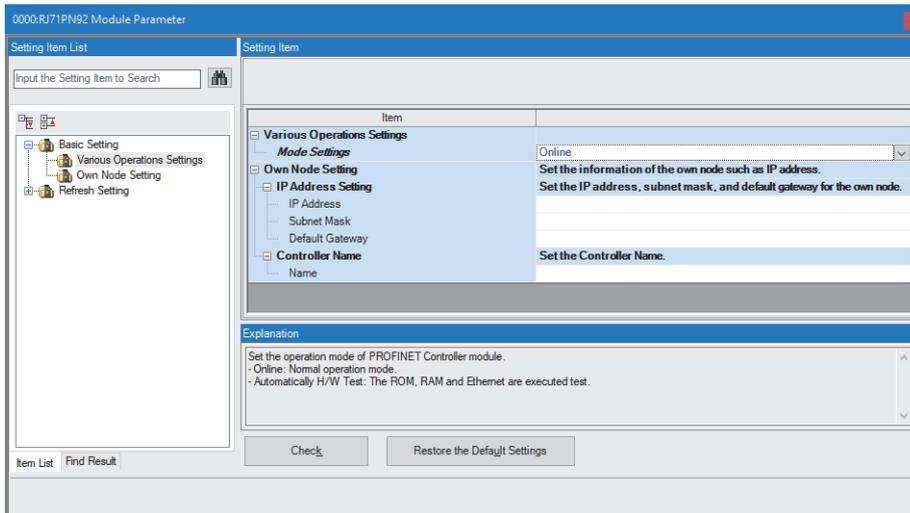
Various Operations Settings

Set the operation mode of the RJ71PN92.

Item	Description	Setting range
Mode Settings	Set the operation mode of the RJ71PN92. • Online: Normal operation mode • Automatic H/W Test: Performs tests related to the hardware such as ROM/RAM/ Ethernet port of the RJ71PN92. For the automatic hardware test, refer to the following. ☞ Page 136 Automatic Hardware Test	• Online • Automatic H/W Test (Default: Online)

Own Node Setting

Set the IP address and name of the RJ71PN92.

Item		Description	Setting range
IP Address Setting	IP Address	Set the IP address of the RJ71PN92.[*1] Set the IO devices which exchange data with the RJ71PN92 so that they have the same class and subnet address. Contact the network administrator before setting the IP address.	• Blank • 0.0.0.1 to 223.255.255.254 (Default: Blank)
	Subnet Mask	Set the subnet mask of the RJ71PN92. When setting the IP address of the default gateway and performing communication with an external device in other network through a router, set the subnet mask pattern of the default gateway. All the devices in the same subnetwork should have a common subnet mask. The subnet mask setting is not required for the communication in the single network.	• Blank • 128.0.0.0 to 255.255.255.252 (Default: Blank)
	Default Gateway	Set the default gateway of the RJ71PN92. Set the IP address of the relay device (default gateway) to access the IO device in another network. Set a value which satisfies the following conditions as the IP address of the default gateway. • The class of the IP address is A, B, or C. • The subnet address of the default gateway is the same as that of the RJ71PN92. • The host address part is not a sequence of "0" or "1".	• Blank • 0.0.0.1 to 223.255.255.254 (Default: Blank)
Controller Name		Set the name of the RJ71PN92.[*2]	Up to 240 one-byte alphanumeric characters[*3] (Default: Blank)

*1   When the parameter is written without the IP address setting (empty), the following address is set.
     192.168.3.3

*2   When the parameter is written without the name setting for the RJ71PN92 (empty), the following name is set.
     rj71pn92

*3   Usable characters: a to z, 0 to 9, "." (dot), "-" (hyphen). "-" cannot be used at the beginning and end of the name.
     The name can be separated by ".". The number of characters in each separated part is limited to 63 or less.

2.3　PROFINET Module Settings (Starting GX Configurator-PN)

Start GX Configurator-PN to set PROFINET communication parameters.

🖰 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ [PROFINET Module Setting]

For details, refer to the following.

☞Page 68 GX Configurator-PN

Point💡

While GX Configurator-PN is running, another GX Configurator-PN cannot be started.

Verifying the PROFINET module setting

Verify the project data set in GX Configurator-PN and the parameter written to the RJ71PN92.

🖰 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ Right-click ⇨ [Verify Configuration]

When the verification is completed, the result is displayed in the dialog window.
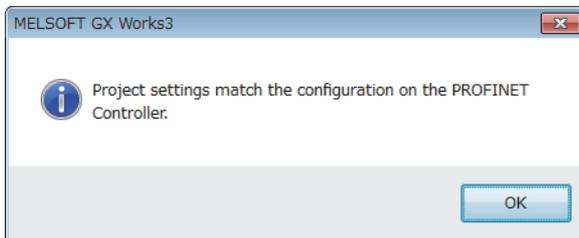
2.4 Refresh Setting

The refresh automatically transfers data between the buffer memory areas related to the I/O data exchange of the RJ71PN92 and the devices of the CPU module.

When the auto refresh setting is set, a global label related to the RJ71PN92 is automatically generated. The device set in the auto refresh setting is assigned to this generated label. When the auto refresh setting is not set, the buffer memory address of the RJ71PN92 is directly assigned to the global label.

Applicable buffer memory areas

The following table lists the buffer memory areas related to the I/O data exchange of the RJ71PN92.

Buffer memory address	Description
Un\G17000 to Un\G17057	PROFINET management output area
Un\G17118 to Un\G17168	PROFINET management input area
Un\G31000 to Un\G35095	Output data area
Un\G36000 to Un\G40095	Input data area

Point

Data cannot be transferred to the following buffer memory areas related to the service interface functions by using the refresh settings. Use the global label which is automatically generated at the label update of PROFINET or create a program to access the buffer memory areas.
- 'Service execution request 1, Service execution request 2' (Un\G17057)
- 'Service execution status' (Un\G17144)
- 'Service request area 1' (Un\G50000 to Un\G52087)
- 'Service request area 2' (Un\G52250 to Un\G54337)
- 'Service response area 1' (Un\G57000 to Un\G59087)
- 'Service response area 2' (Un\G59250 to Un\G61337)

For how to update PROFINET labels, refer to the following.
☞ Page 65 Updating PROFINET Labels

Assignment method

Refresh settings can be assigned in a batch (Batch assignment) or individually (Individual assignment).

Batch assignment

Specify the start device of the CPU module, and refreshing areas are automatically assigned to each buffer memory area.
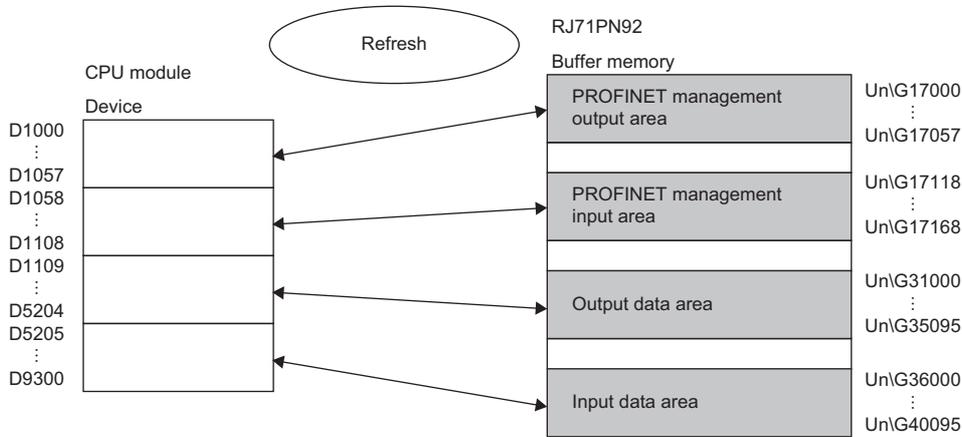
Individual assignment

Individually assign refreshing areas to each buffer memory area.

Note that device range of the CPU module does not overlap with other areas.
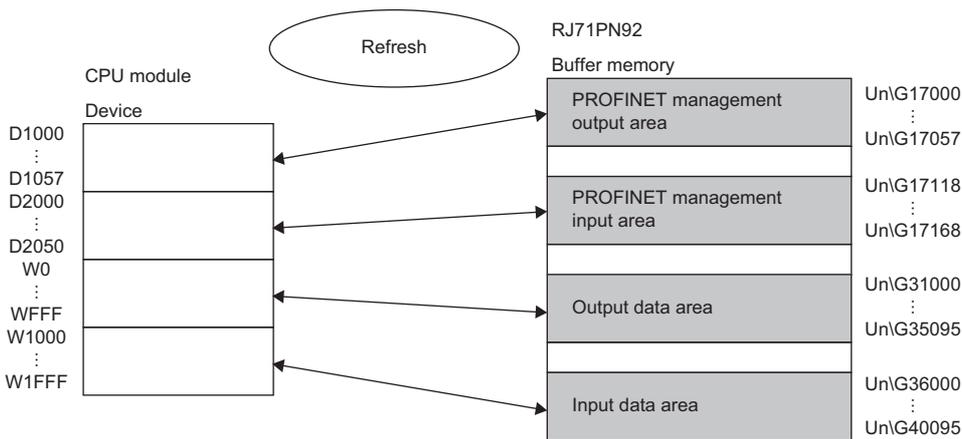
Setting items

Set refresh target devices of the CPU module.

Select "Use autorefresh" to enable the settings.

Item	Description	Setting range
Use autorefresh	Select to enable or disable the refresh settings. • Not selected: The refresh settings are disabled. • Selected: The refresh settings are enabled.	• Not selected • Selected (Default: Selected)
User CPU Device	Set the start addresses of the transfer source device and transfer destination device of the CPU module. With the devices set as the start devices, the range of each buffer memory area is automatically assigned. The set devices will be disabled if "Assign devices per buffer" is selected.	Set this item so that "Start Address" and "End Address" will be within the following device range.[*2] • D0 to D10117631 • W0 to W9A61FF • R0 to R32767 • ZR0 to ZR10027007 (Default: D0)
Assign devices per buffer	Select a method of assigning refresh settings. • Not selected: Batch assignment Assigns devices to each buffer memory areas in a batch. • Selected: Individual assignment Individually assigns devices to each buffer memory area.	• Not selected • Selected (Default: Not selected)
Use label for IO-device	Select whether to generate IO device labels or not when executing "Update PROFINET Label". • Not selected: IO device labels are not generated. • Selected: IO device labels are generated.	• Not selected • Selected (Default: Selected)
Optimize the number of structured data types (SDT)	Select whether to optimize IO device labels or not when executing "Update PROFINET Label". When IO device labels are used in a program, the generated label structure changes depending on this setting, so the program needs to be modified. • Not selected: IO device labels are not optimized. • Selected: IO device labels are optimized. (Structures of individual IO devices are optimized to one structure for input and one structure for output. The number of labels is not changed.)	• Not selected • Selected (Default: Not selected)
Buffer	Displays the buffer memory areas of the transfer source device and transfer destination device of the RJ71PN92. ■Output devices (iQ-R CPU -> PN Controller) tab • PROFINET Management: PROFINET management output area • Cyclic Output: Output data area[*1] ■Input devices (iQ-R CPU <- PN Controller) tab • PROFINET Management: PROFINET management input area • Cyclic Input: Input data area[*1]	—

Item	Description	Setting range
Start Address	Set the start addresses of the transfer source device and transfer destination device of the CPU module. The set values will be disabled if "Assign devices per buffer" is not selected.	Set this item so that "Start Address" and "End Address" will be within the following device range.[*2] • D0 to D10117631 • W0 to W9A61FF • R0 to R32767 • ZR0 to ZR10027007 (Default: Refer to the following.) ■Output devices (iQ-R CPU -> PN Controller) tab • PROFINET Management: D0 ■Input devices (iQ-R CPU <- PN Controller) tab • PROFINET Management: D58
End Address	Displays the last addresses of the transfer source device and transfer destination device of the CPU module.	—
[Show I/O Mapping] button	Displays the list of devices assigned to global labels related to the RJ71PN92 in the HTML format.	—

*1 Adding and setting the IO device module in the network configuration setting on GX Configurator-PN display the items.
*2 Note that the setting range does not exceed each device range of the CPU module.
For the device range of the CPU module, refer to the following.
📖 MELSEC iQ-R CPU Module User's Manual (Application)

Refresh timing

Set the refresh timing in the module parameter.

🖱️ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ [Module Parameter] ⇨ [Refresh Setting]

Item	Description	Setting range
Refresh Timing	Set the refresh timing.	• At the Execution Time of END Instruction • At the execution time of specified program (Default: At the Execution Time of END Instruction)
Refresh Group[n](n: 1-64)	When "Refresh Timing" is set to "At the execution time of specified program", specify the refresh group of programs.	1 to 64 (Default: 1)

Point

When the refresh is enabled, the refresh target values will be valid at the timing set in the engineering tool. At the time, buffer memory areas are overwritten with the refresh target values.
To change the refresh target values in the buffer memory areas, create a program that changes the values in the refresh target devices.

Refresh processing time

The refresh processing time [μs] is an element that configures the scan time of the CPU module. For the scan time, refer to the following.

📖 MELSEC iQ-R CPU Module User's Manual (Application)

The following shows a formula to calculate the refresh processing time [μs] with the refresh settings enabled.

- Refresh processing time [μs] = Refresh read (refresh transfer to the CPU module) time + Refresh write (refresh transfer to an intelligent function module) time

Calculate the refresh read time and refresh write time from the number of items where the refresh settings have been set and the number of transfers (words). For how to calculate, refer to the following.

📖 MELSEC iQ-R CPU Module User's Manual (Application)

2.5 Updating PROFINET Labels

When the IO device is registered and the item name is set in GX Configurator-PN, update global labels and structure related to the RJ71PN92 and compile them in the engineering tool.

For item names of IO devices, refer to the following.

☞ Page 96 List of items

Precautions

- When a setting of an IO device is added or changed in GX Configurator-PN, or the start I/O number of the RJ71PN92 is changed in GX Works3, update PROFINET labels.
- Do not register global labels and structures with the following names since they are used when PROFINET labels are updated. If they are registered, PROFINET labels cannot be updated. Check the names of global labels and structures, and correct them if needed before updating PROFINET labels.
  - Global label with a name starting with "Global_PN92"
  - Structure with a name starting with "RJ71PN92"
  - Structure with a name starting with "stSLV"

Procedure

1. Select "Update PROFINET Label" in the engineering tool.

✎ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ Right-click ⇨ [Update PROFINET Label]

2. The global labels and structures related to the RJ71PN92 will be updated.

When the global labels and structure related to the RJ71PN92 do not exist, they will be newly created.
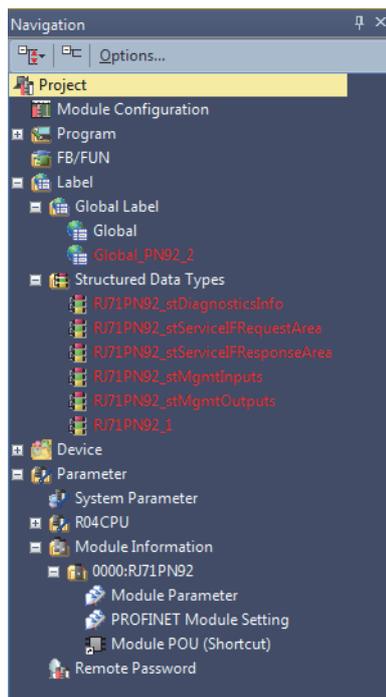
2.6 Writing Parameters

The parameters set in the engineering tool have different write destinations.

Parameter type	Configuration tool	Write destination
Module parameter	GX Works3	CPU module
PROFINET module setting	GX Configurator-PN	RJ71PN92

For writing parameters to the CPU module, refer to the following.

📖 GX Works3 Operating Manual

Writing the PROFINET module setting

The PROFINET module setting is written to the RJ71PN92.

Select "PROFINET Module Setting" and write parameters.

2.7 Precautions

This section describes precautions related to parameter settings.

Verifying projects

Projects including an RJ71PN92 cannot be verified.

Reading, verifying, and deleting the PROFINET module setting

These operations cannot be performed in the window for writing the PROFINET module setting. To perform the operations, use the following methods.

■Reading the PROFINET module setting

Create a backup file of the PROFINET module setting with the RJ71PN92 as shown below.
Note that the setting details of the PROFINET module setting cannot be checked in GX Configurator-PN. (⌐☞ Page 107 Backup with the RJ71PN92)

⌐☞ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ Right-click ⇨ [Upload Config. Image]

■Verifying the PROFINET module setting

Verify PROFINET module setting data as shown below. (⌐☞ Page 58 Verifying the PROFINET module setting)

⌐☞ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ Right-click ⇨ [Verify Configuration]

■Deleting the PROFINET module setting

Perform the following operation.

1. Create a project and open GX Configurator-PN.

⌐☞ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ [PROFINET Module Setting]

2. Save the project without setting anything and close GX Configurator-PN.

⌐☞ [File] ⇨ [Save]

3. Write the PROFINET module setting to the RJ71PN92. (⌐☞ Page 66 Writing the PROFINET module setting)

3 GX Configurator-PN

This chapter describes GX Configurator-PN.

3.1 Window Structure

The following figure shows the window structure.
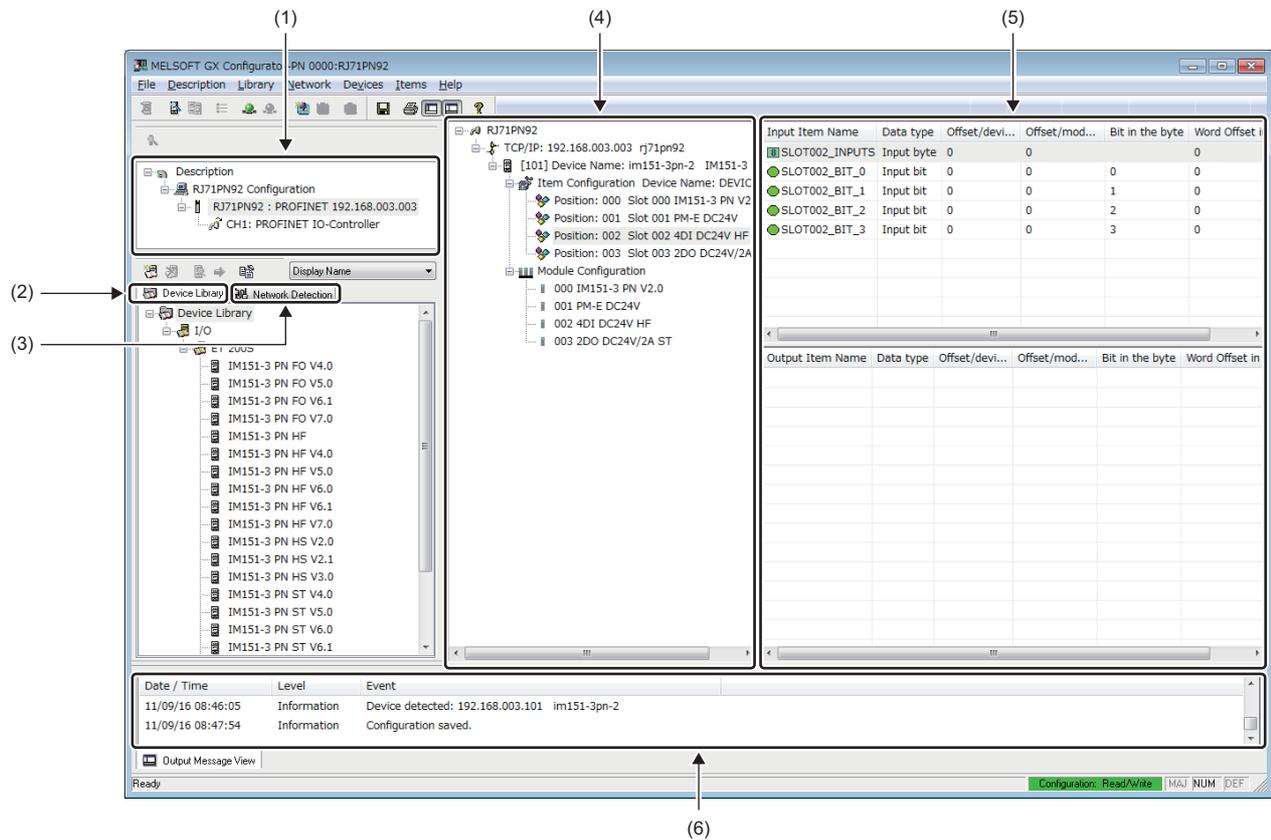
No.	Name	Reference
(1)	IO controller settings	—
(2)	Device Library	Page 73 Device Library
(3)	Network Detection	Page 78 Network Detection
(4)	Network configuration settings	Page 82 Network configuration settings
(5)	List of items	Page 96 List of items
(6)	List of operation information	Page 102 List of operation information

Menu

The following table lists the menu items of GX Configurator-PN.

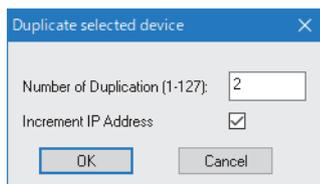| Menu	Description	Reference
File	Saves a project and configures print setting and window structure.	Page 70 File
Description	Not supported in the RJ71PN92.	—
Library	Adds GSDML files, displays file information, and adds or deletes IO devices.	Page 71 Library
Network	Detects IO devices on the network to add them in the network configuration settings and configures the PROFINET settings of the IO devices.	Page 71 Network
Devices	Adds or deletes selected IO devices, enables or disables the settings of IO devices, and enables or disables diagnostic mode.	Page 72 Devices
Items	Changes the item configuration or deletes items of selected IO devices.	Page 72 Items
Help	Displays the help or version information of GX Configurator-PN.	Page 72 Help

3

File

This menu item saves a project and configures print setting and window structure.

Item	Description
Save	Saves a GX Configurator-PN project.
List and Print	Opens the "Preview or Print Listings" window. (☞ Page 70 "Preview or Print Listings" window)
Preferences	Selects a window structure layout and "Advanced Mode". • Clicking "Workspace": Displays or hides the IO controller settings, "Device Library", and "Network Detection". • Clicking "Output Window": Displays or hides the list of operation information. • Selecting "Advanced Mode": PROFINET detail settings can be configured in the "Channel Properties" window. (☞ Page 83 "Channel Properties" window)
Message View	The following actions can be performed on the list of operation information. • Copy: Copies the information displayed in the list of operation information. • Clear: Clears the information displayed in the list of operation information. • Configuration: Sets the information displayed in the list of operation information. (☞ Page 102 "Output Message View Configuration" window)

■"Preview or Print Listings" window

Print the current configuration settings.

🖰 [File] ⇨ [List and Print]
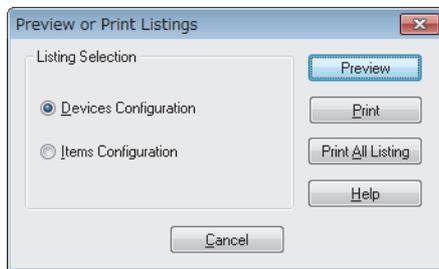
Item		Description	Setting range
Listing Selection	Devices Configuration	Prints information of the RJ71PN92 and IO devices that have been set in the network configuration settings.	• Devices Configuration • Items Configuration (Default: Devices Configuration)
	Items Configuration	Prints item information of the IO devices that have been set in the network configuration settings.	
[Preview] button		Displays the information selected in "Listing Selection" in a text file.	—
[Print] button		Prints the information selected in "Listing Selection".	—
[Print All Listing] button		Prints the information of the IO devices that have been set in the network configuration settings and the information of the PROFINET network configuration.	—

Library

This menu item adds GSDML files, displays file information, and adds or deletes IO devices.

This action can be performed when the [Device Library] tab is selected.

Item	Description
Add	Opens the GSDML Management wizard to add GSDML files. (☞ Page 74 Adding IO devices)
Delete	Deletes selected IO devices from "Device Library".[*1]
Sort	Opens the "Sort Device Library" window. (☞ Page 74 "Sort Device Library" window)
Insert in Configuration	Adds selected IO devices in the network configuration settings. (☞ Page 104 When adding IO devices offline)
Properties	Displays GSDML file information of a selected IO device. (☞ Page 77 GSDML file information)

*1 If IO devices are deleted from "Device Library", the GSDML information of the IO devices is also deleted.
Thus, if multiple IO devices are defined in the GSDML file information to be deleted, those IO devices are also deleted from "Device Library".

Network

Detects IO devices on the network to add them in the network configuration settings and configures the PROFINET settings of the IO devices.

This action can be performed when the [Network Detection] tab is selected.

Item	Description
Read Network Configuration	Reads a network configuration to detect connected IO devices. (☞ Page 78 Network Detection)
Online Action	Opens the "Devices on the Network" window. (☞ Page 80 "Devices on the Network" window)
Insert in Configuration	Adds selected IO devices in the network configuration settings.
Insert and Replace All	Deletes all the IO devices set in the network configuration settings and adds all the IO devices detected by "Network Detection".
Properties	Opens the properties of a selected IO device. (☞ Page 79 Properties of an IO device)

Devices

This menu item adds or deletes selected IO devices, enables or disables the settings of IO devices, and enables or disables diagnostic mode.

Item	Description
Duplicate	Adds a copy of a selected IO device in the network configuration settings.
Delete	Deletes selected IO devices.
Delete all	Deletes all IO devices.
Disable all	Disables all IO device settings.
Enable all	Enables all IO device settings.[*1]
Duplicate X times	Adds copies of a selected IO device by the number of devices that have been set in the "Duplicate selected device" window in the network configuration settings. (☞ Page 72 "Duplicate selected device" window) This action can be performed when an IO device is selected in the network configuration settings.
Properties	Opens the IO device setting window. (☞ Page 87 IO device setting window)
Start Console Diagnostic	Enables diagnostic mode.[*2]
Stop Console Diagnostic	Disables diagnostic mode.
Options	Opens the "Display Option" window. (☞ Page 84 "Display Option" window)

*1 When the icon status of the IO device does not switch to the valid state (🗒) from the invalid state (🗒) even after performing this action, save and restart GX Configurator-PN.

*2 Start the I/O data exchange to enable diagnostic mode. (☞ Page 19 Operating procedure)

■"Duplicate selected device" window

Set the number of IO devices to copy and add copies in the network configuration settings.

Item	Description	Setting range
Number of Duplication	Sets the number of IO devices to be added.	1 to 127 (Default: 2)
Increment IP Address	Sets whether to increment the IP address of the previously set IO device and add the IP address as that of an added IO device. • Selected: The IP address is incremented. • Not selected: The IP address is not incremented.[*1]	• Selected • Not selected (Default: Selected)

*1 If the IP address is not incremented, deselect "Link Parameters" in the [General Configuration] tab in the IO device setting window.

Items

This menu item changes the item configuration or deletes items of selected IO devices.

This action can be performed when an item name is selected from the list of items in the network configuration settings.

Item	Description
Add Item(s)	Opens the "Items Declaration" window. (☞ Page 98 "Items Declaration" window)
Delete Item(s)	Deletes selected items.
Rename Item	Renames selected items.
Properties	Opens the "Item Properties" window of a selected item. (☞ Page 97 "Item Properties" window)

Help

This menu item displays the help or version information of GX Configurator-PN.

Item	Description
Console Help	Opens the help of GX Configurator-PN.
About	Displays version information of GX Configurator-PN. (☞ Page 109 Checking the Software Version)

Device Library

"Device Library" lists the IO devices added in GX Configurator-PN.

The IO devices added in "Device Library" can be added to the network configuration settings.

When IO device information is displayed at execution of Network Detection, the information of the IO devices added in "Device Library" is used.

To add IO devices in "Device Library", add GSDML files provided by manufacturers of the IO devices in GX Configurator-PN.

For details, refer to the following.

☞ Page 74 Adding IO devices
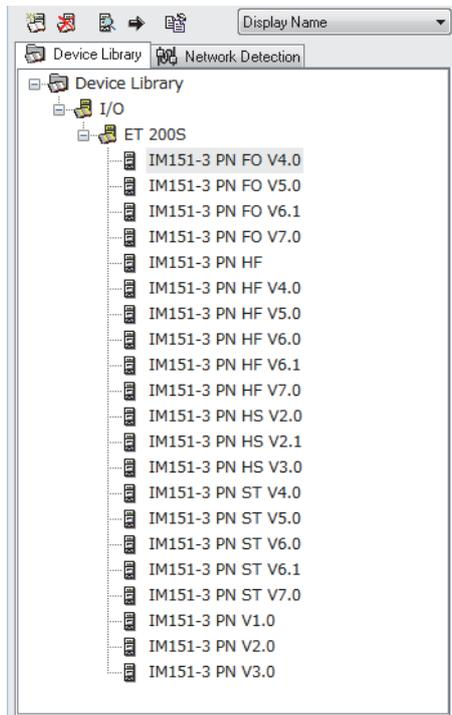
The display of "Device Library" can be changed with the display option in the upper right of "Device Library".

Item	Description
Display Name	Displays product names of IO devices.
Display Order Number	Displays order numbers of IO devices.

Point

Perform the action related to "Device Library" when it is set offline. For the operating procedure, refer to the following.

☞ Page 104 When adding IO devices offline

"Sort Device Library" window

Select the display order of the IO devices added in "Device Library".

🖰 [Library] ⇨ [Sort]

Item	Description
By Category	Displays IO devices according to the categories of main family and product family.
By Manufacturer	Displays IO devices by IO device manufacturer.
By File name	Displays IO devices by GSDML file name.
By Device name	Displays IO devices by IO device name.

Adding IO devices

Follow the GSDML Management wizard to add IO devices in "Device Library".

1. Open the "GSDML Management" window.

🖰 [Library] ⇨ [Add]

2. Click the [Next] button in the "GSDML Management" window.
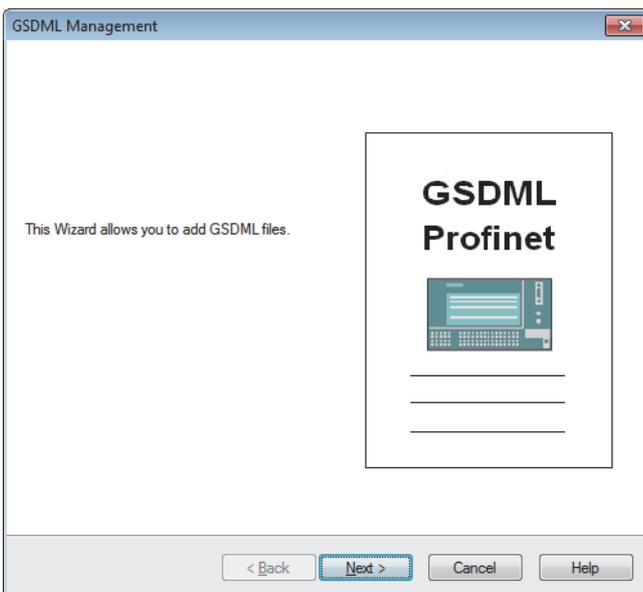
3. Select GSDML files to add and click the [Next] button.
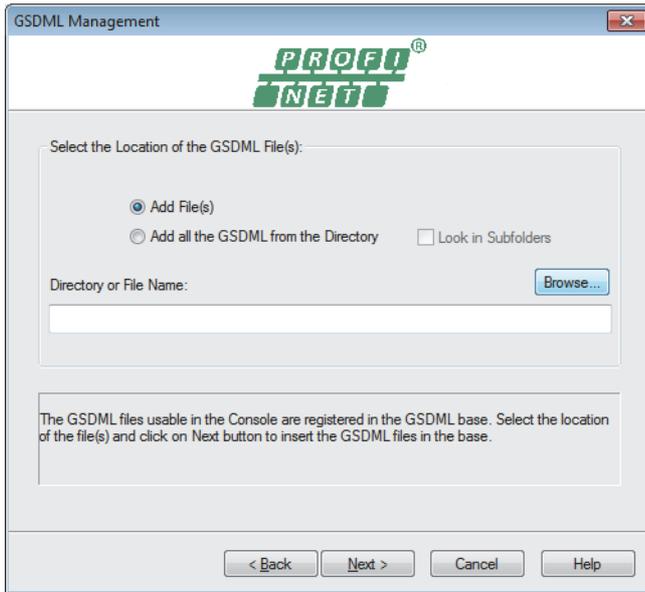
Item	Description	Setting range
Add File(s)	Select this item to add the selected GSDML files. (Multiple GSDML files can be added at a time.) Click the [Browse] button and select GSDML files.	• Selected • Not selected (Default: Selected)
Add all the GSDML from the Directory	Select this item to add all GSDML files in a selected folder. Click the [Browse] button to select a folder.	• Selected • Not selected (Default: Not selected)
Look in Subfolders	Select this item to select subfolders in the selected folder when "Add all the GSDML from the Directory" has been selected.	• Selected • Not selected (Default: Not selected)
Directory or File Name	Displays the path of a selected GSDML file or selected folder. The storage location of the GSDML file or folder can be directly specified.	—
[Browse] button	Selects a GSDML file or folder where GSDML files have been stored.	—

4. The "GSDML Management" window displays the addition result of the GSDML files added in "Device Library".
Check that the files have been properly added and click the [Next] button. (When the files have been properly added, OK is displayed in the "Status" field.)
Selecting an added GSDML file and clicking the [View Selected File] button display information of the GSDML file in a text file.
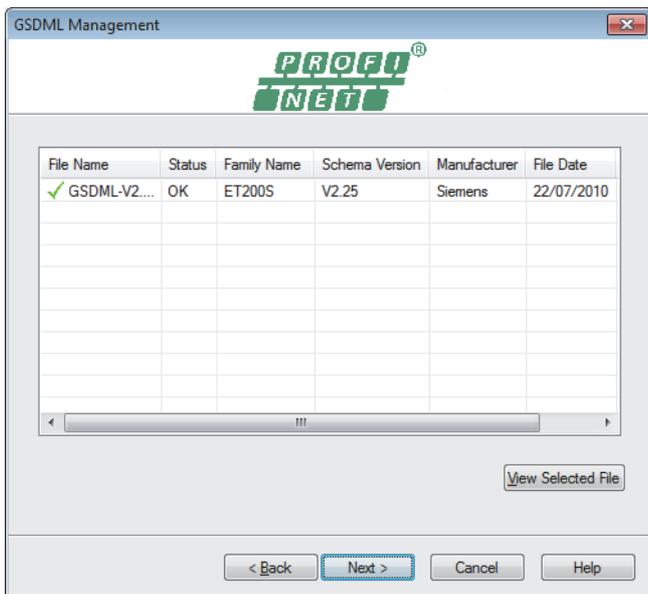
5. Click the [Finish] button to finish the GSDML Management wizard.
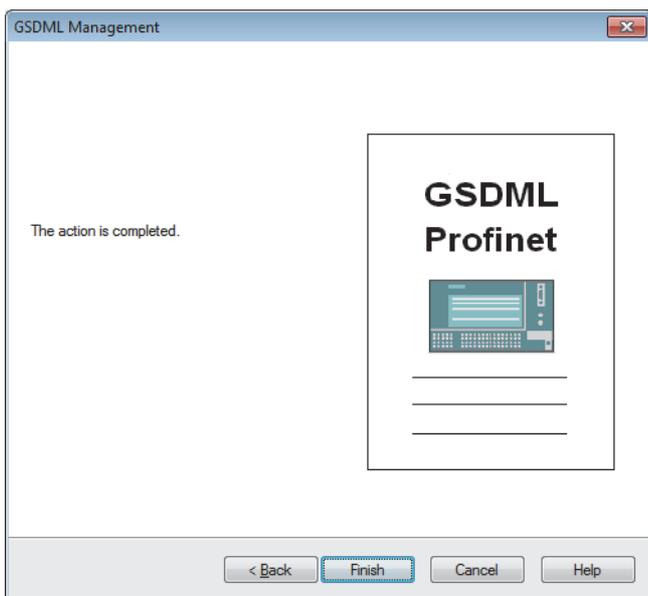
GSDML file information

The following window displays GSDML file information of IO devices.

👆 Select an IO device in "Device Library". ⇨ [Library] ⇨ [Properties]
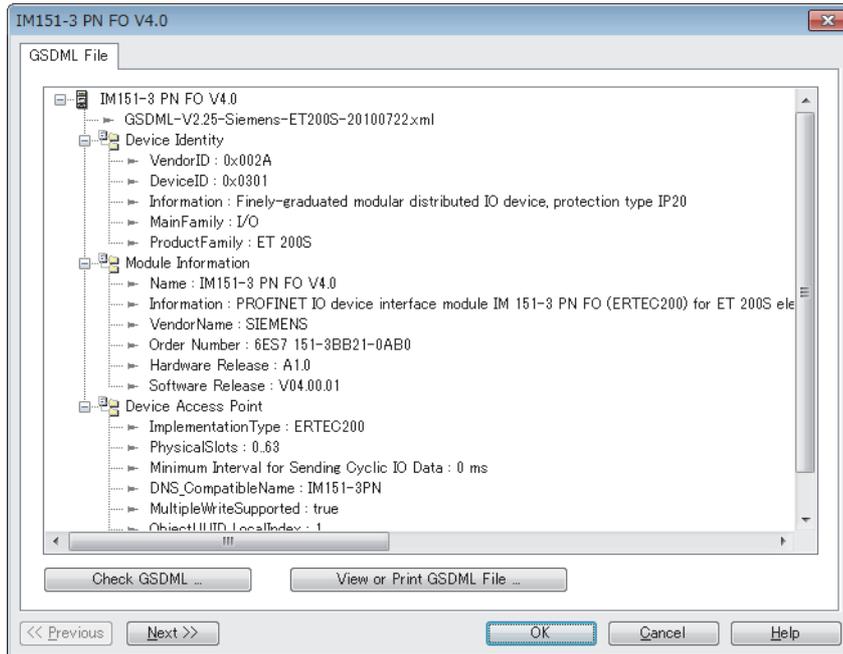
Item	Description
[Check GSDML] button	Opens the "Check GSDML" window. Click the [Check] button to check if the contents of the GSDML files comply with the PROFINET GSDML specifications.
[View or Print GSDML File] button	Displays GSDML file information in the text format.

Network Detection

"Network Detection" detects IO devices on the network and configures PROFINET settings online.

👆 Select the [Network Detection] tab. ⇨ [Network] ⇨ [Read Network Configuration]
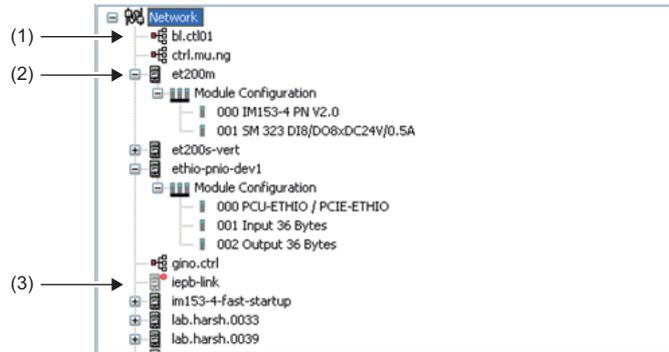
No.	Description
(1)	Indicates the RJ71PN92. Since the RJ71PN92 is not an IO device, it cannot be added in the network configuration settings.
(2)	When this IO device supports the non-connected type Acyclic communication (Implicit Read), slots and sub slots that configure the IO device are also displayed.
(3)	Since this IO device has an IP address in the class different from the RJ71PN92, it cannot be added in the network configuration settings.

When detecting IO devices on the network, note the following points.

- A name has been set to the IO device, and the name does not duplicate with other IO devices.[*1]
- An IP address has been set to the IO device, and the IP address does not duplicate with other IO devices.[*1]
- The GSDML file of each IO device has been added in "Device Library". (The PROFINET setting is based on the GSDML files. When the GSDML files have been added, the PROFINET setting cannot be configured.)[*2]

*1 Set names and IP addresses of the IO devices in the "Devices on the Network" window. (☞ Page 80 "Devices on the Network" window)

*2 Add GSDML files in the "GSDML Management" window. (☞ Page 74 Adding IO devices)

> **Point** 🖉
>
> Perform the action related to "Network Detection" when it is set online. For the operating procedure, refer to the following.
>
> ☞ Page 103 When adding IO devices online

Properties of an IO device

Display the properties of an IO device in "Network Detection".

👈 Select an IO device in "Network Detection". ⇨ [Network] ⇨ [Properties]
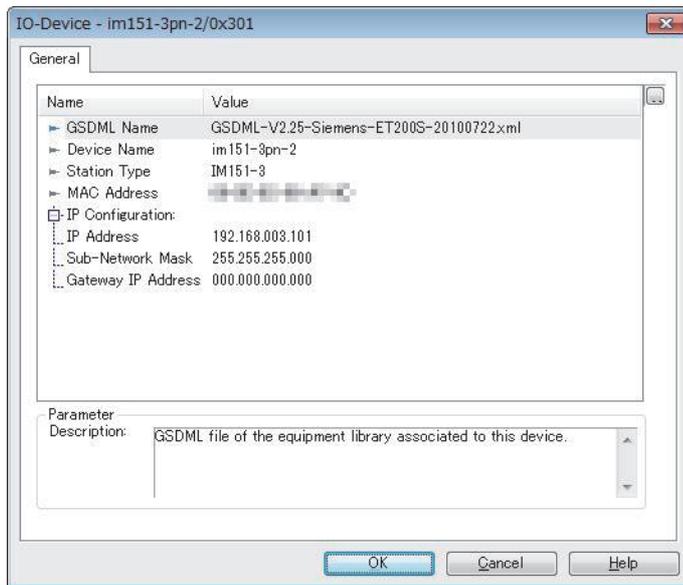
Item	Description
GSDML Name	Displays the GSDML filename of the IO device.
Device Name	Displays the name of the IO device.
Station Type	Displays the type of the IO device.
MAC Address	Displays the MAC address of the IO device.
IP Address	Displays the IP address (IPv4) of the IO device.
Sub-Network Mask	Displays the subnet mask of the IO device.
Gateway IP Address	Displays the gateway IP address of the IO device.
Description	Displays the description of the selected item.

"Devices on the Network" window

The "Devices on the Network" window detects IO devices on the network and sets the names of the IO devices and TCP/IP settings.

🖰 [Network] ⇨ [Online Action]

No.	Item	Description	Setting range
(1)	Number of Nodes on the Network	Displays the number of nodes detected by "Network Detection".	—
(2)	Network Nodes Table	Displays results of "Network Detection". This area displays the name, IP address, type, and MAC address of each IO device.	—
(3)	Scanning	Select whether or not to update "Network Nodes Table". • Selected: "Network Nodes Table" is updated every 3 seconds. • Not selected: "Network Nodes Table" is not updated.	• Selected • Not selected (Default: Selected)
(4)	MAC Address	Displays the MAC address of a selected IO device.	—
(5)	Device Type	Displays the type of a selected IO device.	—
(6)	[Factory Reset] button	Restarts a selected IO device with the factory default setting. "Request Status" displays execution results.	—
(7)	Name	Displays the name of a selected IO device. To rename the selected IO device, enter a new name and click the [Apply Name] button. "Request Status" displays execution results.	Up to 240 one-byte alphanumeric characters[*2] (Default: Name of the current IO device)
(8)	Permanent Name	Sets to save a new name of the IO device in the non-volatile memory or volatile memory of the IO device. • Selected: Saves a new name set in "Name" in the non-volatile memory of the IO device. Even when the IO device is restarted, the new name remains.[*3] • Not selected: Saves a new name set in "Name" in the volatile memory of the IO device. When the IO device is restarted, the new name is discarded and the default name is restored.	• Selected • Not selected (Default: Not selected)
(9)	Addressing Mode	Select one of the following modes. • DCP: The RJ71PN92 can change the TCP/IP settings of IO devices.[*1] • DHCP: Not supported in the RJ71PN92. • Local: Not supported in the RJ71PN92.	DCP (Default: DCP)
(10)	DHCP Based on	Not supported in the RJ71PN92.	—

No.	Item	Description	Setting range
(11)	Client Identifier	Not supported in the RJ71PN92.	—
(12)	IP Address	Displays the IP address of the selected IO device. When setting the IP address of the selected IO device, enter a new IP address and click the [Apply] button. "Request Status" displays execution results.	0.0.0.0 to 255.255.255.255 (Default: IP address of the current IO device)
(13)	Sub-Network Mask	Displays the subnet mask of the selected IO device. When setting the subnet mask of the selected IO device, enter a new subnet mask and click the [Apply] button. "Request Status" displays execution results.	0.0.0.0 to 255.255.255.255 (Default: Subnet mask of the current IO device)
(14)	Gateway IP Address	Displays the gateway IP address of the selected IO device. When setting the gateway IP address of the selected IO device, enter a new gateway IP address and click the [Apply] button. "Request Status" displays execution results.	0.0.0.0 to 255.255.255.255 (Default: Gateway IP address of the current IO device)
(15)	Permanent	Sets to save the TCP/IP setting of the IO device in the non-volatile memory or volatile memory of the IO device. • Selected: Saves the setting in the non-volatile memory of the IO device. When the IO device is restarted, the IP address, subnet mask, and gateway IP address set in (12) to (14) are used.[3] • Not selected: Saves the setting in the volatile memory of the IO device. When the IO device is restarted, the IP address, subnet mask, and gateway IP address are returned to the default.	• Selected • Not selected (Default: Not selected)
(16)	Blinking Test	Not supported in the RJ71PN92.	—
(17)	[Device Blinking] button	Opens the "Blinking Device" window and sends the Blink command to the selected IO device. The LED of the IO device that has received the Blink command flashes. Blinking Device The device is blinking. Click on the button to stop blinking. Stop Blinking	—
(18)	Request Status	Displays execution results of the operation performed in the "Devices on the Network" window.	—

*1 If the IP address set in GX Configurator-PN of the IO device and the actual IP address of the IO device are different, the RJ71PN92 overwrites the actual IP address with the IP address set in GX Configurator-PN.

*2 Characters from a to z, numbers from 0 to 9, "." (dot), and "-" (hyphen) can be used. "-" cannot be used at the beginning and end of the name.
The name can be separated by ".". The number of characters in each separated part is limited to 63 or less.

*3 This function may not be used depending on the IO device. For details, refer to the manual of the IO device.

Point

When IO devices on the network are detected on the "Devices on the Network" window, an execution request is sent from GX Configurator-PN via the RJ71PN92. Connect a personal computer in which GX Configurator-PN is installed, the RJ71PN92, and target IO device to the same network.

In addition, set the module parameters such as an IP address of GX Works3 and write them to the CPU module before IO device detection because the execution request is sent from GX Configurator-PN to the IP address of the RJ71PN92.

Network configuration settings

Check the IO device setting and the connection status.
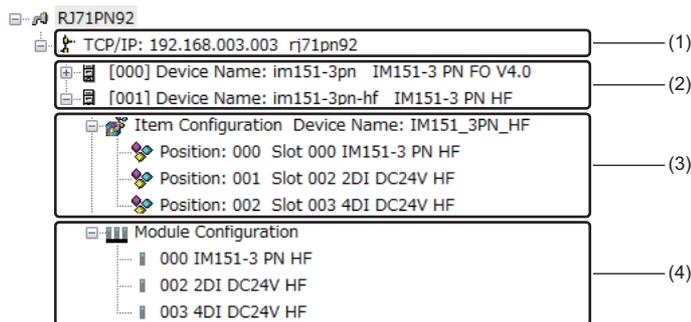
No.	Display area	Display example	Description
(1)	PROFINET IO controller display area	TCP/IP: 192.168.003.003 rj71pn92 (1) (2)	(1) IP address of the RJ71PN92 (2) Name of the RJ71PN92
(2)	IO device display area	[001] Device Name: im151-3pn-hf IM151-3 PN HF (1) (2) (3)	(1) IO device ID of the IO device (2) Name of the IO device[*1] (3) Product name of the IO device
(3)	Item display area	Item Configuration Device Name: IM151_3PN_HF Position: 000 Slot 000 IM151-3 PN HF (1) (2) (3) (4)	(1) Item number (2) Slot number of the module (3) Model name of the module (4) Name of the IO device[*2]
(4)	Module display area	Module Configuration 000 IM151-3 PN HF (1) (2)	(1) Slot number of the module (2) Model name of the module

*1 The name set for "Device Name" in the [General Configuration] tab in the IO device setting window

*2 The name set for "Name" in the [General Configuration] tab in the IO device setting window

"Channel Properties" window

Set the timer used for the PROFINET communications.

Perform the following actions to display this window.

☞ Select "RJ71PN92" in the network configuration settings. ⇨ [Devices] ⇨ [Properties]

Item			Description	Setting range
—		Send Clock Factor[*1]	Sets a send clock factor. The send clock factor is used to calculate Refresh Period of each IO device. (☞ Page 91 [Parameters] tab)	1 to 128 (Default: 32)
DCP		Request Time-out	Sets the timeout time of the DCP request. (Unit: s) This value is set as the timeout of the DCP identification request.	1 to 65 (Default: 3)
		Request Retry	Sets the number of resends after the timeout of the DCP request. (Unit: times)	0 to 65535 (Default: 2)
RTA		Request Time-out	Sets the timeout time of the RTA request. (Unit: ×100ms)	1 to 65535 (Default: 3)
		Request Retry	Sets the number of resends after the timeout of the RTA request. (Unit: times)	3 to 15 (Default: 3)
RPC	Client	Maximum Number of Ping[*1]	Sets the number of executions of PING during a wait for a response. (Unit: times)	2 to 10 (Default: 3)
		Maximum Number of Resend[*1]	Sets the number of resends of the RPC frame. (Unit: times)	2 to 10 (Default: 3)
		Time-out on CANCEL Request[*1]	Sets the timeout time of the RPC cancel request. (Unit: ms)	100 to 10000 (Default: 1000)
		Time-out on Fragment Acknowledge[*1]	Sets the timeout time of the ACK request of RPC. (Unit: ms)	100 to 10000 (Default: 2000)
		Time-out Before Sending First Ping[*1]	Sets the timeout time of the PING execution of RPC. (First time) (Unit: ms)	100 to 10000 (Default: 2000)
		Time-out Before Resending Ping[*1]	Sets the timeout time of the PING execution of RPC. (Second time or later) (Unit: ms)	100 to 10000 (Default: 2000)
	Server	Maximum Number of Resending[*1]	Sets the number of resends of the RPC message before detection of an error. (Unit: times)	2 to 10 (Default: 3)
		Time-out Before Resending[*1]	Sets the waiting time before resending a message. (Unit: ms)	100 to 10000 (Default: 2000)
—		Description	Displays the description of the selected item.	—

*1 This item can be set when "Advanced Mode" is selected. (☞ Page 70 File)

"Display Option" window

The display of the IO devices in the network configuration settings can be changed.

Perform the following actions to display this window.

🖰 [Devices] ⇨ [Options]
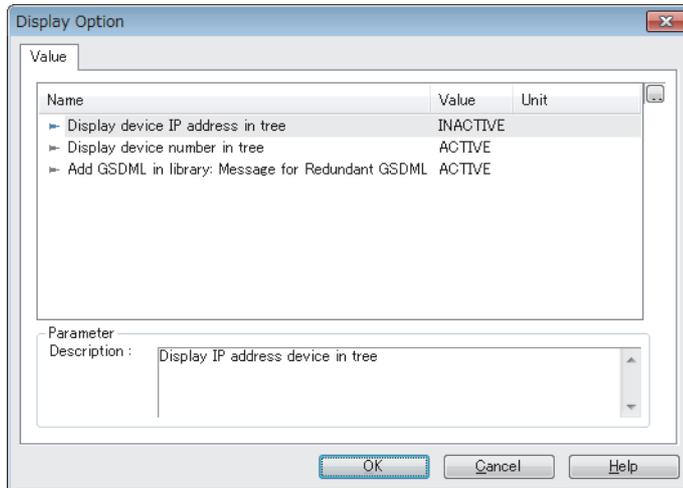
Item	Description	Setting range
Display device IP address in tree	Displays the IP address of each IO device in the tree of the network configuration settings when "ACTIVE" is selected.	• ACTIVE • INACTIVE (Default: INACTIVE)
Display device number in tree	Displays the IO device ID of each IO device in the tree of the network configuration settings when "ACTIVE" is selected.	• ACTIVE • INACTIVE (Default: ACTIVE)
Add GSDML in library: Message for Redundant GSDML	Displays the following message when a GSDML file is added and the same GSDML file exists when "ACTIVE" is selected. When "INACTIVE" is selected, the message is not displayed. When the same GSDML file already exists regardless of the selection of "ACTIVE" or "INACTIVE", the GSDML file is not added in "Device Library".	• ACTIVE • INACTIVE (Default: ACTIVE)
Parameter Description	Displays the description of the selected item.	—

IP address management window

Set the IP address and other items of the RJ71PN92.

Perform the following actions to display this window.

🖝 Select the PROFINET IO controller display area in the network configuration settings. ⇨ [Devices] ⇨ [Properties]

■[General] tab

This tab displays the address settings of the RJ71PN92.

Set the address of the RJ71PN92 with the module parameter of GX Works3. (☞ Page 56 Basic Setting)
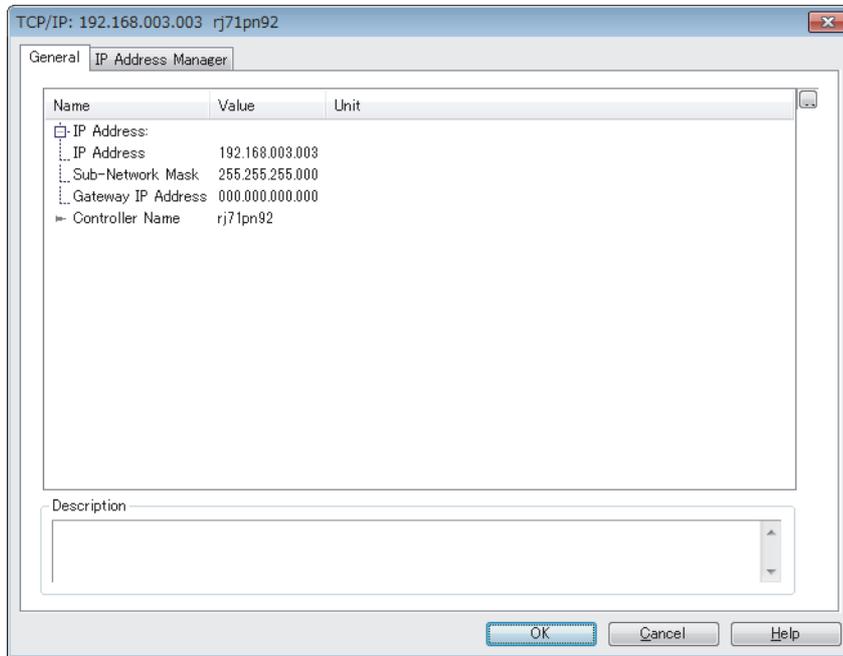
Item	Description	Setting range
IP Address	Displays the IP address of the RJ71PN92.	—
Sub-Network Mask	Displays the subnet mask of the RJ71PN92.	—
Gateway IP Address	Displays the gateway IP address of the RJ71PN92.	—
Controller Name	Displays the name of the RJ71PN92.	—

■[IP Address Manager] tab

This tab manages the IP address assignment to the connected IO devices on PROFINET.

When this setting is enabled, the IP address of each IO device is automatically assigned within the set IP address range.

To change the settings, select "Enable this Service".

Item		Description	Setting range
Enable this Service		Enables the "IP Address Manager" setting when this item is selected.	• Not selected • Selected (Default: Not selected)
Address Ranges		Adds an IP address range. When IO devices are added in the current network configuration settings, IP addresses are assigned to them within this range. Set the IP address range by using the following buttons. • ▤ button: Creates a new address range. • 🔍 button: Edits the address range selected in the list. • ✖ button: Deletes the address range selected in the list.	0.0.0.1 to 223.255.255.254[*1] (Default: Refer to the following.) • Beginning IP Address: 192.168.3.1 • End IP Address: 192.168.3.255
Sub-Network Mask		Displays the subnet mask of the RJ71PN92.	—
Gateway IP Address		Displays the gateway IP address of the RJ71PN92.	—
Address Assignments	—	Reserves IP addresses for IO devices. This setting is used when the IP addresses of IO devices need to be fixed.	—
	[Scan] button	Searches the list of IO devices on PROFINET.	
	Assignments from Network	Clicking the [Scan] button searches IO devices on PROFINET, acquires Device Name, MAC Address, and IP Address, and displays them.	
	⬇ button	Adds the list displayed in "Assignments from Network" to "Configured Assignments".	
	Configured Assignments	Displays the information (Device Name and IP Address) of the RJ71PN92 and IO devices set in the [IP Address Manager] tab. Set this item by using the following buttons. • ▤ button: Adds an IO device name and IP address. • 🔍 button: Edits a selected item. • ✖ button: Deletes a selected item.	• Device Name: Up to 240 one-byte alphanumeric characters[*2] • IP Address: 0.0.0.1 to 223.255.255.254[*1] (Default: Refer to the following.) • Device Name: rj71pn92 • IP Address: 192.168.3.3

*1   The network part of the IP address is determined by the IP address setting of the RJ71PN92. (☞ Page 56 Basic Setting)

*2   Characters from a to z, numbers from 0 to 9, "." (dot), and "-" (hyphen) can be used. "-" cannot be used at the beginning and end of the name.
The name can be separated by ".". The number of characters in each separated part is limited to 63 or less.
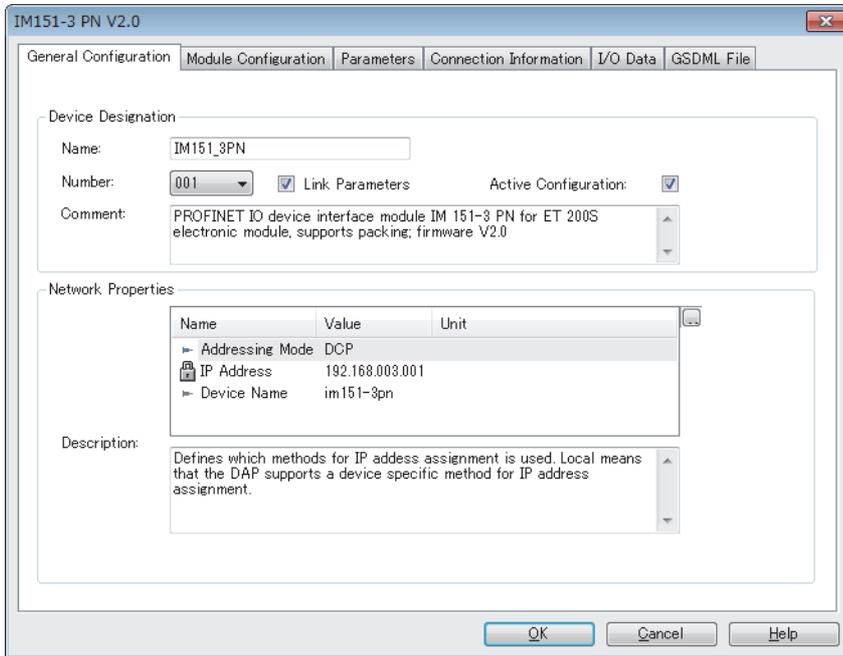
IO device setting window

Set the IO device parameter.

☞ Select the IO device display area in the network configuration settings. ➪ [Devices] ➪ [Properties]

■[General Configuration] tab

Set the parameters such as an IO device name and IP address.

Item	Description	Setting range
Name	Sets a name to be managed in GX Configurator-PN.	Up to 50 characters (Default: Name of the current IO device)
Number	Sets an IO device ID.[*1] Users can select an IO device ID from the list of IO device IDs that have not yet been set.	000 to 127 (Default: 4th octet number of the IP address set as an IO device ID)
Link Parameters	Enables or disables the link of the IP address of an IO device and IO device ID. • Selected: Enabled • Not selected: Disabled Enable this item when the IO device ID needs to be linked with the station No. (fourth octet) of the IP address.	• Not selected • Selected (Default: Selected)
Active Configuration	Enables or disables the IO device setting of the RJ71PN92. • Selected: Enabled • Not selected: Disabled Disable this item when the IO device setting needs to be deleted from the RJ71PN92 with the setting in GX Configurator-PN held.	• Not selected • Selected (Default: Selected)
Comment	Displays the comment input field. Information about the IO device is described with the default setting.	Up to 255 characters (Default: Information about the current IO device)
Addressing Mode	Sets a method of acquiring the IP address setting. Selectable methods vary depending on the IO device. When the IO device does not support a method, the method is not included in options. • DCP: Sets the IP address specified in "IP Address" at the I/O data communication start. • DHCP: Sets the IP address of the IO device acquired from the DHCP server at the I/O data communication start. • LOCAL: Not supported in the RJ71PN92.	• DCP • DHCP • LOCAL (Default: DCP)
IP Address	Sets the IP address of the IO device. When a mode other than "DCP" is set in "Addressing Mode", the IP address of the IO device may not match the specified IP address. Check the IP address and change the setting as required.	1.0.0.0 to 223.255.255.255 (Default: IP address of the current IO device)

Item	Description	Setting range
Device Name	Sets an IO device name used for the PROFINET communications. This name should be the same with the name set on the "Devices on the Network" window in GX Configurator-PN. (☞ Page 80 "Devices on the Network" window)	Up to 240 one-byte alphanumeric characters[*2] (Default: Name of the current IO device)
Description	Displays the description of the selected item.	—

*1 IO device IDs are used to manage IO devices.
   When buffer memory areas are used and their bits need to be specified for each IO device, the specified bits are used to distinguish each IO device.
*2 Characters from a to z, numbers from 0 to 9, "." (dot), and "-" (hyphen) can be used. "-" cannot be used at the beginning and end of the name.
   The name can be separated by ".". The number of characters in each separated part is limited to 63 or less.

Point

When an IO device has been added by "Network Detection", its IP address and name are registered automatically. When an IO device has been added from "Device Library", manually enter its IP address and name.

For the operations on "Network Detection" and "Device Library", refer to the following.

☞ Page 78 Network Detection

☞ Page 73 Device Library

■**[Module Configuration] tab**

Set the module of the IO device.

> *Point*
>
> When an IO device has been added by "Network Detection", a module is registered automatically in "Configured Modules". When an IO device has been added from "Device Library", refer to this section and add a module.

Item	Description	Setting range
Available Modules	Lists modules corresponding to the IO devices. This list varies depending on the IO device. Select a module and click the ➡ button to add the module in the list of "Configured Modules". (When the module is added in the list by a drag-and-drop operation, it can be added in a desired slot.)	—
Display Order Number	Selects a method of displaying modules in "Available Modules" and "Configured Modules". • Not selected: Models are displayed by model name. • Selected: Models are displayed by order number.	• Not selected • Selected (Default: Not selected)
Configured Modules	Sets the modules of the IO device by "Slot" number. Select a module and edit it with the following buttons. • 🔍 button: Opens the "Module Configuration" window. • ⬆ button: Moves up the selected module. • ⬇ button: Moves down the selected module. • ❌ button: Deletes the selected module.	—

• "Module Configuration" window

[Parameters] tab

Set the parameters of the module. Setting items of a parameter vary depending on the module.
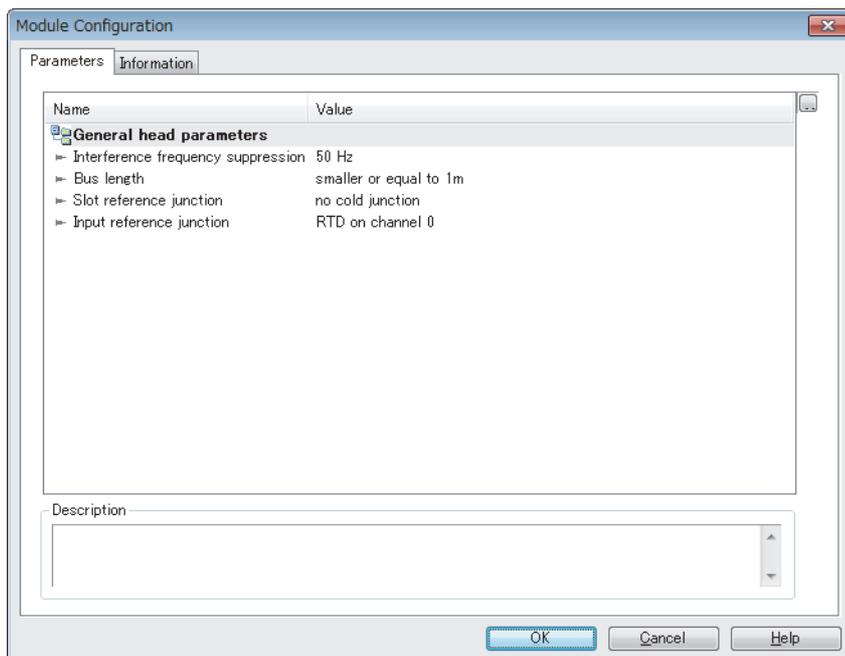
[Information] tab

This tab displays module information.
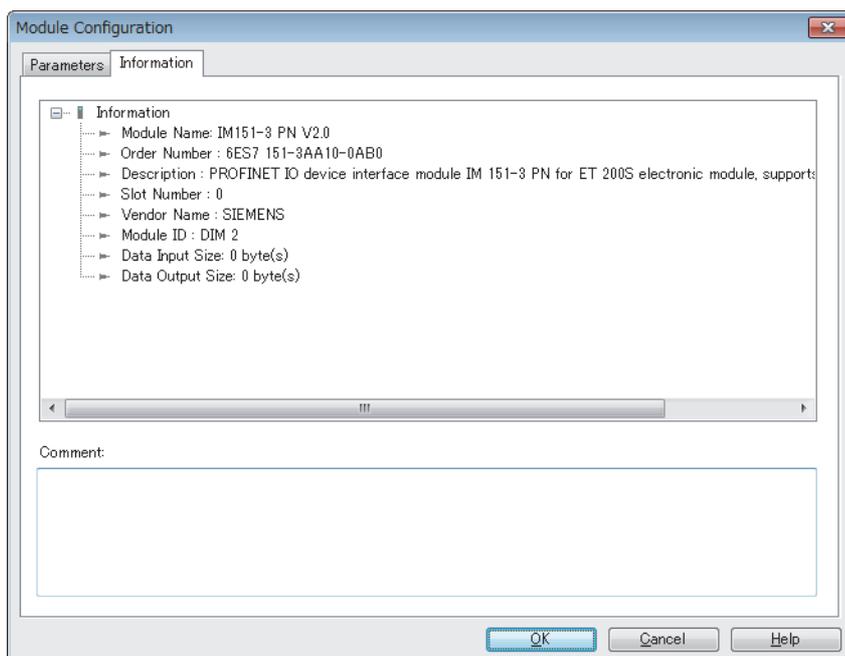
Item	Description	Setting range
Information	Displays module information. Items to be displayed vary depending on the module.	—
Comment	Displays the comment input field for the module.	Up to 30000 characters (Default: Blank)

■[Parameters] tab

Set the parameter specific to the IO device.

Item	Description	Setting range
Refresh Period	Sets the sending interval and receiving interval of the I/O data exchange. (Unit: ms)	• 1 • 2 • 4 • 8 • 16 • 32 • 64 • 128 • 256 • 512 (Default: 16)[2]
Device Data Order	Sets the order to store IO device data. • Big Endian: Stores the data in order from the upper byte to lower byte. • Little Endian: Stores the data in order from the lower byte to upper byte.	• Big Endian • Little Endian (Default: Big Endian)
Watchdog Factor	Sets the number of elements used to calculate the timeout time for sending and receiving data in the I/O data exchange. The timeout time is calculated by the following calculation formula and displayed in "Watchdog". Timeout time = Value set in "Refresh Period" × Value set in "Watchdog factor"	3 to 255 (Default: 3)
Watchdog	Displays the timeout time for sending and receiving data in the I/O data exchange. (Unit: ms)	—
Initiator Activity Time-out[1]	Sets the timeout time of the communication with the RJ71PN92 in increments of 100ms. (Unit: ×100ms)	1 to 1000 (Default: 1)
Remote Application Time-out[1]	Sets the timeout of the RPC call in units of seconds. (Unit: s)	1 to 65535 (Default: 300)
Description	Displays the description of the selected item.	—

*1   This item can be set when "Advanced Mode" is selected. (☞ Page 70 File)
*2   This value is for when the value set in "Send Clock Factor" in the "Channel Properties" window is 32. The setting range of "Refresh Period" varies depending on the setting of "Send Clock Factor" in the "Channel Properties" window. (☞ Page 83 "Channel Properties" window)
    The setting range is calculated by the following calculation formula.
    "Refresh Period" value = "Send Clock Factor" value × 31.25µs × Fixed value
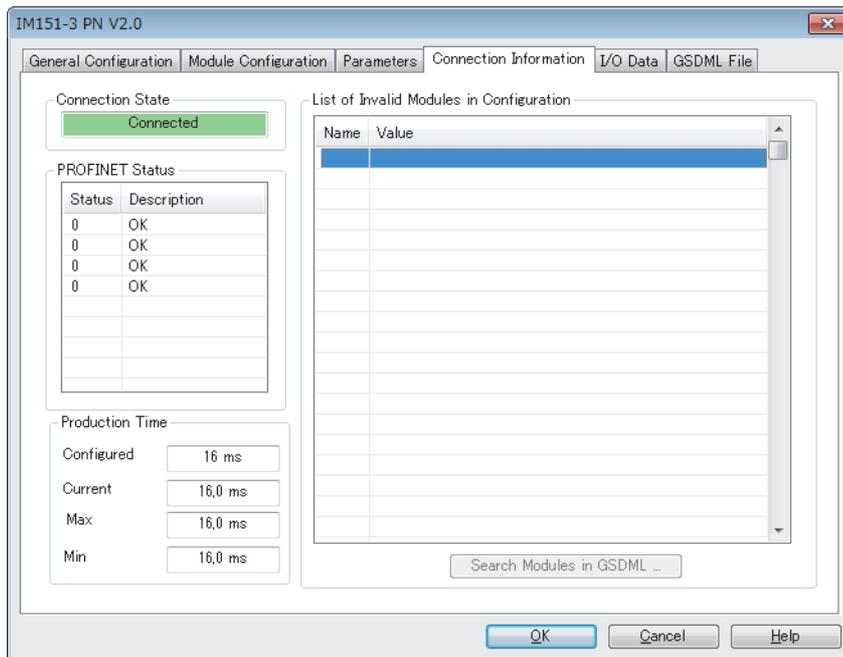
Ex.

The following table lists the setting ranges of "Refresh Period" for when the value set in "Send Clock Factor" is 32.

Fixed value	"Refresh Period" value
1	1ms
2	2ms
4	4ms
8	8ms
16	16ms
32	32ms
64	64ms
128	128ms
256	256ms
512	512ms

■[Connection Information] tab

This tab displays the online status information of the IO device.
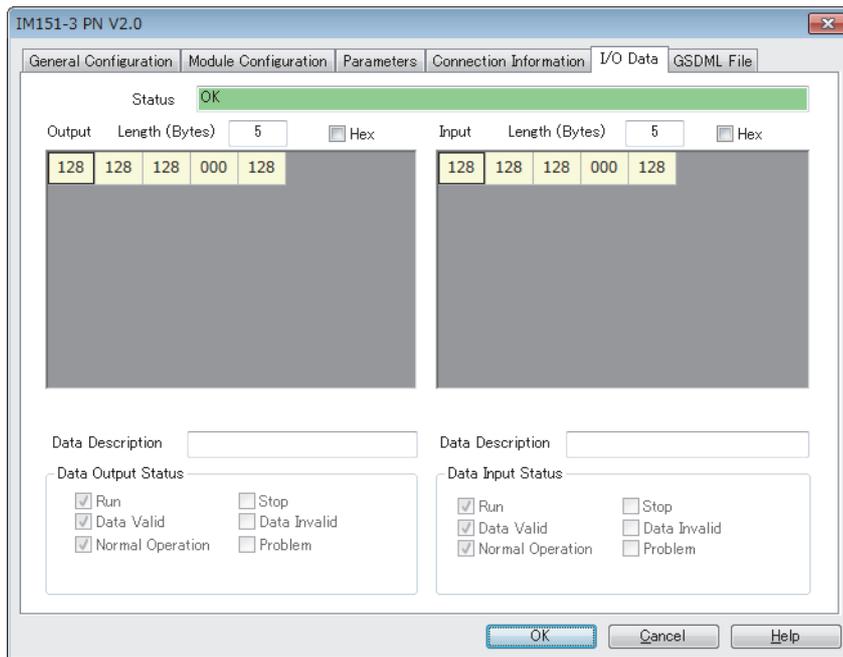
This tab can be used when diagnostic mode is enabled. (☞ Page 72 Devices)

Item	Description	Setting range
Connection State	Displays the connection status between the RJ71PN92 and IO device.	—
PROFINET Status	Displays the PROFINET status. • Status: Displays the status number. • Description: Displays the description corresponding to the status number. The values to be displayed are defined according to the PROFINET standard.	—
List of Invalid Modules in Configuration	Displays mismatched module information when the configuration of the IO devices set in GX Configurator-PN and the configuration of the actually connected IO devices are different. If the module information is displayed in the list, check the configuration of the IO devices set in GX Configurator-PN. The following items are displayed in this list. • Configured identification Number: Displays the ID numbers of the modules. • Real identification Number: Displays the ID numbers of the modules of the actually connected IO devices. • Module state: Displays the current status of each module of the actually connected IO device.	—
[Search Modules in GSDML] button	Searches the information about mismatched modules detected in "List of Invalid Modules in Configuration" from GSDML files and displays it on the Web browser.	—
Production Time	Displays the following information. • Configured: Set I/O data exchange cycle • Current: Actual I/O data exchange cycle • Max: Maximum value of the I/O data exchange cycle after the start of communications • Min: Minimum value of the I/O data exchange cycle after the start of communications	—

■[I/O Data] tab

This tab displays the I/O data status of the IO device.

This tab can be used when diagnostic mode is enabled. (☞ Page 72 Devices)

Item	Description	Setting range
Status	Displays the connection status between the RJ71PN92 and IO device. For detailed status, refer to the [Connection Information] tab. (☞ Page 93 [Connection Information] tab)	—
Output	Displays output values of the IO device.[*1]	—
Input	Displays input values of the IO device.[*1]	—
Data Description	Not supported in the RJ71PN92.	—
Data Output Status	Displays the status (APDU status) of the output (send) frame of the I/O data exchange. ■Run/Stop Displays the RUN state or STOP state of the IO device. When the RJ71PN92 is in the STOP state, IO device data cannot be sent and received. ■Data Valid/Data Invalid Displays if the I/O data of the IO device is enabled or disabled. When the data is disabled, the IO device stops the connection. ■Normal Operation/Problem This tab displays the I/O data status of the IO device. When the data has a problem, the IO device stops the connection.	—
Data Input Status	Displays the status (APDU status) of the input (receive) frame of the I/O data exchange. For details, refer to the description of "Data Output Status".	—

*1 The actual I/O data information including IOPS and IOCS is displayed in "Output" and "Input". To check the output value and input value excluding IOPS and IOCS, check the following buffer memory areas.
'Output data area' (Un\G31000 to Un\G35095)
'Input data area' (Un\G36000 to Un\G40095)

■[GSDML File] tab

This tab displays GSDML file information.
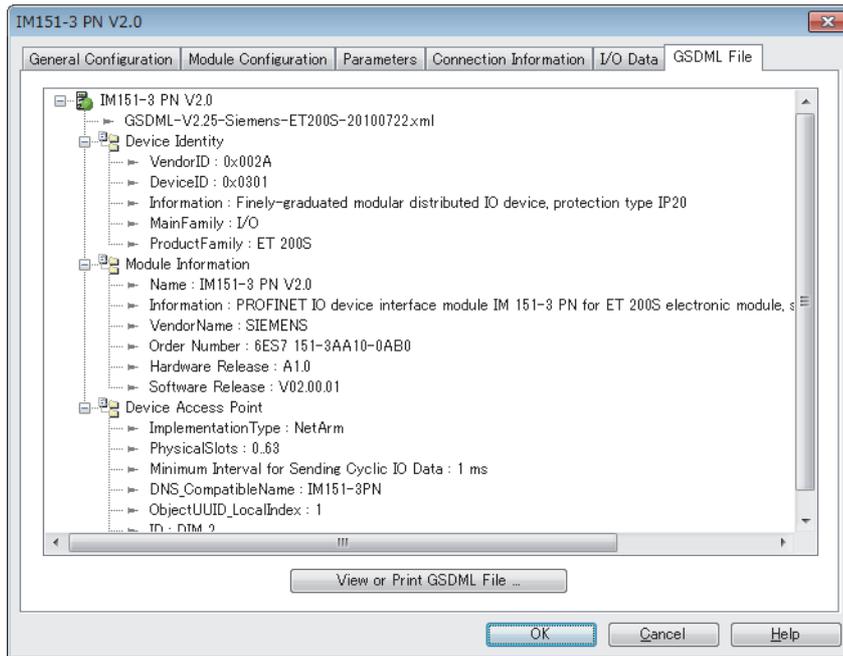
Item	Description	Setting range
[View or Print GSDML File] button	Displays GSDML file information in the text format. This button is the same as the [View or Print GSDML File] button for the GSDML file information of an IO device in "Device Library". (☞ Page 77 GSDML file information)	—

List of items

I/O data of IO devices is stored in multiple blocks called items.

> **Point**
>
> An item name is preset for each item. When IO devices are added in GX Configurator-PN and PROFINET labels are updated in the engineering tool, the global label names of the following buffer memory addresses will be the item names of the registered IO devices.
> - 'Output data area' (Un\G31000 to Un\G35095)
> - 'Input data area' (Un\G36000 to Un\G40095)
>
> For how to update PROFINET labels, refer to the following.
> ☞ Page 65 Updating PROFINET Labels

Select the item display area in the network configuration settings to display the list of item parameters.
For the display of the item parameters, the contents vary depending on module types of IO devices. Thus, some item parameters may not be displayed depending on module types.

Input Item Name	Data type	Offset/device	Offset/module	Bit in the byte	Word Offset in Inputs
8 SLOT007_I_CHANNEL_0	Input byte	42	0		22
● SLOT007_BIT_0	Input bit	42	0	0	22
● SLOT007_BIT_1	Input bit	42	0	1	22
● SLOT007_BIT_2	Input bit	42	0	2	22
● SLOT007_BIT_3	Input bit	42	0	3	22
● SLOT007_BIT_4	Input bit	42	0	4	22
● SLOT007_BIT_5	Input bit	42	0	5	22
● SLOT007_BIT_6	Input bit	42	0	6	22
● SLOT007_BIT_7	Input bit	42	0	7	22
● SLOT007_BIT_0A	Input bit	43	1	0	22
8 SLOT007_I_CHANNEL_1	Input byte	43	1		22

Output Item Name	Data type	Offset/device	Offset/module	Bit in the byte	Word Offset in Outputs
8 SLOT007_O_CHANNEL_0	Output byte	40	0		20
● SLOT007_BIT_1D	Output bit	40	0	1	20
● SLOT007_BIT_2D	Output bit	40	0	2	20
● SLOT007_BIT_3D	Output bit	40	0	3	20
● SLOT007_BIT_4D	Output bit	40	0	4	20
● SLOT007_BIT_5D	Output bit	40	0	5	20
● SLOT007_BIT_6D	Output bit	40	0	6	20
● SLOT007_BIT_7D	Output bit	40	0	7	20

Tree panel:
- RJ71PN92
  - TCP/IP: 192.168.003.003 rj71p
    - [000] Device Name: im151
    - [001] Device Name: im151
      - Item Configuration Dev
        - Position: 000 Slot 00
        - Position: 001 Slot 00
        - Position: 002 Slot 00
        - Position: 003 Slot 00
        - Position: 004 Slot 00
        - Position: 005 Slot 00
        - Position: 006 Slot 00
        - Position: 007 Slot 00
        - Position: 008 Slot 00
        - Position: 009 Slot 01
        - Position: 010 Slot 01
      - Module Configuration
        - 000 IM151-3 PN HF
        - 002 2DI DC24V HF
        - 003 4DI DC24V HF
        - 004 1 SI Modbus Slav
        - 005 1 SSI
        - 006 PM-E DC24V

"Item Properties" window

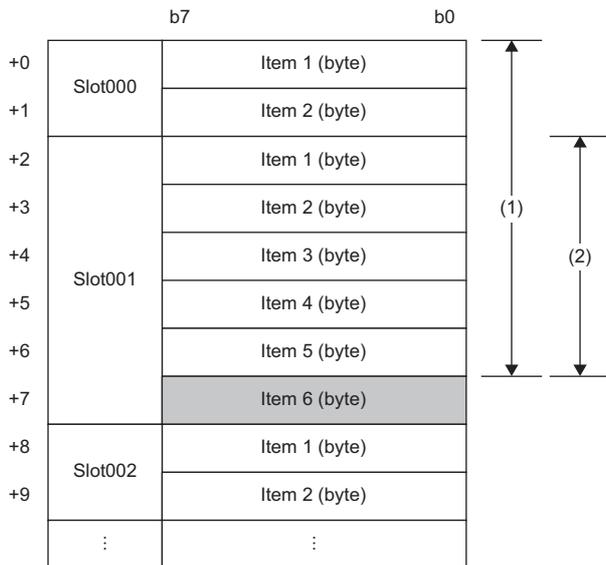This window displays item parameters individually, and items can be renamed.
Perform the following actions to display this window.

🖰 Select the item display area in the network configuration settings. ⇨ Select an item name in the list of items. ⇨ [Items] ⇨ [Properties]
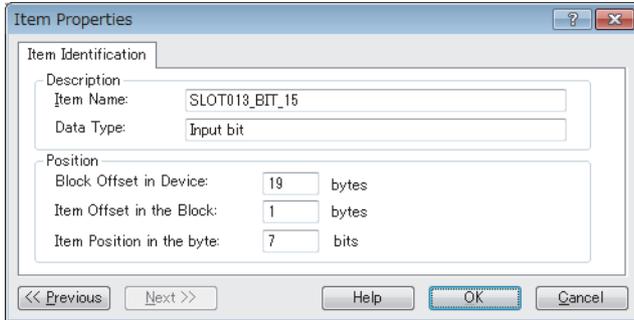
Item	Description	Setting range
Item Name	Displays and sets an item name.	Up to 32 characters (Default: Current item name)
Data Type	Displays the data type of an item.	—
Block Offset in Device	Displays the offset value from the start I/O data area of the IO device to the item in units of bytes.[1]	—
Item Offset in the Block	Displays the offset value of the item in the slot in units of bytes.[1]	—
Item Position in the byte[2]	Displays where the item is located from the start byte data in units of bytes.	—

[1] When Item 6 in Slot001 of the input data area is indicated, "Block Offset in Device" displays 7 and "Item Offset in the Block" displays 5. The following figure shows the image of "Block Offset in Device" and "Item Offset in the Block".

	b7		b0	
+0	Slot000	Item 1 (byte)		
+1		Item 2 (byte)		
+2	Slot001	Item 1 (byte)		
+3		Item 2 (byte)		(1)
+4		Item 3 (byte)		(2)
+5		Item 4 (byte)		
+6		Item 5 (byte)		
+7		Item 6 (byte)		
+8	Slot002	Item 1 (byte)		
+9		Item 2 (byte)		
⋮		⋮		

(1) Offset from the start input data area to Item 6 (7 bytes)
(2) Offset of Item 6 in Slot001 (5 bytes)

[2] This item is displayed only when "Data Type" is set to "Input bit" or "Output bit".

"Items Declaration" window

The item configuration can be changed in this window. The changed configuration is reflected to the global labels related to the I/O data exchange.

Perform the following actions to display this window.

🖱 Select the item display area in the network configuration settings. ⇨ [Devices] ⇨ [Properties]
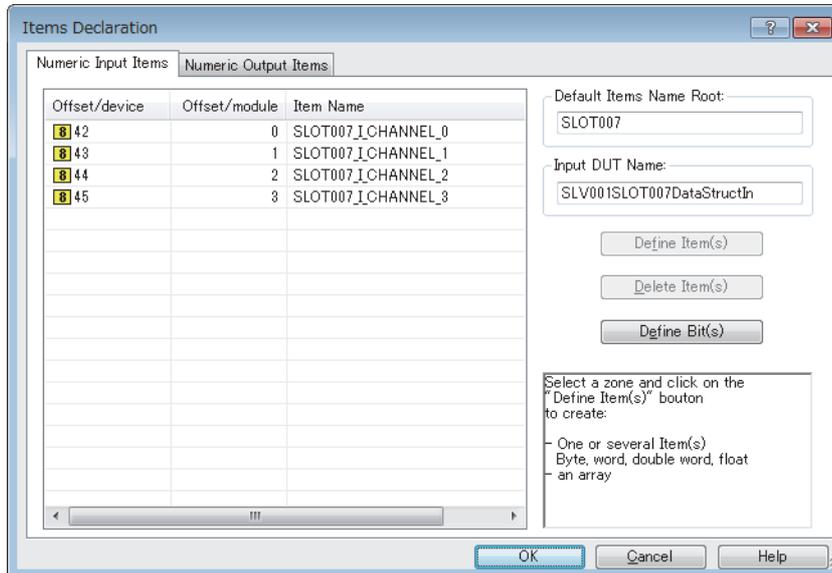
Item		Description	Setting range
[Numeric Input Items] tab	—	Displays items in the input data area.	—
	Offset/device	Displays the offset value from the start I/O data area of the IO device to the item in units of bytes.	—
	Offset/module	Displays the offset value of the item in the slot in units of bytes.	—
	Item Name	Displays the name of an item.	—
	Default Items Name Root	Sets the prefix for item names.	None (Default: SLOT<nnn>) A slot number in the IO device is put in <nnn>.
	Input DUT Name	Displays and sets the structure name.	Up to 32 characters (Default: Current structure name)
	[Define Item(s)] button	Displays the "Item Name Definition" window. (📖 Page 99 "Item Name Definition" window)	—
	[Delete Item(s)] button	Deletes selected items.	—
	[Define Bit(s)] button	Displays the "Items Declaration" window. (📖 Page 101 "Items Declaration" window)	—
[Numeric Output Items] tab	—	Displays items in the output data area. Set the items other than the following in the same way as the [Numeric Input Items] tab.	—
	Output DUT Name	Displays and sets the structure name.	Up to 32 characters (Default: Current structure name)

■"Item Name Definition" window

Set the name and data type of the item.

Item	Description	Setting range
New Item(s) Data Type	Selects a data type of the item.	• Byte(8bits) • Word(16bits) • Dword(32bits) • IEEE float (Default: Byte(8bits))
Define Selected Area As	Selects whether or not to set the array type as the data type of the item.	• One or Several Single Item(s) • One Item of Array Type (Default: One or Several Single Item(s))
Item Name	Renames the item. The setting is reflected in "Item Name" of the "Items Declaration" window.	Up to 32 characters (Default: Current item name)

Restriction

Note that the position of the memory area may change when the data type of an item is changed.

The following data types are assigned consecutively to the memory areas in increments of 16 or 32 bits.

Insert padding so that the data type assignment always starts from a word boundary even though the data type is changed.

- WORD type (Word [unsigned]/Bit string [16 bits])
- DWORD type (Double word [unsigned]/Bit string [32 bits]
- REAL type (Single-precision real number)

Before change

					Label assignment										
b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Word															
Word															
Word															
Dword															
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

On a word boundary

After change

					Label assignment										
b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
								Word→Byte							
Word															
Dword															
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Insert the padding of 8bits.
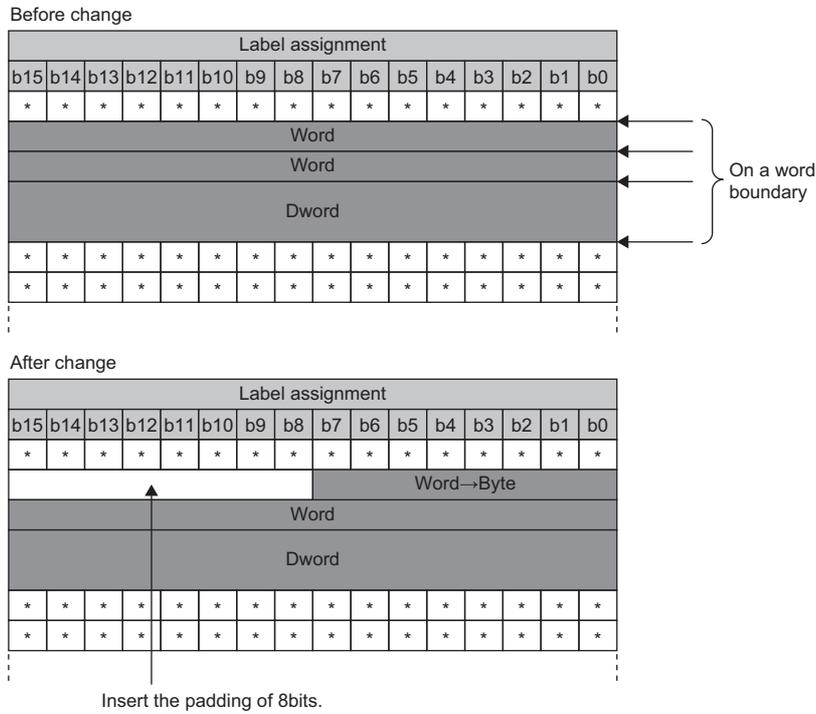
When the padding is inserted, the size of I/O data needs to be changed in the I/O data exchange. Check and correct the refresh settings of both the CPU module and the RJ71PN92.

■"Items Declaration" window

Set items in units of bits.

Information to be displayed varies depending on the item type.

 • Discrete Input Items: Displays items in the input data area.
 • Discrete Output Items: Displays items in the output data area.
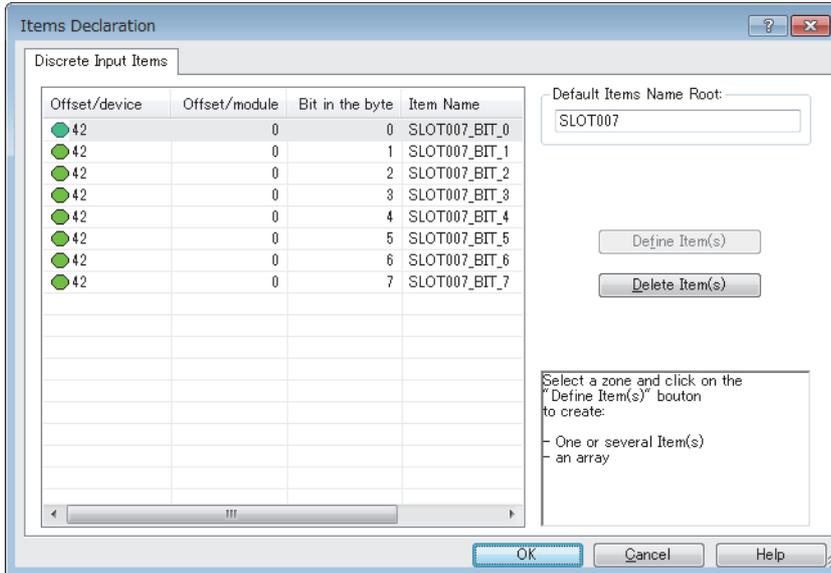
Item	Description	Setting range
Default Items Name Root	Sets the prefix for item names.	None (Default: SLOT<nnn>) A slot number in the IO device is put in <nnn>.
[Define Item(s)] button	Displays the "Item Name Definition" window.	—
[Delete Item(s)] button	Deletes selected items.	—

The following table lists the setting items in the "Item Name Definition" window.
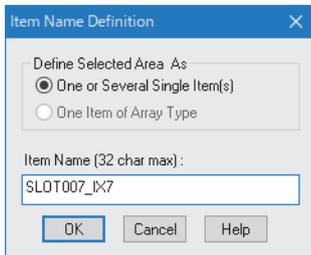
Item	Description	Setting range
Define Selected Area As	Selects whether or not to set the array type as the data type of the item.	• One or Several Single Item(s) • One Item of Array Type (Default: One or Several Single Item(s))
Item Name	Renames the item. The setting is reflected in "Item Name" of the "Items Declaration" window.	Up to 32 characters (Default: Current item name)

List of operation information

This list displays the operations performed in GX Configurator-PN and error messages.

Date / Time	Level	Event
09/23/16 10:24:33	Information	The device library has been updated with GSDML files needed to the configuration.
09/23/16 13:23:47	Information	Normal mode

"Output Message View Configuration" window

Set the information to be displayed in the list of operation information.

Perform the following actions to display this window.

🖱 [File] ⇨ [Message View] ⇨ [Configuration]
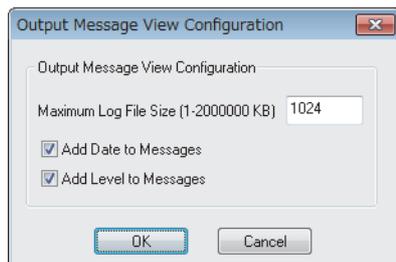
Item	Description	Setting range
Maximum Log File Size	Sets the maximum size of a log file. (Unit: KB)	1 to 2000000 (Default: 1024)
Add Date to Messages	Displays the date as a column item in the list of operation information.	• Not selected • Selected (Default: Selected)
Add Level to Messages	Displays the classification as a column item in the list of operation information.	• Not selected • Selected (Default: Selected)

3.2   Procedure of Registering IO Devices

This section describes the procedure of adding IO devices in the PROFINET setting. IO devices can be added both online and offline.

When adding IO devices online

When adding IO devices online, meet the following conditions. If an IO device name and IP address do not meet the conditions, set them again in the "Devices on the Network" window. (☞ Page 80 "Devices on the Network" window)

 • The RJ71PN92 and IO devices have been connected to the network.
 • A name has been set to the IO device, and the name does not duplicate with other IO devices.
 • An IP address has been set to the IO device, and the IP address does not duplicate with other IO devices.

1. Add the IO devices used in "Device Library". (☞ Page 74 Adding IO devices)

2. Detect the IO devices on the network. (☞ Page 78 Network Detection)

🖱 Select the [Network Detection] tab. ⇨ [Network] ⇨ [Read Network Configuration]

3. Add the detected IO devices in the network configuration settings.
When adding IO devices one by one

🖱 Select an IO device in "Network Detection". ⇨ [Network] ⇨ [Insert in Configuration]
When adding IO devices at once

🖱 Select the [Network Detection] tab. ⇨ [Network] ⇨ [Insert and Replace All]

> **Point**
>
> • When IO devices are added one by one to the network configuration setting, "Device Name" which is set in the detected IO device is registered to "Name" in the IO device setting window.
> • When IO devices are added at once to the network configuration setting, "Name" in the IO device setting window is registered in the format as "DEVICE_A" or "DEVICE_B".

When adding IO devices offline

When adding IO devices offline, the PROFINET setting can be configured without the RJ71PN92 and IO devices. However, check the names of the IO devices used and the network configuration in advance.

1. Add the IO devices used in "Device Library". (☞ Page 74 Adding IO devices)

2. Add IO devices in the network configuration settings.

👆 Select IO devices in "Device Library". ⇨ [Library] ⇨ [Insert in Configuration]

3.3 GX Configurator-PN Backup File

A backup file that contains the saved PROFINET module setting can be created in GX Configurator-PN.

Backup with GX Works3

The PROFINET module setting which is set with GX Works3 can be exported as a backup file and imported to another project. This operation allows users to use the PROFINET module setting in another project.
The extension of the backup file is ".mit".

Operating procedure

The following describes the procedures of importing and exporting a backup file.

■Exporting a backup file (Export GX Configurator-PN Backup File)

1. Click "Export GX Configurator-PN Backup File".

👆 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ Right-click ⇨ [Export GX Configurator-PN Backup File]

2. Set a file name, select the save destination, and click the [Save] button.
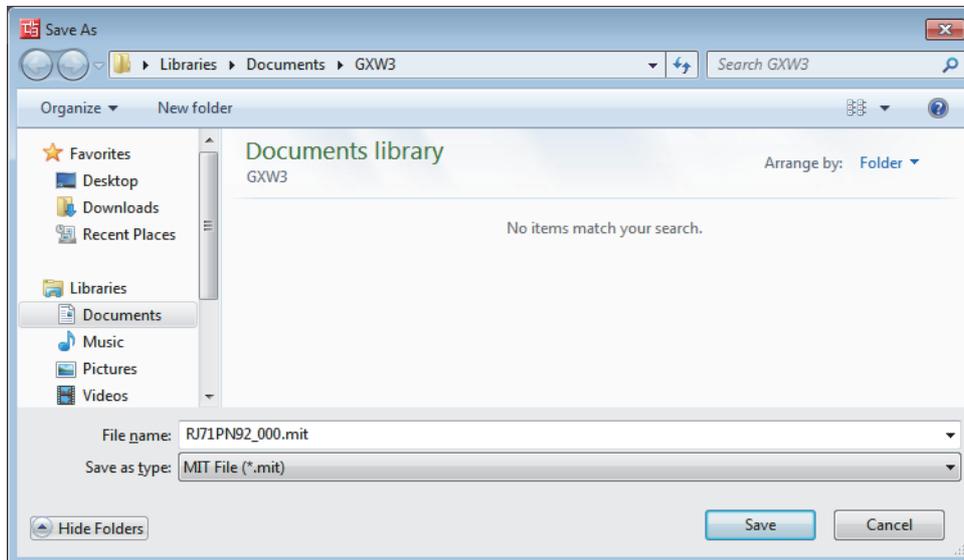
■Importing a backup file (Import GX Configurator-PN Backup File)

1. Click "Import GX Configurator-PN Backup File".

🖱 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ Right-click ⇨ [Import GX Configurator-PN Backup File]

2. Select a backup file to be imported and click the [Open] button.
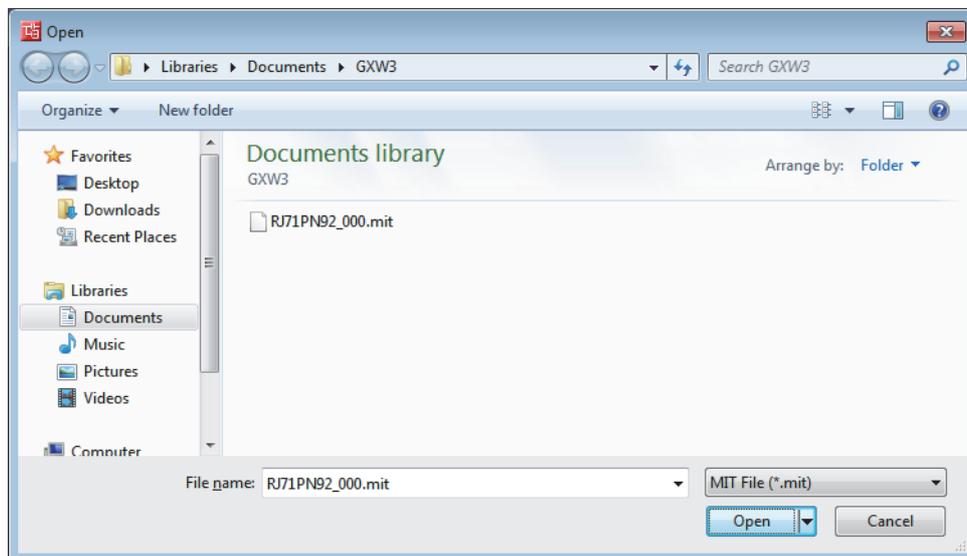
Backup with the RJ71PN92

The PROFINET module setting which is written in the RJ71PN92 can be read as a backup file and written to another RJ71PN92.

The extension of the backup file is ".zip".

Note that the backup file cannot be checked in GX Configurator-PN.

Point

This function is used when a project file of GX Works3 with the GX Configurator-PN setting is lost.

Operating procedure

The following describes the procedures of reading and writing a backup file.

■Reading a backup file (Upload Config. Image)

1. Click "Upload Config. Image".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ Right-click ⇨ [Upload Config. Image]
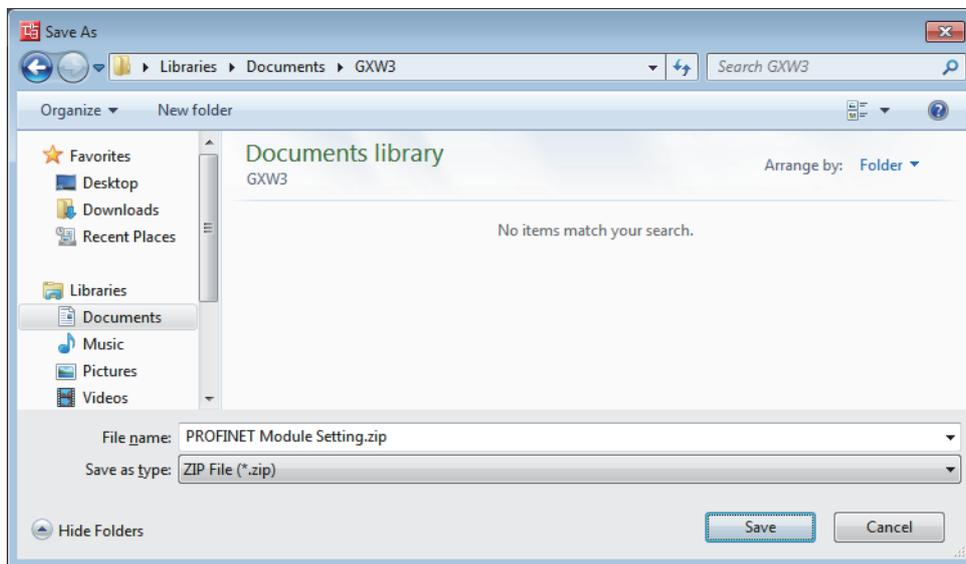
2. Set a file name, select the save destination, and click the [Save] button.

■**Writing a backup file (Download Config. Image)**

1. Click "Download Config. Image".

🐭 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ Right-click ⇨ [Download Config. Image]
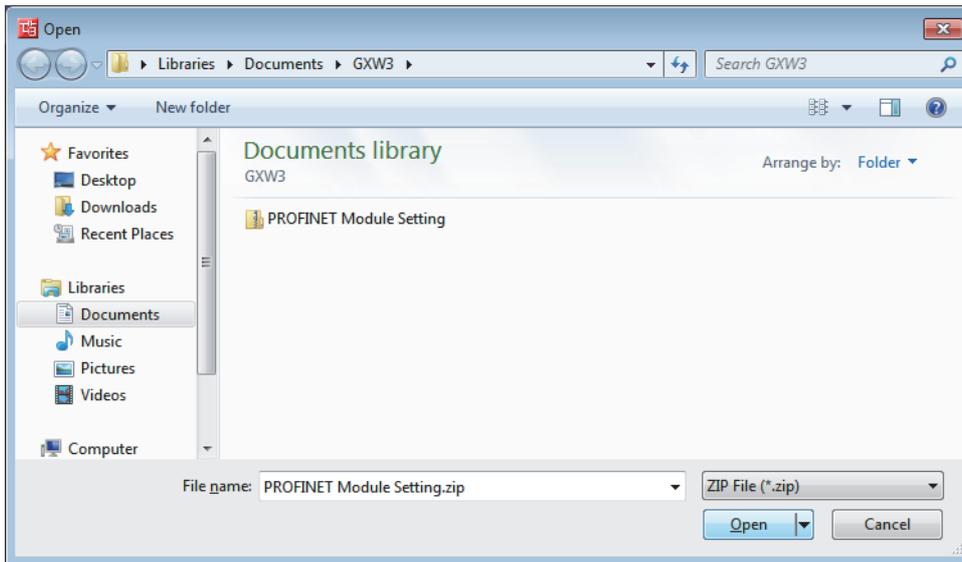
2. Select a backup file to be downloaded and click the [Open] button.

Precautions

The backup file from the RJ71PN92 is a compressed file (*.zip). Write the file without decompressing it.

3.4 Checking the Software Version

Check the software version of GX Configurator-PN in the following window.

☜ [Help] ⇨ [About]

About MELSOFT GX Configurator-PN Untitled Project - [0000:RJ71PN92]

GX Configurator-PN 2.00A

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possible under the law.

OK

3

4 PROGRAMMING

This chapter describes the programming examples of the data consistency function, service interface function, and alarm acquisition function between the RJ71PN92 and the IO device.

For the I/O data exchange between the RJ71PN92 and the IO device, refer to the following.

📖 MELSEC iQ-R PROFINET IO Controller Module User's Manual (Startup)

4.1 System configuration example

The following system configuration is used to explain the program examples of the data consistency function, service interface function, and alarm acquisition function between the RJ71PN92 and the IO device.

System configuration
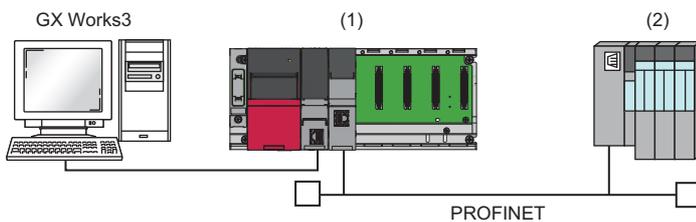
(1) Programmable controller system
 • Power supply module: R61P
 • CPU module: R04CPU
 • PROFINET IO controller module: RJ71PN92 (start I/O number: 0000H to 001FH)
(2) IO device: ET 200S (IM151-3 PN V2.0)[1]
 • Power module: PM-E 24VDC
 • I/O module: 4DI 24VDC
 • I/O module: 2DO 24VDC/0.5A HF

*1   The device is manufactured by Siemens AG.

4.2 Setting parameters

Connect the engineering tool with the CPU module and set the parameters.

Module parameter setting

1. Set the CPU module as follows.

👆 [Project] ⇨ [New]
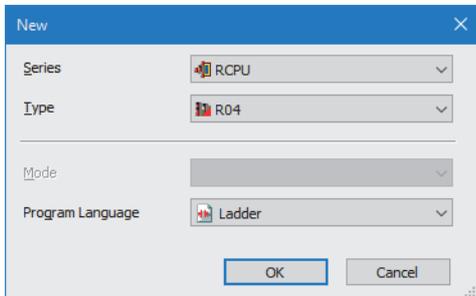
2. Click the [Setting Change] button and set "Use Module Label" to "Yes".
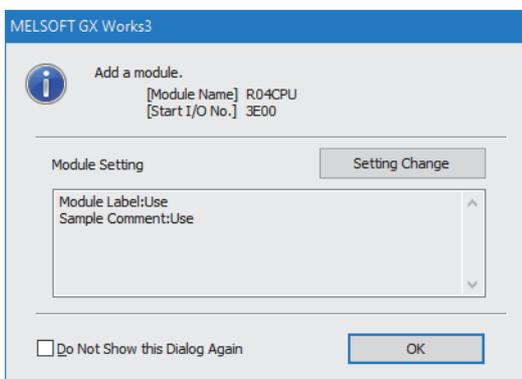
3. Set the RJ71PN92 as follows.

👆 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Right-click ⇨ [Add New Module]
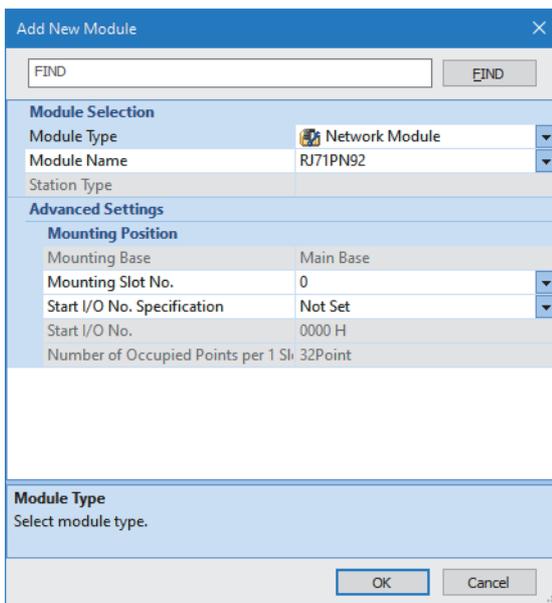
4. Set the items in "Basic Setting" as follows.

👆 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ [Module Parameter] ⇨ [Basic Setting]

Setting Item	
Item	
⊟ *Various Operations Settings*	
Mode Settings	Online
⊟ **Own Node Setting**	Set the information of the own node such as IP address.
⊟ IP Address Setting	Set the IP address, subnet mask, and default gateway for the own node.
IP Address	192.168.3.3
Subnet Mask	255.255.255.0
Default Gateway	
⊟ Controller Name	Set the Controller Name.
Name	rj71pn92

PROFINET module setting

1. Start GX Configurator-PN from the engineering tool.

👆 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ [PROFINET Module Setting]

2. Open the "GSDML Management" window to add a GSDML file of the IO device to "Device Library".

👆 [Library] ⇨ [Add]
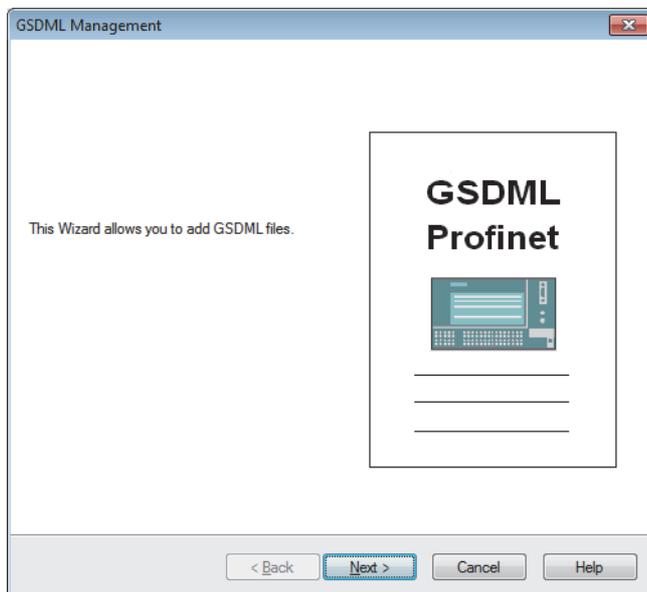
3. Click the [Next] button in the "GSDML Management" window.

4. Click the [Browse] button.
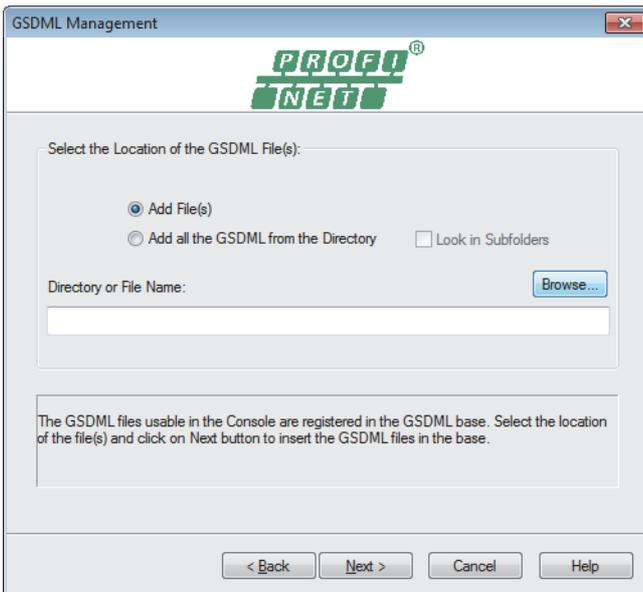
5. Select the GSDML file and click the [Open] button.
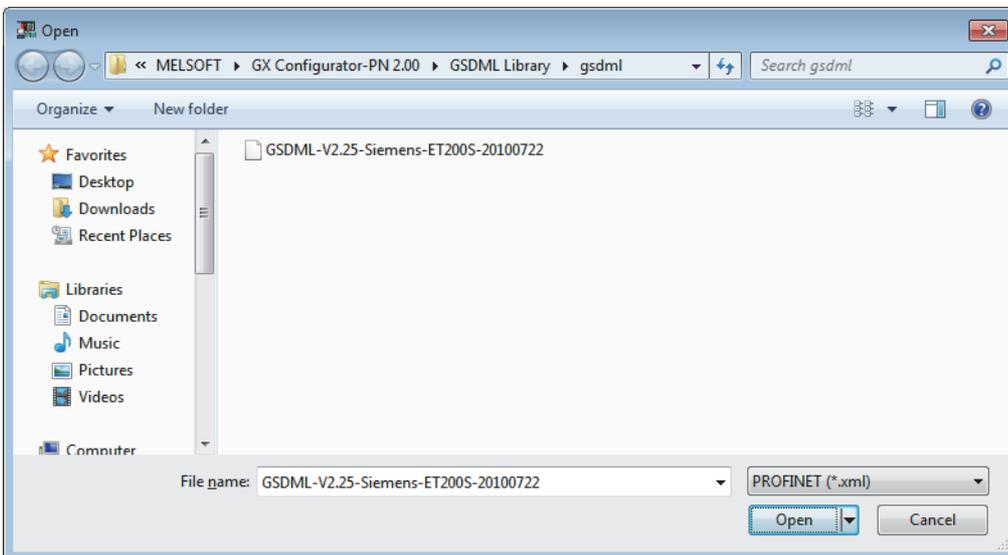
6. Click the [Next] button.
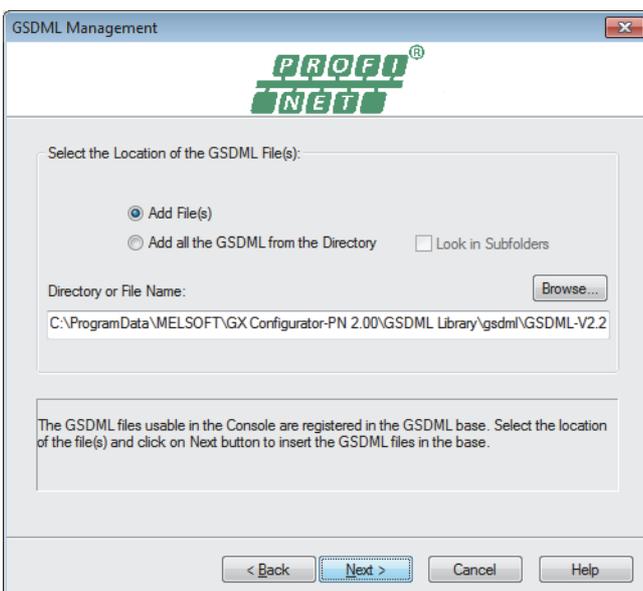
7. The result of the GSDML file addition to "Device Library" is displayed. Click the [Next] button.
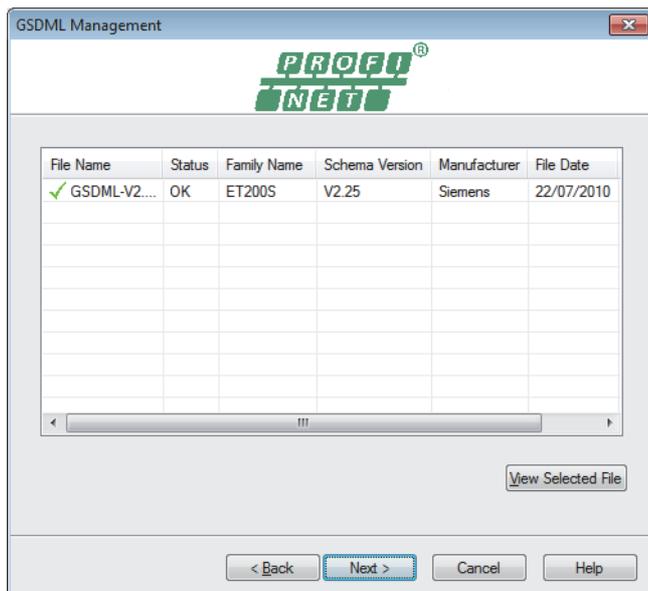
8. Click the [Finish] button to exit the GSDML Management wizard.
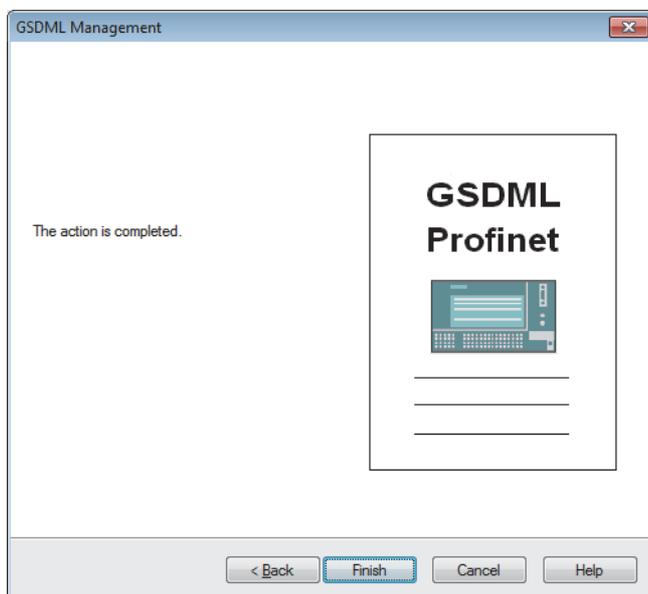
9. Select IM151-3 PN V2.0 in "Device Library" to add it in the network configuration setting.

☜ Select IM151-3 PN V2.0 in "Device Library". ⇨ [Library] ⇨ [Insert in Configuration]

10. Set the parameters of IO device in the IO device setting window. (The IO device setting window pops up when IM151-3 PN V2.0 is added in the network configuration setting from "Device Library".)

• [General Configuration] tab
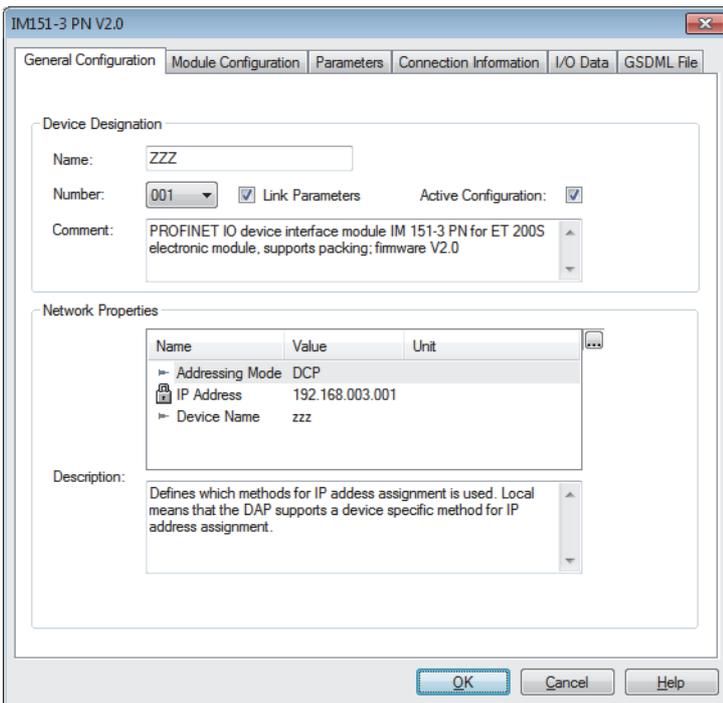
• [Module Configuration] tab
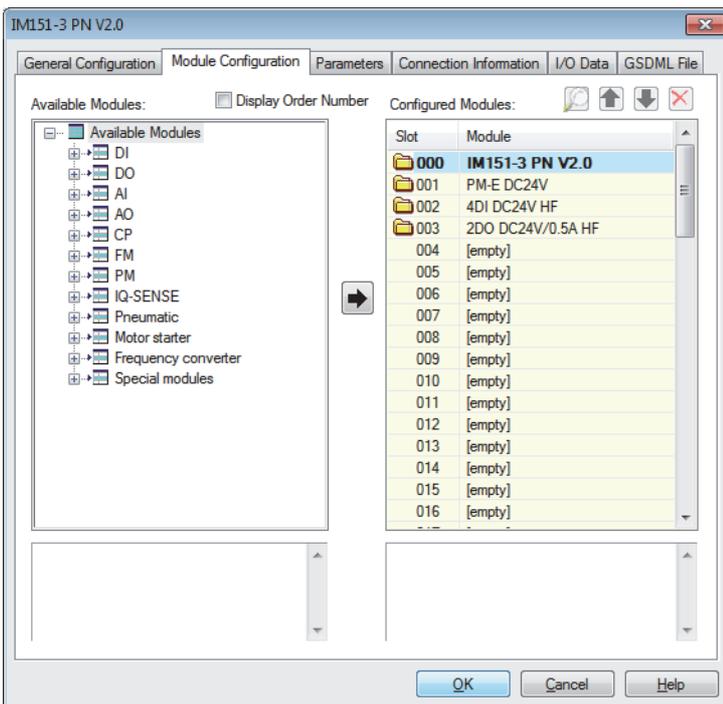
11. Save the set project of GX Configurator-PN.

☞ [File] ⇨ [Save]

12. Exit GX Configurator-PN.

☞ [File] ⇨ [Exit]

Updating global labels and structures

1. Update global labels and structures related to the RJ71PN92.

🖱 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ Right-click ⇨ [Update PROFINET Label]

2. Covert or rebuild programs.

🖱 [Convert] ⇨ [Convert] or [Rebuild All]

3. Write the set parameters to the CPU module and the RJ71PN92. Then reset the CPU module or power off and on the system.

🖱 [Online] ⇨ [Write to PLC]

Point 🔎

In this example, default values were used for parameters that are not shown above. For the parameters, refer to the following.

☞ Page 55 PARAMETER SETTINGS

4.3 Checking the Network Status

After execution of the program, if the LEDs and corresponding bits of each IO device in buffer memory areas are in the following condition, the communications are normally performed.

For the program, refer to the following.

• LEDs of the RJ71PN92

LED	Status
RUN	On
ERR	Off
PN RUN	On
PN ERR	Off

• Corresponding bits of each IO device in buffer memory areas

Name	Status
'IO device communication status' (Un\G17153 to Un\G17160)	ON
'IO device error' (Un\G17161 to Un\G17168)	OFF

4.4 Program Example of the Data Consistency Function

This section provides a program example using the data consistency function.

Input data consistency

Classification	Label name	Description	Device
Module label	RCPU.stSM.bAlways_ON	Always ON	SM400
Global label that was updated in the RJ71PN92	glRJ71PN92_1.stMgmtOutputs.bReq_DataExchangeStartRequest	Data exchange start request	U0\G17000.0
	glRJ71PN92_1.stMgmtOutputs.bnSet_DataConsistencySetting[1]	Data consistency setting area Data consistency valid/invalid (IO device ID1)	U0\G17033.1
	glRJ71PN92_1.stMgmtOutputs.bnReq_IODevicesHandshakeInputRequest[1]	CPU to PN handshake flag (data consistency setting input area) (IO device ID1)	U0\G17041.1
	glRJ71PN92_1.stMgmtInputs.bSts_ConfigurationStatus	Parameter setting status	U0\G17118.0
	glRJ71PN92_1.stMgmtInputs.bSts_DiagnosticError	Module error	U0\G17119.0
	glRJ71PN92_1.stMgmtInputs.bnAcpt_IODevicesHandshakeInput[1]	PN to CPU handshake flag (data consistency setting input area) (IO device ID1)	U0\G17128.1
	glRJ71PN92_1.stMgmtInputs.bnSts_IODevicesConnStatus[1]	IO device communication status	U0\G17153.1
	glRJ71PN92_1.stMgmtInputs.bnSts_IODevicesErr[1]	IO device error	U0\G17161.1
	glRJ71PN92_1.SLV001SLOT002DataStructIn.SLOT002_BIT_0	Input data to IO device 1	U0\G36000.0
	glRJ71PN92_1.SLV001SLOT002DataStructIn.SLOT002_BIT_1		U0\G36000.1
	glRJ71PN92_1.SLV001SLOT002DataStructIn.SLOT002_BIT_2		U0\G36000.2
	glRJ71PN92_1.SLV001SLOT002DataStructIn.SLOT002_BIT_3		U0\G36000.3
Label to be defined	Define global labels as shown below:		

Label Name	Data Type		Class	Assign (Device/Label)
bStartDirection_1	Bit	...	VAR_GLOBAL	M0
bStartExecution_1	Bit	...	VAR_GLOBAL	M1
bIODevicesHandshakeInputRequest_1	Bit	...	VAR_GLOBAL	M2
bInputData_1	Bit	...	VAR_GLOBAL	D100.0
bInputData_2	Bit	...	VAR_GLOBAL	D100.1
bInputData_3	Bit	...	VAR_GLOBAL	D100.2
bInputData_4	Bit	...	VAR_GLOBAL	D100.3

(29) Program to read input data from IO device 1

Output data consistency

Classification	Label name	Description	Device
Module label	RCPU.stSM.bAlways_ON	Always ON	SM400
Global label that was updated in the RJ71PN92	glRJ71PN92_1.stMgmtOutputs.bReq_DataExchangeStartRequest	Data exchange start request	U0\G17000.0
	glRJ71PN92_1.stMgmtOutputs.bnSet_DataConsistencySetting[1]	Data consistency setting area Data consistency valid/invalid (IO device ID1)	U0\G17033.1
	glRJ71PN92_1.stMgmtOutputs.bnReq_IODevicesHandshakeOutputRequest[1]	CPU to PN handshake flag (data consistency setting output area) (IO device ID1)	U0\G17049.1
	glRJ71PN92_1.stMgmtInputs.bSts_ConfigurationStatus	Parameter setting status	U0\G17118.0
	glRJ71PN92_1.stMgmtInputs.bSts_DiagnosticError	Module error	U0\G17119.0
	glRJ71PN92_1.stMgmtInputs.bnAcpt_IODevicesHandshakeOutput[1]	PN to CPU handshake flag (data consistency setting output area) (IO device ID1)	U0\G17136.1
	glRJ71PN92_1.stMgmtInputs.bnSts_IODevicesConnStatus[1]	IO device communication status	U0\G17153.1
	glRJ71PN92_1.stMgmtInputs.bnSts_IODevicesErr[1]	IO device error	U0\G17161.1
Label to be defined	Define global labels as shown below:		

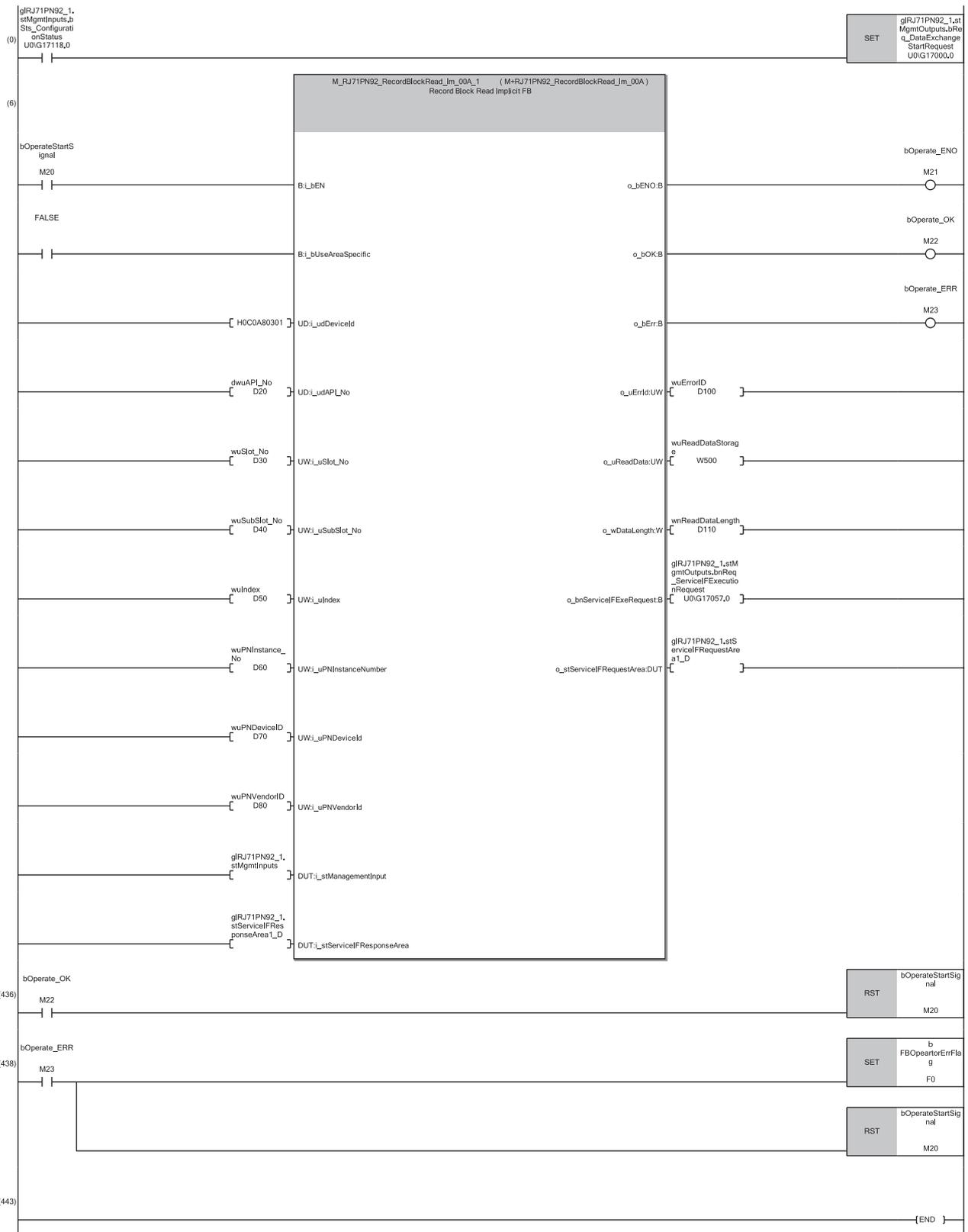| Label Name	Data Type		Class	Assign (Device/Label)
bStartDirection_1	Bit	...	VAR_GLOBAL	M0
bStartExecution_1	Bit	...	VAR_GLOBAL	M1
bIODevicesHandshakeOutputRequest_1	Bit	...	VAR_GLOBAL	M2
uOutputData	Word [Signed]	...	VAR_GLOBAL	D0

(29) Program to write output data to IO device 1

4.5 Program Example of the Service Interface Function

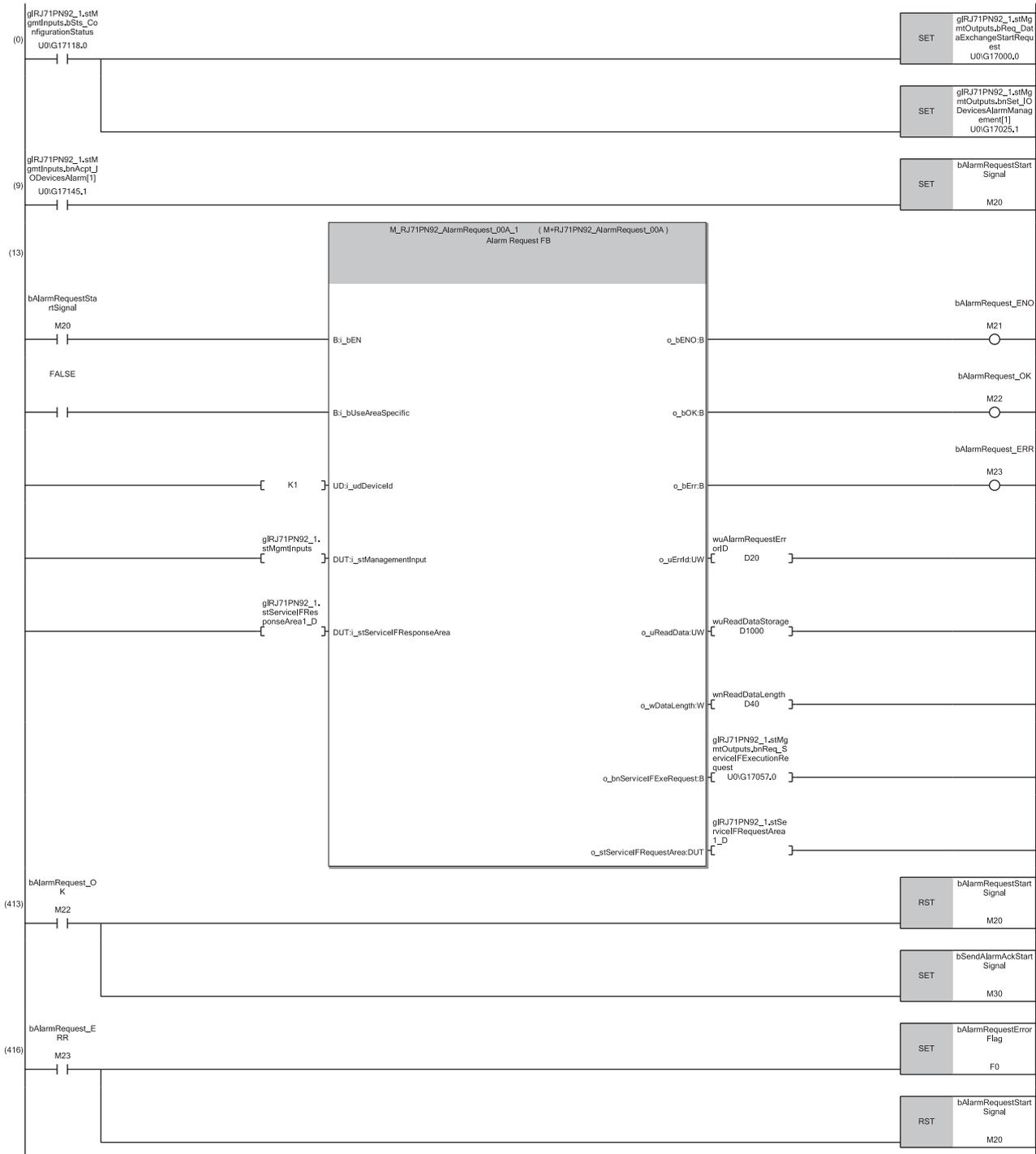This section provides a program example using the service interface function.

Classification	Label name	Description	Device
Global label that was updated in the RJ71PN92	glRJ71PN92_1.stMgmtInputs.bSts_ConfigurationStatus	Parameter setting status	U0\G17118.0
	glRJ71PN92_1.stMgmtOutputs.bReq_DataExchangeStartRequest	Data exchange start request	U0\G17000.0
	glRJ71PN92_1.stMgmtOutputs.bnReq_ServiceIFExecutionRequest	Service execution request	U0\G17057.0
	glRJ71PN92_1.stMgmtInputs	PROFINET management input area	—
	glRJ71PN92_1.stServiceIFResponseArea1_D	Service response area 1	—
	glRJ71PN92_1.stServiceIFRequestArea1_D	Service request area 1	—
Label to be defined	Define global labels as shown below:		
Function block to be used	The following shows the function block to be used in the program example. • M+RJ71PN92_RecordBlockRead_Im		

Define global labels as shown below:

Label Name	Data Type		Class		Assign (Device/Label)
bOperateStartSignal	Bit	...	VAR_GLOBAL	▼	M20
bOperate_ENO	Bit	...	VAR_GLOBAL	▼	M21
bOperate_OK	Bit	...	VAR_GLOBAL	▼	M22
bOperate_ERR	Bit	...	VAR_GLOBAL	▼	M23
dwuAPI_No	Double Word [Unsigned]/Bit String [32-bit]	...	VAR_GLOBAL	▼	D20
wuSlot_No	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	▼	D30
wuSubSlot_No	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	▼	D40
wuIndex	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	▼	D50
wuPNInstance_No	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	▼	D60
wuPNDeviceID	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	▼	D70
wuPNVendorID	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	▼	D80
wuErrorID	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	▼	D100
wuReadDataStorage	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	▼	W500
wnReadDataLength	Word [Signed]	...	VAR_GLOBAL	▼	D110
bFBOpeartorErrFlag	Bit	...	VAR_GLOBAL	▼	F0

```
(0)  glRJ71PN92_1.                                                              glRJ71PN92_1.st
     stMgmtInputs.b                                                            MgmtOutputs.bRe
     Sts_Configurati                                                            q_DataExchange
     onStatus                                                           SET     StartRequest
     U0\G17118.0                                                                U0\G17000.0
     ┤├

(6)                          ┌─────────────────────────────────────────────┐
                             │ M_RJ71PN92_RecordBlockRead_Im_00A_1  ( M+RJ71PN92_RecordBlockRead_Im_00A ) │
                             │           Record Block Read Implicit FB        │
     bOperateStartS          │                                                │          bOperate_ENO
     ignal                   │                                                │              M21
     M20                     │                                                │
     ┤├──────────────────────┤ B:i_bEN                            o_bENO:B ├───────────────( )
                             │                                                │
                             │                                                │          bOperate_OK
     FALSE                   │                                                │              M22
     ┤├──────────────────────┤ B:i_bUseAreaSpecific                o_bOK:B ├───────────────( )
                             │                                                │
                             │                                                │          bOperate_ERR
                             │                                                │              M23
         ──[ H0C0A80301 ]────┤ UD:i_udDeviceId                     o_bErr:B ├───────────────( )
                             │                                                │
         dwuAPI_No           │                                                │  wuErrorID
         ──[ D20 ]───────────┤ UD:i_udAPI_No                    o_uErrId:UW ├──[ D100 ]──
                             │                                                │
         wuSlot_No           │                                                │  wuReadDataStorag
         ──[ D30 ]───────────┤ UW:i_uSlot_No                  o_uReadData:UW ├──e
                             │                                                │  [ W500 ]──
         wuSubSlot_No        │                                                │  wnReadDataLength
         ──[ D40 ]───────────┤ UW:i_uSubSlot_No              o_wDataLength:W ├──[ D110 ]──
                             │                                                │  glRJ71PN92_1.stM
                             │                                                │  gmtOutputs.bnReq
         wuIndex             │                                                │  _ServiceIFExecutio
         ──[ D50 ]───────────┤ UW:i_uIndex               o_bnServiceIFExeRequest:B ├──nRequest
                             │                                                │  U0\G17057.0
                             │                                                │  glRJ71PN92_1.stS
         wuPNInstance_       │                                                │  erviceIFRequestAre
         No                  │                                                │  a1_D
         ──[ D60 ]───────────┤ UW:i_uPNInstanceNumber    o_stServiceIFRequestArea:DUT ├──
                             │                                                │
         wuPNDeviceID        │                                                │
         ──[ D70 ]───────────┤ UW:i_uPNDeviceId                               │
                             │                                                │
         wuPNVendorID        │                                                │
         ──[ D80 ]───────────┤ UW:i_uPNVendorId                               │
                             │                                                │
         glRJ71PN92_1.       │                                                │
         stMgmtInputs        │                                                │
         ──[ ]───────────────┤ DUT:i_stManagementInput                        │
                             │                                                │
         glRJ71PN92_1.       │                                                │
         stServiceIFRes      │                                                │
         ponseArea1_D        │                                                │
         ──[ ]───────────────┤ DUT:i_stServiceIFResponseArea                  │
                             └─────────────────────────────────────────────┘

     bOperate_OK                                                               bOperateStartSig
(436)                                                                         nal
     M22                                                                RST    M20
     ┤├

     bOperate_ERR                                                              b
(438)                                                                         FBOpeartorErrFla
     M23                                                                SET    g
     ┤├──────┬──────────────────────────────────────────────────────           F0
             │
             │                                                                 bOperateStartSig
             │                                                          RST    nal
             │                                                                 M20
             └──────────────────────────────────────────────────────

(443)
                                                                                    ─[END]─
```

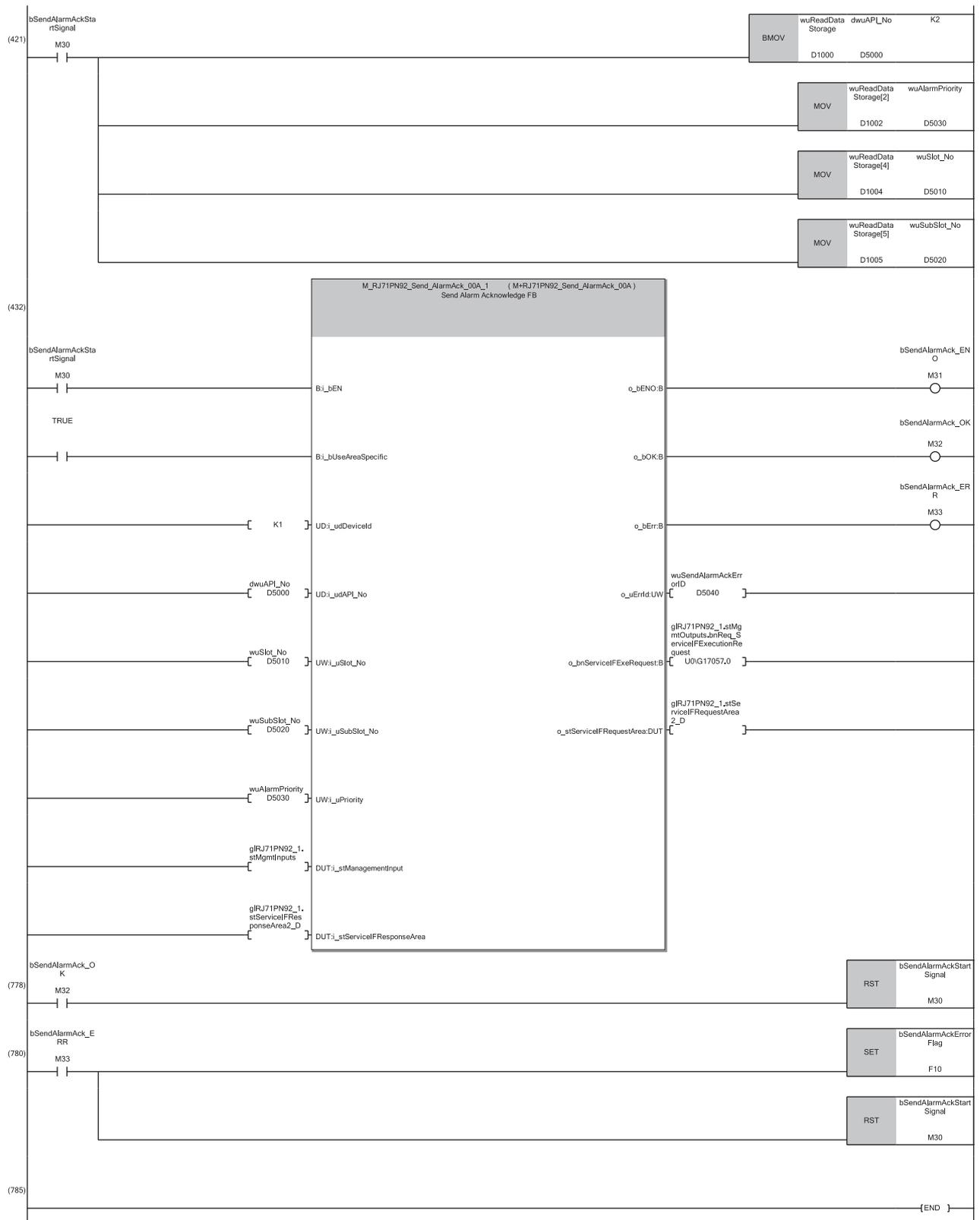# 4.6 Program Example of the Alarm Acquisition Function

This section provides a program example using the alarm acquisition function.

Classification	Label name	Description	Device
Global label that was updated in the RJ71PN92	glRJ71PN92_1.stMgmtInputs.bSts_ConfigurationStatus	Parameter setting status	U0\G17118.0
	glRJ71PN92_1.stMgmtOutputs.bReq_DataExchangeStartRequest	Data exchange start request	U0\G17000.0
	glRJ71PN92_1.stMgmtOutputs.bnSet_IODevicesAlarmManagement[1]	IO device alarm management area (IO device ID1)	U0\G17025.1
	glRJ71PN92_1.stMgmtInputs.bnAcpt_IODevicesAlarm[1]	IO device alarm indication area (IO device ID1)	U0\G17145.1
	glRJ71PN92_1.stMgmtOutputs.bnReq_ServiceIFExecutionRequest	Service execution request	U0\G17057.0
	glRJ71PN92_1.stMgmtInputs	PROFINET management input area	—
	glRJ71PN92_1.stServiceIFResponseArea1_D	Service response area 1	—
	glRJ71PN92_1.stServiceIFRequestArea1_D	Service request area 1	—
	glRJ71PN92_1.stServiceIFResponseArea2_D	Service response area 2	—
	glRJ71PN92_1.stServiceIFRequestArea2_D	Service request area 2	—
Label to be defined	Define global labels as shown below:		

Label Name	Data Type		Class	Assign (Device/Label)
bAlarmRequestStartSignal	Bit	...	VAR_GLOBAL	M20
bAlarmRequest_ENO	Bit	...	VAR_GLOBAL	M21
bAlarmRequest_OK	Bit	...	VAR_GLOBAL	M22
bAlarmRequest_ERR	Bit	...	VAR_GLOBAL	M23
wuAlarmRequestErrorID	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D20
wuReadDataStorage	Word [Unsigned]/Bit String [16-bit](0..727)	...	VAR_GLOBAL	D1000
wnReadDataLength	Word [Signed]	...	VAR_GLOBAL	D40
bAlarmRequestErrorFlag	Bit	...	VAR_GLOBAL	F0
bSendAlarmAckStartSignal	Bit	...	VAR_GLOBAL	M30
bSendAlarmAck_ENO	Bit	...	VAR_GLOBAL	M31
bSendAlarmAck_OK	Bit	...	VAR_GLOBAL	M32
bSendAlarmAck_ERR	Bit	...	VAR_GLOBAL	M33
dwuAPI_No	Double Word [Unsigned]/Bit String [32-bit]	...	VAR_GLOBAL	D5000
wuSlot_No	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D5010
wuSubSlot_No	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D5020
wuAlarmPriority	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D5030
wuSendAlarmAckErrorID	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D5040
bSendAlarmAckErrorFlag	Bit	...	VAR_GLOBAL	F10

Function block to be used	The following shows the function blocks to be used in the program example. • M+RJ71PN92_AlarmRequest • M+RJ71PN92_Send_AlarmAck

(0) glRJ71PN92_1.stMgmtInputs.bSts_ConfigurationStatus
U0\G17118.0

SET — glRJ71PN92_1.stMgmtOutputs.bReq_DataExchangeStartRequest U0\G17000.0

SET — glRJ71PN92_1.stMgmtOutputs.bnSet_IODevicesAlarmManagement[1] U0\G17025.1

(9) glRJ71PN92_1.stMgmtInputs.bnAcpt_IODevicesAlarm[1]
U0\G17145.1

SET — bAlarmRequestStartSignal M20

(13)

M_RJ71PN92_AlarmRequest_00A_1 (M+RJ71PN92_AlarmRequest_00A)
Alarm Request FB

bAlarmRequestStartSignal
M20 — B:i_bEN   o_bENO:B — bAlarmRequest_ENO M21

FALSE — B:i_bUseAreaSpecific   o_bOK:B — bAlarmRequest_OK M22

K1 — UD:i_udDeviceId   o_bErr:B — bAlarmRequest_ERR M23

glRJ71PN92_1.stMgmtInputs — DUT:i_stManagementInput   o_uErrId:UW — wuAlarmRequestErrorID D20

glRJ71PN92_1.stServiceIFResponseArea1_D — DUT:i_stServiceIFResponseArea   o_uReadData:UW — wuReadDataStorage D1000

o_wDataLength:W — wnReadDataLength D40

o_bnServiceIFExeRequest:B — glRJ71PN92_1.stMgmtOutputs.bnReq_ServiceIFExecutionRequest U0\G17057.0

o_stServiceIFRequestArea:DUT — glRJ71PN92_1.stServiceIFRequestArea1_D

(413) bAlarmRequest_OK
M22

RST — bAlarmRequestStartSignal M20

SET — bSendAlarmAckStartSignal M30

(416) bAlarmRequest_ERR
M23

SET — bAlarmRequestErrorFlag F0

RST — bAlarmRequestStartSignal M20

4

5 TROUBLESHOOTING

This section describes troubleshooting of the RJ71PN92.

5.1 Checking with LED

This section describes troubleshooting using the LEDs.

Error status can be determined by status of the RUN LED and the ERR LED.

RUN LED	ERR LED	Error status[1]	Description
Off	On, flashing	Major error	An error such as hardware failure or memory failure. The module stops operating.
On	Flashing	Moderate error	An error such as system bus failure. The module stops operating.
On	On	Minor error	An error such as communication failure. The module continues operating.

[1] When multiple errors occur, the error status is displayed in the order of major, moderate, and minor.

When the RUN LED turns off

When the RUN LED turns off after the RJ71PN92 is powered on, check the following.

Check item	Action
Is the RJ71PN92 mounted correctly?	Securely mount the RJ71PN92 on the base unit.
Is the CPU module powered off and on or reset while parameters are written?	Power off and on or reset the CPU module and start the RJ71PN92. After that, write the parameters again.

If the above actions do not solve the problem, perform the self-diagnostic test to check for hardware failure.

(☞ Page 136 Automatic Hardware Test)

When the ERR LED turns on or is flashing

When the ERR LED turns on or is flashing, check the following.

Check item	Action
Does the system watchdog timer error (Error code: 3C00H) occur?	Check the corrective action for this error. (☞ Page 141 List of Error Codes)
Does any error occur in the module diagnostics?	Take the actions displayed on the window.

If the above actions do not solve the problem, perform the self-diagnostic test to check for hardware failure.

(☞ Page 136 Automatic Hardware Test)

When the PN RUN LED turns off

When the PN RUN LED turns off, check the following.

Check item	Action
Is 'Data exchange start request' (Un\G17000.0) off?	Turn on 'Data exchange start request' (Un\G17000.0).
Is 'Module status' (Un\G17118 to Un\G17119) as follows? • 'Parameter setting status' (Un\G17118.0) is on. • 'Module error' (Un\G17119.0) is off.	• When 'Parameter setting status' (Un\G17118.0) is off, the parameter is corrupted or the incorrect parameter type is set. Set the parameter again and restart the RJ71PN92. • When 'Module error' (Un\G17119.0) is on, the possible cause is a hardware failure of the RJ71PN92. Please consult your local Mitsubishi representative.

When the PN ERR LED turns on

When the PN ERR LED turns on, check the following.

Check item	Action
Is a value other than 3030H stored in 'Module error details' (Un\G17169)?	Check 'Module error details' (Un\G17169) and take actions. (☞ Page 157 Module error details (Un\G17169))
Is a value stored in 'IO device error details' (Un\G21858 to Un\G21921)?	Check 'IO device error details' (Un\G21858 to Un\G21921) and take actions. (☞ Page 158 IO device error details (Un\G21858 to Un\G21921))

When the PN ERR LED is flashing

When the PN ERR LED is flashing, check the following.

Check item	Action
Is a value stored in 'IO device error details' (Un\G21858 to Un\G21921)?	Check 'IO device error details' (Un\G21858 to Un\G21921) and take actions. (☞ Page 158 IO device error details (Un\G21858 to Un\G21921))
Is the wiring of PROFINET correct?	Check if the wiring of PROFINET is correct.
Are the IO device names correct?	• Check if the names of the IO devices set in the PROFINET module setting and the names of the IO devices actually connected are matched. • Check if the names of the IO devices set in the PROFINET module setting are not overlapped.
Is the setting of the IO device correct?	Refer to the user manuals of the IO device.

When the DIA LED turns on

When the DIA LED turns on, check the following.

Check item	Action
Is an alarm received from the IO device?	Obtain information of the received alarm and check the details. (☞ Page 52 Alarm Acquisition Function)

5.2 Checking the Module Status

The following functions can be used in the "Module Diagnostics" window for the RJ71PN92.

Function	Application
Error Information	Displays the details of the errors currently occurring. Click the [Event History] button to check the history of errors that have occurred on the RJ71PN92, errors detected for each module, and operations that have been executed.
Module Information List	Displays various status information of the RJ71PN92.

Error Information

Check the details of the error currently occurring and action to eliminate the error.
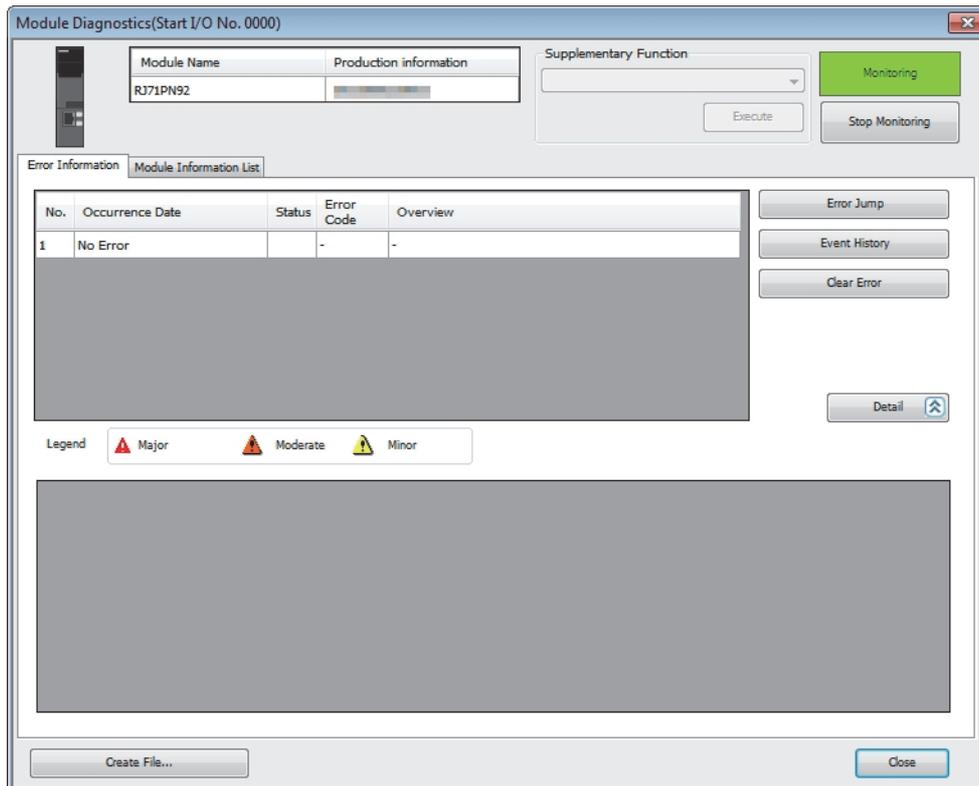
Item	Description
Status	Major: An error such as hardware failure or memory failure. The module stops operating.
	Moderate: An error, such as parameter error, which affects module operation. The module stops operating.
	Minor: An error such as communication failure. The module continues operating.
Detailed Information	Displays detailed information about each error (maximum of 3 pieces).
Cause	Displays the detailed error causes.
Corrective Action	Displays the actions to eliminate the error causes.

Module Information List

Switch to the [Module Information List] tab to check various status information of the RJ71PN92.
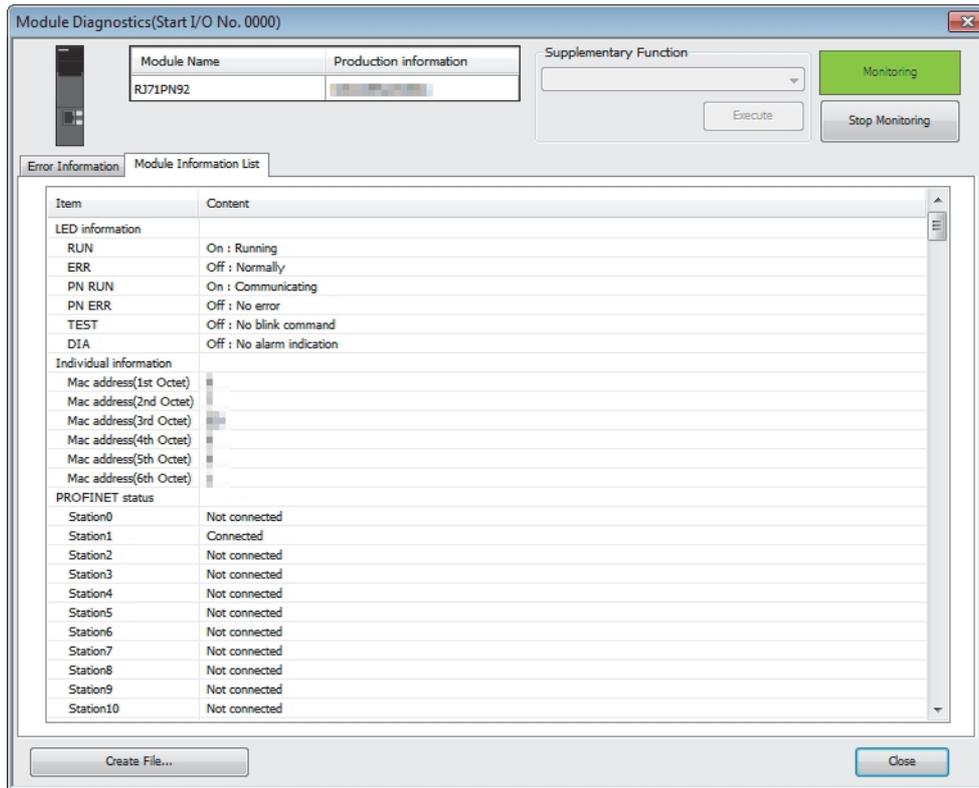
Item		Description
LED information		Displays the LED status of the RJ71PN92.
Device Information	MAC address (1st Octet)	Displays the MAC address of the selected module.
	MAC address (2nd Octet)	
	MAC address (3rd Octet)	
	MAC address (4th Octet)	
	MAC address (5th Octet)	
	MAC address (6th Octet)	
PROFINET status	IO device 1 to 128	Displays the connection status of the IO devices.

5.3 Checking the Network Status

The PROFINET network status can be diagnosed by checking the buffer memory or using the network diagnostics of GX Configurator-PN.

Checking with the buffer memory

The connection status and error details of IO devices can be checked.

Connection status of IO devices

The connection status of IO devices can be checked with the corresponding bit of 'IO device communication status' (Un\G17153 to Un\G17160) and 'IO device error' (Un\G17161 to Un\G17168).

'IO device communication status' (Un\G17153 to Un\G17160)	'IO device error' (Un\G17161 to Un\G17168)	Connection status of IO devices
OFF	OFF	The IO device is not connected. Otherwise, no connection request is received.
ON	OFF	The IO device is correctly connected.
OFF	ON	The IO device is not connected. • When the setting of 'IO device data exchange start method setting area' (Un\G17001 to Un\G17008) is off (I/O data exchange automatic start): The IO device cannot be connected. • When the setting of 'IO device data exchange start method setting area' (Un\G17001 to Un\G17008) is on (I/O data exchange manual start): The last connection request failed to be received.
ON	ON	An error has occurred in the connected IO device.

Error details of IO devices

The error details of IO devices can be checked with the corresponding bit of 'IO device error details' (Un\G21858 to Un\G21921).

'IO device communication status' (Un\G17153 to Un\G17160)	'IO device error' (Un\G17161 to Un\G17168)	'IO device error details' (Un\G21858 to Un\G21921)	Error details of IO devices	Action
ON	OFF	00H	No error has occurred.	—
ON	ON	01H	The IO device is in the stop mode.	Check the status of the IO device, and eliminate the error cause.
ON	ON	02H	An error has occurred on the input module of the IO device in I/O data exchange.	
ON	ON	03H	An error has occurred on the output module of the IO device in I/O data exchange.	
ON	ON	04H	The IO device configuration set in GX Configurator-PN is different from the actual IO device configuration.	Check the network configuration setting of GX Configurator-PN. (☞ Page 82 Network configuration settings)
			Diagnostic information is detected on the IO device to be connected at the start of communications.	Check the status of the IO device, and eliminate the error cause.
OFF	ON	64H	The IO device has not responded to the DCP identification request. The name of the IO device set in GX Configurator-PN has not been found in the network.	• Check if the IO device name set in GX Configurator-PN and the actual IO device name are the same. • Check if the IO device and the RJ71PN92 are on the same network. • Check the status of the IO device, and eliminate the error cause.

'IO device communication status' (Un\G17153 to Un\G17160)	'IO device error' (Un\G17161 to Un\G17168)	'IO device error details' (Un\G21858 to Un\G21921)	Error details of IO devices	Action
OFF	ON	65H	Multiple IO devices have the same name. Multiple IO devices have responded to the DCP identification request.	Check the duplicated name of the IO device. (☞ Page 80 "Devices on the Network" window)
OFF	ON	66H	Overlap of IP addresses of IO devices is detected during the DCP identification request.	Check the duplicated IP address of the IO device. (☞ Page 80 "Devices on the Network" window)
OFF	ON	67H	The IO device cannot be connected due to lack of resource.	The number of connected IO devices exceeds the upper limit. Disconnect unnecessary connections on the IO device side.
OFF	ON	FDH	Connection has failed.	• Check if the IO device is communicating with another IO controller module. • Check if the line is overloaded or the line has any problems. • Check the status of the IO device, and eliminate the error cause.
OFF	OFF	FEH	The IO device has never been connected. The IO device ID exists in the IO device configuration set for the RJ71PN92; however, the RJ71PN92 has never sent a connection request.	Check if 'Data exchange start request' (Un\G17000.0) is on.
OFF	OFF	FFH	The IO device is not used. The IO device ID does not exist in the IO device configuration set for the RJ71PN92.	Check the network configuration setting of GX Configurator-PN. (☞ Page 82 Network configuration settings)

Network diagnostics of GX Configurator-PN

The connection information of IO devices and the status of I/O data exchange can be checked by accessing the RJ71PN92 via Ethernet using the network diagnostics of GX Configurator-PN.

For details on GX Configurator-PN, refer to the following.

☞ Page 68 GX Configurator-PN

> **Point**
>
> An execution request is sent from GX Configurator-PN via the RJ71PN92 for the network diagnostics of GX Configurator-PN. Connect a personal computer in which GX Configurator-PN is installed, the RJ71PN92, and target IO device to the same network.
>
> In addition, set the module parameters such as an IP address of GX Works3 and write them to the CPU module before the network diagnostics because the execution request is sent from GX Configurator-PN to the IP address of the RJ71PN92.

Connection status of IO devices

The connection status of IO devices can be checked with the network configuration setting of GX Configurator-PN.

1. Connect a personal computer in which the engineering tool is installed to the same network as the RJ71PN92.

2. Start GX Configurator-PN.

3. Enable the diagnostic mode.

✎ [Devices] ⇨ [Start Console Diagnostic]

4. When the diagnostic mode is enabled, the connection status of IO devices is displayed in the network configuration setting.

```
☐ RJ71PN92
   ☐ TCP/IP: 192.168.003.003  rj71pn92
      ☐ [101] Device Name: im151-3pn-2   IM151-3 PN V2.0
```
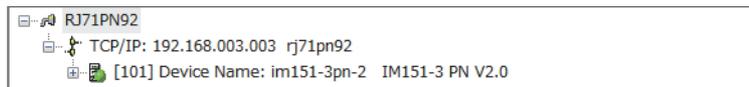
- 📇 : The RJ71PN92 communicates with the IO device.
- 📇 : The RJ71PN92 is not connected to the IO device.
- 📇 : The I/O data exchange cannot be performed.

To check the connection status of IO devices, the actual network configuration needs to be written to the RJ71PN92 in the PROFINET module setting window. When the diagnostic mode is enabled, the network configuration setting cannot be changed.

> **Point**
>
> To enable the diagnostic mode, I/O data exchange needs to be started.
> (☞ Page 19 Operating procedure)

Checking the connection information of IO devices

The following describes how to check the connection information of IO devices.

1. Display the IO device setting window.

✍ Select the IO device display area in the network configuration setting. ⇨ [Devices] ⇨ [Properties]

2. Select the [Connection Information] tab.

3. The connection information of IO devices is displayed. For details on the window, refer to the following.
☞ Page 93 [Connection Information] tab
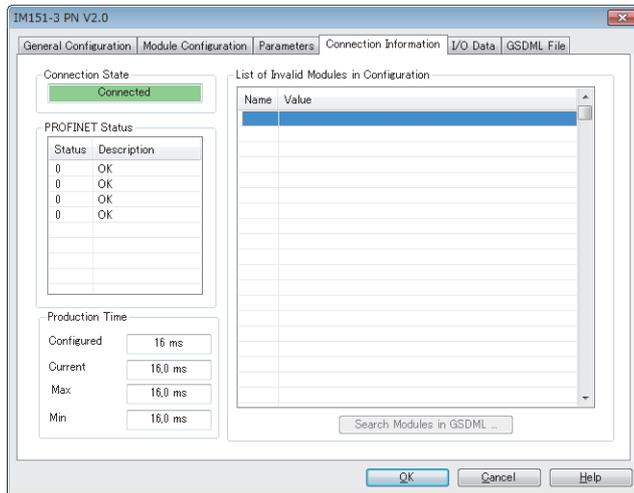
Monitoring I/O data in IO data exchange

The following describes how to monitor I/O data in IO data exchange.

1. Display the IO device setting window.

☞ Select the IO device display area in the network configuration setting. ⇨ [Devices] ⇨ [Properties]

2. Select the [I/O Data] tab.

3. The status of I/O data in IO data exchange is displayed. For details on the window, refer to the following.

☞ Page 94 [I/O Data] tab
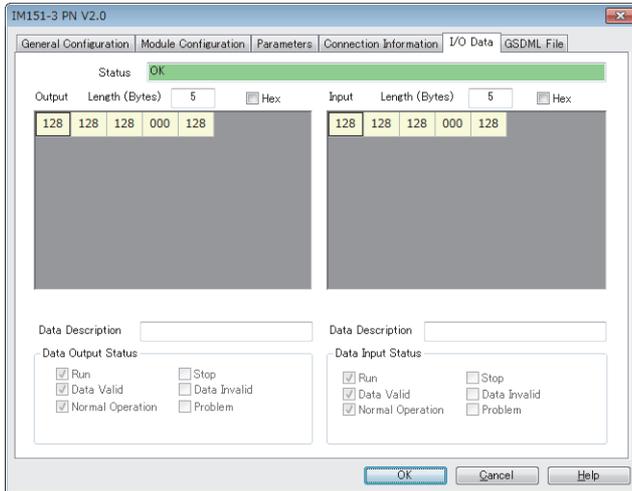
5.4 Automatic Hardware Test

This section describes how to perform a test related to hardware, such as a ROM/RAM/Ethernet port of the RJ71PN92.

Restriction
- During the automatic hardware test, values in the buffer memory cannot be referred from the engineering tool or the program.
- Do not change the operating status of the CPU module during the automatic hardware test. If the operating status of the CPU module is changed, the module major error (2442H) occurs in the CPU module.

Operating procedure

1. Set the mode setting of the RJ71PN92 to the automatic hardware test using the engineering tool.

✎ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ [Module Parameter] ⇨ [Basic Setting] ⇨ [Various Operations Settings] ⇨ [Mode Settings] ⇨ Select "Automatic H/W Test".

2. When a cable is connected to the Ethernet port, disconnect it.

3. Set the CPU module to the STOP state and write parameters.

4. Power off and on or reset the CPU module.

5. The automatic hardware test is automatically executed.

The following table shows the LED indication of the RJ71PN92 for the automatic hardware test.

| Status		RUN LED status	ERR LED status
During automatic hardware test		Flashing	Off
Automatic hardware test completion	Completed successfully	On	Off
	Completed with an error	On	On

6. When the test completed successfully, set the mode setting of the RJ71PN92 to online using the engineering tool.

✎ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71PN92] ⇨ [Module Parameter] ⇨ [Basic Setting] ⇨ [Various Operations Settings] ⇨ [Mode Settings] ⇨ Select "Online".

Write parameters, and power off and on or reset the CPU module.

7. When the test completed with an error, check that adequate measures to reduce noise are taken for the programmable controller system, and retry the automatic hardware test. If the result is still error completion, the hardware failure of the RJ71PN92 may have been occurred. Please consult your local Mitsubishi representative.

When removing a module, do not use any electric screwdriver. Loosen the module fixing screws fully before removing the module.

5.5 Troubleshooting by Symptom

This section describes troubleshooting method by symptom. If an error has occurred in the RJ71PN92, identify the error cause using the engineering tool. (☞ Page 129 Checking the Module Status)

When I/O data exchange cannot be performed

The following lists the actions to be taken if I/O data exchange with IO devices cannot be performed.

Check item	Action
Is the wiring of PROFINET correct?	Check if the wiring of PROFINET is correct.
Is the setting of I/O data exchange is correct?	• Check if the IO device to be used has been added to the network configuration setting of GX Configurator-PN. In addition, check if there is any difference between the network configuration setting and the configuration of the IO device to be used on the [Module Configuration] tab of the IO device setting window. • Check if the name of the RJ71PN92 has been set to "Own Node Setting" in "Basic Setting". • Check if 'Data exchange start request' (Un\G17000.0) is on. (☞ Page 150 Data exchange start request)
Are the IO device names correct?	• Check if the names of the IO devices set in the PROFINET module setting and the names of the IO devices actually connected are matched. • Check if the names of the IO devices set in the PROFINET module setting are not overlapped.
Has an error occurred in IO devices?	Check the error details of the IO devices in 'IO device error details' (Un\G21858 to Un\G21921). (☞ Page 158 IO device error details)
Does the IP address of the RJ71PN92 overlap with other IP addresses?	Disconnect the RJ71PN92 from the network and execute the PING command from the personal computer to the IP address of the disconnected RJ71PN92. When a response is received, change the IP address of the RJ71PN92.
Does the IP address of the IO device overlap with other IP addresses?	Disconnect the IO device for which the I/O data exchange cannot be performed and execute the PING command from the personal computer to the IP address of the disconnected IO device. When a response is received, change the IP address of the disconnected IO device.
Does the controller name or the IO device name to be connected overlap with other names?	Detect the IO devices on the network in the "Devices on the Network" window of GX Configurator-PN and check if the controller name or the IO device name on the network overlaps with other names. When overlap is found, correct the name.

If the above actions do not solve the problem, perform the self-diagnostic test to check for hardware failure. (☞ Page 136 Automatic Hardware Test)

When communications cannot be performed by using the service interface function

The following lists the actions to be taken if communications with IO devices cannot be performed by using the service interface function.

Check item	Action
Is the wiring of PROFINET correct?	Check if the wiring of PROFINET is correct.
Are the IO device names correct?	• Check if the names of the IO devices set in the PROFINET module setting and the names of the IO devices actually connected are matched. • Check if the names of the IO devices set in the PROFINET module setting are not overlapped.
Have 'Service response area 1' (Un\G57000 to Un\G59087)' and 'Service response area 2' (Un\G59250 to Un\G61337) been checked?	Check the Status of 'Service response area 1' (Un\G57000 to Un\G59087) and 'Service response area 2' (Un\G59250 to Un\G61337). (☞ Page 158 Service response area 1, Service response area 2)
Does the IP address of the RJ71PN92 overlap with other IP addresses?	Disconnect the RJ71PN92 from the network and execute the PING command from the personal computer to the IP address of the disconnected RJ71PN92. When a response is received, change the IP address of the RJ71PN92.
Does the IP address of the IO device overlap with other IP addresses?	Disconnect the IO device for which the I/O data exchange cannot be performed and execute the PING command from the personal computer to the IP address of the disconnected IO device. When a response is received, change the IP address of the disconnected IO device.

If the above actions do not solve the problem, perform the self-diagnostic test to check for hardware failure. (☞ Page 136 Automatic Hardware Test)

When communications are unstable

The following lists the actions to be taken if communications are unstable.

Check item	Action
Is the wiring of PROFINET correct?	Check if the wiring of PROFINET is correct.
Is the network overloaded?	Connect the IO device with unstable communications to the RJ71PN92 one-on-one and check if the communication status is improved. When the communication status is improved, the network may be overloaded. Take the following actions. • Check and correct the settings of the RJ71PN92, for example, set the communication cycle longer, to reduce the communication load. • Check if a large amount of unrelated data is received in broadcast. If it is received, isolate the network or take other actions.
Does the IP address of the RJ71PN92 overlap with other IP addresses?	Disconnect the RJ71PN92 from the network and execute the PING command from the personal computer to the IP address of the disconnected RJ71PN92. When a response is received, change the IP address of the RJ71PN92.
Does the IP address of the IO device overlap with other IP addresses?	Disconnect the IO device for which the I/O data exchange cannot be performed and execute the PING command from the personal computer to the IP address of the disconnected IO device. When a response is received, change the IP address of the disconnected IO device.

If the above actions do not solve the problem, perform the self-diagnostic test to check for hardware failure. (☞ Page 136 Automatic Hardware Test)

When communications with the devices cannot be performed by GX Configurator-PN

The following lists the actions to be taken if communications with the external device (RJ71PN92 or IO device) cannot be performed from GX Configurator-PN.

Check item	Action
Is the cable connected correctly?	Connect the cable again.
Has an error occurred in the RJ71PN92?	Perform troubleshooting using the LEDs. (☞ Page 127 Checking with LED)
Is the hub used correct?	• Check if the hub used satisfies the standard. (📖 MELSEC iQ-R PROFINET IO Controller Module User's Manual (Startup)) • Power off and on the hub.
Is the IP address of the RJ71PN92 correctly set?	When an operation is performed on the "Devices on the Network" window or the network diagnostics is performed in GX Configurator-PN, an execution request is issued from GX Configurator-PN to the IP address set in the module parameter of GX Works3. For this reason, write the settings of GX Works3 (IP address of the RJ71PN92 and other settings) before such operations.
Are the IP address segments different between the personal computer and external devices (RJ71PN92 and IO devices)?	When an operation is performed on the "Devices on the Network" window or the network diagnostics is performed in GX Configurator-PN, communications are performed between the personal computer and the RJ71PN92. Thus, set the IP addresses of the personal computer and external devices (RJ71PN92 and IO devices) to the same segment.
Do the IP addresses of the personal computer and external devices (RJ71PN92 and IO devices) overlap with each other?	Contact the LAN network administrator to eliminate the overlap of the IP addresses of the personal computer and external devices (RJ71PN92 and IO devices).
Is the device (such as Ethernet-equipped module, external device, hub, and router) on the line replaced by the one having the same IP address before an error occurs?	Take any of the following actions when the device (such as Ethernet-equipped module, external device, hub, and router) on the line is replaced by the one having the same IP address. • Wait until the ARP cache is updated. (The wait time varies depending on the device). • Restart all the devices on the line.[1]
Has an IP address outside the range been specified?	Consider the following and specify a correct IP address. • The IP address should start with a number from 1 to 233, excluding 127. • No space should be included in the IP address.
Is the network overloaded?	Connect the IO device with unstable communications to the RJ71PN92 one-on-one and check if the communication status is improved. When the communication status is improved, the network may be overloaded. Take the following actions. • Check and correct the settings of the RJ71PN92, for example, set the communication cycle longer, to reduce the communication load. • Check if a large amount of unrelated data is received in broadcast. If it is received, isolate the network or take other actions.
Is communication blocked by the firewall of the personal computer?	Check the following if the firewall settings of the personal computer are correct. Check if m2mDriverLauncher is registered or the domain and public network settings are selected in Windows Defender list.

[1] A device on Ethernet has a table of IP addresses and their corresponding MAC address, called ARP cache. When a device on the line is replaced by the one having the same IP address, the MAC address in the ARP cache is different from that of the replaced device; therefore, communications may not be normally performed. The ARP cache is updated by resetting the device or after a while. The time varies depending on the device.

Errors related to GX Works3

For errors related to GX Works3, check the following.

Check item	Action
Is the following message displayed during conversion? "Device is insufficient. Please check the memory/device setting of CPU parameter. Or, please check the device range of module."	The values may be out of the range of the set CPU device. Correct the settings of "User CPU Device" in "PROFINET Autorefresh Settings".
Check that PROFINET labels are not updated when "Update PROFINET Label" is executed.	Do not use any characters other than one-byte alphanumeric characters and German umlauts (ä, ö, ü) in the label name of GX Works3. To use German umlauts, use GX Works3 with version 1.105K or later and GX Configurator-PN with version 2.04E or later.
Is the following message displayed when "Update PROFINET Label" is executed? "The limit for 'structured data types (SDT)' has been exceeded. Please reduce the number of SDTs by either of the following methods:"	The number of IO device labels exceeds the maximum number of structures set in GX Works3. Take the following actions to reduce the number of structures, and execute "Update PROFINET Label" again. • Delete unnecessary structures. • Select "Optimize the number of structured data types (SDT)" in "PROFINET Autorefresh Settings" to reduce the number of structures to be generated IO device labels. • If the IO device labels are not used, deselect "Use label for IO-device" in "PROFINET Autorefresh Settings".
Is the following message displayed when "Update PROFINET Label" is executed? "Label names are duplicated across the slots/subslots. The PROFINET label cannot be created. The following tasks will help you resolve the duplicate label names:"	Since the IO device label names are duplicated, perform the following steps to set different names, and execute "Update PROFINET Label" again. ❶ Open the bottom of the window where the message on the left is displayed, and check the duplicate label names. Alternatively, check the label names displayed in red in "Show I/O Mapping" of "PROFINET Autorefresh Settings". ❷ Open the PROFINET module setting, and rename "Item Name" of the duplicated label to a unique name.
The IO device labels become undefined and the operation does not normal after an IO device is added or deleted.	Back up the project, then delete all PROFINET labels manually. Afterwards, execute "Update PROFINET Label" to reset IO device labels used in the program.

5.6   List of Error Codes

This section lists the error codes, error details and causes, and actions for the errors that occur in the processing for data exchange between the RJ71PN92 and IO devices or that caused by processing requests from the CPU module on the own station.

Error codes are classified into major error, moderate error, and minor error, and can be checked in the [Error Information] tab of the "Module Diagnostics" window of the RJ71PN92. (☞ Page 129 Error Information)

> **Point**
>
> The RJ71PN92 provides not only a method for checking error codes with the module diagnostics but a method for checking the PROFINET communication error status with the buffer memory. For details on the checking method with the buffer memory, refer to the following.
> - Checking the PROFINET communication error status of the RJ71PN92 (☞ Page 157 Module error details)
> - Checking the PROFINET communication error status of IO devices (☞ Page 158 IO device error details)

Error code	Error details and causes	Action	Detailed Information
1801H	The number of writes to the FlashROM (data memory, program memory, and system memory) exceeded 100000 times. (Number of writes > 100000)	Replace the RJ71PN92.	—
24C0H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module, RJ71PN92, base unit, or extension cable. Please consult your local Mitsubishi representative.	System configuration information • I/O No. • Base No. • Slot No. • CPU No.
24C1H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module, RJ71PN92, base unit, or extension cable. Please consult your local Mitsubishi representative.	System configuration information • I/O No. • Base No. • Slot No. • CPU No.
24C3H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module, RJ71PN92, base unit, or extension cable. Please consult your local Mitsubishi representative.	System configuration information • I/O No. • Base No. • Slot No. • CPU No.
24C4H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the RJ71PN92, base unit, or extension cable. Please consult your local Mitsubishi representative.	System configuration information • I/O No. • Base No. • Slot No.
24C5H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the RJ71PN92, base unit, or extension cable. Please consult your local Mitsubishi representative.	—
24C6H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module or extension cable. Please consult your local Mitsubishi representative.	—

Error code	Error details and causes	Action	Detailed Information
24C8H	An error was detected on the system bus.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the RJ71PN92 or extension cable. Please consult your local Mitsubishi representative.	—
300EH	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information
3C00H	The system watchdog timer controlled by the system detected an error. Or, an error occurred in the system software. • The monitoring time of the system watchdog timer is too short. • A task of high CPU utilization is running. • A program that will cause an error in the memory or stack was executed. • An operation (writing parameters) that will increase the CPU utilization of the system task was executed. • The station using station-based block data assurance of the network was accessed when a stop error had occurred. • The CPU module runs out of control or has broken down. (A malfunction or hardware error by noise or other causes)	• Reset the CPU module. • Decrease the CPU utilization of the task with high CPU utilization. Or, disable the task operation. • Check and correct the user program. • Taking into account the CPU utilization of the system task, sufficiently prolong the user watchdog timer monitoring time. • Check and correct the user program so that the station using station-based block data assurance of the network is not accessed when a stop error occurs. • Take measures to reduce noise. • Check if the RJ71PN92 is securely mounted on the base unit and the environment is within the general specification range. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information
3C01H to 3C03H	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information
3C0FH	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information
3C22H	An error was detected in the memory.	• Take measures to reduce noise. • Format the memory. After that, write all the files and reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information
3C2FH	An error was detected in the memory.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information
3E08H	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information
3E09H	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information
3E0EH	An error was detected in the memory.	• Take measures to reduce noise. • Format the memory. After that, write all the files and reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information

Error code	Error details and causes	Action	Detailed Information
3E11H	An error was detected in the memory.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information
3E19H	An error was detected in the memory.	• Take measures to reduce noise. • Format the memory. After that, write all the files and reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information
3E1AH to 3E21H	An error was detected in the memory.	• Take measures to reduce noise. • Reset the CPU module. If the error occurs again even after the above is taken, the possible cause is a hardware failure of the CPU module. Please consult your local Mitsubishi representative.	Failure information

5

5.7   Event List

This section lists the events which occur in the RJ71PN92.

Event code	Event type	Overview	Cause
20100	Operation	Error clear	An error was cleared.
21800	Operation	PROFINET information	An error occurred in the IO device.

APPENDICES

Appendix 1   I/O Signals

This section describes the I/O signals for the CPU module. The I/O signal assignment of when the start I/O number of the RJ71PN92 is "0" is listed below.

List of I/O signals

The following table lists I/O signals. The device X is an input signal from the RJ71PN92 to the CPU module. The device Y is an output signal from the CPU module to the RJ71PN92.

Input signals

Device No.	Signal name
X0	Module ready
X1 to XE	Use prohibited
XF	Module error status
X10 to X1F	Use prohibited

Output signals

Device No.	Signal name
Y0 to YE	Use prohibited
YF	Error clear request
Y10 to Y1F	Use prohibited

Point

> Do not use (turn on) any "use prohibited" signals as an input or output signal to the CPU module. Doing so may cause malfunction of the programmable controller system.

A

Details of input signals

Module ready (X0)

After the CPU module is powered off and on or is reset, this signal turns on at the completion of RJ71PN92 preparation.

This signal turns off at the occurrence of a watchdog timer error.

- On: The module has been prepared.
- Off: The module is being prepared or a watchdog timer error has occurred.

Module error status (XF)

This signal turns on or off depending on the module error occurrence status.

- On: An error (minor error, moderate error, or major error) has occurred.
- Off: No error has occurred.

Details of output signals

Error clear request (YF)

Turning on this signal clears the latest error code.

- On: Error clear request
- Off: —

If this signal turns on when a module error has occurred, the following operations are executed.

- The ERR LED is turned off.
- The module error status (XF) is turned off.
- The latest error code is cleared.

Appendix 2　Buffer Memory

The buffer memory is used to exchange data between the RJ71PN92 and the CPU module or IO devices. Buffer memory values are defaulted when the CPU module is powered off or reset.

List of buffer memory addresses

Address (decimal)	Address (hexadecimal)	Name	Initial value	Read, write
0 to 139	0H to 8BH	System area		
140	8CH	Current error area	0	Read
141 to 16999	8DH to 4267H	System area		
17000	4268H	Data exchange start request	0	Read, write
17001 to 17008	4269H to 4270H	IO device data exchange start method setting area	0	Read, write
17009 to 17016	4271H to 4278H	IO device data exchange management setting area	0	Read, write
17017 to 17024	4279H to 4280H	IO device data exchange management execution request	0	Read, write
17025 to 17032	4281H to 4288H	IO device alarm management area	0	Read, write
17033 to 17040	4289H to 4290H	Data consistency setting area	0	Read, write
17041 to 17048	4291H to 4298H	CPU to PN handshake flag (data consistency setting input area)	0	Read, write
17049 to 17056	4299H to 42A0H	CPU to PN handshake flag (data consistency setting output area)	0	Read, write
17057	42A1H	Service execution request 1, Service execution request 2	0	Read, write
17058 to 17117	42A2H to 42DDH	System area		
17118 to 17119	42DEH to 42DFH	Module status	0	Read
17120 to 17127	42E0H to 42E7H	IO device data exchange management execution completion	0	Read
17128 to 17135	42E8H to 42EFH	PN to CPU handshake flag (data consistency setting input area)	0	Read
17136 to 17143	42F0H to 42F7H	PN to CPU handshake flag (data consistency setting output area)	0	Read
17144	42F8H	Service execution status	0	Read
17145 to 17152	42F9H to 4300H	IO device alarm indication area	0	Read
17153 to 17160	4301H to 4308H	IO device communication status	0	Read
17161 to 17168	4309H to 4310H	IO device error	0	Read
17169	4311H	Module error details	0	Read
17170 to 21857	4312H to 5561H	System area		
21858 to 21921	5562H to 55A1H	IO device error details	0	Read
21922 to 30999	55A2H to 7917H	System area		
31000 to 35095	7918H to 8917H	Output data area	0	Read, write
35096 to 35999	8918H to 8C9FH	System area		
36000 to 40095	8CA0H to 9C9FH	Input data area	0	Read
40096 to 49999	9CA0H to C34FH	System area		
50000 to 52087	C350H to CB77H	Service request area 1	0	Read, write
52088 to 52249	CB78H to CC19H	System area		
52250 to 54337	CC1AH to D441H	Service request area 2	0	Read, write
54338 to 56999	D442H to DEA7H	System area		
57000 to 59087	DEA8H to E6CFH	Service response area 1	0	Read
59088 to 59249	E6D0H to E771H	System area		
59250 to 61337	E772H to EF99H	Service response area 2	0	Read
61338 to 2097129	EF9AH to 1FFFE9H	System area		
2097130	1FFFEAH	Communication stop at CPU STOP setting area	0	Read, write
2097131 to 2097151	1FFFEBH to 1FFFFFH	System area		

Point

Do not write data to "System area". Doing so may cause malfunction of the programmable controller system.

A

Corresponding list of buffer memory areas and global labels

Name		Global label
Current error area (Un\G140)		—
Data exchange start request (Un\G17000.0)		glRJ71PN92_1.stMgmtOutputs.bReq_DataExchangeStartRequest
IO device data exchange start method setting area (Un\G17001 to Un\G17008)		glRJ71PN92_1.stMgmtOutputs.bnSet_DataExchangeStartMethodSetting
IO device data exchange management setting area (Un\G17009 to Un\G17016)		glRJ71PN92_1.stMgmtOutputs.bnSet_DataExchangeManagementSetting
IO device data exchange management execution request (Un\G17017 to Un\G17024)		glRJ71PN92_1.stMgmtOutputs.bnReq_DataExchangeManagementExecution
IO device alarm management area (Un\G17025 to Un\G17032)		glRJ71PN92_1.stMgmtOutputs.bnSet_IODevicesAlarmManagement
Data consistency setting area (Un\G17033 to Un\G17040)		glRJ71PN92_1.stMgmtOutputs.bnSet_DataConsistencySetting
CPU to PN handshake flag (data consistency setting input area) (Un\G17041 to Un\G17048)		glRJ71PN92_1.stMgmtOutputs.bnReq_IODevicesHandshakeInputRequest
CPU to PN handshake flag (data consistency setting output area) (Un\G17049 to Un\G17056)		glRJ71PN92_1.stMgmtOutputs.bnReq_IODevicesHandshakeOutputRequest
Service execution request 1, Service execution request 2 (Un\G17057)		glRJ71PN92_1.stMgmtOutputs.bnReq_ServiceIFExecutionRequest
Module status (Un\G17118 to Un\G17119)	Parameter setting status (Un\G17118.0)	glRJ71PN92_1.stMgmtInputs.bSts_ConfigurationStatus
	Communication start completion (Un\G17118.3)	glRJ71PN92_1.stMgmtInputs.bSts_DataExchangeStartCompleted
	Module error (Un\G17119.0)	glRJ71PN92_1.stMgmtInputs.bSts_DiagnosticError
IO device data exchange management execution completion (Un\G17120 to Un\G17127)		glRJ71PN92_1.stMgmtInputs.bnCompl_DataExchangeManagementExecution
PN to CPU handshake flag (data consistency setting input area) (Un\G17128 to Un\G17135)		glRJ71PN92_1.stMgmtInputs.bnAcpt_IODevicesHandshakeInput
PN to CPU handshake flag (data consistency setting output area) (Un\G17136 to Un\G17143)		glRJ71PN92_1.stMgmtInputs.bnAcpt_IODevicesHandshakeOutput
Service execution status (Un\G17144)	Service request area 1 execution request completion bit (Un\G17144.0)	glRJ71PN92_1.stMgmtInputs.bCompl_ServiceIFArea1
	Service request area 2 execution request completion bit (Un\G17144.1)	glRJ71PN92_1.stMgmtInputs.bCompl_ServiceIFArea2
	Service request area 1 execution request acceptance bit (Un\G17144.8)	glRJ71PN92_1.stMgmtInputs.bAcpt_ServiceIFArea1
	Service request area 2 execution request acceptance bit (Un\G17144.9)	glRJ71PN92_1.stMgmtInputs.bAcpt_ServiceIFArea2
IO device alarm indication area (Un\G17145 to Un\G17152)		glRJ71PN92_1.stMgmtInputs.bnAcpt_IODevicesAlarm
IO device communication status (Un\G17153 to Un\G17160)		glRJ71PN92_1.stMgmtInputs.bnSts_IODevicesConnStatus
IO device error (Un\G17161 to Un\G17168)		glRJ71PN92_1.stMgmtInputs.bnSts_IODevicesErr
Module error details (Un\G17169)		—
IO device error details (Un\G21858 to Un\G21921)		glRJ71PN92_1.stDiagnosticsInfo_D.unVal_IODevicesErrorDetails_D
Output data area (Un\G31000 to Un\G35095)		—
Input data area (Un\G36000 to Un\G40095)		—

Name		Global label
Service request area 1 (Un\G50000 to Un\G52087)	RequestID (Un\G50000 to Un\G50001)	glRJ71PN92_1.stServiceIFRequestArea1_D.udVal_RequestID_D
	ServiceID (Un\G50002)	glRJ71PN92_1.stServiceIFRequestArea1_D.uVal_ServiceID_D
	Status (Un\G50003)	glRJ71PN92_1.stServiceIFRequestArea1_D.uVal_Status_D
	DeviceID (Un\G50004 to Un\G50005)	glRJ71PN92_1.stServiceIFRequestArea1_D.udVal_DeviceID_D
	API (Un\G50006 to Un\G50007)	glRJ71PN92_1.stServiceIFRequestArea1_D.udVal_API_D
	SlotNumber (Un\G50008)	glRJ71PN92_1.stServiceIFRequestArea1_D.uVal_SlotNumber_D
	SubslotNumber (Un\G50009)	glRJ71PN92_1.stServiceIFRequestArea1_D.uVal_SubslotNumber_D
	Index (Un\G50010)	glRJ71PN92_1.stServiceIFRequestArea1_D.uVal_Index_D
	Data length(byte) (Un\G50011)	glRJ71PN92_1.stServiceIFRequestArea1_D.wVal_DataLength_D
	PnDeviceID (Un\G50012)	glRJ71PN92_1.stServiceIFRequestArea1_D.uVal_ProfinetDeviceID_D
	PNVendorID (Un\G50013)	glRJ71PN92_1.stServiceIFRequestArea1_D.uVal_ProfinetVendorID_D
	ARUUID (Un\G50014 to Un\G50021)	glRJ71PN92_1.stServiceIFRequestArea1_D.unVal_ARUUID_D
	Data (Un\G50030 to Un\G52087)	glRJ71PN92_1.stServiceIFRequestArea1_D.unArea_Data_D
Service request area 2 (Un\G52250 to Un\G54337)	RequestID (Un\G52250 to Un\G52251)	glRJ71PN92_1.stServiceIFRequestArea2_D.udVal_RequestID_D
	ServiceID (Un\G52252)	glRJ71PN92_1.stServiceIFRequestArea2_D.uVal_ServiceID_D
	Status (Un\G52253)	glRJ71PN92_1.stServiceIFRequestArea2_D.uVal_Status_D
	DeviceID (Un\G52254 to Un\G52255)	glRJ71PN92_1.stServiceIFRequestArea2_D.udVal_DeviceID_D
	API (Un\G52256 to Un\G52257)	glRJ71PN92_1.stServiceIFRequestArea2_D.udVal_API_D
	SlotNumber (Un\G52258)	glRJ71PN92_1.stServiceIFRequestArea2_D.uVal_SlotNumber_D
	SubslotNumber (Un\G52259)	glRJ71PN92_1.stServiceIFRequestArea2_D.uVal_SubslotNumber_D
	Index (Un\G52260)	glRJ71PN92_1.stServiceIFRequestArea2_D.uVal_Index_D
	Data length(byte) (Un\G52261)	glRJ71PN92_1.stServiceIFRequestArea2_D.wVal_DataLength_D
	PnDeviceID (Un\G52262)	glRJ71PN92_1.stServiceIFRequestArea2_D.uVal_ProfinetDeviceID_D
	PNVendorID (Un\G52263)	glRJ71PN92_1.stServiceIFRequestArea2_D.uVal_ProfinetVendorID_D
	ARUUID (Un\G52264 to Un\G52271)	glRJ71PN92_1.stServiceIFRequestArea2_D.unVal_ARUUID_D
	Data (Un\G52280 to Un\G54337)	glRJ71PN92_1.stServiceIFRequestArea2_D.unArea_Data_D
Service response area 1 (Un\G57000 to Un\G59087)	RequestID (Un\G57000 to Un\G57001)	glRJ71PN92_1.stServiceIFResponseArea1_D.udVal_RequestID_D
	ServiceID (Un\G57002)	glRJ71PN92_1.stServiceIFResponseArea1_D.uVal_ServiceID_D
	Status (Un\G57003)	glRJ71PN92_1.stServiceIFResponseArea1_D.uVal_Status_D
	DeviceID (Un\G57004 to Un\G57005)	glRJ71PN92_1.stServiceIFResponseArea1_D.udVal_DeviceID_D
	Data length(byte) (Un\G57006)	glRJ71PN92_1.stServiceIFResponseArea1_D.wVal_DataLength_D
	ErrorDecode (Un\G57007)	glRJ71PN92_1.stServiceIFResponseArea1_D.uVal_ErrorDecode_D
	ErrorCode1 (Un\G57008)	glRJ71PN92_1.stServiceIFResponseArea1_D.uVal_ErrorCode1_D
	ErrorCode2 (Un\G57009)	glRJ71PN92_1.stServiceIFResponseArea1_D.uVal_ErrorCode2_D
	Data (Un\G57020 to Un\G59087)	glRJ71PN92_1.stServiceIFResponseArea1_D.unArea_Data_D
Service response area 2 (Un\G59250 to Un\G61337)	RequestID (Un\G59250 to Un\G59251)	glRJ71PN92_1.stServiceIFResponseArea2_D.udVal_RequestID_D
	ServiceID (Un\G59252)	glRJ71PN92_1.stServiceIFResponseArea2_D.uVal_ServiceID_D
	Status (Un\G59253)	glRJ71PN92_1.stServiceIFResponseArea2_D.uVal_Status_D
	DeviceID (Un\G59254 to Un\G59255)	glRJ71PN92_1.stServiceIFResponseArea2_D.udVal_DeviceID_D
	Data length(byte) (Un\G59256)	glRJ71PN92_1.stServiceIFResponseArea2_D.wVal_DataLength_D
	ErrorDecode (Un\G59257)	glRJ71PN92_1.stServiceIFResponseArea2_D.uVal_ErrorDecode_D
	ErrorCode1 (Un\G59258)	glRJ71PN92_1.stServiceIFResponseArea2_D.uVal_ErrorCode1_D
	ErrorCode2 (Un\G59259)	glRJ71PN92_1.stServiceIFResponseArea2_D.uVal_ErrorCode2_D
	Data (Un\G59270 to Un\G61337)	glRJ71PN92_1.stServiceIFResponseArea2_D.unArea_Data_D

Details of buffer memory addresses

The following describes the buffer memory addresses of the RJ71PN92.

Current error area

■Current error area (Un\G140)
An error code is stored.

Data exchange start request

■Data exchange start request (Un\G17000)
Set to start or stop the I/O data exchange of the RJ71PN92.

Address	Bit	Name	Description
Un\G17000	b0	Data exchange start request	0: RJ71PN92 I/O data exchange stop The I/O data exchange between the RJ71PN92 and all IO devices is stopped regardless of the setting of 'IO device data exchange start method setting area' (Un\G17001 to Un\G17008). 1: RJ71PN92 I/O data exchange start By setting 1 in this area, the IO device where I/O data exchange automatic start is set in 'IO device data exchange start method setting area' (Un\G17001 to Un\G17008) starts the I/O data exchange.
	b1 to b15	System area	—

For the I/O data exchange of the IO device where I/O data exchange manual start is set in 'IO device data exchange start method setting area' (Un\G17001 to Un\G17008), it is controlled with 'IO device data exchange management setting area' (Un\G17009 to Un\G17016) and 'IO device data exchange management execution request' (Un\G17017 to Un\G17024).

IO device data exchange start method setting area

■IO device data exchange start method setting area (Un\G17001 to Un\G17008)
Set a method of starting the I/O data exchange of each IO device.

Set this area before turning on 'Data exchange start request' (Un\G17000.0).
 • 0: I/O data exchange automatic start

The I/O data exchange between the RJ71PN92 and each IO device is automatically started.
 • 1: I/O data exchange manual start

The I/O data exchange between the RJ71PN92 and each IO device is manually started.

By setting 'IO device data exchange management setting area' (Un\G17009 to Un\G17016) and 'IO device data exchange management execution request' (Un\G17017 to Un\G17024) after turning on 'Data exchange start request' (Un\G17000.0), the start/stop of the I/O data exchange with each IO device is controlled.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17001	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17008	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

IO device data exchange management setting area

■IO device data exchange management setting area (Un\G17009 to Un\G17016)

Set to start or stop the I/O data exchange with each IO device.

The setting of this area is applied to the IO device where I/O data exchange manual start is set in 'IO device data exchange start method setting area' (Un\G17001 to Un\G17008).

By setting 'IO device data exchange management execution request' (Un\G17017 to Un\G17024) after setting this area, the start/stop of the I/O data exchange with each IO device is controlled.

 • 0: Stop I/O data exchange with each IO device
 • 1: Start I/O data exchange with each IO device

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17009	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17016	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

IO device data exchange management execution request

■IO device data exchange management execution request (Un\G17017 to Un\G17024)

Set whether or not to apply the setting of 'IO device data exchange management setting area' (Un\G17009 to Un\G17016).

After setting 'IO device data exchange management setting area' (Un\G17009 to Un\G17016), set 1 in this area to control the start/stop of the I/O data exchange with each IO device.

The setting of this area is applied to the IO device where I/O data exchange manual start is set in 'IO device data exchange start method setting area' (Un\G17001 to Un\G17008).

 • 0: Do not apply the setting of 'IO device data exchange management setting area' (Un\G17009 to Un\G17016)
 • 1: Apply the setting of 'IO device data exchange management setting area' (Un\G17009 to Un\G17016)

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17017	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17024	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

A

IO device alarm management area

■IO device alarm management area (Un\G17025 to Un\G17032)

Set a method of managing alarms of each IO device.

 • 0: Alarm automatic processing

This processing automatically returns the alarm ACK to the alarm that has been received from each IO device.

'IO device alarm indication area' (Un\G17145 to Un\G17152) is not used.

 • 1: Alarm manual processing

This processing stores alarm information in 'IO device alarm indication area' (Un\G17145 to Un\G17152) when the RJ71PN92 has received an alarm from each IO device.

This processing uses the service interface function to execute the alarm request and alarm ACK.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17025	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17032	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

Data consistency setting area

■Data consistency setting area (Un\G17033 to Un\G17040)

Set whether to enable or disable the I/O data consistency setting.

 • 0: Disable data consistency setting
 • 1: Enable data consistency setting

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17033	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17040	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

CPU to PN handshake flag (data consistency setting input area)

■CPU to PN handshake flag (data consistency setting input area) (Un\G17041 to Un\G17048)

This flag is used when the data consistency function is executed. For details on data consistency function, refer to the following.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17041	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17048	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

CPU to PN handshake flag (data consistency setting output area)

■CPU to PN handshake flag (data consistency setting output area) (Un\G17049 to Un\G17056)

This flag is used when the data consistency function is executed. For details on data consistency function, refer to the following.

☞ Page 23 Data Consistency Function

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17049	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17056	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

☞ Page 87 [General Configuration] tab

Service execution request 1, Service execution request 2

■Service execution request 1, Service execution request 2 (Un\G17057)

These execution request bits are for 'Service request area 1' (Un\G50000 to Un\G52087) and 'Service request area 2' (Un\G52250 to Un\G54337).

To execute the service, set these areas. For details on the service interface functions, refer to the following.

☞ Page 27 Service Interface Function

Address	Bit	Name	Description
Un\G17057	b0	Service request area 1 execution request bit	0: Do not send execution request to Service request area 1 1: Send execution request to Service request area 1
	b1	Service request area 2 execution request bit	0: Do not send execution request to Service request area 2 1: Send execution request to Service request area 2
	b2 to b15	System area	—

Module status

■Module status (Un\G17118 to Un\G17119)

The RJ71PN92 status and errors can be checked.

Address	Bit	Name	Description
Un\G17118	b0	Parameter setting status	The status of parameter setting of the RJ71PN92 is stored.[1] 0: Parameter setting not completed 1: Parameter setting completed successfully
	b1 to b2	System area	—
	b3	Communication start completion	The communication start status of the RJ71PN92 is stored. 0: Communication start not completed 1: Communication start completed
	b4 to b15	System area	—
Un\G17119	b0	Module error	The error status of the RJ71PN92 is stored. 0: No error 1: Error
	b1 to b15	System area	—

*1 When parameters are newly written, 1 is set when the CPU module is powered off and on or reset.

A

IO device data exchange management execution completion

■IO device data exchange management execution completion (Un\G17120 to Un\G17127)

The execution request status of the I/O data exchange with each IO device is stored.

The setting of this area is applied to the IO device where I/O data exchange manual start is set in 'IO device data exchange start method setting area' (Un\G17001 to Un\G17008).

The communication status of each IO device can be checked in 'IO device communication status' (Un\G17153 to Un\G17160).

 • 0: No execution request or execution request cleared
 • 1: During execution request

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17120	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17127	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

☞ Page 87 [General Configuration] tab

PN to CPU handshake flag (data consistency setting input area)

■PN to CPU handshake flag (data consistency setting input area) (Un\G17128 to Un\G17135)

This flag is used when the data consistency function is executed. For details on data consistency function, refer to the following.

☞ Page 23 Data Consistency Function

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17128	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17135	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

☞ Page 87 [General Configuration] tab

PN to CPU handshake flag (data consistency setting output area)

■PN to CPU handshake flag (data consistency setting output area) (Un\G17136 to Un\G17143)

This flag is used when the data consistency function is executed. For details on data consistency function, refer to the following.

☞ Page 23 Data Consistency Function

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17136	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17143	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

☞ Page 87 [General Configuration] tab

Service execution status

■Service execution status (Un\G17144)

The execution status of the service requested with 'Service execution request 1, Service execution request 2' (Un\G17057) is stored.

Address	Bit	Name	Description
Un\G17144	b0	Service request area 1 execution request completion bit	0: Service not executed or completed 1: Service completed Response results from the IO device is stored in Service response area 1.
	b1	Service request area 2 execution request completion bit	0: Service not executed or completed 1: Service completed Response results from the IO device is stored in Service response area 2.
	b2 to b7	System area	—
	b8	Service request area 1 execution request acceptance bit	0: Service not executed or Service execution request not received 1: Service execution request received
	b9	Service request area 2 execution request acceptance bit	0: Service not executed or Service execution request not received 1: Service execution request received
	b10 to b15	System area	—

IO device alarm indication area

■IO device alarm indication area (Un\G17145 to Un\G17152)

The occurrence of an error in each IO device is stored.

The setting of this area is applied to the IO device where Alarm manual processing is set in 'IO device alarm management area' (Un\G17025 to Un\G17032).

 • 0: Alarm not received

 • 1: Alarm received

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17145	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17152	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

☞ Page 87 [General Configuration] tab

IO device communication status

■IO device communication status (Un\G17153 to Un\G17160)

The communication status of each IO device is stored.

- 0: Communication unexecuted
- 1: During communication

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17153	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17160	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

IO device error

■IO device error (Un\G17161 to Un\G17168)

The occurrence of an error in each IO device is stored. For error details, refer to the following.

- 0: No error
- 1: Error

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G17161	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮																
Un\G17168	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

Each number in the table represents an IO device ID. Each bit corresponds to the IO device ID. For IO device IDs, refer to the following.

Module error details

■Module error details (Un\G17169)

The communication error status of PROFINET is stored.

Stored value	PN ERR LED	Error details and causes	Action
3030H	Off	During normal communications with all IO devices	—*1
	Flashing	One or more IO devices are not connected or an error has occurred in one or more IO devices.	Correct the PROFINET module setting and write it in the RJ71PN92 again.
3031H	On	System error (RJ71PN92 initial error)	Reset the CPU module. If the error occurs again even after the measure is taken, the possible cause is a hardware failure of the RJ71PN92. Please consult your local Mitsubishi representative.
3033H	On	Communications have not been performed with all IO devices.	• Check if the PROFINET module setting is correct. • Check if no error has occurred in the communication path with the IO devices.
3038H	Off	The I/O data exchange has not been started.	—
3039H	On	System error (RJ71PN92 initial error)	Reset the CPU module. If the error occurs again even after the measure is taken, the possible cause is a hardware failure of the RJ71PN92. Please consult your local Mitsubishi representative.
3130H to 3138H	On	System error (RJ71PN92 initial error)	Reset the CPU module. If the error occurs again even after the measure is taken, the possible cause is a hardware failure of the RJ71PN92. Please consult your local Mitsubishi representative.
3139H	On	PROFINET module setting access error (The PROFINET module setting is not set or an access has failed.)	• Reset the CPU module. • Write the PROFINET module setting in the RJ71PN92 again.
3230H	On	PROFINET module setting access error (The PROFINET module setting is not set or an access has failed.)	• Reset the CPU module. • Write the PROFINET module setting in the RJ71PN92 again.
3231H	On	System error (RJ71PN92 initial error)	Reset the CPU module. If the error occurs again even after the measure is taken, the possible cause is a hardware failure of the RJ71PN92. Please consult your local Mitsubishi representative.

*1 When the RJ71PN92 cannot communicate with IO devices in this status, the IO device information may not exist in the set parameter. Correct the PROFINET module setting and write it in the RJ71PN92 again.

A

IO device error details

■IO device error details (Un\G21858 to Un\G21921)

Error details of each IO device are stored.

For details on error details of each IO device, refer to the following.

☞ Page 131 Error details of IO devices

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G21858	Error details of the IO device (IO device ID: 1)								Error details of the IO device (IO device ID: 0)							
Un\G21859	Error details of the IO device (IO device ID: 3)								Error details of the IO device (IO device ID: 2)							
⋮																
Un\G21920	Error details of the IO device (IO device ID: 125)								Error details of the IO device (IO device ID: 124)							
Un\G21921	Error details of the IO device (IO device ID: 127)								Error details of the IO device (IO device ID: 126)							

For IO device IDs, refer to the following.

☞ Page 87 [General Configuration] tab

Output data area

■Output data area (Un\G31000 to Un\G35095)

This area stores the data to be output from the RJ71PN92 to each IO device by the I/O data exchange.

Set the data to be output from the RJ71PN92 to each IO device in the engineering tool. (☞ Page 61 Setting items)

For details on this area, refer to the following.

☞ Page 17 Data Exchange Function

Input data area

■Input data area (Un\G36000 to Un\G40095)

This area stores the data to be input from each IO device to the RJ71PN92 by the I/O data exchange.

Set the data to be input from each IO device to the RJ71PN92 in the engineering tool. (☞ Page 61 Setting items)

For details on this area, refer to the following.

☞ Page 17 Data Exchange Function

Service request area 1, Service request area 2

■Service request area 1 (Un\G50000 to Un\G52087), Service request area 2 (Un\G52250 to Un\G54337)

This area stores service request data.

By storing service request data in this area and sending a service execution request with 'Service execution request 1,

Service execution request 2' (Un\G17057), the service is executed.

For details on this area, refer to the following.

☞ Page 27 Service Interface Function

Service response area 1, Service response area 2

■Service response area 1 (Un\G57000 to Un\G59087), Service response area 2 (Un\G59250 to Un\G61337)

This area stores service response data.

When execution of the requested service is completed, service request data is stored in this area and the execution request completion bit of the service request area corresponding to 'Service execution status' (Un\G17144) turns on.

For details on this area, refer to the following.

☞ Page 27 Service Interface Function

Communication stop at CPU STOP setting area

■Communication stop at CPU STOP (Un\G2097130)

Set whether to enable or disable the communication stop at CPU STOP.

0: Disable the communication stop at CPU STOP

1: Enable the communication stop at CPU STOP

> **Point**
>
> Once the communication stop at CPU STOP is enabled after the RJ71PN92 is started up, the enabled state of this function continues until the RJ71PN92 is restarted.

For details on the communication stop at CPU STOP, refer to the following.

☞ Page 54 Communication Stop at CPU STOP

A

Appendix 3 Processing Time

Transmission delay time

The following are the formulas to calculate transmission delay time of I/O data exchange.

Note that the processing time may be prolonged depending on the load ratio of the network (line congestion degree), processing performance of connected devices, and the system configuration.

Transmission delay time of output data

The following time is shown:

• The time between the CPU module device turning on or off and the output of the IO device turned on or off

• The time between data set to the CPU module device and the data output to the IO device

Calculation value	Not using the refresh settings[*1]	Using the refresh settings[*2]
Normal value	CT	CT+ST
Maximum value	CT×2	(CT×2)+ST

*1   The time to update 'Output data area' (Un\G31000 to Un\G35095) and 'Input data area' (Un\G36000 to Un\G40095).
     The data transfer between the devices of the I/O data and the CPU module is performed on the program. The processing time is not included in the calculation formula because the processing time varies depending on the programming method and the program execution type.
*2   The time to update the CPU module device set in the refresh settings.

CT: Cycle time [ms] (☞ Page 91 [Parameters] tab)

ST: Sequence scan time [ms] (📖 MELSEC iQ-R CPU Module User's Manual (Application))

Transmission delay time of input data

The following time is shown:

• The time between a signal input to the IO device and the CPU module device turned on or off

• The time between data input to the IO device and the data stored in the CPU module device

Calculation value	Not using the refresh settings[*1]	Using the refresh settings[*2]	
		ST≤CT	ST>CT
Normal value	CT	CT+ST	ST
Maximum value	CT×2	(CT×2)+ST	ST×2

*1   The time to update 'Output data area' (Un\G31000 to Un\G35095) and 'Input data area' (Un\G36000 to Un\G40095).
     The data transfer between the devices of the I/O data and the CPU module is performed on the program. The processing time is not included in the calculation formula because the processing time varies depending on the programming method and the program execution type.
*2   The time to update the CPU module device set in the refresh settings.

CT: Cycle time [ms] (☞ Page 91 [Parameters] tab)

ST: Sequence scan time [ms] (📖 MELSEC iQ-R CPU Module User's Manual (Application))

Appendix 4 Added and Enhanced Functions

The following table lists the added and enhanced functions in the RJ71PN92.

Added and enhanced function	Firmware version of the RJ71PN92	Software version of GX Configurator-PN	Software version of GX Works3
Compatible with R00CPU, R01CPU, R02CPU	—	Version 2.02C or later	—
Communication stop at CPU STOP	"03" or later	Version 2.02C or later	—

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MEMO

REVISIONS

WARRANTY

Please confirm the following product warranty details before using this product.

1. <u>Gratis Warranty Term and Gratis Warranty Range</u>

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. <u>Onerous repair term after discontinuation of production</u>

 (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. <u>Overseas service</u>

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. <u>Exclusion of loss in opportunity and secondary loss from warranty liability</u>

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:

 (1) Damages caused by any cause found not to be the responsibility of Mitsubishi.

 (2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.

 (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.

 (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. <u>Changes in product specifications</u>

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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