MITSUBISHI ELECTRIC

Programmable Controller

MELSEC iQ-R series

MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Startup)

-RJ71EIP91

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 CPU module User's Manual used.

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.

[Design Precautions]

⚠WARNING

- Configure a circuit so that the programmable controller is turned on first and then the external power supply. If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.
- For the operating status of each station after a communication failure, refer to manuals relevant to the network. 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.
- 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.
- 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. Failure to do so may result in an accident due to an incorrect output or malfunction.
- For the operating status of each EtherNet/IP device after a communication failure, refer to the MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Application). 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 EtherNet/IP devices. Failure to do so may result in an accident due to an incorrect output or malfunction.

[Design Precautions]

⚠CAUTION

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

[Safety 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 screw, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- When using an extension cable, connect it to the extension cable connector of the base unit securely. Check the connection for looseness. Poor contact may cause 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 and an included extension connector protective cover to the unused extension cable connector before powering on the system for operation. Failure to do so may result in electric shock.

[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. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
- 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.

[Wiring Precautions]

⚠CAUTION

- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring. Do not remove the film during wiring. Remove it for heat dissipation before system operation.
- 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 described in Page 26 Wiring Products. 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) more than 25cm 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.

[Startup and Maintenance Precautions]

⚠CAUTION

- 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 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.

[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 procedures, system configuration, and wiring 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

RJ71EIP91

COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

Method of ensuring compliance

To ensure that Mitsubishi programmable controllers maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to one of the following manuals.

- MELSEC iQ-R Module Configuration Manual
- Safety Guidelines (This manual is included with the base unit.)

Additional measures

To ensure that this product maintains EMC and Low Voltage Directives, please refer to one of the following manuals.

- MELSEC iQ-R Module Configuration Manual
- Safety Guidelines (This manual is included with the base unit.)

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RELEVANT MANUALS

Manual name [manual number]	Description	Available form
MELSEC iQ-R Module Configuration Manual [SH-081262ENG]	Common information on the hardware configuration of all modules, overview of each system configuration, and specifications of the power supply module, base unit, SD memory card, and battery.	Print book e-Manual PDF
MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Startup) [SH-081913ENG] (this manual)	Specifications, procedures before operation, system configuration, wiring, and communication examples of the EtherNet/IP network interface module	Print book e-Manual PDF
MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Application) [SH-081915ENG]	Functions, parameter settings, operation methods of EtherNet/IP Configuration Tool, programming, troubleshooting, I/O signals, and buffer memory of the EtherNet/IP network interface module	Print book e-Manual PDF
GX Works3 Operating Manual [SH-081215ENG]	System configuration, parameter settings, and online operations of GX Works3	e-Manual PDF
MELSEC iQ-R EtherNet/IP Network Interface Module Function Block Reference [BCN-P5999-0942]	Specifications of the FBs, functions, and I/O labels of the EtherNet/IP network interface module	e-Manual PDF

This manual does not include detailed information on the following:

- General specifications
- Applicable combinations of CPU modules and the other modules, and the number of mountable modules
- Installation

For details, refer to the following.

MELSEC iQ-R Module Configuration Manual

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
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.
Engineering tool	A tool used for setting up programmable controllers, programming, debugging, and maintenance
EtherNet/IP Configuration Tool	EtherNet/IP Configuration Tool for RJ71EIP91. A tool for setting the network configuration for EtherNet/IP.
EtherNet/IP device	A device, personal computer, and other equipment connected via EtherNet/IP for data communications
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.
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
Module label	A label that represents one of memory areas (I/O signals and buffer memory areas) specific to each module in a given character string. For the module used, GX Works3 automatically generates this label, which can be used as a global label.

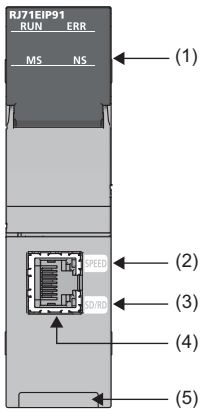
GENERIC TERMS AND ABBREVIATIONS

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

Generic term/abbreviation	Description
Consumer Tag	Another name for the consumed tag
CPU module	A generic term for the MELSEC iQ-R series CPU modules
PPS	An abbreviation for Packets Per Second. The number of packets that can be processed per second.
Producer Tag	Another name for the produced tag
RPI	An abbreviation for Requested Packet Interval. A communication cycle that is decided by the originator during communications between EtherNet/IP devices.

1 PART NAMES

This chapter describes the names of each part of the RJ71EIP91.



No.	Name	Description
(1)	RUN LED	Indicates the operating status. On: Normal operation Flashing: Initial processing Off: Error (📖 MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Application))
	ERR LED	Indicates the error status of the module. On, flashing: Error (📖 MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Application)) Off: Normal operation
	MS LED*1	Indicates the error status of the EtherNet/IP device. On (green): Data communication possible On (red): Moderate error or major error Flashing (red): Minor error
	NS LED*1	Indicates the EtherNet/IP network status. On (green): Data communications being performed Flashing (green): Failed to establish connection
(2)	SPEED LED	Indicates the EtherNet/IP link status. On (orange): Link-up (1Gbps) On (green): Link-up (100Mbps) Off: Link-down
(3)	SD/RD LED	Indicates the EtherNet/IP data sending/receiving status. On: Data being sent or received Off: Data not sent or received
(4)	Ethernet port	A connector for EtherNet/IP. Connect an Ethernet cable. For wiring method and wiring precautions, refer to the following. ☞ Page 25 WIRING
(5)	Production information marking	Shows the production information (16 digits) of the module.

*1 At power-on, MS LED and NS LED turn on in green → red, but this behavior is not a malfunction.

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2 SPECIFICATIONS

2.1 Performance Specifications

The following table lists the performance specifications of the RJ71EIP91.

Item			Description
EtherNet/IP communications*3	Class 1 communications	Communication format	Standard EtherNet/IP, tag communications
		Number of connections	• Standard EtherNet/IP: 256*1 • Tag communications: 256*1
		Communication data size	1444 bytes (per connection)
		Connection type	Point-to-point, multicast
		RPI (communication cycle)	0.5 to 60000ms
		PPS (communication processing performance)	12000PPS
	Class 3 communications	Communication format	Standard EtherNet/IP
		Number of connections	• Server: 256*1 • Client: None
		Communication data size	1414 bytes (per connection)
		Connection type	Point-to-point
	UCMM communications	Communication format	Standard EtherNet/IP
		Number of connections (number of simultaneous executions)	• Server: 96 • Client: 32
		Communication data size	1414 bytes
		Connection type	Point-to-point
Transmission specifications	Number of ports		1
	Communication mode		Full-duplex
	Data transmission speed*4		• 1Gbps • 100Mbps
	Transmission method		Base band
	Maximum segment length		100m (length between a switching hub and a node)*2
	Number of cascade connections		Consult the manufacturer of the switching hub used.
	Interface		RJ45 connector
	IP version		IPv4 is supported.
Number of occupied I/O points			32
Internal current consumption (5VDC)			1.09A
External dimensions	Height		106mm (base unit mounting side: 98mm)
	Width		27.8mm
	Depth		110mm
Weight			0.24kg

*1 The total number of connections for Class 1 communications and Class 3 communications is 256.
*2 For maximum segment length (length between switching hubs), consult the manufacturer of the switching hub used.
*3 EtherNet/IP communication specifications are available only within the specifications of the communication destination.
*4 The communication speed of 100Mbps is recommended.

MEMO

3 FUNCTION LIST

The following table lists the functions of the RJ71EIP91. For details on the functions, refer to the following.

MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Application)

EtherNet/IP communication functions

Function	Description
Class1 instance communications	Periodically performs data communications between the RJ71EIP91 and the EtherNet/IP device to which the connection has been established using an instance ID. This function is used for performing cyclic (Implicit) communications with an adapter. Data communications are performed between the originator that transmits the connection request and the target that receives the connection request.
Class1 tag communications	Performs data communications between the RJ71EIP91 modules to which the connection has been established using a tag name. This function is used for performing cyclic (Implicit) communications between scanners supported tag communications on the programmable controller. Data communications are periodically performed between tags that have the same Tag name and the same Data Size using Producer Tag and Consumer Tag.
Class3 message communications	Performs message (Explicit) communications between the RJ71EIP91 and the EtherNet/IP device to which the connection has been established by specifying a message (Explicit) communication destination using an instance ID. Class3 message communications support the server function.
UCMM message communications	Performs message (Explicit) communications between the RJ71EIP91 and the EtherNet/IP device by specifying a message (Explicit) communication destination using an instance ID without establishing the connection. UCMM message communications support the client function and the server function.

Others

Function	Description
Communication status setting function at the occurrence of a CPU stop error	Sets whether to stop or continue EtherNet/IP communications when a stop error occurs on the CPU module to which the RJ71EIP91 is mounted. This setting can be made for each module.

MEMO

4 PROCEDURES BEFORE OPERATION

This chapter describes the procedures before operation.

1. Mounting the module to the base unit

The RJ71EIP91 has no module fixing hooks. For how to mount/remove a module having no module fixing hooks to/from the base unit, refer to the following.

📖 MELSEC iQ-R Module Configuration Manual

2. Network configuration

Configure the system and set the parameters that are required for start-up.

- Wiring (☞ Page 25 WIRING)
- Parameter settings (📖 MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Application))

3. Network diagnostics

Check the connection status of the connected EtherNet/IP device using EtherNet/IP Configuration Tool.

For details, refer to the following.

📖 MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Application)

4. Programming

Create a program. For details, refer to the following.

☞ Page 28 COMMUNICATION EXAMPLE

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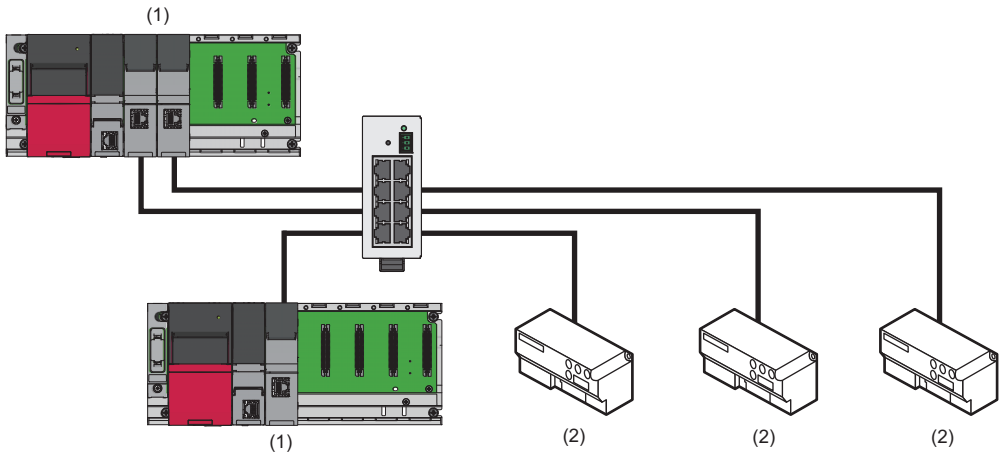
5 SYSTEM CONFIGURATION

5.1 EtherNet/IP Configuration

EtherNet/IP consists of the RJ71EIP91 (1) and EtherNet/IP devices (2).
Connect the modules in a star topology using a switching hub and Ethernet cables. Line and ring topologies are not possible.



Point

In EtherNet/IP, other external devices that perform TCP/IP communications can be used with the devices on the same network.

Scanner and adapter

In EtherNet/IP, station types are separated into scanner and adapter.

Station type	Description
Scanner	A station type of EtherNet/IP that corresponds to the master station. The scanner has the control information and controls the overall network. Devices that have a connection of originator or target can be operated as the scanner.
Adapter	A station type of EtherNet/IP that corresponds to slave stations. The adapter indicates stations other than the scanner. Devices that have a connection of target can be operated as the adapter.

5.2 Available Software Packages

To configure the settings of the RJ71EIP91, the engineering tool and EtherNet/IP Configuration Tool are required.

EtherNet/IP Configuration Tool

Please consult your local Mitsubishi representative to obtain EtherNet/IP Configuration Tool.

■Operating environment, installation/uninstallation

For the operating environment and installation/uninstallation of EtherNet/IP Configuration Tool, refer to the following.

📖 EtherNet/IP Configuration Tool Installation Instructions

■Operation methods and functions

For the operation methods and functions of EtherNet/IP Configuration Tool, refer to the following.

📖 MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Application)

■Profile of the RJ71EIP91

Profile is data in which the information (such as models) of the connected devices is stored.

When EtherNet/IP Configuration Tool with the software version 1.00A is used, the profile of the RJ71EIP91 is automatically registered in the engineering tool at the installation of EtherNet/IP Configuration Tool.

Point

- Separately install EtherNet/IP Configuration Tool because it is not automatically installed at the installation of the engineering tool.
- If the engineering tool is installed when EtherNet/IP Configuration Tool with the software version 1.00A has already been installed, the RJ71EIP91 cannot be added in the engineering tool. Install the engineering tool, then EtherNet/IP Configuration Tool.
- When using EtherNet/IP Configuration Tool with the software version 1.01B or later, use the engineering tool with the software version 1.075D or later.
- If EtherNet/IP Configuration Tool with the software version 1.00A is installed in the environment where the engineering tool with the software version 1.075D or later has already been installed, it is likely that some of the functions cannot be used. In such a case, uninstall the engineering tool once, and then re-install it again.

■EDS file

For EDS file, download from Mitsubishi Electric FA Global Site.

www.MitsubishiElectric.com/fa

6 WIRING

This chapter describes the wiring for EtherNet/IP.

6.1 Wiring Method

This section describes how to connect and disconnect the Ethernet cable.

Connecting the cable

1. Push the Ethernet cable connector into the RJ71EIP91 until it clicks. Pay attention to the orientation of the connector.
2. Lightly pull the connector to check that the connector is securely connected.
3. Check whether the SPEED LED of the port connected with an Ethernet cable is on.*1

*1 The time between the cable connection and the turning on of the SPEED LED may vary. The SPEED LED usually turns on in a few seconds. Note, however, that the time may be extended further if the link-up processing is repeated depending on the status of the device on the line. Check whether the cables are connected properly if the SPEED LED does not turn on. (MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Application))

Disconnecting the cable

1. Unplug the Ethernet cable while pressing the latch connector down.

Precautions

- Place the Ethernet cable in a duct or clamp it. Failure to do so may lead to swinging or inadvertent pulling of dangling cable, resulting in damage to the module or the cable or malfunction due to poor contact.
- Do not touch the core of the cable-side or module-side connector, and protect them from dirt or dust. If oil on your hands, dirt, or dust adheres to the core, transmission loss may increase, causing communication problems.
- Check that the Ethernet cable is not disconnected or not shorted and check that the cable is connected properly.
- Do not use Ethernet cables with broken latch connectors. Doing so may cause the Ethernet cables to be disconnected or the module to malfunction.
- Hold the connector part of the Ethernet cable when connecting and disconnecting it. Pulling the cable connected to the module may result in damage to the module or the cable or malfunction due to poor contact.
- The maximum segment length of the Ethernet cable is 100m. However, the acceptable length may be shorter depending on the environment where the cable is used. For details, contact the cable manufacturer.
- The bending radius of the Ethernet cable is limited. For details, check the specifications of the Ethernet cable to be used.
- The recommended maximum number of cascade connections is three. Four or more connections increase the possibility of packet loss caused by the switching hub.

6.2 Wiring Products

This section describes the devices used to comprise EtherNet/IP.

Ethernet cable

Use Ethernet cables that meet the following standards.

Communication speed	Ethernet cable	Connector	Standard
100Mbps	Category 5 or higher, (shielded STP) straight cable	RJ45 connector	100BASE-TX

Point

Depending on the connection environment, communication errors may occur due to high-frequency noise from devices other than programmable controllers. The following describes precautionary measures to be taken on the RJ71EIP91 to avoid the influence of high-frequency noise.

- When wiring cables, do not bundle them together with or keep them in close proximity to the main circuit lines or power cables.
- Place cables in a duct.
- Use STP cables in place of UTP cables.

Switching hub

When using a switching hub for EtherNet/IP, use a switching hub that supports the transmission speed of communications. To use a switching hub with the IGMP snooping function is recommended.

MEMO

7 COMMUNICATION EXAMPLE

7.1 Communication Example between RJ71EIP91 and EtherNet/IP Device

This section describes examples of Class 1 instance communications and Class 1 tag communications between the RJ71EIP91 and an EtherNet/IP device.

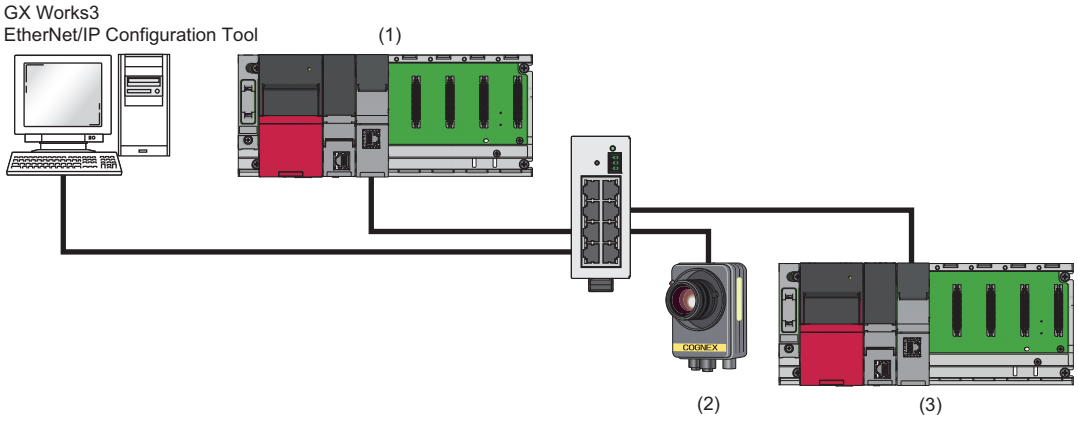
Point

Data communications between the send/receive data assigned to the buffer memory area and the CPU device can be used the following methods: using by the MOV instruction or the FROM/TO instruction and using with a module FB.
Use a module FB when "Block assurance per connection" under "Application Setting" is set to "Enable".
For details on the communication method with a module FB, refer to the following.
MELSEC iQ-R EtherNet/IP Network Interface Module Function Block Reference

System configuration example

The following system configuration is used to for the examples of Class 1 instance communications and Class 1 tag communications.

System configuration



(1) Programmable controller system (originator)
- Power supply module: R61P
- CPU module: R04CPU
- EtherNet/IP network interface module: RJ71EIP91 (start I/O number: 0000H to 001FH, IP address: 192.168.3.51)

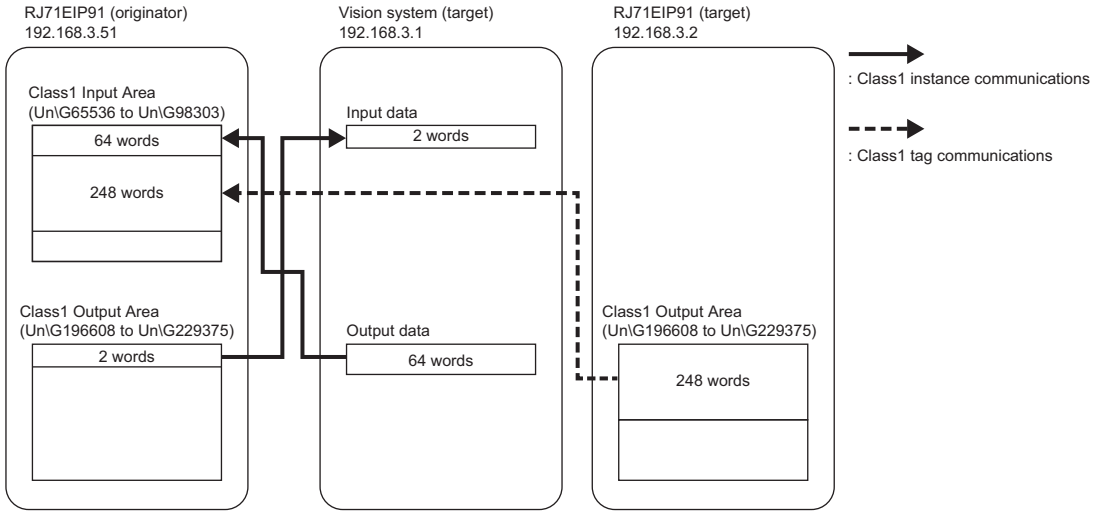
(2) EtherNet/IP device (target)
- Vision system (IP address: 192.168.3.1)*1

(3) Programmable controller system (target)
- Power supply module: R61P
- CPU module: R04CPU
- EtherNet/IP network interface module: RJ71EIP91 (start I/O number: 0000H to 001FH, IP address: 192.168.3.2)

*1 This device is manufactured by Cognex Corporation.

Communication description

The following figure shows the relationship between the buffer memory areas of the RJ71EIP91 and each target.



7

Setting parameters

Set the parameters using the engineering tool and EtherNet/IP Configuration Tool.

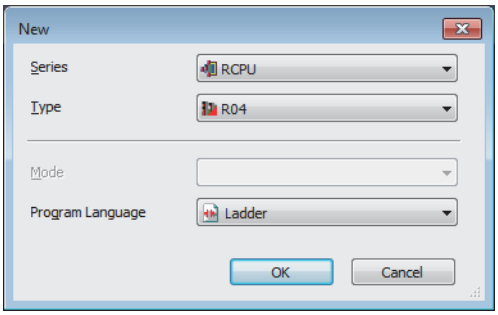
Setting the engineering tool

■Setting the RJ71EIP91 (originator)

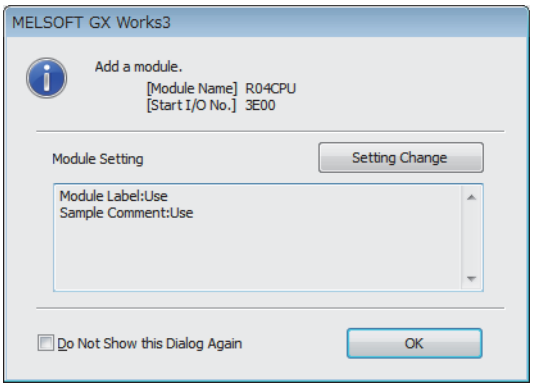
Connect the engineering tool to the scanner-side CPU module and set the parameters.

1. Set the CPU module as follows.

[Project] ⇨ [New]

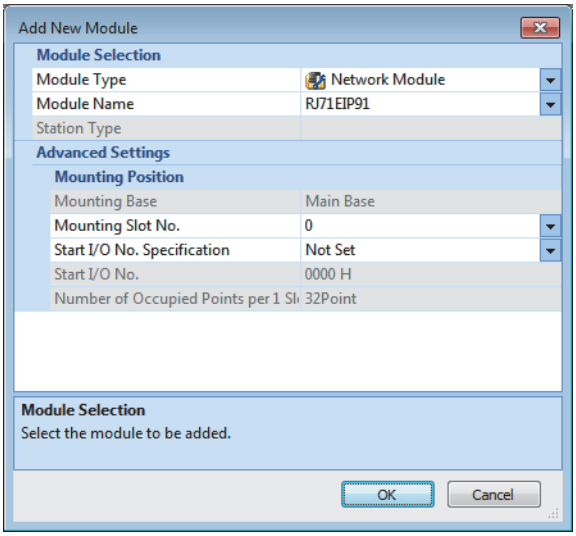


2. Click the [Setting Change] button to use the module label.



3. Set the RJ71EIP91 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] ⇨ [RJ71EIP91] ⇨ [Basic Setting]

Item	Setting Value
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	192.168.3.51
Subnet Mask	255.255.255.0
Default Gateway	

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

[Online] ⇨ [Write to PLC]

■Setting the RJ71EIP91 (target)

Connect the engineering tool to the adapter-side CPU module and set the parameters.

The setting procedure is the same as steps 1 to 5 for the RJ71EIP91 (originator). (☞ Page 30 Setting the RJ71EIP91 (originator))

The setting items in "Basic Setting" are shown below.

Item	Setting Value
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	192.168.3.2
Subnet Mask	255.255.255.0
Default Gateway	

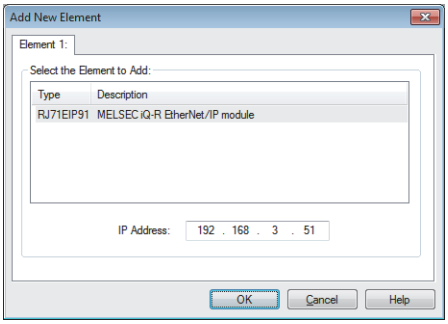
Setting EtherNet/IP Configuration Tool

Start EtherNet/IP Configuration Tool, and then set the parameters.

■IP address setting of the RJ71EIP91 (originator)

Set the IP address in the "Add New Element" window that is popped up when EtherNet/IP Configuration Tool is started.

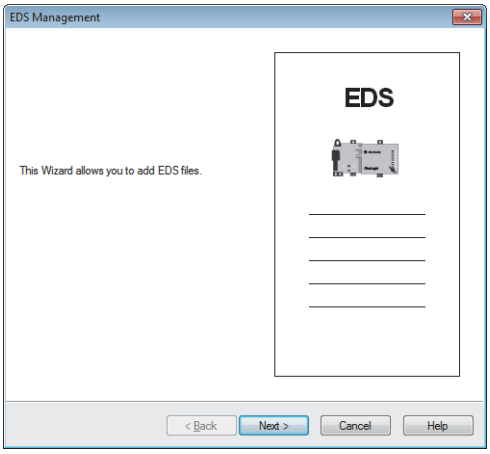
Set the same IP address as that set in "Basic Setting" in the engineering tool.



■Adding the EDS file

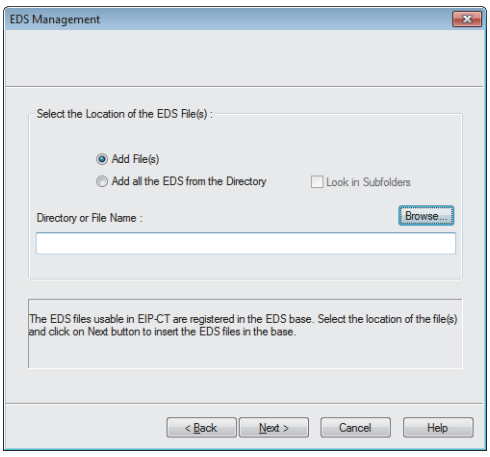
1. Open the "EDS Management" window to add an EDS file for the EtherNet/IP device to "Device Library".

[Library] ⇨ [Add]

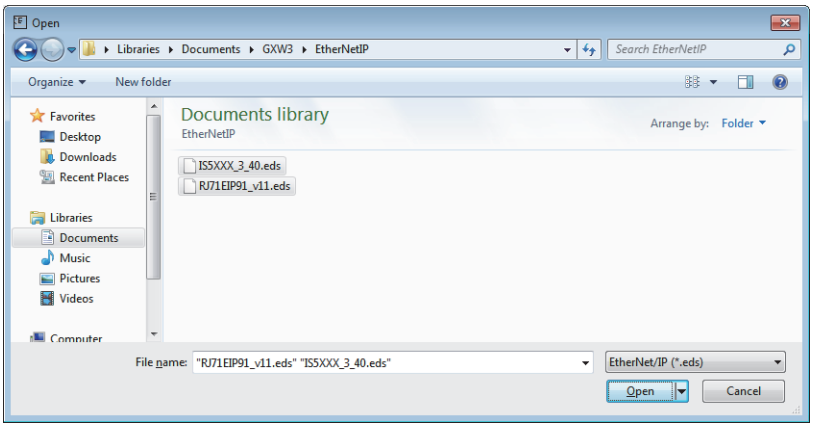


2. Click the [Next] button in the "EDS Management" window.

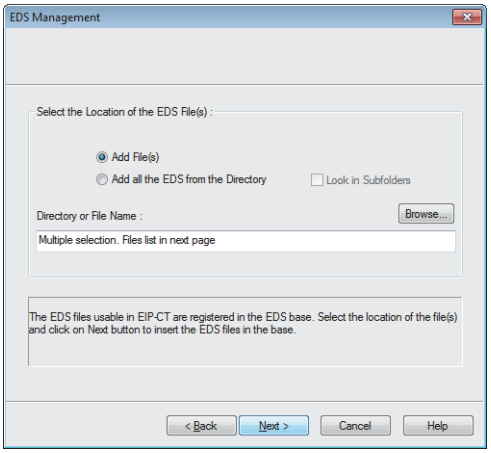
3. Click the [Browse] button.



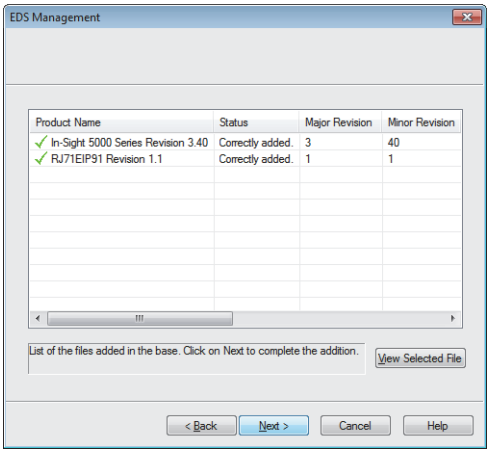
4. Select the EDS file and click the [Open] button.



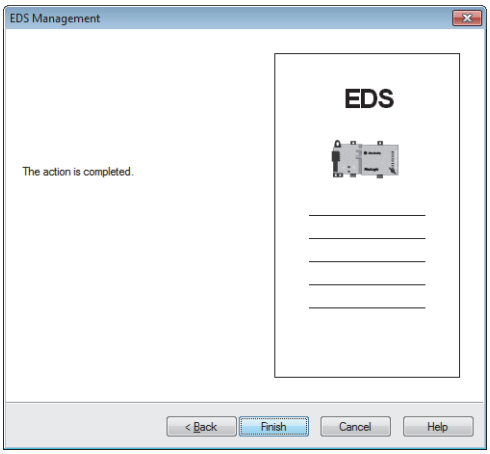
5. Click the [Next] button.



6. The addition result of the EDS file to "Device Library" is displayed. Click the [Next] button.



7. Click the [Finish] button to exit the EDS Management wizard.

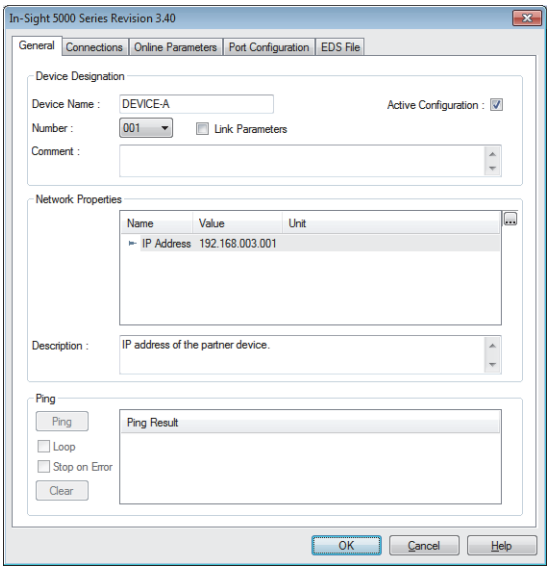


■EtherNet/IP device setting of the RJ71EIP91 (originator)

1. Select the EtherNet/IP device in "Device Library" to add it to the network configuration setting.

Select the EtherNet/IP device in "Device Library" ⇨ [Library] ⇨ [Insert in Configuration]

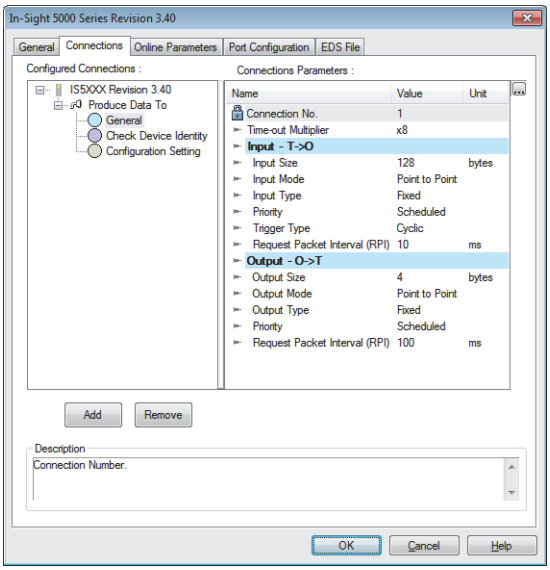
• [General] tab



2. Configure the Class 1 instance communication settings for the connection 1 EtherNet/IP device.

Select the EtherNet/IP device in the network configuration setting ⇨ [Devices] ⇨ [Properties]

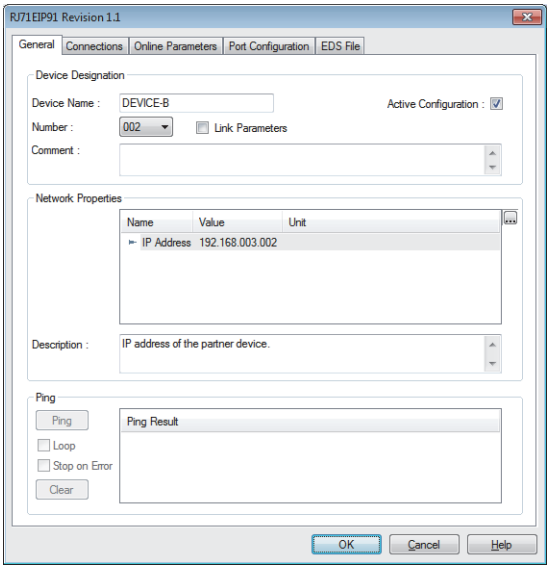
• [Connections] tab



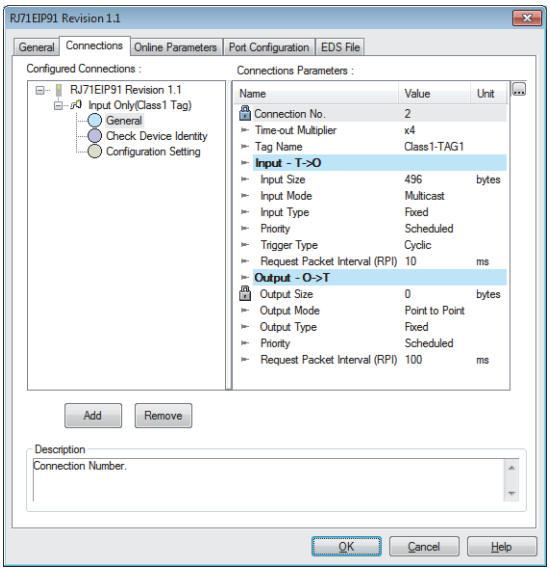
3. Configure the Class 1 tag communication settings for the connection 2 EtherNet/IP device.

Select the EtherNet/IP device in the network configuration setting ⇨ [Devices] ⇨ [Properties]

• [General] tab



• [Connections] tab

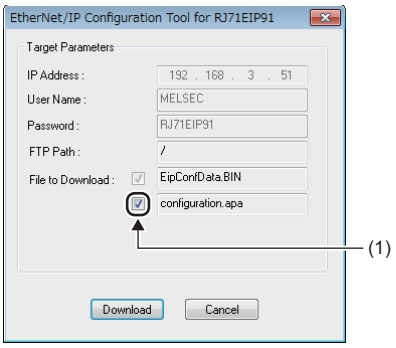


4. Switch the engineering tool to the online state.

[File] ⇨ [Go Online]

5. Write the set parameters to the RJ71EIP91.

[File] ⇨ [Download]

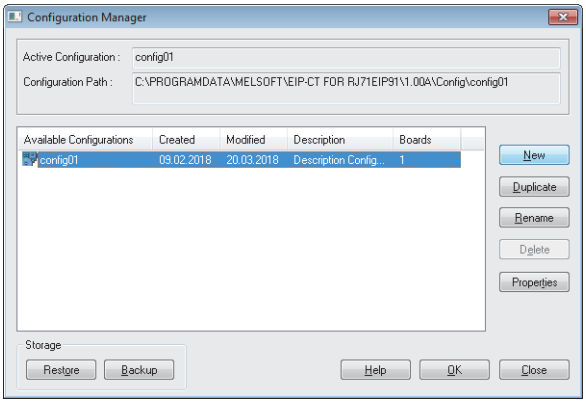


(1) Select the checkbox for "configuration.apa" under "File to Download" to download the setting file (*.apa). The parameters can be changed as required by uploading the downloaded setting file (*.apa).

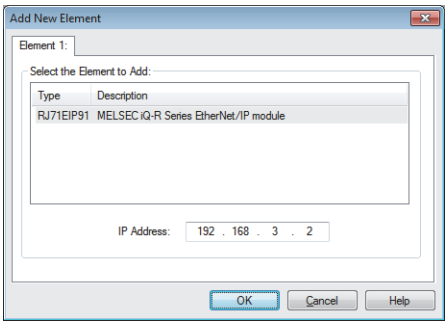
■Setting the RJ71EIP91 (target)

1. Create a new project in the "Configuration Manager" window.

Right-click "EtherNet/IP Network" in the EtherNet/IP setting. ⇨ [Configuration Manager] ⇨ [New] button



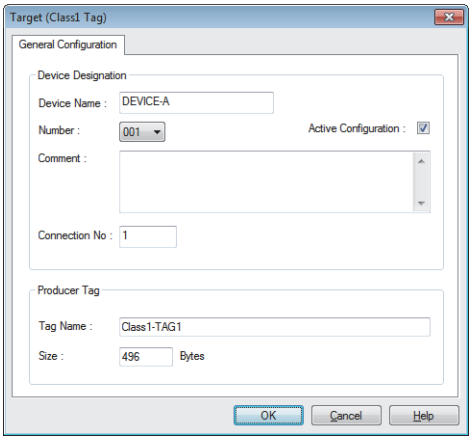
2. Set the IP address of the RJ71EIP91 (target).



3. Select the target in "Device Library" to add it to the network configuration setting.

Select the "Target(Class1 Tag)" in "Device Library". ⇨ [Library] ⇨ [Insert in Configuration]

4. Configure the Class 1 tag communication settings for the RJ71EIP91 (target).

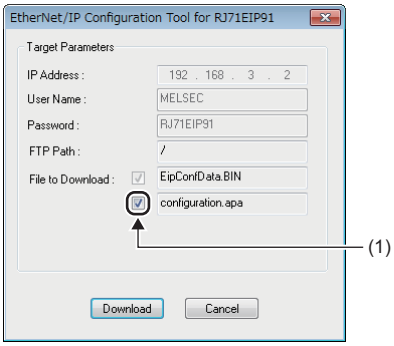


5. Switch the engineering tool to the online state.

[File] ⇨ [Go Online]

6. Write the set parameters to the RJ71EIP91.

[File] ⇨ [Download]



(1) Select the checkbox for "configuration.apa" under "File to Download" to download the setting file (*.apa). The parameters can be changed as required by uploading the downloaded setting file (*.apa).

Point

- Set the IP addresses for the personal computer connected to the RJ71EIP91 so that they have the same class and subnet address.
- For the Class1 tag communication settings, match a Tag name and data size of the RJ71EIP91 (originator) by those of the RJ71EIP91 (target).
- In the program example, default values are used for parameters that are not shown above. For the parameters, refer to the following.

MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Application)

- In the [Connections] tab, the connection displayed "Tag Name" indicates the Class1 tag communications. If not, the connection indicates the Class1 instance communications. The connection supported by the communication destination can be added or deleted by using the [Add] or [Remove] button.

Network status check

Check whether the RJ71EIP91 and the EtherNet/IP device can communicate with each other normally.

Communications are performed normally if the status of the LEDs is as shown below.

LED	Status
RUN LED	On
ERR LED	Off
MS LED	On (green)
NS LED	On (green)

Program example

The following program executes the Class1 instance communications and the Class1 tag communications by executing STOP to RUN on the CPU module.

In addition, the following program reads the connection information by turning on the connection information read request command in the program.

Program of the RJ71EIP91 (originator)

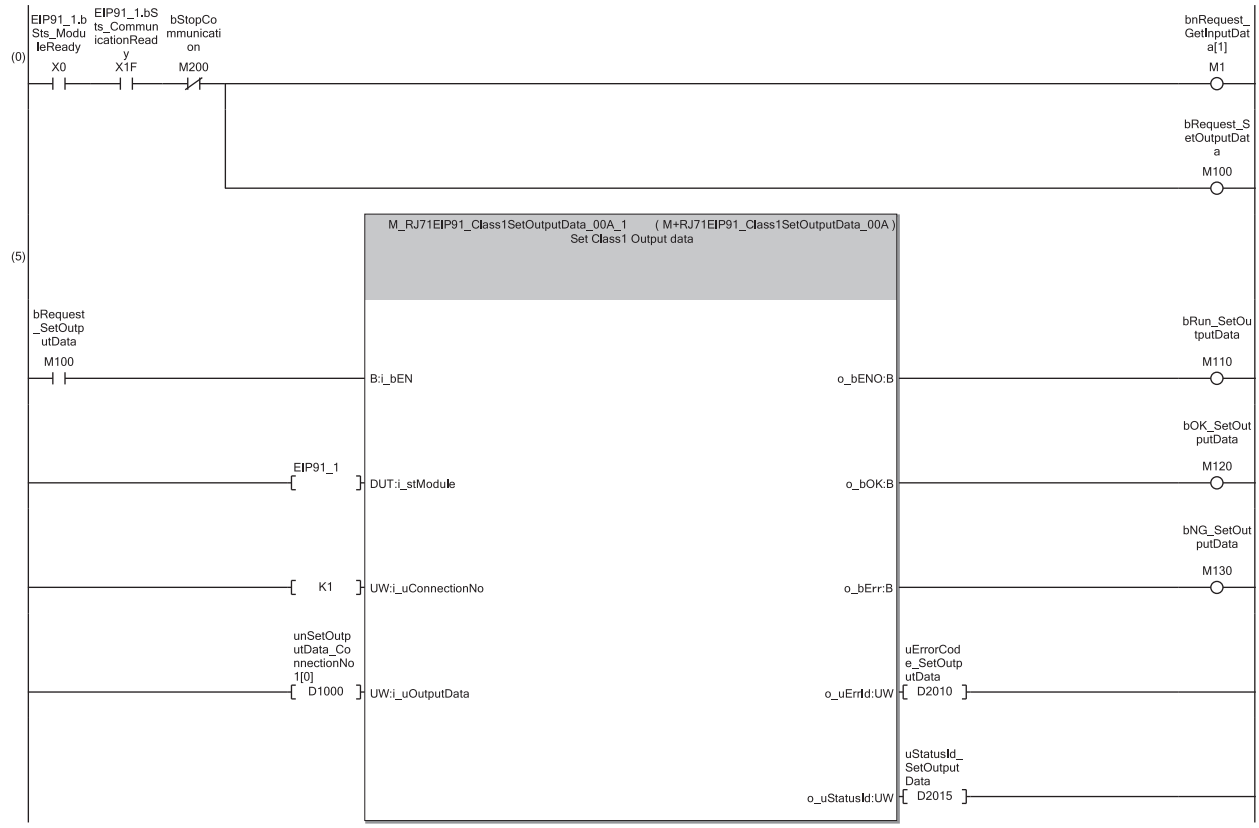
Classification	Label name	Description	Device
Module label	EIP91_1.bSts_ModuleReady	Module Ready	X0
	EIP91_1.bSts_CommunicationDuringStartup	EtherNet/IP communication in process	X10
	EIP91_1.bSts_ConnectionInfoReadComplete	Connection information read completion	X14
	EIP91_1.bSts_ConnectionInfoReadError	Connection information read error	X15
	EIP91_1.bSts_CommunicationReady	Communication Ready	X1F
	EIP91_1.bSet_CommunicationStartupRequest	EtherNet/IP communication start request	Y10
	EIP91_1.bSet_ConnectionInfoRequest	Connection information read request	Y14
	EIP91_1.uSet_ConnectionInfoReadReq_D	Connection information request area	U0\G28288
	EIP91_1.unArea_ConnectionInformationArea_D	Connection information area	U0\G28290
	EIP91_1	Module label	—
Label to be defined	Define global labels as shown below.		

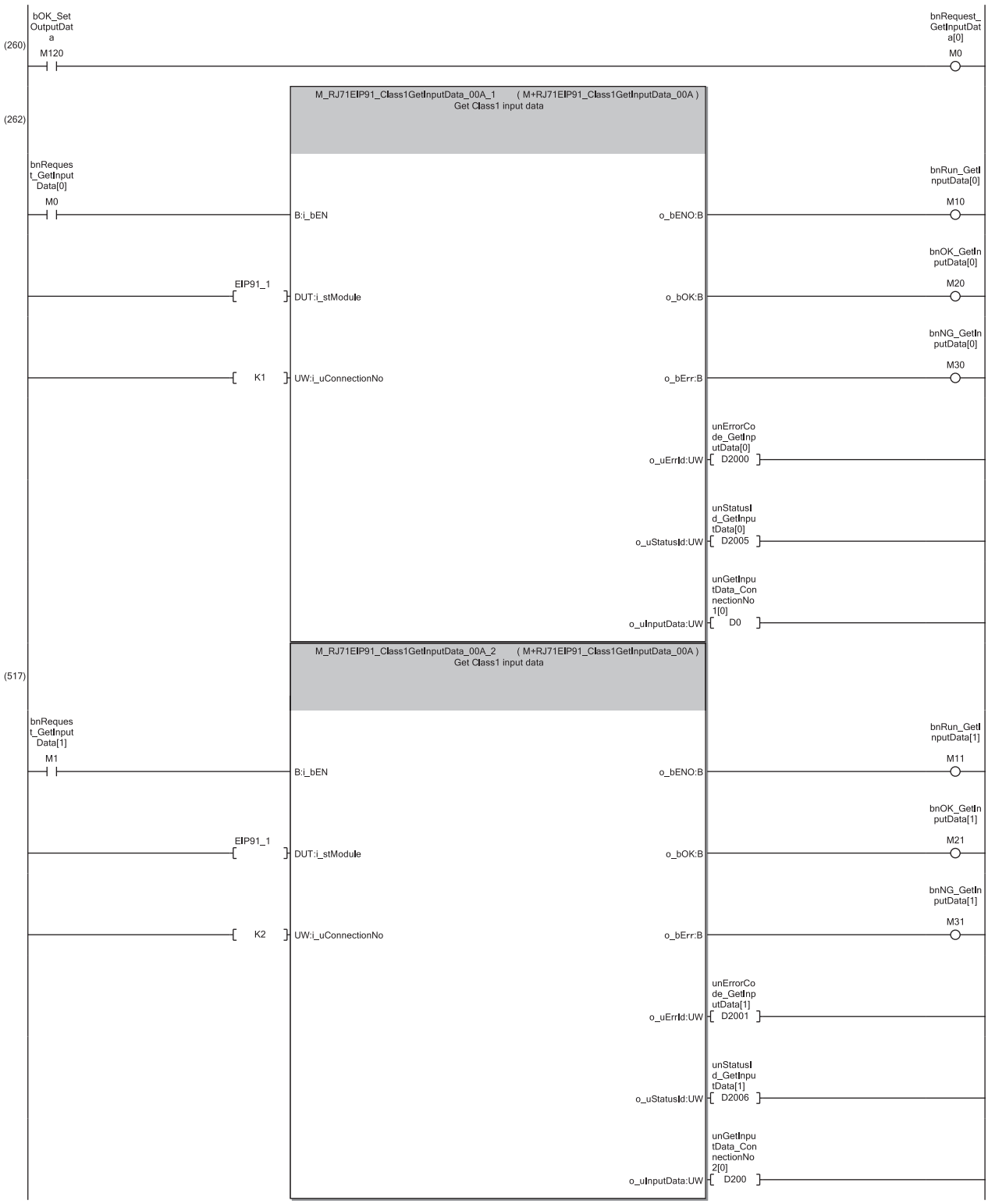
Label Name	Data Type		Class	Assign (Device/Label)
bnRequest_GetInputData	Bit(0..1)	...	VAR_GLOBAL	M0
bnRun_GetInputData	Bit(0..1)	...	VAR_GLOBAL	M10
bnOK_GetInputData	Bit(0..1)	...	VAR_GLOBAL	M20
bnNG_GetInputData	Bit(0..1)	...	VAR_GLOBAL	M30
unErrorCode_GetInputData	Word [Unsigned]/Bit String [16-bit](0..1)	...	VAR_GLOBAL	D2000
unStatusId_GetInputData	Word [Unsigned]/Bit String [16-bit](0..1)	...	VAR_GLOBAL	D2005
unGetInputData_ConnectionNo1	Word [Unsigned]/Bit String [16-bit](0..63)	...	VAR_GLOBAL	D0
unGetInputData_ConnectionNo2	Word [Unsigned]/Bit String [16-bit](0..127)	...	VAR_GLOBAL	D200
unSetOutputData_ConnectionNo1	Word [Unsigned]/Bit String [16-bit](0..1)	...	VAR_GLOBAL	D1000
bRequest_SetOutputData	Bit	...	VAR_GLOBAL	M100
bRun_SetOutputData	Bit	...	VAR_GLOBAL	M110
bOK_SetOutputData	Bit	...	VAR_GLOBAL	M120
bNG_SetOutputData	Bit	...	VAR_GLOBAL	M130
uErrorCode_SetOutputData	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D2010
uStatusId_SetOutputData	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D2015
bStopCommunication	Bit	...	VAR_GLOBAL	M200
bRequest_GetConnectionInfo	Bit	...	VAR_GLOBAL	M40
unGetConnectionNo1InfoData	Word [Unsigned]/Bit String [16-bit](0..51)	...	VAR_GLOBAL	D4000
bConnectionInformationError	Bit	...	VAR_GLOBAL	F1

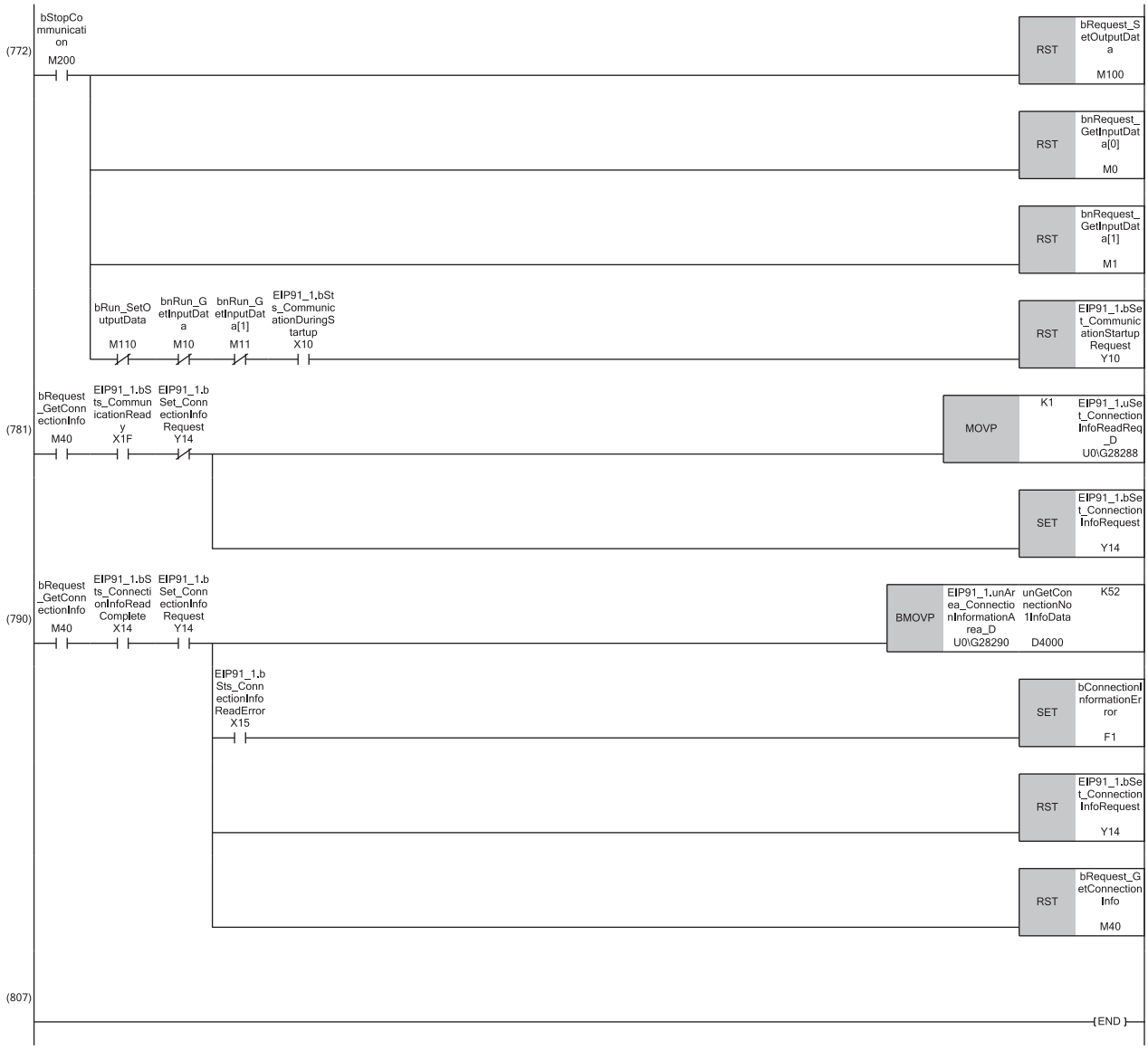
■FBs to be used

The following shows FBs to be used in this program example.

- M+RJ71EIP91_Class1SetOutputData_00A
- M+RJ71EIP91_Class1GetInputData_00A


(0)
EIP91_1.bSts_ModuleReady
X0
EIP91_1.bSts_CommunicationReady
X1F
bStopCommunication
M200
bnRequest_GetInputData[1]
M1
bRequest_SetOutputData
M100
(5)
M_RJ71EIP91_Class1SetOutputData_00A_1 (M+RJ71EIP91_Class1SetOutputData_00A)
Set Class1 Output data
bRequest_SetOutputData
M100
B:i_bEN
o_bENO:B
bRun_SetOutputData
M110
EIP91_1
DUT:i_stModule
o_bOK:B
bOK_SetOutputData
M120
K1
UW:i_uConnectionNo
o_bErr:B
bNG_SetOutputData
M130
unSetOutputData_ConnectionNo1[0]
D1000
UW:i_uOutputData
o_uErrId:UW
uErrorCode_SetOutputData
D2010
o_uStatusId:UW
uStatusId_SetOutputData
D2015


(260)
bOK_Set OutputDat a
M120
bnRequest_ GetInputDat a[0]
M0
(262)
M_RJ71EIP91_Class1GetInputData_00A_1 (M+RJ71EIP91_Class1GetInputData_00A)
Get Class1 input data
bnReques t_GetInput Data[0]
M0
B:i_bEN
o_bENO:B
bnRun_GetI nputData[0]
M10
bnOK_GetIn putData[0]
M20
EIP91_1
DUT:i_stModule
o_bOK:B
bnNG_GetIn putData[0]
M30
K1
UW:i_uConnectionNo
o_bErr:B
unErrorCo de_GetInp utData[0]
D2000
o_uErrId:UW
unStatusI d_GetInpu tData[0]
D2005
o_uStatusId:UW
unGetInpu tData_Con nectionNo 1[0]
D0
o_uInputData:UW
(517)
M_RJ71EIP91_Class1GetInputData_00A_2 (M+RJ71EIP91_Class1GetInputData_00A)
Get Class1 input data
bnReques t_GetInput Data[1]
M1
B:i_bEN
o_bENO:B
bnRun_GetI nputData[1]
M11
bnOK_GetIn putData[1]
M21
EIP91_1
DUT:i_stModule
o_bOK:B
bnNG_GetIn putData[1]
M31
K2
UW:i_uConnectionNo
o_bErr:B
unErrorCo de_GetInp utData[1]
D2001
o_uErrId:UW
unStatusI d_GetInpu tData[1]
D2006
o_uStatusId:UW
unGetInpu tData_Con nectionNo 2[0]
D200
o_uInputData:UW



(0) Start communications, and then acquire input data and set output data.
(5) Set output data on the connection number 1.
(262) Acquire input data on the connection number 1 when the output data setting is configured correctly.
(517) Acquire input data on the connection number 2.
(772) Turn on M200 to stop the acquisition processing of input data or the setting processing of output data or to stop communication processing. However, communication processing is stopped when 'EtherNet/IP data link continuation specification state' (Un\G16635) is "2: Operation is in progress with the setting for stopping EtherNet/IP communication".
(781) Set the connection number in the connection number specification.
(790) Store the data from which the connection information is read.

Program of the RJ71EIP91 (target)

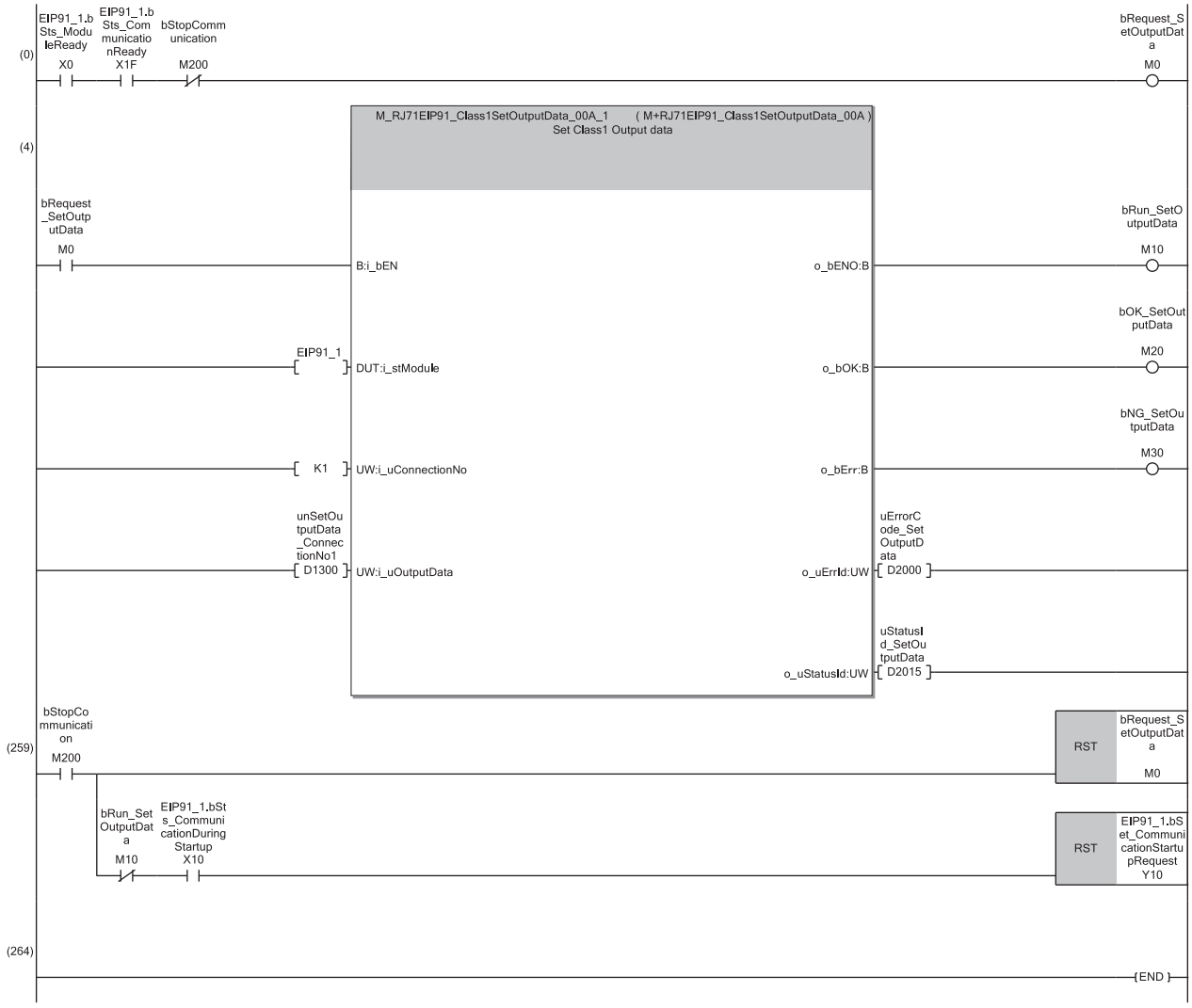
Classification	Label name	Description	Device
Module label	EIP91_1.bSts_ModuleReady	Module Ready	X0
	EIP91_1.bSts_CommunicationDuringStartup	EtherNet/IP communication in process	X10
	EIP91_1.bSts_CommunicationReady	Communication Ready	X1F
	EIP91_1.bSet_CommunicationStartupRequest	EtherNet/IP communication start request	Y10
	EIP91_1	Module label	—
Label to be defined	Define global labels as shown below.		

Label Name	Data Type		Class	Assign (Device/Label)
bStopCommunication	Bit	...	VAR_GLOBAL	M200
bRun_SetOutputData	Bit	...	VAR_GLOBAL	M10
bRequest_SetOutputData	Bit	...	VAR_GLOBAL	M0
bOK_SetOutputData	Bit	...	VAR_GLOBAL	M20
bNG_SetOutputData	Bit	...	VAR_GLOBAL	M30
unSetOutputData_ConnectionNo1	Word [Unsigned]/Bit String [16-bit](0..127)	...	VAR_GLOBAL	D1300
uErrorCode_SetOutputData	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D2000
uStatusId_SetOutputData	Word [Unsigned]/Bit String [16-bit]	...	VAR_GLOBAL	D2015

■FB to be used

The following shows FB to be used in this program example.

• M+RJ71EIP91_Class1SetOutputData_00A



(0) Start communications, and set output data on the connection number 1.

(4) Acquire input data on the connection number 1.

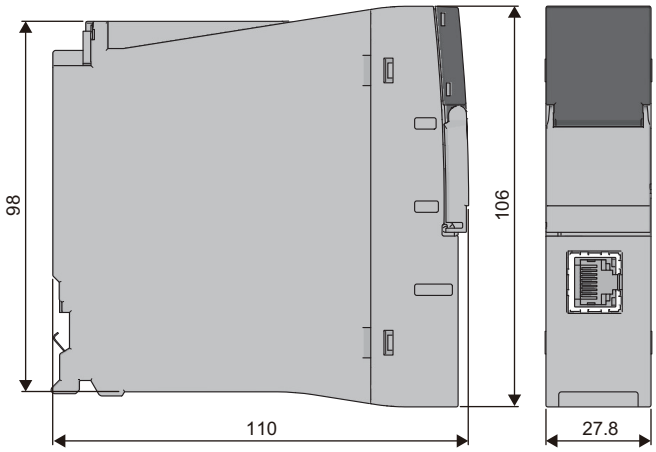
(259) Turn on M200 to stop the acquisition processing of input data or the setting processing of output data or to stop communication processing. However, communication processing is stopped when 'EtherNet/IP data link continuation specification state' (Un\G16635) is "2: Operation is in progress with the setting for stopping EtherNet/IP communication".

MEMO

APPENDIX

Appendix 1 External Dimensions

This section describes the external dimensions of the RJ71EIP91.



(Unit: mm)

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REVISIONS

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

Revision date	*Manual number	Description
May 2018	SH(NA)-081913ENG-A	First edition
August 2019	SH(NA)-081913ENG-B	■Added or modified parts TERMS, Section 2.1, 7.1
October 2019	SH(NA)-081913ENG-C	■Added or modified parts SAFETY PRECAUTIONS, COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES, RELEVANT MANUALS, TERMS, GENERIC TERMS AND ABBREVIATIONS, Chapter 3, Section 6.1 ■Deleted part Section 5.2
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WARRANTY

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

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

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(2) Product supply (including repair parts) is not available after production is discontinued.

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

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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. Changes in product specifications

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

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MODEL: RJ71EIP91-U-IN-E
MODEL CODE: 13JX83

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN

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