



Programmable Controller

MELSEC iQ-R
series

MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Startup)

-RJ72GF15-T2



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.
 - 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.
-

[Design Precautions]

WARNING

- 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.
 - Configure safety circuits external to the remote head module to ensure that the entire system operates safely even when a fault occurs in the external power supply or the remote head module. 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 remote head module.
 - (2) When the remote head module detects an abnormal condition, outputs are:
 - Held or turned off according to the parameter setting of each module mounted on the main base unit or extension base unit if the self-diagnostic function of the remote head 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 remote head 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 remote head module. For a fail-safe circuit example, refer to "General Safety Requirements" in the MELSEC iQ-R Module Configuration Manual.
 - Configure a circuit so that the remote head module 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.
 - When connecting an external device with a remote head module to modify data of a running remote head module, configure an interlock circuit in the program of the master station to ensure that the entire system will always operate safely. For other forms of control (such as parameter change, forced output, or operating status change) of a running remote head module, 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 head module is remotely controlled by an external device, immediate action cannot be taken if a problem occurs in the remote head module due to a communication failure. To prevent this, configure an interlock circuit in the program of the master station, and determine corrective actions to be taken between the external device and remote head module in case of a communication failure.
 - Do not write any data to the buffer memory in the remote head module. Doing so may cause malfunction of the programmable controller system.
 - Do not write any data from the remote head module to the "system area" and "write-protect area" of the buffer memory in each module. Also, do not use any "use prohibited" signals as an output signal from the remote head 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.
-

[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.
 - After the remote head module is powered on or is reset, the time taken to enter the RUN status varies depending on the system configuration and/or parameter settings. Design circuits so that the entire system will always operate safely, regardless of the time.
 - Do not power off or reset the remote head module while the parameters are being written. Doing so may cause malfunction or failure of the module.
-

[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 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 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, 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 cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact. 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.
 - 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 in the user's manual for the module used. If not, normal data transmission is not guaranteed.
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[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 mount/remove the module to/from the base unit, and the terminal block to/from the module, and do not insert/remove the extended SRAM cassette to/from the CPU module more than 50 times (IEC 61131-2 compliant) respectively. Exceeding the limit may cause malfunction.
 - 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. 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.
 - When connecting an external device with a remote head module to modify data of a running programmable controller, configure an interlock circuit in the program of the master station to ensure that the entire system will always operate safely. For other forms of control (such as parameter change, forced output, or operating status change) of a running remote head module, 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 head module is remotely controlled by an external device, immediate action cannot be taken if a problem occurs in the remote head module due to a communication failure. To prevent this, configure an interlock circuit in the program of the master station, and determine corrective actions to be taken between the external device and remote head module in case of a communication failure.
-

[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 undefined. The values need to be set in the buffer memory and written to the flash ROM 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 specifications, procedures before operation, system configuration, wiring, and communication examples 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

RJ72GF15-T2

COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

Method of ensuring compliance

To ensure that Mitsubishi Electric 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.)

The CE mark on the side of the programmable controller indicates compliance with EMC and Low Voltage Directives.

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 CC-Link IE Field Network Remote Head Module User's Manual (Startup) [SH-081614ENG] (this manual)	Specifications, procedures before operation, system configuration, wiring, and communication examples of the CC-Link IE Field Network remote head module	Print book e-Manual PDF
MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application) [SH-081616ENG]	Functions, parameter settings, and troubleshooting of the CC-Link IE Field Network remote head module	Print book e-Manual PDF

This manual does not include detailed information on the following:

- General specifications
- Applicable combinations of the remote head module 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
Base unit	A generic term for main base units, extension base units, and RQ extension base units
Buffer memory	Memory in an intelligent function module for storing data such as setting values and monitored values.
Control system	A system that controls a redundant system and performs network communications in a redundant system
CPU module	A generic term for the MELSEC iQ-R series, MELSEC-Q series, and MELSEC-QS series CPU modules
Cyclic transmission	A function by which data are periodically exchanged among stations on the same network using link devices
Data link	A generic term for cyclic transmission and transient transmission
Dedicated instruction	An instruction for using the functions of a module
Device	A device (X, Y, W, or others) in a CPU module and remote head module
Device station ^{*1}	A generic term for a local station, remote I/O station, remote device station, and intelligent device station
Disconnection	A process of stopping data link if a data link error occurs
Engineering tool	The product name of the software package for the MELSEC programmable controllers
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 the engineering tool, and an optional label, which can be created for any specified device.
I/O module	A generic term for the input module, output module, I/O combined module, and interrupt module
Intelligent device station	A station that exchanges I/O signals (bit data) and I/O data (word data) with another station by cyclic transmission. This station responds to a transient transmission request from another station and also issues a transient transmission request to another station.
Intelligent function module	A module that has functions other than input and output, such as an A/D converter module and D/A converter module
Label	A label that represents a device in a given character string
Link device	A device (RX, RY, RWr, or RWw) in a module on CC-Link IE Field Network
Link special register (SW)	Word data that indicates the operating status and data link status of a module on CC-Link IE Field Network
Link special relay (SB)	Bit data that indicates the operating status and data link status of a module on CC-Link IE Field Network
Local station	A station that performs cyclic transmission and transient transmission with the master station and other local stations
Master station	A station that controls the entire network. This station can perform cyclic transmission and transient transmission with all stations. Only one master station can be used in a network.
Master/local module	A generic term for the RJ71GF11-T2, QJ71GF11-T2, QS0J71GF11-T2, LJ71GF11-T2 CC-Link IE Field Network master/local module and the following modules when the CC-Link IE Field Network function is used: <ul style="list-style-type: none"> • RJ71EN71 • RnENCPU
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.
RAS	An abbreviation for Reliability, Availability, and Serviceability. This term refers to the overall usability of automated equipment.
Redundant system	A system consisting of two systems that have same configuration (CPU module, power supply module, network module, and other modules). Even after an error occurs in one of the two system, the other system takes over the control of the entire system. For details, refer to "Redundant System" of the following manual.  MELSEC iQ-R Module Configuration Manual
Remote device station	A station that exchanges I/O signals (bit data) and I/O data (word data) with another station by cyclic transmission. This station responds to a transient transmission request from another station.
Remote head module	An abbreviation for the RJ72GF15-T2 CC-Link IE Field Network remote head module
Remote I/O station	A station that exchanges I/O signals (bit data) with the master station by cyclic transmission
Remote input (RX)	Bit data input from a device station to the master station (For some areas in a local station, data are input in the opposite direction.)
Remote output (RY)	Bit data output from the master station to a device station (For some areas in a local station, data are output in the opposite direction.)

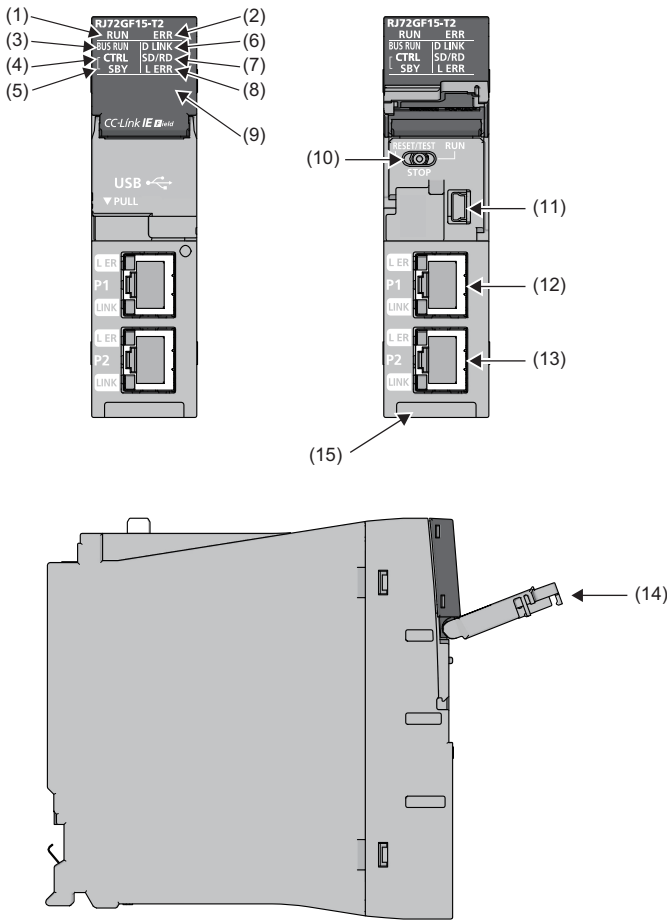
Term	Description
Remote register (RWr)	Word data input from a device station to the master station (For some areas in a local station, data are input in the opposite direction.)
Remote register (RWw)	Word data output from the master station to a device station (For some areas in a local station, data are output in the opposite direction.)
SIL2 function module	Another name for the R6PSFM. This module is used with the SIL2 Process CPU as a pair and performs safety control. The module can only be paired with the SIL2 Process CPU.
SIL2 Process CPU	A generic term for the R08PSFCPU, R16PSFCPU, R32PSFCPU, and R120PSFCPU. This module is used with a SIL2 function module as a pair, and performs both standard control and safety control. This module is also used with a redundant function module as a pair and configures a redundant system.
SIL2 mode	An operation mode of the I/O module and the intelligent function module to perform safety input and output at the SIL2 level. For details on the SIL2 mode, refer to the following.  Manuals for the I/O module or the intelligent function module used
Standby system	A backup system in a redundant system
System switching	A function which switches the systems between the control system and the standby system to continue operation of the redundant system when a failure or an error occurs in the control system
Transient transmission	A function of communication with another station, which is used when requested by a dedicated instruction or the engineering tool

*1 The term has not been replaced yet in some areas in the engineering tool, and there may be differences between some window images of the engineering tool and the corresponding description in this manual.
In case of inconsistency, refer to the following.




Term used in software window	Term after change
Slave station	Device station

1 PART NAMES

This chapter describes the part names of the remote head module.



No.	Name	Description
(1)	RUN LED	Indicates the operating status of the CPU module and the error level.
(2)	ERR LED	<p>● RUN LED—ERR LED status</p> <p>On—off: Normal operation</p> <p>On—on: Minor error</p> <p>On—flashing: Moderate error</p> <p>Flashing (every 2s)—off: Initial processing</p> <p>Flashing (every 400ms)—off: Module communication test in progress or changing module online</p> <p>Flashing (every 400ms)—on: Minor error (Module communication test in progress or changing module online)</p> <p>Off—on/flashing: Major error</p> <p>For troubleshooting using LED when an error occurs, refer to the following.</p> <p>📖 MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)</p>
(3)	BUS RUN LED	<p>Indicates the operating status of the module.</p> <p>On: RUN state</p> <p>Off: STOP state</p> <p>The module will be in the STOP state by the following:</p> <ul style="list-style-type: none"> • The switch of the remote head module is set to STOP. • The master station is in the STOP state. (When the remote head module is connected to the master station)⁶ • Remote STOP • A moderate error or major error was detected in the remote head module (except when "Continue" is selected in "Remote head Module Operation Setting at Error Detection" under "RAS Setting" of "CPU Parameter").

No.	Name	Description	
(4)	CTRL LED ^{*1}	Indicates the status of the control system when the remote head module is redundant. (Always off when the module is not redundant.) On: Operating as the control system (system switching enabled state) Flashing: Operating as the control system (system switching disabled state) Off: Not operating as a control system	
(5)	SBY LED ^{*1}	Indicates the status of the standby system and memory copy when the remote head module is redundant. (Always off when the module is not redundant.) On: Operating as a standby system Flashing: Memory copy being performed Off: Not operating as a standby system and memory copy not performed	
(6)	D LINK LED ^{*1}	Indicates the data link status. On: Data link (cyclic transmission being performed) Flashing: Data link (cyclic transmission stopped) Off: Data link not performed (disconnection)	
(7)	SD/RD LED	Indicates the data sending/receiving status. On: Data being sent or received Off: Data not sent nor received	
(8)	L ERR LED ^{*1}	Indicates the error status of receive data and line. When the L ERR LED is on, the port in which the error was detected can be checked with the L ER LED of P1 or P2. On: Abnormal data received or loopback being performed Off: Normal data received and loopback not performed	
(9)	Dot matrix LED	Indicates the station number set in the module and the module communication test result. Station number not set: "— — —" When station number is set: 1 to 120 In offline mode: "..." For indication of the module communication test result, refer to the following.  MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)	
(10)	Switch ^{*2}	RESET/TEST	Resets the remote head module or switches it to module communication test mode. • Reset method Hold the switch in the RESET/TEST position for a second. • Module communication test method Refer to the following.  MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)
		STOP ^{*3}	Sets the remote head module to the STOP state. When the module is in the STOP state, all output (Y) points of the remote head module turn off. Set the module to the STOP state in the following cases: • To stop the cyclic transmission with the master station and temporarily separate the remote head module from the system for changeover of CC-Link IE Field system • To perform a debug operation between modules connected to the remote head module and external devices • To write parameters to the remote head module The following shows an example of a debug method with external devices using the STOP switch. (1) Set the switch to STOP. (2) Data transfer is stopped between the link devices of the remote head module and the devices in the remote head module, and the devices are separated from the master station control. (3) Perform an input/output test between the module connected to the remote head module and the external device. Since the data transfer is stopped, the input/output status data are not sent to the master or local station. (4) Upon completion of the test, data are written to the remote head module and the system operation starts.
		RUN	Sets the remote head module to the RUN state. ^{*5} In the RUN state, the data transfer is started between the link devices (cyclic data from the master station) of the remote head module and the devices in the remote head module. Also, the output from the master station is output from the module connected to the remote head module. The input from the module connected to the remote head module is input to the master station.
(11)	USB port ^{*4}	A connector for a USB-compatible peripheral (Connector type: miniB)	
(12)	Ethernet port (P1)	PORT1 connector for CC-Link IE Field Network. Connect an Ethernet cable. For wiring methods and wiring precautions, refer to the following.  Page 31 WIRING)	
	L ER LED	Indicates the port status. On: Abnormal data received or loopback being performed Off: Normal data received and loopback not performed	
	LINK LED	Indicates the link status. On: Link-up Off: Link-down	

No.	Name	Description
(13)	Ethernet port (P2)	PORT2 connector for CC-Link IE Field Network. Connect an Ethernet cable. For wiring methods and wiring precautions, refer to the following. (☞ Page 31 WIRING)
	L ER LED	Same as the P1 connector
	LINK LED	
(14)	Switch/USB cover	A cover for a switch and USB port. Open this cover and operate the switch or connect a USB-compatible peripheral. Otherwise, keep the cover closed to prevent entry of foreign matter such as dust.
(15)	Production information marking	Shows the production information (16 digits) of the module.

*1 The LED is always off in offline mode.

*2 Operate the switch with your fingers. To prevent the switch from being damaged, do not use any tool such as a screwdriver.

*3 Even if the switch is set to STOP, the master station will indicate that a cyclic transmission is being performed in the remote head module.

*4 When a cable is connected to the USB connector at all times, clamp the cable to prevent a poor connection, moving, and disconnection by unintentional pulling.

*5 When the remote head module is in any of the following status, the remote head module will not enter the RUN state.

· Moderate error or major error is detected.


· Remote STOP is performed with the remote operation.



*6 When the master station is in the STOP state and the remote head module is disconnected, the remote head module retains the STOP state.

2 PERFORMANCE SPECIFICATIONS

This chapter describes the performance specifications of the remote head module.

For the specifications of CC-Link IE Field Network, refer to the following.

 User's manual for the master/local module used

Item		Specifications
Maximum number of link points per station	RX	2K points (2048 points, 256 bytes)
	RY	2K points (2048 points, 256 bytes)
	RWr	1K points (1024 points, 2K bytes)
	RWw	1K points (1024 points, 2K bytes)
Station type		Intelligent device station
Station number		1 to 120
Network number		1 to 239
Communication speed		1Gbps
Network topology		Line topology, star topology (coexistence of line topology and star topology is also possible), and ring topology
Communication cable		Ethernet cable which satisfies 1000BASE-T standard: Category 5e or higher, straight cable (double shielded, STP)  User's manual for the master/local module used
Maximum station-to-station distance		100m (conforms to ANSI/TIA/EIA-568-B (Category 5e))
Number of cascade connections		20 levels maximum
Number of I/O points	Input relay (X)	4096 points (Number of points accessible to the actual module)* ¹
	Output relay (Y)	4096 points (Number of points accessible to the actual module)* ¹
Number of user device points	Input (X)	12288 points (Number of points can be used in the program. Assign X0 to RX0.)
	Output (Y)	12288 points (Number of points can be used in the program. Assign RY0 to Y0.)
	Link special relay (SB)	8192 points (SB0000 to SB0FFF are used by the system. SB1000 to SB1FFF can be used by the user.)
	Link register (W)	8192 points (Assign 1024 points (W0 to W3FF) from RWw0. Assign 1024 points (W1000 to W13FF) from RWr0.)
	Link special register (SW)	8192 points (SW0000 to SW0FFF are used by the system. SW1000 to SW1FFF can be used by the user.)
Number of system device points	Special relay (SM)	4096 points
	Special register (SD)	4096 points
Number of module access device points	Intelligent function module device (U□\G□)	268435456 points* ²
Number of refresh data register points	Refresh data register (RD)	12288 points
Label capacity		2048 words
Memory capacity	Device/label memory	256K bytes
	Data memory	2049K bytes
Number of storable files	Device/label memory	One (A system file is stored.)
	Data memory	256* ³
Allowable momentary power failure time		The time differs depending on the power supply module used. ( MELSEC iQ-R Module Configuration Manual)
Internal current consumption (5VDC)		0.75A
External dimensions	Height	106mm (Base unit mounting side: 98mm)
	Width	27.8mm
	Depth	110mm
Weight		0.20kg

- *1 This is the maximum number of points that can be assigned to the actual module in "I/O Assignment Setting" in the [I/O Assignment] tab of the "System Parameter" window of the engineering tool.
- *2 These are the maximum points that can be handled in the remote head module. The number of points actually used differs depending on the module used.
- *3 The number indicates the number of files and folders (including system files and system folders) can be created in the root directory on the condition that the number of characters in the file or folder name is 13 or less. In a subdirectory, up to 32767 folders can be created. Note that the number of storable files and folders will decrease if many folders with a long name, more than 13 characters (including an extension), are created.

3 FUNCTION LIST

The following table lists the functions of the remote head module. For details on the functions, refer to the following.

📖 MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)

Function		Description
Cyclic transmission		Uses the input and output data of the modules connected to the remote head module just like those of the master station.
Transient transmission		Directly accesses the devices in the remote head module and the buffer memory in an intelligent function module from the master station and a local station. Communications with different networks is also possible. The master station and a local station send requests to the remote head module by using dedicated instructions. (📖 User's manual for the master/local module used)
Remote operation		Remotely controls the operating status of the remote head module, while keeping the position of the switch located in front of the remote head module at RUN.
Label access setting from external device		Enables communications specifying the global label name from the GOT and external devices using SLMP.
RAS function	Self-diagnostics function	Self-diagnoses the remote head module to see whether an error exists or not.
	Error clear function	Batch-clears all of the clearable errors being detected.
	Event history function	Collects operations executed and errors detected from the modules, and saves them in the remote head module. The saved logs can be checked in chronological order.
	Redundant power supply system diagnostic function	Performs diagnostics of the redundant power supply system.
	Module diagnostics	Performs diagnostics of the remote head module and connected modules using the engineering tool.
	Online module change	Replaces a module without stopping the system. (📖 MELSEC iQ-R Online Module Change Manual)
	Operation setting at error detection	Specifies whether to clear or hold the output to each module when a moderate or major error, or a data link error occurs in the remote head module. (📖 User's manual for the module used)
CC-Link IE Field Network diagnostics		Checks the status of CC-Link IE Field Network using the engineering tool. The error locations, error causes, and corrective actions can be checked in the engineering tool.
Security function	Remote password function	Prevents unauthorized access to the remote head module from a remote location.
Redundant system		Mounts two remote head modules on the main base unit for the redundant remote head module system. When an error occurs on the remote head module in the control system, it is switched to the remote head module in the standby system to control the remote head module system and continue the data link.
Safety communication relay function		Relays safety communications between the SIL2 Process CPU in the master station and the module set to the SIL2 mode in the intelligent device station.
Station number setting from the master station		Sets a station number of the remote head module from the CC-Link IE Field Network diagnostics of the master station.
Monitor function	Device/buffer memory batch monitor	Monitors values in devices and buffer memory using the engineering tool connected.
Synchronization function	CC-Link IE Field Network synchronous communication function ^{*1}	Controls the remote head module at the synchronization cycle of the master station corresponding to the CC-Link IE Field Network synchronous communication function. This allows different device stations on the same network to operate with the same timing. (📖 MELSEC iQ-R Inter-Module Synchronization Function Reference Manual)
	Inter-module synchronization function	Controls multiple modules synchronously. (📖 MELSEC iQ-R Inter-Module Synchronization Function Reference Manual)
SLMP communication function		Enables accesses to devices/labels and remote operations from external devices other than the engineering tool by sending request messages using SLMP. (📖 SLMP Reference Manual)
IP packet transfer function		Enables communications in a protocol such as FTP and HTTP using the specified IP address of an Ethernet device, over CC-Link IE Field Network. With this function, two networks of CC-Link IE Field Network and Ethernet are not required, resulting in reduced wiring cost. (📖 MELSEC iQ-R CC-Link IE Field Network User's Manual (Application))

- *1 When the network synchronization communication is performed with the master station, set the inter-module synchronization cycle to any of the following.
- 0.888ms
 - 1.777ms
 - 3.555ms
 - 0.8 to 10.0ms (set in increments of 0.05ms)

4 PROCEDURES BEFORE OPERATION

This chapter describes the procedures before operation.

1. Mounting modules and connecting cables

Mount modules on the base unit, and connect cables. (📖 MELSEC iQ-R Module Configuration Manual, 📄 Page 31 WIRING)

2. Powering on the system

Check the following items, and then power on the system.

- A cable is correctly connected to the power supply.
- Power supply voltage is within the specified range.
- The remote head module is in the STOP state.

3. Creating a project

Activate the engineering tool and create a project. (📄 Page 25 Creating a Project)

4. Connecting a personal computer

Connect a personal computer where an engineering tool has been installed to the remote head module. (📄 Page 25 Connecting a Personal Computer)

5. Initializing the remote head module

Initialize the remote head module using the engineering tool. (📄 Page 26 Initializing the Remote Head Module)

6. Setting parameters

Set system parameters and CPU parameters. (📄 Page 26 Setting Parameters)

Set parameters other than those mentioned above when any intelligent function module is mounted. (📖 User's Manual (Application) for the module used)

System parameters are automatically set by loading an actual system configuration to the Module Configuration window of the engineering tool.

7. Writing to the remote head module

Write the parameters set using the engineering tool to the remote head module. (📄 Page 28 Writing to the Remote Head Module)

8. Resetting the remote head module

Restart the system in either of the following ways.

- Power off and on the system.
- Reset the remote head module. (📄 Page 28 Resetting the Remote Head Module)

9. Network diagnostics

Connect the personal computer with the engineering tool installed to the master station, and perform CC-Link IE Field Network diagnostics from the master station to check if the cables are connected properly and communication is performed normally using the set parameter. (📖 User's manual for the master/local module used)

Point

Module label is a label where the I/O signals and buffer memory areas of a module have already been defined.

The module label is not available for the remote head module because it has no module label.

The module label of the connected modules cannot be used in the remote head module project.

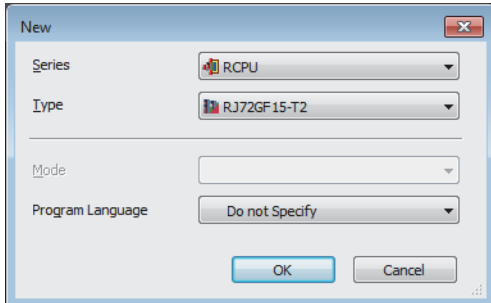
There is no module FB for the module connected to the remote head module.

4.1 Creating a Project

Activate the engineering tool and create a project.

 [Project] ⇒ [New]


Procedure



1. Select one of the following types from "Type" depending on the system configuration of the remote head module, and then click the [OK] button.
 - RJ72GF15-T2: When the redundant remote head module system is not used
 - RJ72GF15-T2 (SR): When the redundant remote head module system is used (single line)
 - RJ72GF15-T2 (LR): When the redundant remote head module system is used (redundant line)

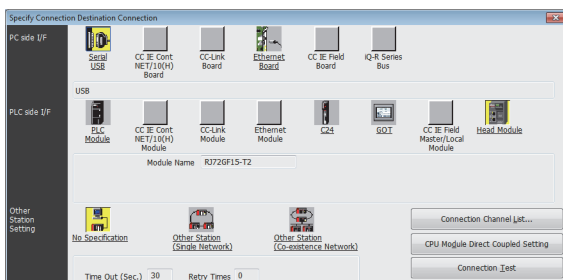
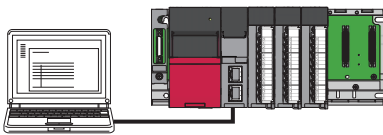
4.2 Connecting a Personal Computer

Connect a personal computer where an engineering tool has been installed to the remote head module.

Install a USB driver to use a USB cable for the first time. ( GX Works3 Operating Manual)

Procedure

Connect a personal computer directly to the remote head module by following the procedure below.



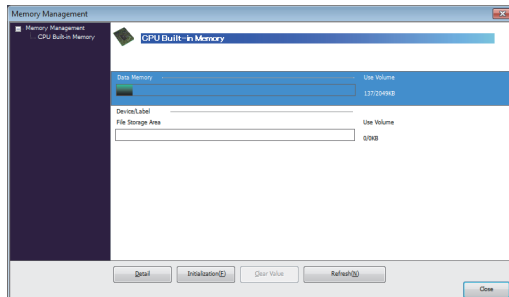
1. Connect a personal computer and the remote head module using a USB cable.
2. Select [Online] ⇒ [Current Connection Destination] on the menu bar of the engineering tool.
3. Click the [CPU Module Direct Coupled Setting] button on the "Specify Connection Destination Connection" window.
4. Click the [Connection Test] button, and check if the personal computer is connected to the remote head module.

4.3 Initializing the Remote Head Module

Initialize the remote head module.

 [Online] ⇒ [CPU Memory Operation]

Procedure




1. Select "Data Memory" on the "Memory Management" window, and click the [Initialization] button.
2. Select "File Storage Area", and click the [Initialization] button.
3. After the initialization processing completes, click the [Close] button.

4.4 Setting Parameters

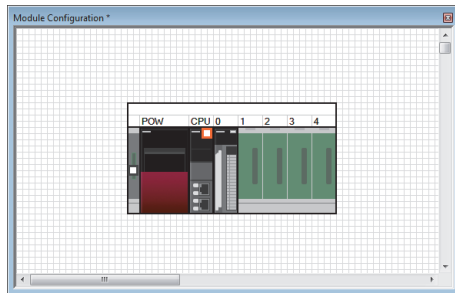
Set system parameters and parameters for each module.

When the engineering tool is connected to the actual system

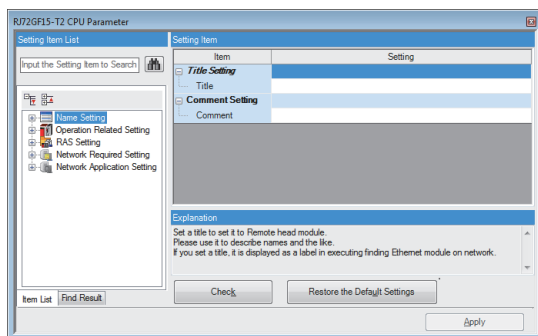
Set parameters by loading an actual system configuration to the Module Configuration window of the engineering tool.

 [Navigation window] ⇒ [Module Configuration]

1. Open the Module Configuration window, and select [Online] ⇒ [Read Module Configuration from PLC] on the menu bar.
2. Click the [OK] button when the window for adding module labels of the mounted modules appears. Check that "Module Label: Not use" is displayed on the window.
3. The system parameters are automatically set, and the actual system configuration is displayed on the Module Configuration window.

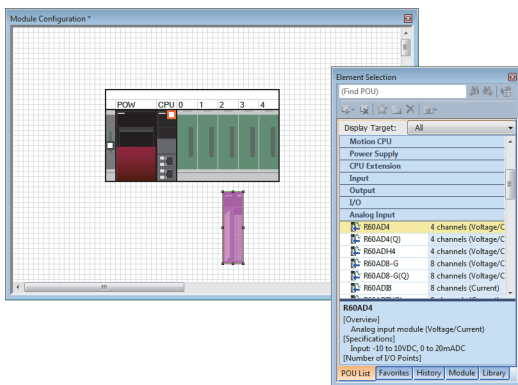


4. Double-click each module (remote head module, I/O module, or intelligent function module) to display the corresponding module parameter editor.
5. Set parameters, and click the [Apply] button to close the window.



When the engineering tool is not connected to the actual system

Set parameters by configuring a system manually on the Module Configuration window of the engineering tool.



1. Select a base unit on the Element Selection window, and drag and drop it to the Module Configuration window.
2. Drag and drop modules to be used on the base unit placed.
3. Select [Edit] ⇒ [Parameter] ⇒ [Fix] on the menu bar.
4. Click the [OK] button when the window for adding module labels of the configured modules appears. Check that "Module Label: Not use" is displayed on the window.
5. Double-click the module to open the parameter editor of each module.
6. Set parameters, and click the [Apply] button to close the window.

4

Setting parameters from the Navigation window

Set the following parameters from the Navigation window.

■ System parameters

These parameters need to be set from the Navigation window in the following cases: to change the number of slots on the base unit or the number of occupied points of the module, or to perform inter-module synchronization operations.

[Navigation window] ⇒ [Parameter] ⇒ [System Parameter]

■ Parameters of the remote head module

Set CPU parameters of the remote head module including a network number and station number.

[Navigation window] ⇒ [Parameter] ⇒ [RJ72GF15-T2] ⇒ [CPU Parameter]

■ Multiple module parameters and module extension parameters

Some intelligent function modules require multiple module parameters and module extension parameters.

[Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ Target module ⇒ [Module Extended Parameter] or [Module Parameter]

Point

System parameters can be set on the following windows. Select the window depending on their application purposes.

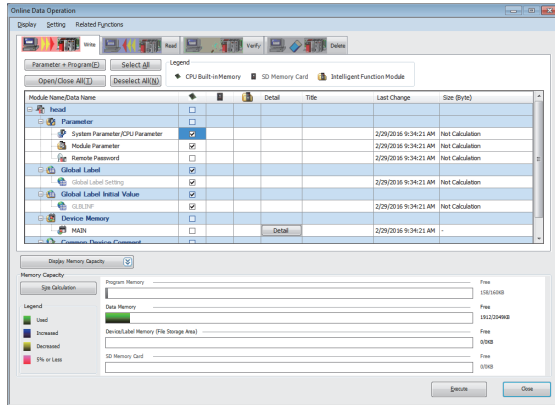
- Module Configuration window: Use this window when using the module specific data (such as number of occupied points) as is.
- System Parameter window: Use this window when changing the number of slots or the number of occupied points.

4.5 Writing to the Remote Head Module

Write the parameters to the remote head module.

 [Online] ⇨ [Write to PLC]

Procedure



1. Select the "System Parameter/CPU Parameter" and "Module Parameter" on the "Online Data Operation" window.
2. Click the [Execute] button.
3. After the write processing completes, click the [Close] button.

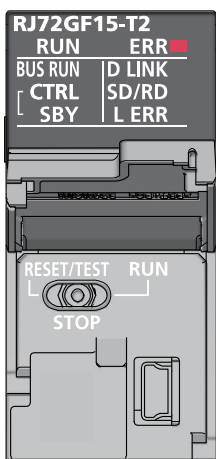
Point

- For the operation of the remote head module, the system parameter file and CPU parameter file must be written. For the operation of the I/O modules and intelligent function modules, the module parameter files and module extension parameter file must be written as well.
- Use of the [Select Favorites] button enables users to easily select frequently-used items such as "System Parameter/CPU Parameter". Register items as favorites on the window opened by selecting [Setting] ⇨ [Register Favorites Selection] on the menu bar.

4.6 Resetting the Remote Head Module

Reset the remote head module using the switch located on the front of the remote head module.

Procedure



1. Set the switch to the RESET/TEST position for a second or longer.
2. Check that the ERROR LED flashes several times and turns off.
3. Set the switch back to the STOP position.

Point

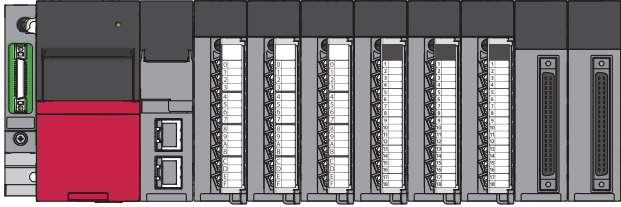
Operate the switch with your fingers. To prevent the switch from being damaged, do not use any tool such as a screwdriver.

5 SYSTEM CONFIGURATION

Mount the remote head module into the CPU slot on the main base unit.

For CC-Link IE Field Network configuration, refer to the following.

📖 User's manual for the master/local module used



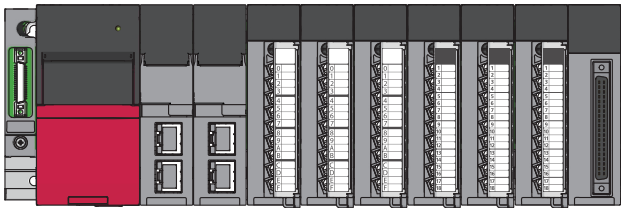
Redundant system

The redundant system comprises of two remote head modules mounted in slots, CPU slot and slot number 0, on the main base unit, and it controls I/O modules and intelligent function modules.

With the redundant system structure, the system reliability can be improved even if one remote head module fails, the other continues the station operation.

For details on the functions, refer to the following.

📖 MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)



When a redundant power supply module is used, the power supply module can be redundant by changing the main base unit to the redundant power supply main base unit.

For the redundant power supply system, refer to the following.

📖 MELSEC iQ-R Module Configuration Manual

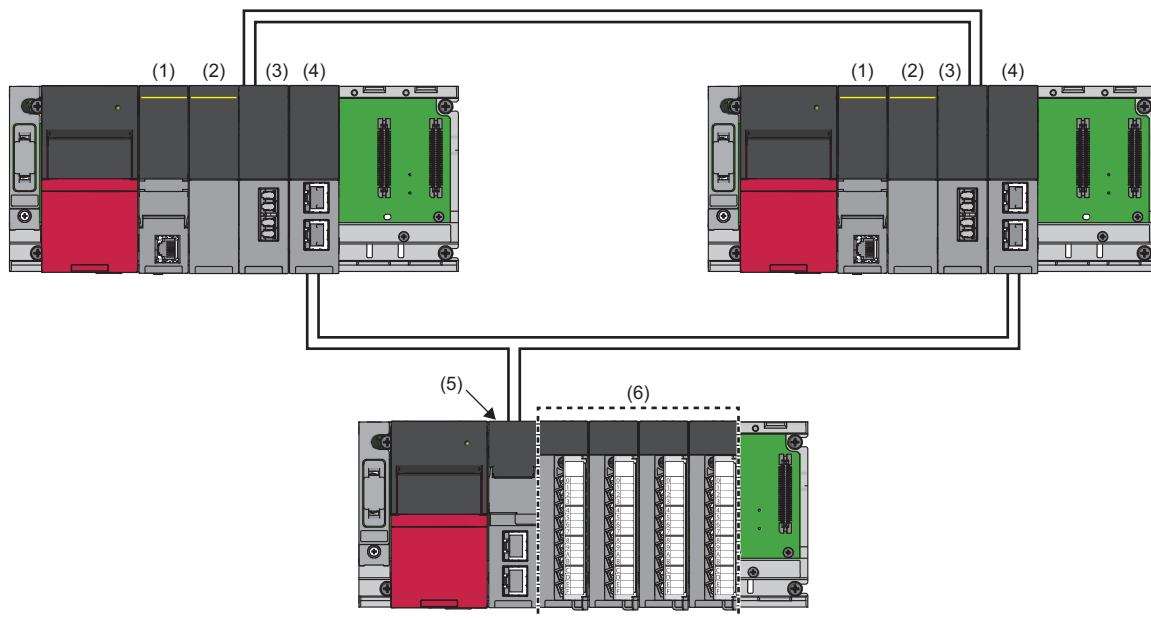
System using the SIL2 Process CPU

Use the SIL2 Process CPU with the SIL2 function module as a pair. Programs for safety control and for standard control can be executed simultaneously in one system.

These products can be used to construct a safety function for general industrial machinery.

For details on the functions, refer to the following.

📖 MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)



- (1) SIL2 Process CPU
- (2) SIL2 function module
- (3) Redundant function module
- (4) RJ71GF11-T2
- (5) Remote head module
- (6) Modules set to SIL2 mode

6 WIRING

This chapter describes the wiring to the remote head module.

Wiring methods

The following describes connection and disconnection of the Ethernet cable. For cables and switching hubs required for wiring, refer to the following.

📖 User's manual for the master/local module used

■Connecting the cable

1. Push the Ethernet cable connector into the remote head module until it clicks. Pay attention to the connector's direction.
2. Lightly pull it to check that it is securely connected.
3. Check whether the LINK LED of the port connected with an Ethernet cable is on. ^{*1}

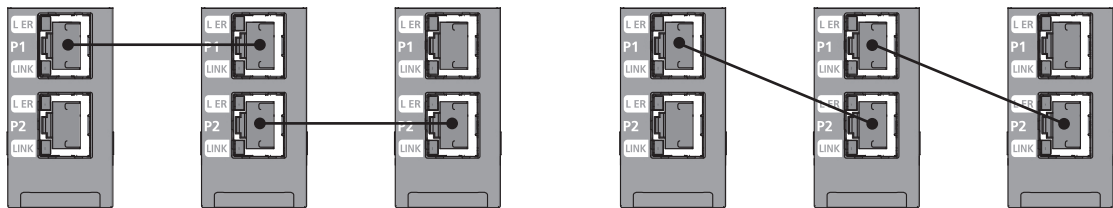
^{*1} The time between the cable connection and the LINK LED turning on may vary. The LINK LED usually turns on in a few seconds. Note, however, that the time may be extended further if the link-up processing is repeated depending on the status of the device on the line. If the LINK LED does not turn on, refer to the following and take corrective actions.

📖 MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)

Point

Both P1 connector and P2 connector can be used.

- When only one connector is used in star topology, either P1 connector or P2 connector is applicable.
- When two connectors are used in line topology and ring topology, the cable can be connected between P1 and P1, P2 and P2, or between P1 and P2 as shown below.



■Disconnecting the cable

1. Press the latch down and unplug the Ethernet cable.

■ Precautions

- Place the Ethernet cable in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.
- Do not touch the core of the cable-side or module-side connector, and protect it from dirt or dust. If oil from your hand, dirt or dust is attached to the core, it can increase transmission loss, arising a problem in data link.
- Check that the Ethernet cable is not disconnected or not shorted and there is no problem with the connector connection.
- Do not use Ethernet cables with broken latches. Doing so may cause the cable to become unplugged or malfunction.
- Hold the connector part when connecting and disconnecting the Ethernet cable. Pulling the cable connected to the module may result in damage to the module or cable or malfunction due to poor cable connection.
- For connectors without Ethernet cable, attached connector cover should be placed to prevent foreign matter such as dirt or dust.
- The maximum station-to-station distance of the Ethernet cable is 100m. However, the length may be shorter depending on the operating environment of the cable. For details, contact your cable manufacturer.
- The bend radius of the Ethernet cable is limited. For details, check the specifications of the Ethernet cable to be used.

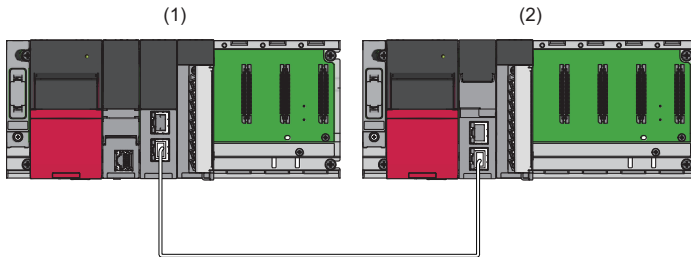
7 COMMUNICATION EXAMPLES

This chapter describes examples communications between the master station and intelligent device station.

7.1 System Configuration Example

The following system configuration is used to explain communication between the master station and intelligent device station.

System configuration



(1) Master station (network number 1, station number 0)

- Power supply module: R61P
- CPU module: R04CPU
- Master/local module: RJ71GF11-T2 (start I/O number: 0000H to 001FH)
- Input module: RX10 (start I/O number: 0020H to 002FH)

(2) Intelligent device station (network number 1, station number 1)

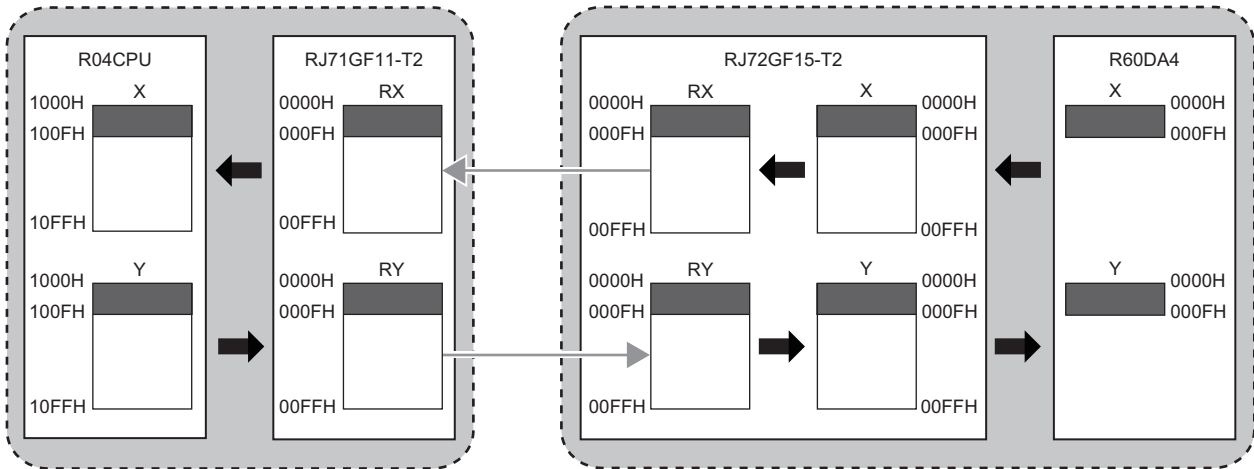
- Power supply module: R61P
- Remote head module: RJ72GF15-T2
- Analog output module: R60DA4 (start I/O number: 0000H to 000FH^{*1})

*1 For RX/RV setting of the master station, set 1000H to 100FH as a start I/O number of the analog output module.

Link device assignment

256 points are assigned to each station.

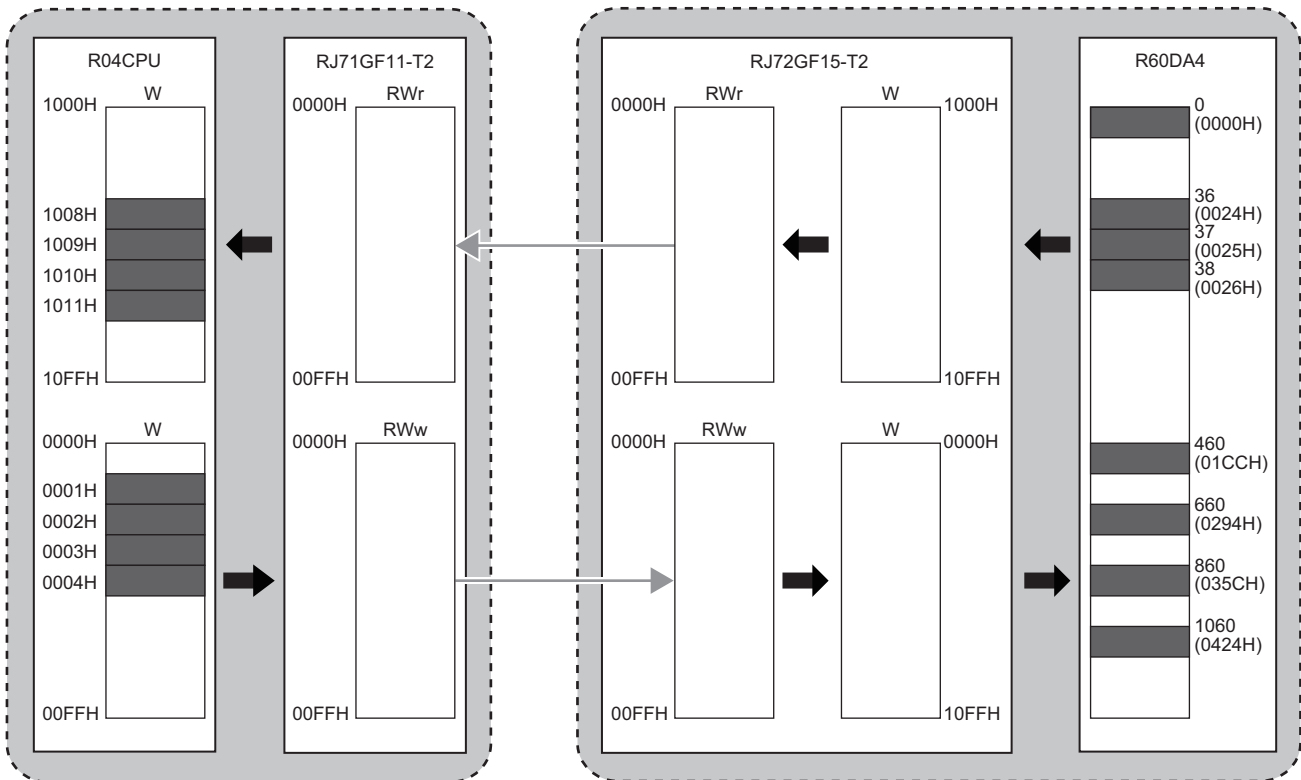
■RX/RX assignment



The following shows the correspondence between CPU module devices and I/O signals of the analog output module.

CPU module	Analog output module	
Device	I/O signals	Device
X1000	Module READY	X0
X1007	External power supply READY flag	X7
X100D	Disconnection detection signal	XD
X100E	Alert output signals	XE
X100F	Error flag	XF
Y1001	CH1 Output enable/disable flag	Y1
Y1002	CH2 Output enable/disable flag	Y2
Y1003	CH3 Output enable/disable flag	Y3
Y1004	CH4 Output enable/disable flag	Y4
Y100E	Alert output clear request	YE
Y100F	Error clear request	YF

■RWr/RWw assignment



The following shows the correspondence between CPU module devices and buffer memory areas of the analog output module.

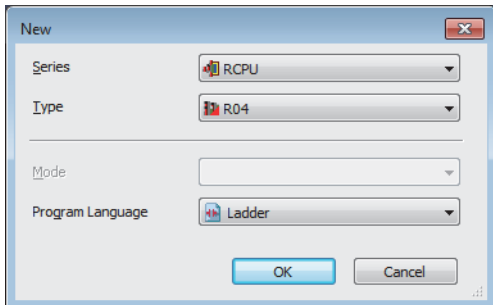
CPU module	Analog output module	
Device	Buffer memory	Address decimal (hexadecimal)
W1008	Alert output upper limit flag	36 (0024H)
W1009	Alert output lower limit flag	37 (0025H)
W1010	Latest error code	0 (0000H)
W1011	Disconnection detection flag	38 (0026H)
W1	CH1 Digital value	460 (01CCH)
W2	CH2 Digital value	660 (0294H)
W3	CH3 Digital value	860 (035CH)
W4	CH4 Digital value	1060 (0424H)

7.2 Setting in the Master Station

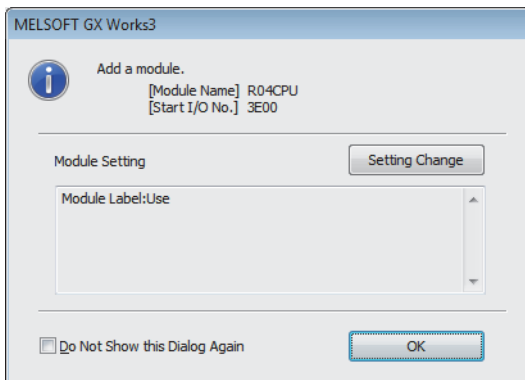
Connect the engineering tool to the CPU module of the master station and set parameters.

1. Set the CPU module as follows.


 [Project] ⇒ [New]

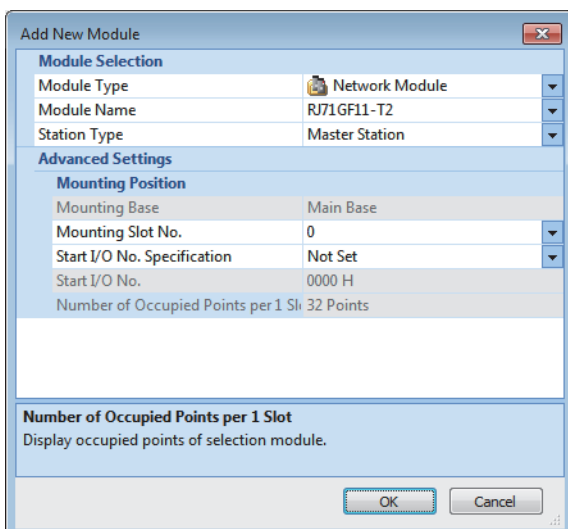


2. Click the [OK] button to add the module labels of the CPU module.
3. Click the [Setting Change] button to set to use module labels.

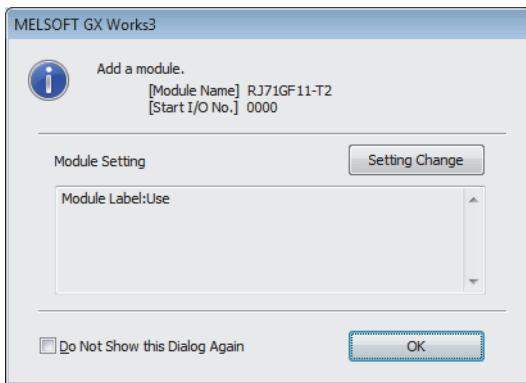


4. Set the master/local module as follows.

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



- Click the [Setting Change] button to set to use module labels.
- Click the [OK] button to add the module labels of the master/local module.



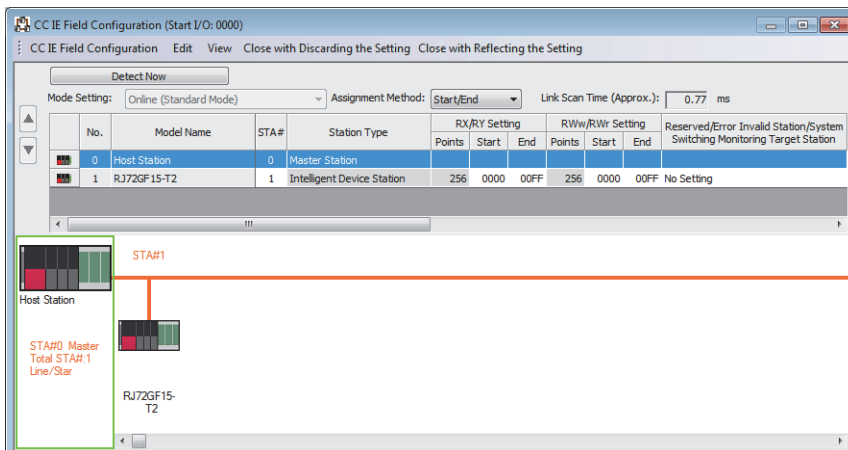
- Set the items in "Required Settings" of "Module Parameter" as follows.

[Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [RJ71GF11-T2] ⇒ [Required Settings]

Item	Setting
Station Type	
Station Type	Master Station
Network No.	
Network No.	1
Station No.	
Setting Method	Parameter Editor
Station No.	0
Parameter Setting Method	
Setting Method of Basic/Application Settings	Parameter Editor

- Set the network configuration as follows.

[Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [RJ71GF11-T2] ⇒ [Basic Settings] ⇒ [Network Configuration Settings]




- Set the refresh settings as follows.

[Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [RJ71GF11-T2] ⇒ [Basic Settings] ⇒ [Refresh Setting]


No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB	512	00000	001FF	↔	Module Label				
-	SW	512	00000	001FF	↔	Module Label				
1	RX	256	00000	000FF	↔	Specify Device	X	256	01000	010FF
2	RY	256	00000	000FF	↔	Specify Device	Y	256	01000	010FF
3	RWw	256	00000	000FF	↔	Specify Device	W	256	00000	000FF
4	RWr	256	00000	000FF	↔	Specify Device	W	256	01000	010FF

10. Write the set parameters to the CPU module on the master station. 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.

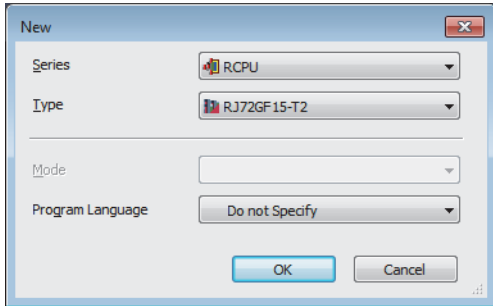
 MELSEC iQ-R CC-Link IE Field Network User's Manual (Application)

7.3 Setting the Intelligent Device Station


Connect the engineering tool to the remote head module on the intelligent device station and set the parameters.

1. Set the remote head module as follows.

 [Project] ⇒ [New]




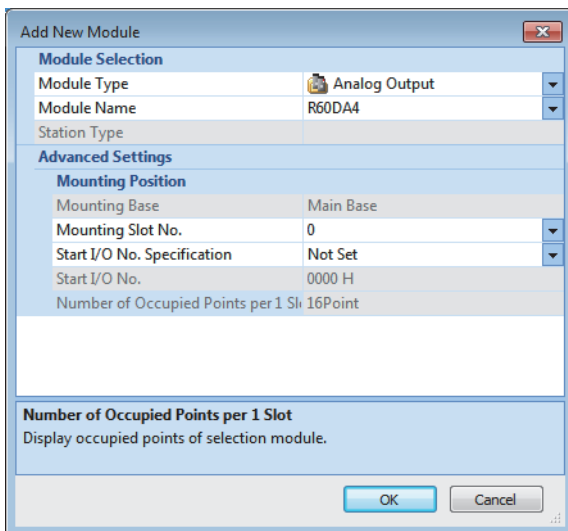
2. Set the items in "Network Required Setting" of "CPU Parameter" as follows.

 [Navigation window] ⇒ [Parameter] ⇒ [RJ72GF15-T2] ⇒ [CPU Parameter] ⇒ [Network Required Setting]

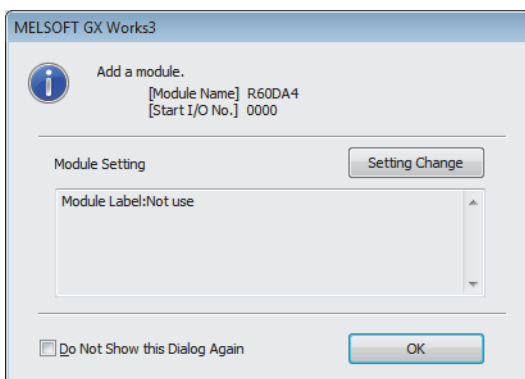
Setting Item	
Item	Setting
Network No.	1
Station No.	1

3. Set the analog output module as follows.

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



4. Click the [OK] button.



5. Set the items in "Basic setting" of "Module Parameter" as follows.

[Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [R60DA4] ⇒ [Basic setting]

Setting Item	CH1	CH2	CH3	CH4
Range switching function	This function enables to select the output range to be used from multiple ranges.			
Output range setting	-10 to 10V	-10 to 10V	0 to 20mA	4 to 20mA
Operation mode setting function	The two operation modes, "Normal mode" to execute the D/A conversion and "Offset/gain setting mode" to execute the offset/gain setting, can be set.			
Operation mode setting	Normal mode (D/A conversion process)			
Output mode setting	Normal output mode			
Output mode setting function	HOLD or CLEAR can be set in the analog output HOLD/CLEAR setting.			
Analog output HOLD/CLEAR setting	HOLD	HOLD	HOLD	HOLD
D/A conversion enable/disable function	This function sets whether to enable or disable the D/A conversion for each channel.			
D/A conversion enable/disable setting	D/A conversion enable	D/A conversion enable	D/A conversion enable	D/A conversion enable

6. Set the items in "Application setting" of "Module Parameter" as follows.

[Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [R60DA4] ⇒ [Application setting]


Setting Item	CH1	CH2	CH3	CH4
Scaling setting	This function enables to change the upper limit value or lower limit value of the digital value input range to any value.			
Scaling enable/disable setting	Disable	Disable	Enable	Disable
Scaling upper limit value	0	0	16000	0
Scaling lower limit value	0	0	2000	0
Shift function	This function adds the set amount to the digital value. A fine adjustment at the system startup can be easily performed.			
Input value shift amount	0	0	2000	0
Warning output function	This function outputs an Warning when the digital value is outside the setting range.			
Warning output setting	Disable	Enable	Disable	Disable
Warning output upper limit value	0	32000	0	0
Warning output lower limit value	0	0	0	0
Rate control function	This function controls the increasing and decreasing amount of the analog output value per conversion cycle for one channel.			
Rate control enable/disable setting	Enable	Disable	Disable	Disable
Increase digital limit value	8000	64000	64000	64000
Decrease digital limit value	1600	64000	64000	64000
Inter-module synchronization function	D/A conversion is performed in the inter-module synchronization cycle.			
Output selection during synchronous error	Inter-module synchronization continue			
Online module change	The module can be changed without the system being stopped.			
Auto restore of Offset/ gain setting with the	Enable			
CPU error output mode setting	You can be the setting of whether to keep or not to clear the output of the module to the CPU stop error.			
CPU error output mode setting	Hold			

7. Set the items in "Refresh settings" of "Module Parameter" as follows.

[Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ [R60DA4] ⇒ [Refresh settings]



Setting Item	CH1	CH2	CH3	CH4
Target	Device			Number of transfers to intelligent function module Number of transfers to CPU
				4 4
Refresh at the set timing.				
Transfer to the intelligent function module.	Transfer the buffer memory data to the specified device.			
Digital value	W1	W2	W3	W4
Transfer to the CPU.	Transfer the buffer memory data to the specified device.			
Latest error code	W1010			
Latest address of error history				
Latest alarm code				
Latest address of alarm history				
Interrupt factor detection flag 1				
Interrupt factor detection flag 2				
Interrupt factor detection flag 3				
Interrupt factor detection flag 4				
Interrupt factor detection flag 5				
Interrupt factor detection flag 6				
Interrupt factor detection flag 7				
Interrupt factor detection flag 8				
Interrupt factor detection flag 9				
Interrupt factor detection flag 10				
Interrupt factor detection flag 11				
Interrupt factor detection flag 12				
Interrupt factor detection flag 13				
Interrupt factor detection flag 14				
Interrupt factor detection flag 15				
Interrupt factor detection flag 16				
Set value check code				
Warning output upper flag	W1008			
Warning output lower flag	W1009			
Disconnection detection flag	W1011			
Wave output status monitor				

8. Write the set parameters to the remote head module on the intelligent device station. Then, reset the remote head module or power the system off and on.

 [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.

-  MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)
 -  MELSEC iQ-R Digital-Analog Converter Module User's Manual (Application)
-


7.4 Checking the Network Status

Once parameters are set for the master station and intelligent device station, CC-Link IE Field Network diagnostics of the engineering tool can be used to check whether data link is normally operating between the master station and intelligent device station.

1. Connect the engineering tool to the CPU module on the master station.
2. Start the CC-Link IE Field Network diagnostics.

 [Diagnostics] ⇒ [CC-Link IE Field Diagnostics]

For information on the CC-Link IE Field Network diagnostics from the master station, refer to the following.

 MELSEC iQ-R CC-Link IE Field Network User's Manual (Application)

7.5 Program Examples

This program uses the module labels of the master/local module.

Write the program to the CPU module on the master station.

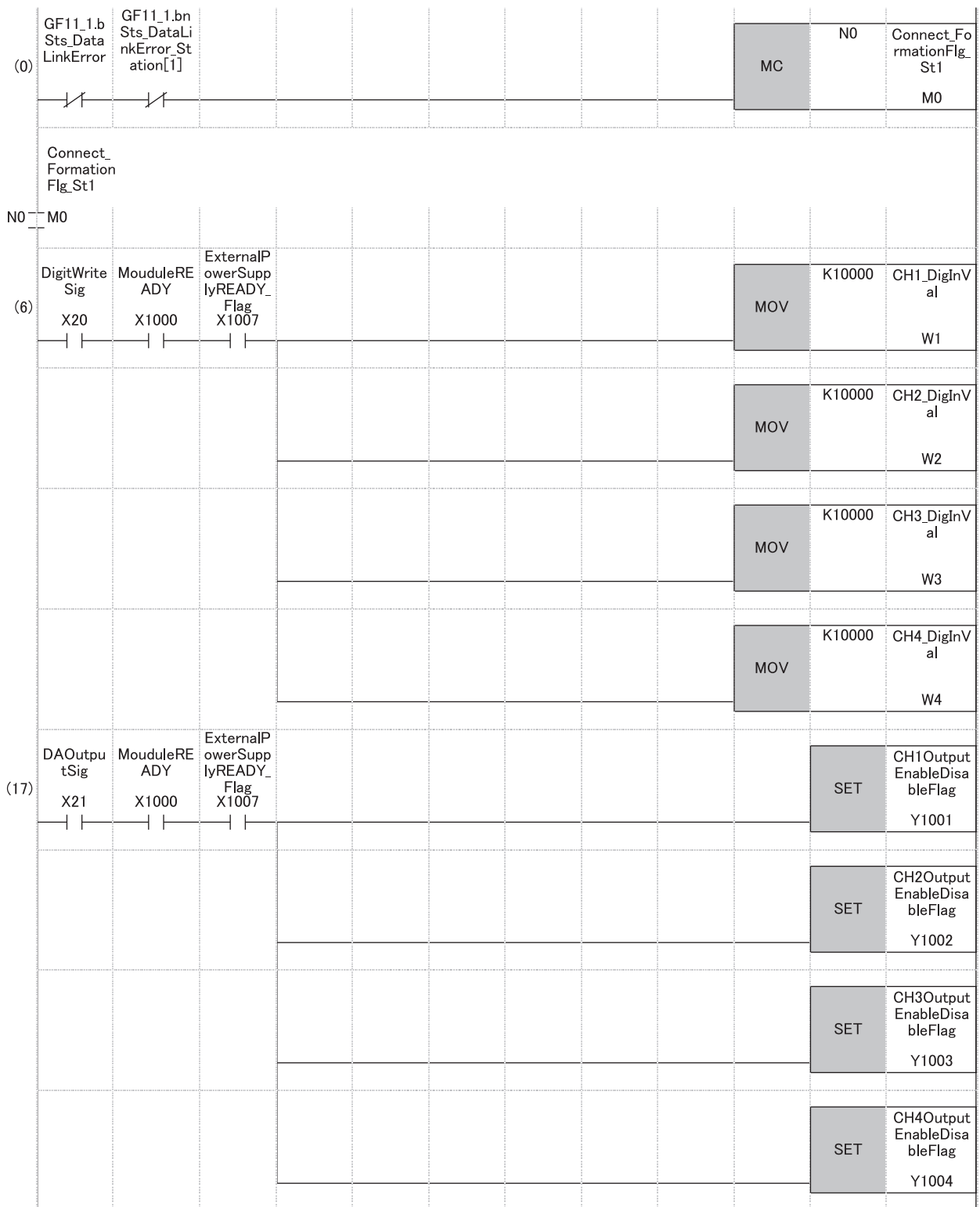
Classification	Label name	Description	Device
Module label	GF11_1.bSts_DataLinkError	Data link error status of own station	SB0049
	GF11_1.bnSts_DataLinkError_Station[1]	Data link status of each station (station No.1)	SW00B0.0

Label to be defined Define global labels as shown below:

Label Name	Data Type	Class	Assign
MouduleREADY	Bit	VAR_GLOBAL	X1000
ExternalPowerSupplyREADY_Flag	Bit	VAR_GLOBAL	X1007
DisconnectionDetectionSignal	Bit	VAR_GLOBAL	X100D
WarningOutputSignal	Bit	VAR_GLOBAL	X100E
ErrorFlag	Bit	VAR_GLOBAL	X100F
CH1OutputEnableDisableFlag	Bit	VAR_GLOBAL	Y1001
CH2OutputEnableDisableFlag	Bit	VAR_GLOBAL	Y1002
CH3OutputEnableDisableFlag	Bit	VAR_GLOBAL	Y1003
CH4OutputEnableDisableFlag	Bit	VAR_GLOBAL	Y1004
WarningOutputClearRequest	Bit	VAR_GLOBAL	Y100E
ErrorClearRequest	Bit	VAR_GLOBAL	Y100F
CH1_DigInVal	Word [Signed]	VAR_GLOBAL	W1
CH2_DigInVal	Word [Signed]	VAR_GLOBAL	W2
CH3_DigInVal	Word [Signed]	VAR_GLOBAL	W3
CH4_DigInVal	Word [Signed]	VAR_GLOBAL	W4
WarningOutputUpperFlag	Word [Signed]	VAR_GLOBAL	W1008
WarningOutputLowerFlag	Word [Signed]	VAR_GLOBAL	W1009
DisconnectionDetectionFlag	Word [Signed]	VAR_GLOBAL	W1011
CH2_AlmUpLimit	Bit	VAR_GLOBAL	F0
CH2_AlmLowLimit	Bit	VAR_GLOBAL	F1
CH4_DisconnectDetect	Bit	VAR_GLOBAL	F2
DigitWriteSig	Bit	VAR_GLOBAL	X20
DAOutputSig	Bit	VAR_GLOBAL	X21
WarningOutClrSig	Bit	VAR_GLOBAL	X22
ErrResetSig	Bit	VAR_GLOBAL	X23
Connect_FormationFlg_St1	Bit	VAR_GLOBAL	M0

The following signals are input signals from the input module (RX10).

- 'DigitWriteSig' (X20)
- 'DAOutputSig' (X21)
- 'WarningOutClrSig' (X22)
- 'ErrResetSig' (X23)



(24)	DAOutputSig X21 /							RST	CH1Output EnableDisa bleFlag Y1001
	MouduleR EADY X1000 /							RST	CH2Output EnableDisa bleFlag Y1002
	ExternalP owerSupp lyREADY Flag X1007 /							RST	CH3Output EnableDisa bleFlag Y1003
								RST	CH4Output EnableDisa bleFlag Y1004
(31)	WarningO utputUpp erFlag.1 W1008.1 ↑							SET	CH2_AlmUp Limit F0
(36)	WarningO utputLow erFlag.1 W1009.1 ↑							SET	CH2_AlmLo wLimit F1
(41)	WarningO utClrSig X22 ↑	WarningOu tputSignal X100E 						SET	WarningOut putClearRe quest Y100E
(45)	WarningO utputSign al X100E /	WarningOu tputClearR equest Y100E 						RST	WarningOut putClearRe quest Y100E
(48)	Disconne ctionDete ctionFlag. 3 W1011.3 ↑							SET	CH4 Discon nectDetect F2
(53)	ErrorFlag X100F 	ErrResetSi g X23 ↑						SET	ErrorClearR equest Y100F
	Disconne ctionDete ctionSign al X100D 								
(58)	ErrorFlag X100F /	Disconne ctionDete ctionSign al X100D /	ErrorClea rRequest Y100F 					RST	ErrorClearR equest Y100F

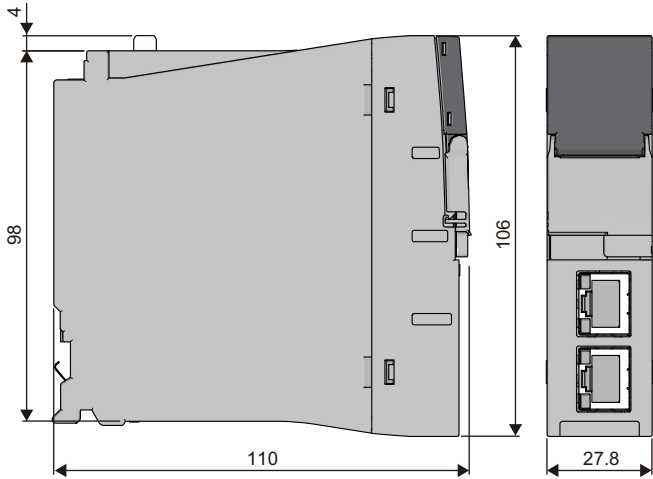
(62)											MCR	NO
(63)												[END]

- (0) Check the data link status of the remote head module (station number 1).
- (6) Set the digital values of CH1 to CH4.
- (17) Enable outputs from CH1 to CH4.
- (24) Disable outputs from CH1 to CH4 if any of the following signals is off.
 - 'DAOutputSig' (X21)
 - 'ModuleREADY' (X1000)
 - 'ExternalPowerSupplyREADY_Flag' (X1007)
- (31) At the time when an upper limit alert is issued in CH2, the processing is to be performed.
- (36) At the time when a lower limit alert is issued in CH2, the processing is to be performed.
- (41) Turn on 'WarningOutputClearRequest' (Y100E).
- (45) Turn off 'WarningOutputClearRequest' (Y100E).
- (48) At the time when a disconnection is detected in CH4, the processing is to be performed.
- (53) Turn on 'ErrorClearRequest' (Y100F).
- (58) Turn off 'ErrorClearRequest' (Y100F).

APPENDIX

Appendix 1 External Dimensions

RJ72GF15-T2



(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 2016	SH(NA)-081614ENG-A	First edition
August 2016	SH(NA)-081614ENG-B	Error correction
January 2017	SH(NA)-081614ENG-C	■Added or modified parts SAFETY PRECAUTIONS, INTRODUCTION, Chapter 1, Section 7.1
December 2017	SH(NA)-081614ENG-D	■Added function Safety communication relay function ■Added or modified parts SAFETY PRECAUTIONS, TERMS, Chapter 1, 3, 5, Section 7.2, 7.3
June 2018	SH(NA)-081614ENG-E	■Added or modified parts Section 7.1, 7.3
March 2021	SH(NA)-081614ENG-F	■Added or modified parts SAFETY PRECAUTIONS, CONDITIONS OF USE FOR THE PRODUCT
November 2022	SH(NA)-081614ENG-G	■Added or modified part Chapter 5
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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]

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- (2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
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 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.
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- (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.
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SH(NA)-081614ENG-H(2310)MEE

MODEL: RJ2GF15-T2-U-IN-E

MODEL CODE: 13JX52

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