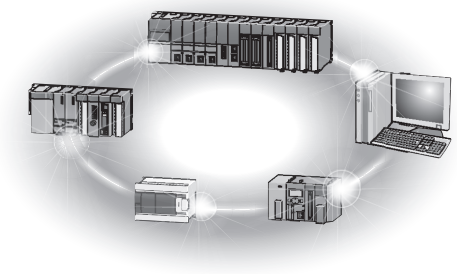
MITSUBISHI ELECTRIC

Programmable Controller

Industrial PC

# CC-Link IE Field Network Basic Reference Manual



# SAFETY PRECAUTIONS

(Read these precautions before using Mitsubishi Electric programmable controllers.)
Before using Mitsubishi Electric programmable controllers and Industrial PC, please read the manuals for the products used and the relevant manuals carefully and pay full attention to safety to handle the products correctly.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

# CONDITIONS OF USE FOR THE PRODUCT

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

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(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 programmable controllers and Industrial PC.
This manual describes the specifications, procedures before operation, system configuration, functions, and troubleshooting of CC-Link IE Field Network Basic.
Before using the products, please read this manual carefully and develop familiarity with CC-Link IE Field Network Basic to handle the products correctly.
When applying the program and circuit 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.

**Point**

In this manual, special relay (SM)/special register (SD) numbers and buffer memory addresses are described using those of the MELSEC iQ-R series. When a different series is used, refer to the following.
☞ Page 59 List of SM/SD/Buffer Memory Areas for CC-Link IE Field Network Basic

# CONTENTS

SAFETY PRECAUTIONS . . . . . 1
CONDITIONS OF USE FOR THE PRODUCT . . . . . 1
INTRODUCTION . . . . . 2
TERMS . . . . . 5

**CHAPTER 1 OVERVIEW 6**

**1.1 Features . . . . . 7**

**CHAPTER 2 SPECIFICATIONS 9**

**2.1 Performance Specifications . . . . . 9**

**CHAPTER 3 FUNCTION LIST 12**

**CHAPTER 4 PROCEDURES BEFORE OPERATION 14**

**CHAPTER 5 SYSTEM CONFIGURATION 16**

**5.1 CC-Link IE Field Network Basic System Configuration . . . . . 16**
Access range . . . . . 17
Number of link points . . . . . 18
**5.2 Product List . . . . . 19**
Modules and devices can be used as the master station . . . . . 19
Modules and devices can be used as a remote station . . . . . 20
Wiring products . . . . . 20

**CHAPTER 6 PROGRAMMING 21**

**6.1 Interlock Programs of Cyclic Transmission . . . . . 21**
Program using labels . . . . . 21
Program using devices . . . . . 23

**CHAPTER 7 FUNCTIONS 24**

**7.1 Cyclic Transmission . . . . . 24**
Data flow and link device assignment . . . . . 24
Link refresh . . . . . 28
Operation of the link scan . . . . . 30
Group number setting . . . . . 32
Input and output status when failure occurs . . . . . 34
Output status for CPU STOP . . . . . 34
**7.2 Reserved Station Specification . . . . . 35**

**CHAPTER 8 PARAMETER SETTINGS 36**

**8.1 Settings for MELSEC iQ-R/MELSEC iQ-L/MELSEC iQ-F . . . . . 36**
CC-Link IEF Basic settings . . . . . 36
**8.2 Settings for MELSEC-Q/MELSEC-L . . . . . 45**
CC-Link IEF Basic settings . . . . . 45
**8.3 Settings for MELIPC . . . . . 47**

CHAPTER 9 TROUBLESHOOTING 48

9.1 CC-Link IE Field Network Basic Diagnostics . . . . 48
9.2 Troubleshooting by Symptom . . . . 51
9.3 Acquiring Diagnostic Information of Remote Stations . . . . 54
How to acquire diagnostic information. . . . . 54
Program for acquiring diagnostic information . . . . 54

APPENDICES 59

Appendix 1 List of SM/SD/Buffer Memory Areas for CC-Link IE Field Network Basic . . . . 59
Appendix 2 Processing Time . . . . 62
Link scan time . . . . 63
Transmission delay time . . . . 64
Appendix 3 Added and Enhanced Functions . . . . 65

INDEX 68

REVISIONS . . . . 70
WARRANTY . . . . 71
INFORMATION AND SERVICES . . . . 72
TRADEMARKS . . . . 72

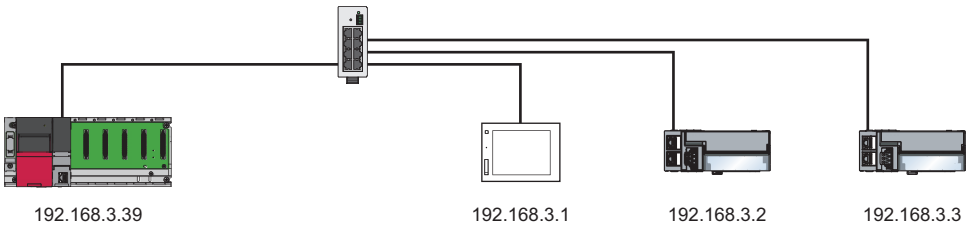
# TERMS

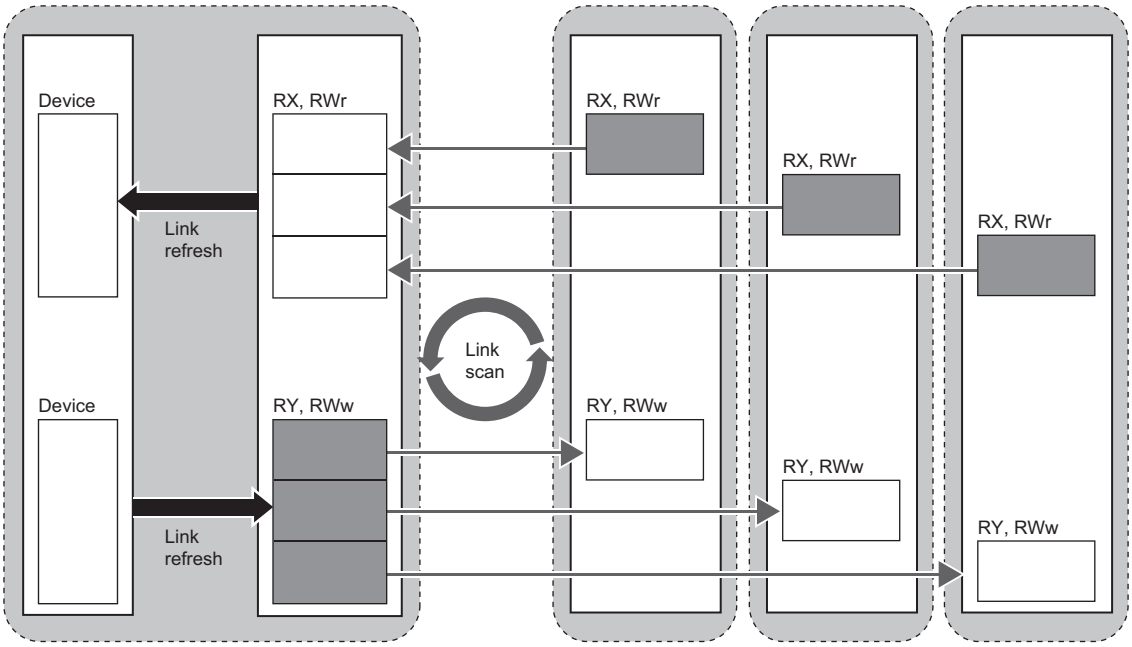
Unless otherwise specified, this manual uses the following terms.

| Term | Description |
|---|---|
| Buffer memory | Memory in a module for storing data such as setting values and monitored values |
| Cyclic transmission | A function by which data are periodically exchanged among stations on the same network using link devices on CC-Link IE Field Network Basic |
| Disconnection | A process of stopping data link if a data link error occurs |
| Label | A label that represents a device in a given character string |
| Link device | A device (RX, RY, RWr, or RWw) in a CPU module and a MELIPC for the purpose of communicating with remote stations. |
| Link refresh | Automatic data transfer between a user device and a link device |
| Link scan (link scan time) | The master station of CC-Link IE Field Network Basic sends requests to all remote stations. After receiving responses from all the remote stations, the master station sends next requests. The time taken from when requests are sent to when the next requests are started to send by the master station. |
| Master station | A station that controls the entire CC-Link IE Field Network Basic. Only one master station can be used in a network. |
| MELIPC | An abbreviation for Mitsubishi Electric Industrial PC, MI5122-VW. |
| RAS | An abbreviation for Reliability, Availability, and Serviceability. This term refers to usability of automated equipment. |
| Reference response time | The time taken from when a remote station of CC-Link IE Field Network Basic has received a request from the master station to when the remote station send a response to the master station. |
| Remote station | A station that performs cyclic transmission with the master station on CC-Link IE Field Network Basic. I/O signals in units of bits and I/O data in units of words are exchanged. |
| Reserved station | A station reserved for future use. This station is not actually connected on CC-Link IE Field Network Basic, but counted as a connected station |
| Return | A process of restarting data link when a station recovers from an error |
| SLMP | An abbreviation for Seamless Message Protocol. This protocol is used to access an SLMP-compatible device or a programmable controller connected to an SLMP-compatible device from an external device. |
| Subnet mask | A number used to logically divide one network into multiple subnetworks and manage them easily. The following Ethernet network systems can be configured:<br>• A small-scale Ethernet network system in which multiple network devices are connected<br>• A medium- or large-scale network system in which multiple small-scale network systems are connected via routers or other network communication devices |
| User device | A device (X, Y, M, D, or others) in a CPU module and a MELIPC. |

# 1 OVERVIEW

CC-Link IE Field Network Basic is a factory automation network using the standard Ethernet.
Data is periodically communicated between the master station and remote stations using link devices (cyclic transmission).



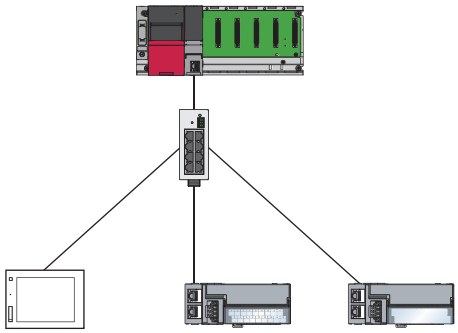

For details on cyclic transmission, refer to the following.
☞ Page 24 Cyclic Transmission

# 1.1 Features



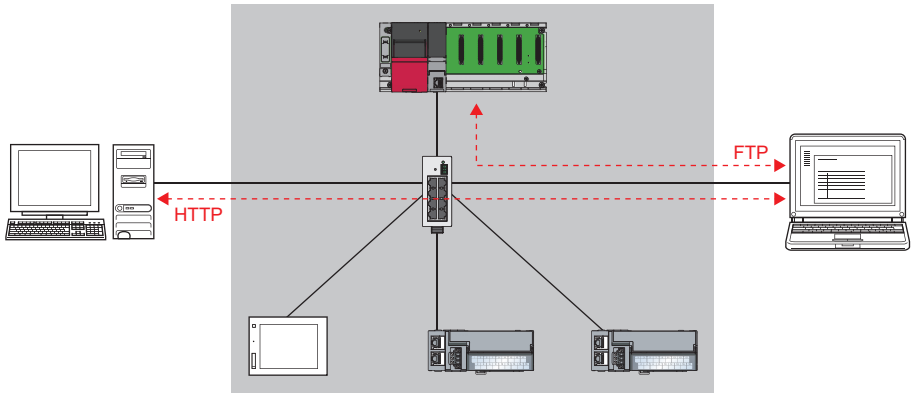
## Cost saving of the system

The CPU module with built-in Ethernet port or the MELIPC can be used as the master station of CC-Link IE Field Network Basic. Since a dedicated network module is not used, the cost for the system can be reduced.



## Using different protocols

CC-Link IE Field Network Basic can be used with other standard Ethernet protocols. Thus, a network system in which different protocols such as FTP, HTTP, and SLMP coexist can be configured.
Moreover, a gateway is not required for communications with personal computers and other information devices.




**Point**

The link scan time of cyclic transmission is increased by executing following functions:

- The built-in Ethernet functions such as FTP. socket communications, and SLMP communications
- Communications with other Ethernet devices on the same line

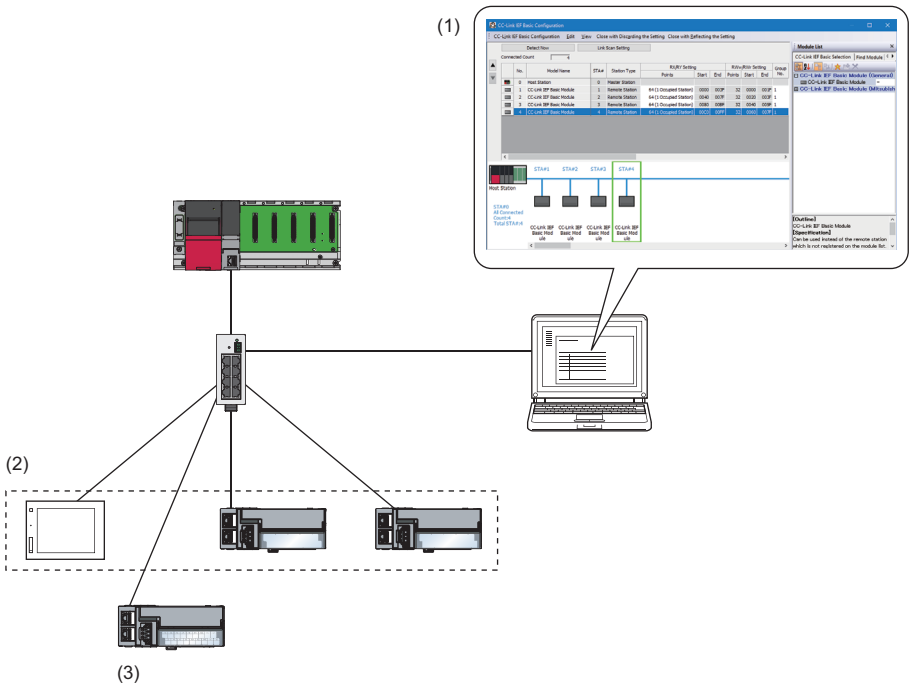
Use the built-in Ethernet function above or other Ethernet devices so that the system being used is not affected. (☞ Page 53 When access to the CPU module is slow)

## Easy system configuration

Configure the entire network of CC-Link IE Field Network Basic in the master station. To perform the cyclic transmission, set an IP address and subnet mask to each remote station. Setting the information of the master station to each remote station is not required.

When the devices are connected in star topology, there are no restrictions on the connection order or connection position of devices. Thus, it is also easy to connect a new remote station.

When the devices are connected in line topology, the CC-Link IE Field Network Basic devices that support line topology are required. To check if the devices support line topology, refer to the manuals for the devices used.




(1) Configure the entire network of CC-Link IE Field Network Basic in the master station.
(2) Set the IP address and subnet mask.
(3) There are no restrictions on the connection order or connection position when a new remote station is added on the same network. Changing the setting for existing remote stations is not required.

**Point**

CC-Link IE Field Network Basic does not require setting of the connection with the remote station.

# 2 SPECIFICATIONS

This chapter describes the specifications of CC-Link IE Field Network Basic.



## 2.1 Performance Specifications

The following table lists the performance specifications of CC-Link IE Field Network Basic.

For the performance specifications of CC-Link IE Field Network Basic with the MELIPC, refer to the following.

MELIPC MI5000 Series User's Manual (Startup)

| Item | | | Specifications | | | | |
|---|---|---|---|---|---|---|---|
| | | | MELSEC iQ-R*2 | MELSEC iQ-L | MELSEC iQ-F*3 | MELSEC-Q*4 | MELSEC-L*4 |
| Number of connectable modules per network | | Master station | 1 | | | | |
| | | Remote station*1 | 64 (16 × 4 groups) | 64 (16 × 4 groups) | FX5 CPU module: 16<br>FX5-ENET: 32 | 64 (16 × 4 groups) | 16 |
| Number of stations occupied by a remote station | | | 1 to 4 | | | | |
| Maximum number of link points per network | | RX | 4096 | 4096 | FX5 CPU module: 1024<br>FX5-ENET: 2048 | 4096 | 1024 |
| | | RY | 4096 | 4096 | FX5 CPU module: 1024<br>FX5-ENET: 2048 | 4096 | 1024 |
| | | RWr | 2048 | 2048 | FX5 CPU module: 512<br>FX5-ENET: 1024 | 2048 | 512 |
| | | RWw | 2048 | 2048 | FX5 CPU module: 512<br>FX5-ENET: 1024 | 2048 | 512 |
| Maximum number of link points per station | Master station | RX | 4096 | 4096 | FX5 CPU module: 1024<br>FX5-ENET: 2048 | 4096 | 1024 |
| | | RY | 4096 | 4096 | FX5 CPU module: 1024<br>FX5-ENET: 2048 | 4096 | 1024 |
| | | RWr | 2048 | 2048 | FX5 CPU module: 512<br>FX5-ENET: 1024 | 2048 | 512 |
| | | RWw | 2048 | 2048 | FX5 CPU module: 512<br>FX5-ENET: 1024 | 2048 | 512 |
| | Remote station | RX | 64 (1 station occupied)<br>128 (2 station occupied)<br>192 (3 station occupied)<br>256 (4 station occupied) | | | | |
| | | RY | 64 (1 station occupied)<br>128 (2 station occupied)<br>192 (3 station occupied)<br>256 (4 station occupied) | | | | |
| | | RWr | 32 (1 station occupied)<br>64 (2 station occupied)<br>96 (3 station occupied)<br>128 (4 station occupied) | | | | |
| | | RWw | 32 (1 station occupied)<br>64 (2 station occupied)<br>96 (3 station occupied)<br>128 (4 station occupied) | | | | |
| UDP port number used in the cyclic transmission | | | 61450 | | | | |
| UDP port number used in the automatic detection of connected device | | | Master station: An unused port number is assigned automatically.<br>Remote station: 61451 | | | | |

| Item | | | Specifications | | | | |
|---|---|---|---|---|---|---|---|
| | | | MELSEC iQ-R*2 | MELSEC iQ-L | MELSEC iQ-F*3 | MELSEC-Q*4 | MELSEC-L*4 |
| Transmission specifications | Data transmission speed | | 100Mbps | | | | |
| | Number of cascade connections | 100BASE-TX | For the number of the connectable stages when using a switching hub, check with the manufacturer of the switching hub used. | | | | |
| Network topology | | | Star topology, line topology (A mixed network topology of star and line can also be configured.)*5 | | | | |
| Connection cable | | | Ethernet cable compliant with the 100BASE-TX standard (☞ Page 20 Ethernet cable) | | | | |
| Maximum station-to-station distance | | | 100m (ANSI/TIA/EIA-568-B (Category 5e) compliant) | | | | |
| Overall cable distance | | | Depends on the system configuration | | | | |

*1 It is the maximum number of connectable modules for a remote station controlled by the master station. It varies depending on the number of stations occupied by a remote station. Ensure that the total number of occupied stations does not exceed the maximum number of connectable modules.

*2 When using the programmable controller CPU (except for the R00CPU, R01CPU, and R02CPU) with the firmware version "28" or earlier, refer to the following.
☞ Page 11 Performance specifications vary depending on the version of the CPU module

*3 The specifications differ depending on the firmware versions. For details, refer to the following.
☞ Page 11 Performance specifications vary depending on the version of the CPU module

*4 When using the CPU module with serial number earlier than "19042" (first five digits), refer to the following.
☞ Page 11 Performance specifications vary depending on the version of the CPU module

*5 Line topology can be configured only with the modules that support line topology.

## Performance specifications vary depending on the version of the CPU module

The following table lists performance specifications vary in the case below.

- MELSEC iQ-R: When the programmable controller CPU (except for the R00CPU, R01CPU, and R02CPU) with the firmware version earlier than "28" is used.
- MELSEC iQ-F: When the CPU module with the firmware version earlier than the following version is used.
  FX5S CPU module: 1.040
  FX5UJ CPU module: 1.080
  FX5U CPU module, FX5UC CPU module: 1.110
- MELSEC-Q, MELSEC-L: When the CPU module with serial number earlier than "19042" (first five digits) is used

| Item | | | Specifications | | | | |
|---|---|---|---|---|---|---|---|
| | | | MELSEC iQ-R | MELSEC iQ-F | | MELSEC-Q | MELSEC-L |
| | | | | FX5S, FX5UJ | FX5U, FX5UC | | |
| Number of connectable modules per network | | Remote station | 16 | 8 | 6 | 16 | 8 |
| Maximum number of link points per network | | RX | 1024 | 512 | 384 | 1024 | 512 |
| | | RY | 1024 | 512 | 384 | 1024 | 512 |
| | | RWr | 512 | 256 | 192 | 512 | 256 |
| | | RWw | 512 | 256 | 192 | 512 | 256 |
| Maximum number of link points per station | Master station | RX | 1024 | 512 | 384 | 1024 | 512 |
| | | RY | 1024 | 512 | 384 | 1024 | 512 |
| | | RWr | 512 | 256 | 192 | 512 | 256 |
| | | RWw | 512 | 256 | 192 | 512 | 256 |

# 3 FUNCTION LIST

The following table shows whether each function can be used in the master station on CC-Link IE Field Network Basic.
For functions when the MELIPC is used as the master station, refer to the following.
MELIPC MI5000 Series User's Manual (Application)

**Point**

Some functions have restrictions on versions of GX Works3/CW Configurator/GX Works2 or the modules and devices of each series that can be used as the master station.
(Page 65 Added and Enhanced Functions)

(1): MELSEC iQ-R, (2): MELSEC iQ-L, (3): MELSEC iQ-F, (4): MELSEC-Q, (5): MELSEC-L
○: Yes, ×: No

## Cyclic transmission

| Function | Description | Yes/No | | | |
|---|---|---|---|---|---|
| | | (1), (2) | (3)*1 | (4) | (5) |
| Data communication using link devices (RX/RY/RWr/RWw) | Periodically performs data communication between the master station and remote stations using link devices (RX/RY/RWr/RWw). (Page 24 Data flow and link device assignment) | ○ | ○ | ○ | ○ |
| Link refresh | Automatically transfers data between devices and link devices of the master station. (Page 28 Link refresh) | ○ | ○ | ○ | ○ |
| Cyclic data integrity assurance | Assures cyclic data integrity in station-based units. | ○ | ○ | ○ | ○ |
| Group number setting | Divides remote stations into groups by setting a group number to each remote station and each of groups performs the cyclic transmission. By organizing groups separating remote stations with shorter response processing time from ones with longer response processing time, the differences of the reference response times of each remote station does not badly affect the cyclic transmission. (Page 32 Group number setting) | ○ | × | ○ | × |
| Input and output status when failure occurs | Clears or holds status of input from a data link faulty station and output status of cyclic data if a stop error occurs in the CPU module (Page 34 Input and output status when failure occurs) | ○ | ○ | ○ | ○ |
| Output status for CPU STOP | Clears or holds cyclic data output when the CPU module is set to STOP state. (Page 34 Output status for CPU STOP) | ○ | ○ | ○ | ○ |

*1 For the functions that can be used when the FX5-ENET is used, refer to the following.
MELSEC iQ-F FX5-ENET User's Manual

## RAS

| Function | Description | Yes/No | | | |
|---|---|---|---|---|---|
| | | (1), (2) | (3) | (4) | (5) |
| Remote station disconnection | Disconnects the corresponding remote station if no response is received within the timeout time or number of times for disconnection detection set in the remote station disconnection detection settings. (Page 42 Link Scan Setting) | ○ | ○ | ○ | ○ |
| Automatic return | Automatically returns a disconnected station to the network and restarts the data link when the station returns to normal. | ○ | ○ | ○ | ○ |

## Diagnostics

| Function | Description | Yes/No | | | |
|---|---|---|---|---|---|
| | | (1), (2) | (3) | (4) | (5) |
| CC-Link IE Field Network Basic diagnostics | Checks the status of CC-Link IE Field Network Basic. (Page 48 CC-Link IE Field Network Basic Diagnostics) | ○ | ○ | ○ | ○ |

## Others

| Function | Description | Yes/No | | | |
|---|---|---|---|---|---|
| | | (1), (2) | (3) | (4) | (5) |
| Reserved station specification | Reserves a station (a station not actually connected but counted as a connected station) for future use. A reserved station is not detected as a faulty station even though it is not actually connected. (☞ Page 35 Reserved Station Specification) | ○ | ○ | ○ | ○ |

# 4 PROCEDURES BEFORE OPERATION

This chapter describes the procedures before operation.
For the procedure when the FX5-ENET is used, refer to the following.
📖 MELSEC iQ-F FX5-ENET User's Manual

***1.*** Configuring a network system

Configure a network system. (☞ Page 16 SYSTEM CONFIGURATION, ☞ Page 15 Wiring precautions)

***2.*** Setting parameters of the master station

- IP address setting (such as IP address, subnet mask)
- CC-Link IEF Basic setting (☞ Page 36 Settings for MELSEC iQ-R/MELSEC iQ-L/MELSEC iQ-F, ☞ Page 45 Settings for MELSEC-Q/MELSEC-L)

**Point**

Actually connected devices can be detected by the automatic detection of connected device and reflected in the network configuration setting. (☞ Page 39 Automatic detection of connected device)
In the network configuration setting, communication settings, such as IP addresses and subnet masks, and writing/reading parameters that are inherent in the remote stations can also be performed to the remote stations. (Some remote stations do not support these features.)

***3.*** Configure the necessary settings of the remote station such as the IP address and subnet mask. (📖 Manual for the remote station used)

***4.*** Write parameters to the CPU module and the MELIPC on the master station. (📖 Operating manual for the tool used)

***5.*** Start up the remote stations.

***6.*** Cyclic transmission starts if the CPU module and the MELIPC on the master station are powered off and on or reset.

***7.*** Diagnosing a network

Check the status of a network by executing the CC-Link IE Field Network Basic diagnostics. (☞ Page 48 CC-Link IE Field Network Basic Diagnostics)

***8.*** Programming

Create a program. For details, refer to the following.
☞ Page 21 PROGRAMMING

## Wiring precautions

- Place the Ethernet 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 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 unplug or malfunction.
- Hold the connector part when connecting and disconnecting the Ethernet cable. Pulling the cable connected to the module may result in malfunction or damage to the module or cable.
- For connectors without Ethernet cable, attached connector cover should be placed to prevent foreign matter such as dirt or dust.
- The maximum segment length of the Ethernet cable is 100m. However, the length may be shorter depending on the operating environment of the cable. For details, contact the manufacturer of the cable used.
- The bending radius of the Ethernet cable is limited. For details, check the specifications of the Ethernet cable to be used.
- For a cascade connection, recommended number of levels is up to three. If connected four levels or more, a packet loss caused by switching hubs is more likely to occur.

# 5 SYSTEM CONFIGURATION

This chapter describes the system configuration of CC-Link IE Field Network Basic.

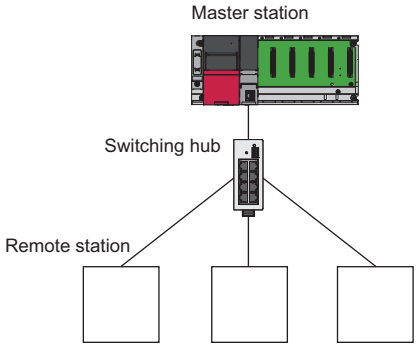
## 5.1 CC-Link IE Field Network Basic System Configuration

Configure a network system using modules and partner products supporting CC-Link IE Field Network Basic.
For the system configuration of CC-Link IE Field Network Basic with the MELIPC, refer to the following.
MELIPC MI5000 Series User's Manual (Startup)

### Network topology

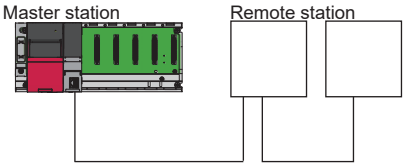
#### ■Star topology

In star topology, connect remote stations using Ethernet cables and a switching hub.




#### ■Line topology

In line topology, connect remote stations using Ethernet cables in a line. A mixed network topology of star and line can also be configured.
For remote stations, the modules that support line topology are required.

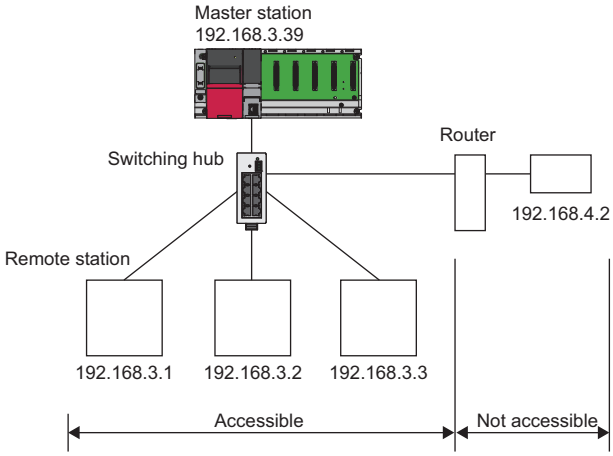


# Access range

The access range of CC-Link IE Field Network Basic is within the same network address of Ethernet. The device connected beyond a router is not accessible.

Ex.

When the subnet mask is 255.255.255.0 and the network address is 192.168.3.☐




**Point**

Use the same subnet mask value and do not assign the same IP address for each remote station.

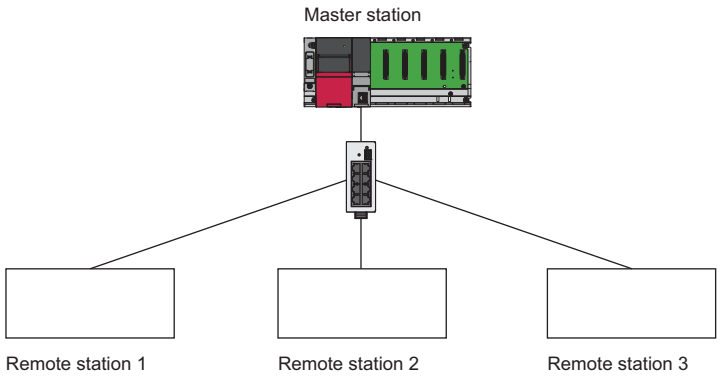
# Number of link points

The number of link points per remote station is 64 points for RX/RY and 32 points for RWr/RWw. (☞ Page 9 Performance Specifications)

However, by changing the number of occupied stations, RX/RY can be set to a maximum of 256 points in increments of 64 points and RWr/RWw can be set to a maximum of 128 points in increments of 32 points. For details on the number of occupied stations (whether or not the number can be changed), refer to the manual for the remote station used.

If the number of link points for the remote station is changed, the assignment range and station number are changed.

Ex.




- Remote station 1: 1 station occupied
- Remote station 2: 2 stations occupied
- Remote station 3: 4 stations occupied

The following table lists the number of link points.

| Remote station | Number of occupied stations | RX/RY | | | RWr/RWw | | |
|---|---|---|---|---|---|---|---|
| | | Number of points | Start | End | Number of points | Start | End |
| 1 | 1 | 64 | 0 | 3F | 32 | 0 | 1F |
| 2 | 2 stations occupied | 128 | 40 | BF | 64 | 20 | 5F |
| 3 | 4 stations occupied | 256 | C0 | 1BF | 128 | 60 | DF |

**Point**

Setting the number of link points for a remote station to 2 stations occupied means that two remote stations are connected. Thus, if the number of link points is increased, the number of connectable remote stations per network is decreased.

# 5.2 Product List

This section describes the products which configure a CC-Link IE Field Network Basic system.

## Modules and devices can be used as the master station

The following tables list the modules and devices that can be used as the master station of CC-Link IE Field Network Basic. To check the firmware version of them, refer to the following.

☞ Page 65 Added and Enhanced Functions

### MELSEC iQ-R

| Product name | Model name |
|---|---|
| Programmable controller CPU | R00CPU, R01CPU, R02CPU, R04CPU, R04ENCPU, R08CPU, R08ENCPU, R16CPU, R16ENCPU, R32CPU, R32ENCPU, R120CPU, R120ENCPU |
| C Controller module | R12CCPU-V |

### MELSEC iQ-L

| Product name | Model name |
|---|---|
| CPU module | L04HCPU, L08HCPU, L16HCPU |

### MELSEC iQ-F

| Product name | Model name |
|---|---|
| FX5S CPU module | FX5S-30MR/ES, FX5S-30MT/ES, FX5S-30MT/ESS, FX5S-40MR/ES, FX5S-40MT/ES, FX5S-40MT/ESS, FX5S-60MR/ES, FX5S-60MT/ES, FX5S-60MT/ESS, FX5S-80MR/ES, FX5S-80MT/ES, FX5S-80MT/ESS, FX5S-30MR/DS, FX5S-30MT/DS, FX5S-30MT/DSS, FX5S-40MR/DS, FX5S-40MT/DS, FX5S-40MT/DSS, FX5S-60MR/DS, FX5S-60MT/DS, FX5S-60MT/DSS, FX5S-80MR/DS, FX5S-80MT/DS, FX5S-80MT/DSS |
| FX5UJ CPU module | FX5UJ-24MR/ES, FX5UJ-24MT/ES, FX5UJ-24MT/ESS, FX5UJ-40MR/ES, FX5UJ-40MT/ES, FX5UJ-40MT/ESS, FX5UJ-60MR/ES, FX5UJ-60MT/ES, FX5UJ-60MT/ESS, FX5UJ-24MR/DS, FX5UJ-24MT/DS, FX5UJ-24MT/DSS, FX5UJ-40MR/DS, FX5UJ-40MT/DS, FX5UJ-40MT/DSS, FX5UJ-60MR/DS, FX5UJ-60MT/DS, FX5UJ-60MT/DSS |
| FX5U CPU module | FX5U-32MR/ES, FX5U-32MT/ES, FX5U-32MT/ESS, FX5U-64MR/ES, FX5U-64MT/ES, FX5U-64MT/ESS, FX5U-80MR/ES, FX5U-80MT/ES, FX5U-80MT/ESS, FX5U-32MR/DS, FX5U-32MT/DS, FX5U-32MT/DSS, FX5U-64MR/DS, FX5U-64MT/DS, FX5U-64MT/DSS, FX5U-80MR/DS, FX5U-80MT/DS, FX5U-80MT/DSS |
| FX5UC CPU module | FX5UC-32MT/D, FX5UC-32MT/DSS, FX5UC-64MT/D, FX5UC-64MT/DSS, FX5UC-96MT/D, FX5UC-96MT/DSS, FX5UC-32MT/DS-TS, FX5UC-32MT/DSS-TS, FX5UC-32MR/DS-TS |
| FX5 intelligent function module | FX5-ENET |

### MELSEC-Q

| Product name | Model name |
|---|---|
| High-speed Universal model QCPU | Q03UDVCPU, Q04UDVCPU, Q06UDVCPU, Q13UDVCPU, Q26UDVCPU |

### MELSEC-L

| Product name | Model name |
|---|---|
| Built-in Ethernet port LCPU | L02CPU, L02CPU-P, L06CPU, L06CPU-P, L26CPU, L26CPU-P, L26CPU-BT, L26CPU-PBT |

### MELIPC

| Product name | Model name |
|---|---|
| MELIPC MI5000 series | MI5122-VW |

# Modules and devices can be used as a remote station

For modules and devices which can be used as a remote station of CC-Link IE Field Network Basic, refer to the manual for each module and device.

**Point**

The modules and devices that can be used as the master station cannot be used as a remote station. (☞ Page 19 Modules and devices can be used as the master station)

# Wiring products

This section describes the wiring products used in CC-Link IE Field Network Basic.

## Ethernet cable

Use an Ethernet cable which conforms to the following standards.

| Ethernet cable | Connector | Standard |
|---|---|---|
| Category 5 or higher, (STP) straight cable | RJ45 connector | • IEEE 802.3 (100BASE-TX)<br>• ANSI/TIA/EIA-568-B (Category 5) |
| Category 5 or 5e, (STP) crossover cable | | |

## Hub

Use hubs which satisfy all the following conditions. If hubs not satisfying the conditions are used, operation is not guaranteed.

- IEEE 802.3 (100BASE-TX) compliant
- The auto MDI/MDI-X function equipped
- The auto-negotiation function equipped
- Switching hub (layer 2 switch)*1

*1 A repeater hub cannot be used.

For switching hubs that can be used for CC-Link IE Field Network Basic, refer to the following.

Applicable products (switching hubs) for CC-Link IE Field Network Basic module (FA-A-0234)

# 6 PROGRAMMING

This chapter describes the programming of CC-Link IE Field Network Basic.
When the C Controller module is used, refer to the following.
📖 MELSEC iQ-R C Controller Module User's Manual
When the FX5-ENET is used, refer to the following.
📖 MELSEC iQ-F FX5-ENET User's Manual
When the MELIPC is used, refer to the following.
📖 MELIPC MI5000 Series User's Manual (Application)

## 6.1 Interlock Programs of Cyclic Transmission

When creating a cyclic transmission program, configure an interlock such that the processing is performed when normal cyclic transmission between the master station and remote stations is performed.

**Point**

For details on special relay areas (SM) and special register areas (SD), refer to the following.
☞ Page 59 List of SM/SD/Buffer Memory Areas for CC-Link IE Field Network Basic



### Program using labels

A program using labels is provided below.

#### Labels used in the program

**■Module label**

The following module labels are used.

| Module label | | | Description | Device |
|---|---|---|---|---|
| MELSEC iQ-R | MELSEC iQ-L | MELSEC iQ-F | | |
| RCPU.stSM.bSts_CyclicTransmission | LHCPU.stSM.bSts_CyclicTransmission | FX5CPU.stSM.bSts_CyclicTransmission | Cyclic transmission status | SM1536 |
| RCPU.stSD.bnSts_CyclicTransmission_Station[1] | LHCPU.stSD.bnSts_CyclicTransmission_Station[1] | FX5CPU.stSD.bnSts_CyclicTransmission_Station[1] | Cyclic transmission status of each station (station No.1) | SD1536.0 |
| RCPU.stSD.bnSts_CyclicTransmission_Station[2] | LHCPU.stSD.bnSts_CyclicTransmission_Station[2] | FX5CPU.stSD.bnSts_CyclicTransmission_Station[2] | Cyclic transmission status of each station (station No.2) | SD1536.1 |

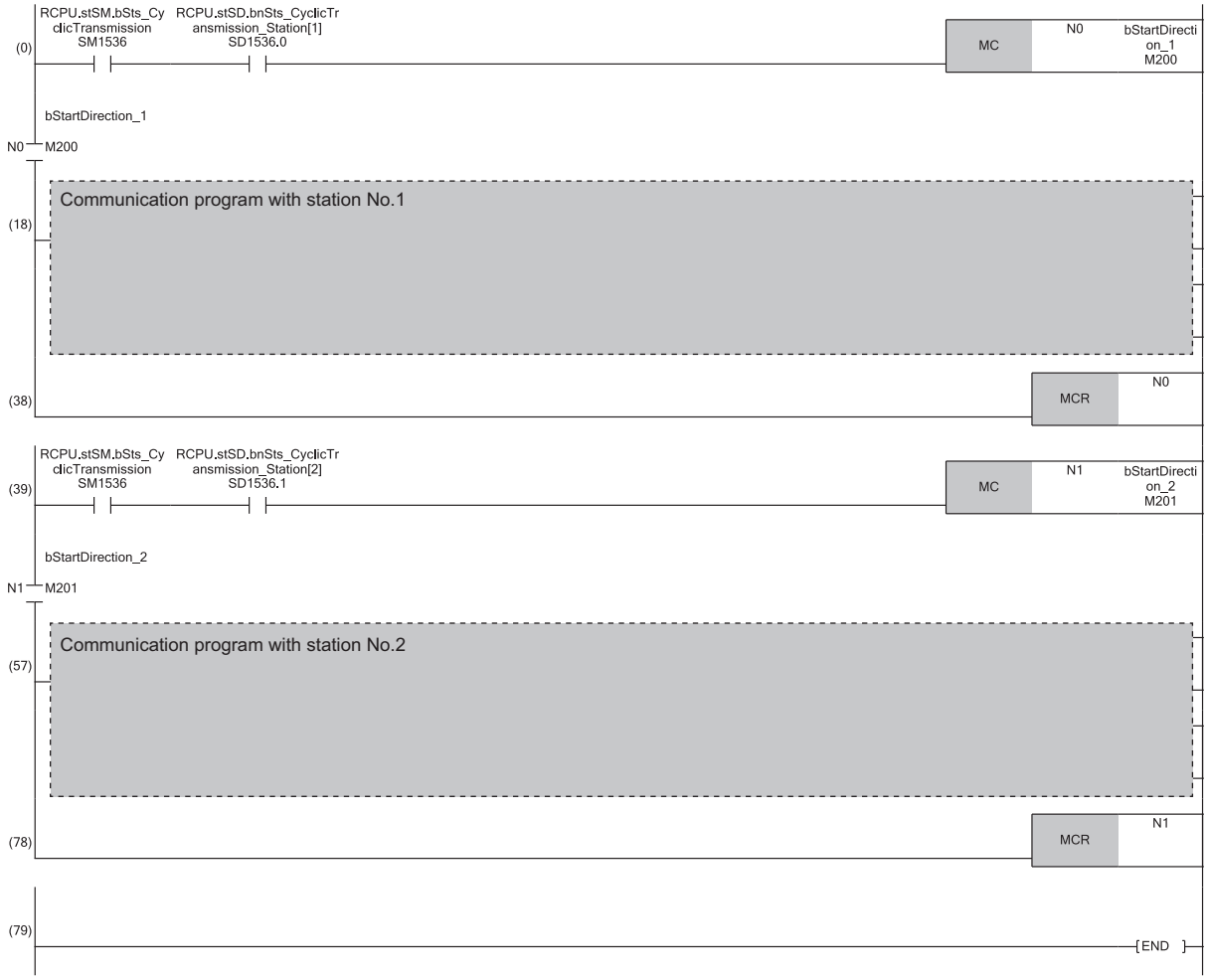
**■Labels to be defined**

Define global labels as follows.

| | Label Name | Data Type | | Class | Assign (Device/Label) |
|---|---|---|---|---|---|
| 1 | bStartDirection_1 | Bit | ... | VAR_GLOBAL | M200 |
| 2 | bStartDirection_2 | Bit | ... | VAR_GLOBAL | M201 |

## Program example

The following is a program example of MELSEC iQ-R series.



# Program using devices

A program using devices is provided below.

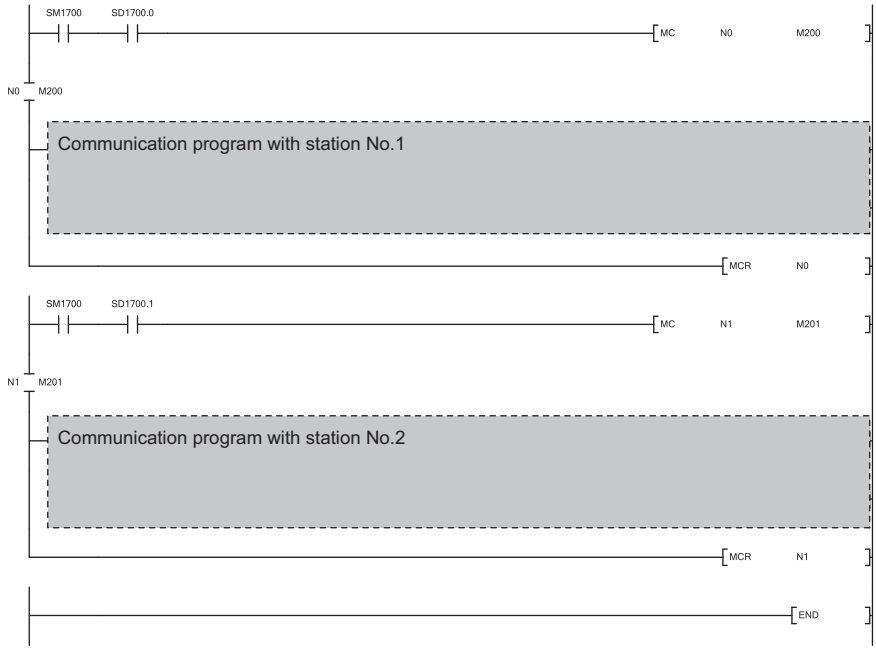
## Devices used in the program

The following devices are used.

| Device | | Description |
|---|---|---|
| MELSEC iQ-R, MELSEC iQ-L, MELSEC iQ-F | MELSEC-Q, MELSEC-L | |
| SM1536 | SM1700 | Cyclic transmission status |
| SD1536.0 | SD1700.0 | Cyclic transmission status of each station (station No.1) |
| SD1536.1 | SD1700.1 | Cyclic transmission status of each station (station No.2) |

## Program example

The following is a program example of MELSEC-Q series.



# 7 FUNCTIONS

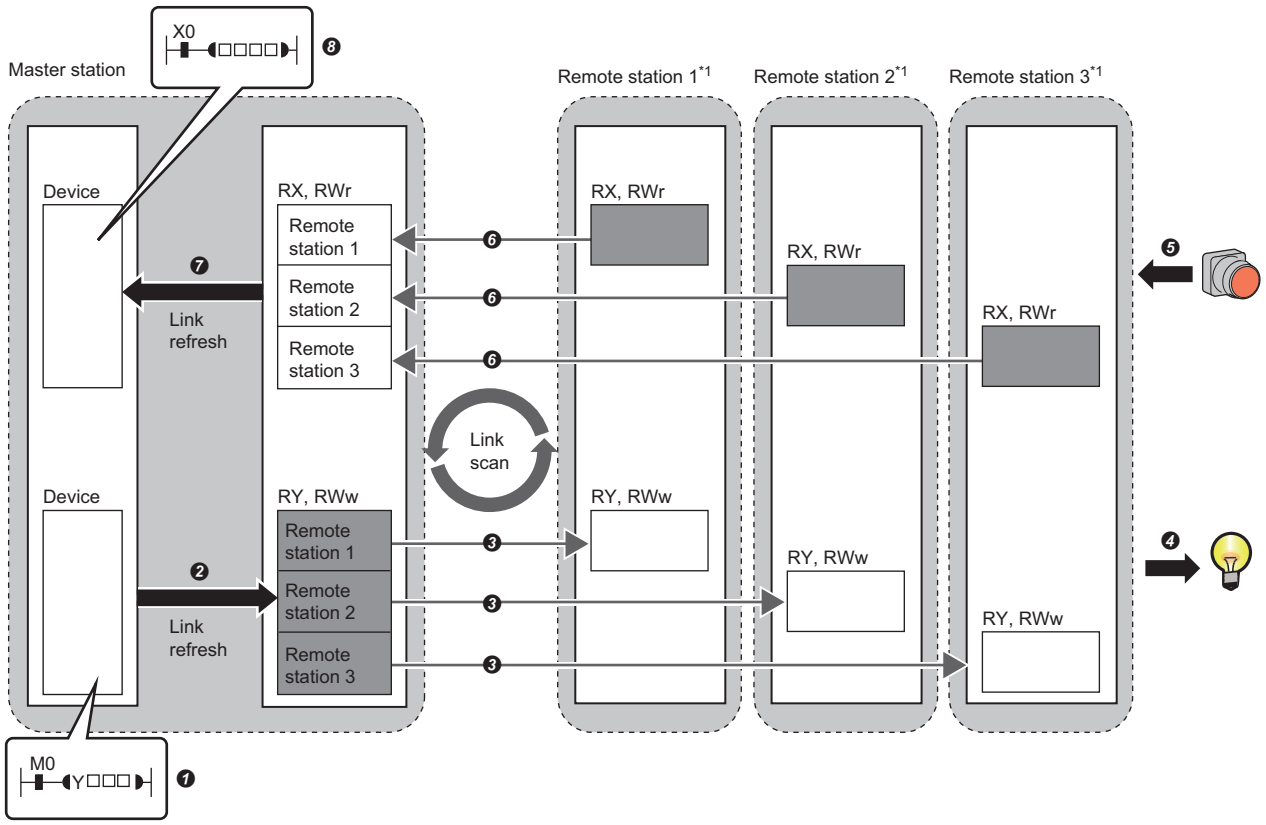
This chapter describes the functions of CC-Link IE Field Network Basic.
When the C Controller module is used, refer to the following.
📖 MELSEC iQ-R C Controller Module User's Manual
When the MELIPC is used, refer to the following.
📖 MELIPC MI5000 Series User's Manual (Application)

## 7.1 Cyclic Transmission

This function periodically performs data communication between the master station and remote stations using link devices.

### Data flow and link device assignment

The following figure shows the data flow of communications using link devices between the master station and remote stations.




: Area where data is sent to other stations

*1 The remote station order is the same as the order set in the network configuration setting. (☞ Page 38 Network Configuration Settings)

- Output from the master station

❶ The devices of the master station turn on.
❷ The status of the devices of the master station is stored in the link devices (RY, RWw) of the master station by link refresh.
❸ The status of link devices (RY, RWw) of the master station is stored in the link devices (RY, RWw) of each remote station by link scan.
❹ The status of the link devices (RY, RWw) of the remote station is output to external devices.

- Input from the remote station

❺ The status of external devices is stored in the link devices (RX, RWr) of each remote station.
❻ The status of the link devices (RX, RWr) of each remote station is stored in the link devices (RX, RWr) of the master station by link scan.
❼ The status of the link devices (RX, RWr) of the master station is stored in the devices of the master station by link refresh.
❽ The devices of the master station turn on.

## Setting method

Assignments of link devices are configured in "Network Configuration Settings". (☞ Page 38 Network Configuration Settings)

Assignments for link refresh are configured in "Refresh Settings". (☞ Page 44 Refresh Settings, ☞ Page 45 CC-Link IEF Basic settings)

**Point**

Groups of remote stations (16 stations maximum) individually perform the cyclic transmission. (☞ Page 32 Group number setting)

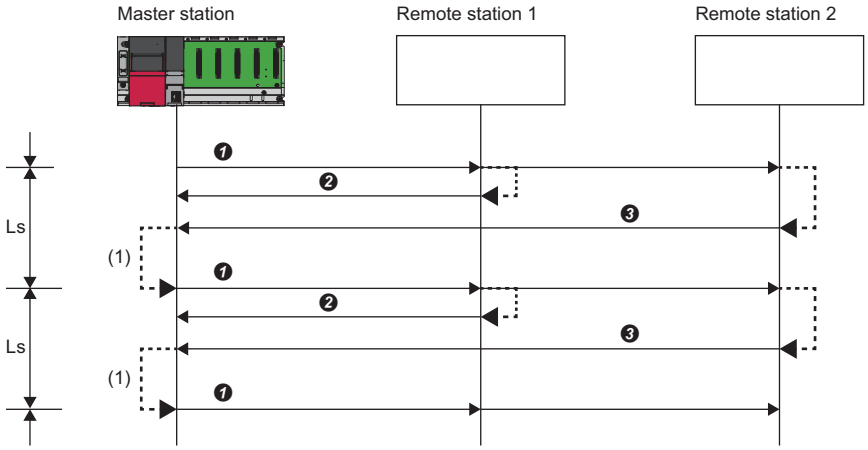
For assignments of link devices and ones for link refresh, however, there is no to consider the groups.

## Data flow of cyclic transmission

The following describes the data flow of cyclic transmission.

### ■Basic operation

The master station sends a request to all remote stations (including Ethernet devices within the same network address). After receiving responses from all remote stations set with parameters, the master station starts sending another request. The link scan refers to the operation from sending a request to sending another request and the link scan time refers to the time required for a link scan. (☞ Page 30 Operation of the link scan)




Ls: Link scan

❶ The master station sends a request to remote station 1 and remote station 2.

❷ Remote station 1 sends a response to the master station.

❸ Remote station 2 sends a response to the master station.

(1) Once the master station has received responses from remote station 1 and remote station 2, the master station starts sending another request.

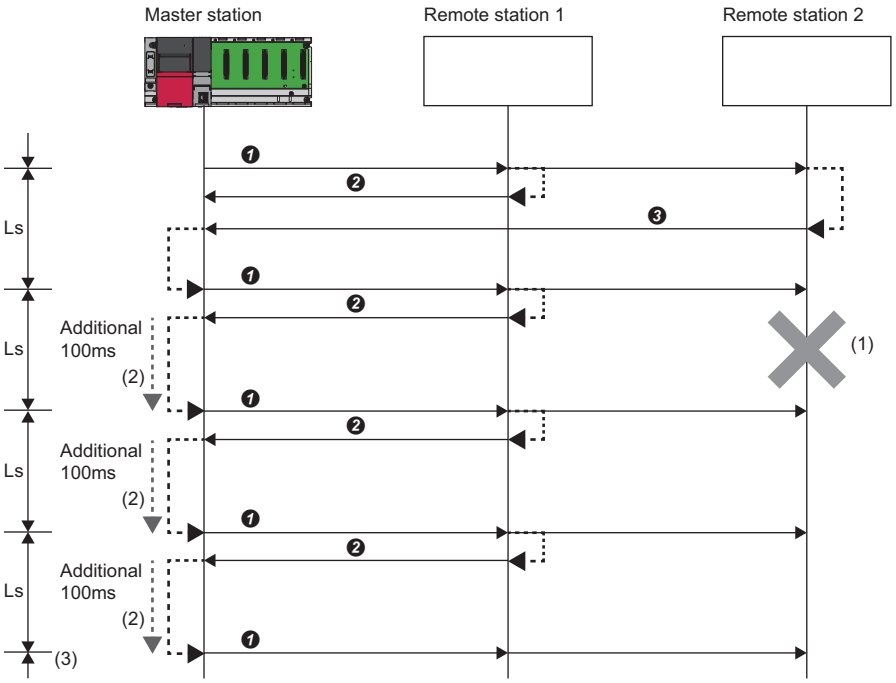
**Point**

- When the master station sends a request (starts cyclic transmission) to all remote stations, 'Cyclic transmission status' (SM1536) turns on, and when the master station receives responses from each remote station, a bit, that is corresponding to the station number of the remote stations which have sent a response, of 'Cyclic transmission status of each station' (SD1536 to SD1539) turns on.
- When the master station starts cyclic transmission, if no response has been received from a remote station, the applicable remote station is not detected as a faulty station. (The 'Data link status' (SM1540) does not turn on.) In addition, the transmission status of CC-Link IE Field Network Basic diagnostics becomes "Unfixed".
- When remote stations are divided into groups, each of the groups performs the cyclic transmission. For the data flow of group number setting, refer to the following.

☞ Page 33 Data flow of cyclic transmission

## ■No response received from a remote station

If the master station is unable to receive a response from a remote station due to the power-off or cable disconnection of the remote station, the master station waits for a response from the remote station within the timeout time set in the link scan settings. If no response is received within the specified number of times for disconnection detection, the master station disconnects the remote station.




(Remote station disconnection detection setting: Timeout time = 100ms, number of times = 3 times)

Ls: Link scan

❶ The master station sends a request to remote station 1 and remote station 2.

❷ Remote station 1 sends a response to the master station.

❸ Remote station 2 sends a response to the master station.

(1) Remote station 2 cannot respond to the master station due to an error such as power-off or cable disconnection of the remote station.

(2) The master station waits for the response from remote station 2 until the timeout time runs out and then send a request to remote station 1 and remote station 2 because the master station cannot receive a response from remote station 2. Note that the link scan time is extended by the timeout time.

(3) The master station disconnect remote station 2 because the master station cannot receive a response from remote station 2 by the specified number of times (three times) for the disconnection detection.

The following table lists the special relay and special register operations when a remote station which did not send a response is disconnected.

| Special relay/special register | Operation |
|---|---|
| 'Cyclic transmission status' (SM1536) | Remains turned on. |
| 'Cyclic transmission status of each station' (SD1536 to SD1539) | The bit corresponding to the station number of the disconnected remote station is turned off. |
| 'Data link status' (SM1540) | Turns off and on. |
| 'Data link status of each station' (SD1540 to SD1543) | The bit corresponding to the station number of the disconnected remote station is turned on (indicating that the remote station is a faulty station). |

**Point**

- If a timeout due to a failure of a remote device occurs, a timeout time will be equivalent to a link scan time. To lessen the impact on communications with normal remote stations by transmission delay, adjust the timeout time. (☞ Page 42 Link Scan Setting) For example, check the current link scan time (when all remote stations normally operate) using the CC-Link IE Field Network Basic diagnostics, and then specify a value, which is about five times as long as the link scan time, for timeout time. (When the current link scan time is 10ms, specify 50ms for the timeout time.)
- The delay in the link scan time caused by a timeout can be checked in 'Accumulated number of timeouts' (Un\G1063). (☞ Page 54 Acquiring Diagnostic Information of Remote Stations)

### ■An abnormal response received from a remote station

The master station immediately disconnects the remote station regardless of the timeout time and the number of times for disconnection detection set in the link scan settings.

The following table lists the special relay and special register operations when a remote station is disconnected.

| Special relay/special register | Operation |
|---|---|
| 'Cyclic transmission status' (SM1536) | Remains turned on. |
| 'Cyclic transmission status of each station' (SD1536 to SD1539) | The bit corresponding to the station number of the disconnected remote station is turned off. |
| 'Data link status' (SM1540) | Turns off and on. |
| 'Data link status of each station' (SD1540 to SD1543) | The bit corresponding to the station number of the disconnected remote station is turned on (indicating that the remote station is a faulty station). |

**Point**

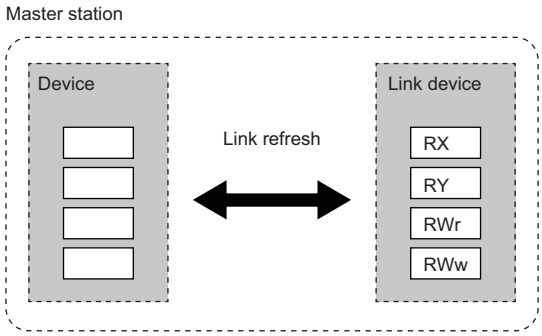
Some remote stations are equipped with a function that makes them disconnected without being a faulty station*1. For details, refer to the manuals of the remote station used.

*1 Since the remote station does not become a faulty station, 'Data link status' (SM1540) and 'Data link status of each station' (SD1540 to SD1543) do not change.

# Link refresh

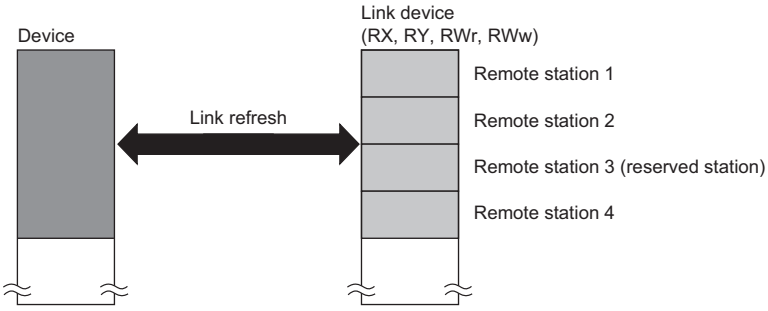
This function automatically transfers data between devices and link devices of the master station. Link refresh is performed in END processing.*1

*1 It is also performed at the arbitrary timing of the COM instruction (Selecting refresh to be performed). (MELSEC iQ-F does not support the COM instruction.)




## Concept of the link refresh range (number of points)

A batch refresh is performed for all the stations set in the parameter starting from the head of the link device.




**Point**

A reserved station is also included in the refresh range.

## Setting method

Link refresh is assigned in "Refresh Settings" under "CC-Link IEF Basic Setting". (☞ Page 44 Refresh Settings, ☞ Page 45 CC-Link IEF Basic settings)

## Precautions

### ■Latched devices of the CPU module

If data in latched devices of the CPU module is cleared to zero in a program when the CPU module is powered off and on or reset, the data may be output without being cleared to zero, depending on the timing of link scan and link refresh. Take the following actions so as not to output the data in the latched devices of the CPU module.

| CPU module device | How to disable the device data |
|---|---|
| File register (R, ZR)*1 | Use the device initial value to clear the device to zero. |
| Latch relay (L) | Delete from the refresh settings |
| Devices within the latch range, extended data register (D)*2 and extended link register (W)*2 | Delete all the latch range settings. |

*1 In the FX5U CPU modules and FX5UC CPU modules, the file register (R) is latched when it is specified to be included in the latch range.

*2 The devices are available for MELSEC-Q and MELSEC-L. (📖 User's Manual (Function Explanation, Program Fundamentals) for the CPU module used)

### ■Boundary between extended data register (D) and extended link register (W)

Do not set the refresh range beyond the boundary between the user device and extended data register (D)[*1] or extended link register (W)[*1].

*1 The devices are available for MELSEC-Q and MELSEC-L. (📖 User's Manual (Function Explanation, Program Fundamentals) for the CPU module used)

### ■Devices of the FX5S CPU module

In 30-point type and 60-point type CPU modules, do not use the following devices for link refresh because link refresh may not be performed correctly, though these devices can be set for the refresh target.

- 30-point type CPU module: Y16, Y17
- 60-point type CPU module: X44 to X47

### ■Devices of the FX5UJ CPU module

In 24-point type and 60-point type CPU modules, do not use the following devices for link refresh because link refresh may not be performed correctly, though these devices can be set for the refresh target.

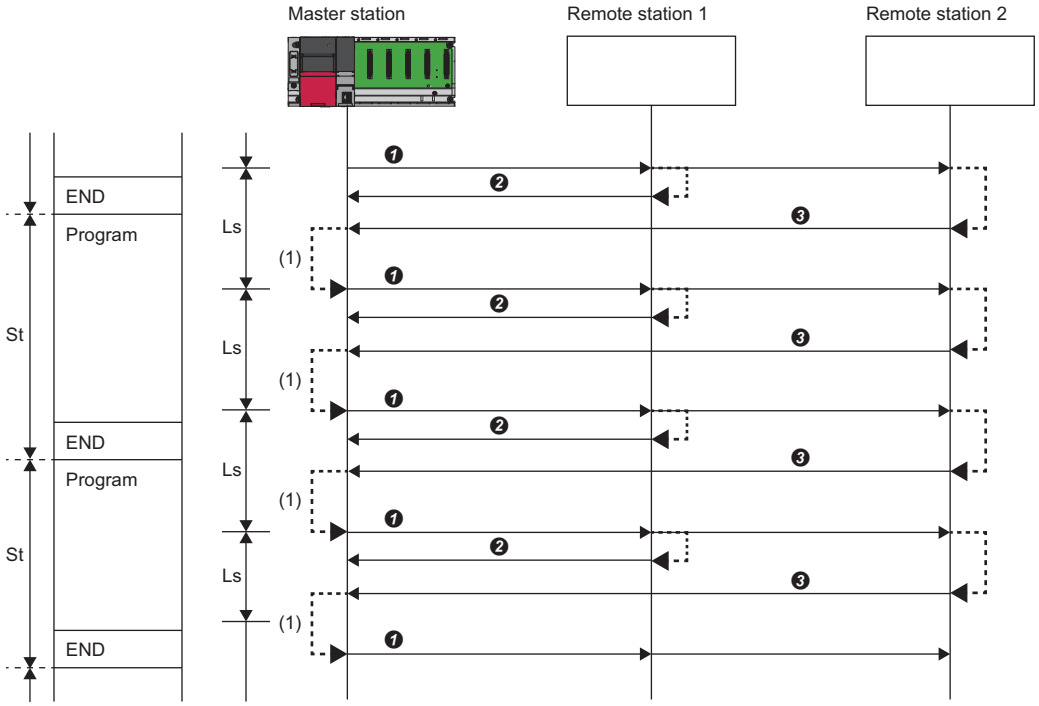
- 24-point type CPU module: X16, X17, Y12 to Y17
- 60-point type CPU module: X44 to X47

# Operation of the link scan

This section describes the operation of the link scan.

## MELSEC iQ-R, MELSEC iQ-L, MELSEC-Q, MELSEC-L

After sending the requests to all of remote stations and subsequently receiving responses from all the remote stations, the master station starts the next link scan. Link refresh is performed in END processing after receiving responses from all the remote stations.



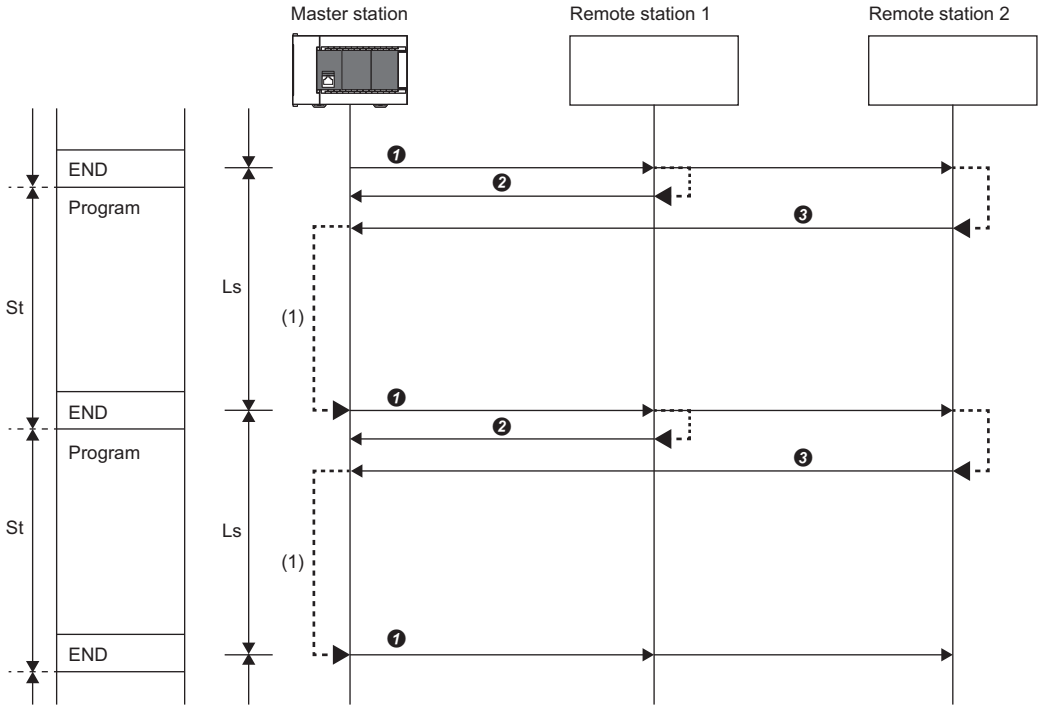

St: Scan time (sequence scan)
Ls: Link scan
END: END processing
❶ The master station sends a request to remote station 1 and remote station 2.
❷ Remote station 1 sends a response to the master station.
❸ Remote station 2 sends a response to the master station.
(1) Once the master station has received responses from remote station 1 and remote station 2, the master station starts the next link scan.

**Point**

- The link scan operates separately from the operation of programs.
- If the scan time is smaller than link scan time, link refresh is not performed until the master station receives responses from all remote stations.
- The link scan time may increase five times longer than the normal time depending on the processing load or communication load of the master station. Set an appropriate time for the timeout time. (☞ Page 25 Data flow of cyclic transmission, ☞ Page 42 Link Scan Setting)

## MELSEC iQ-F

After sending requests to all remote stations, the master station receives responses from remote stations in END processing. After receiving responses from all the remote stations, the master station performs link refresh and starts the next link scan.




St: Scan time (sequence scan)
Ls: Link scan
END: END processing
❶ The master station sends a request to remote station 1 and remote station 2.
❷ Remote station 1 sends a response to the master station.
❸ Remote station 2 sends a response to the master station.
(1) Although the master station received responses from remote station 1 and remote station 2, the master station does not start the next link scan until link refresh is performed in END processing.

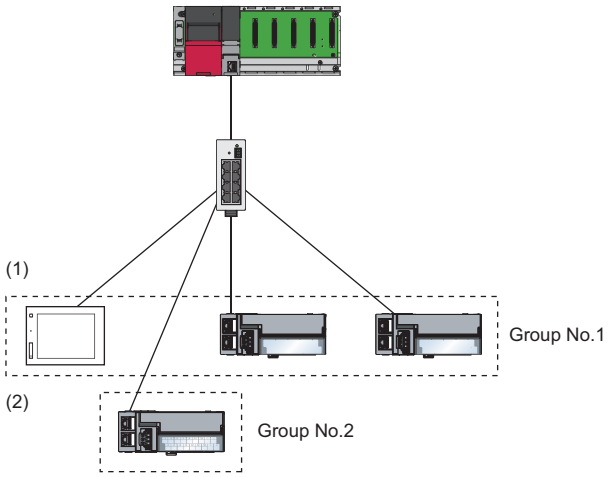
**Point**

- If the scan time is smaller than link scan time, link refresh is not performed until the master station receives responses from all remote stations.
- The link scan time may increase five times longer than the normal time depending on the processing load or communication load of the master station. Set an appropriate time for the timeout time. (☞ Page 25 Data flow of cyclic transmission, ☞ Page 42 Link Scan Setting)

# Group number setting

This function divides remote stations into groups by setting a group number to each remote station and each of groups performs the cyclic transmission.

By organizing groups separating remote stations with shorter response processing time from ones with longer response processing time, the differences of the reference response times of each remote station does not badly affect the cyclic transmission.




(1)The total number of occupied stations for one group is 16 maximum.
(2)Up to four groups can be organized.

**Restriction**

Before using the group number setting, check the versions of the CPU module and the engineering tool. (☞ Page 65 Added and Enhanced Functions)

Note, however, there is no restriction for the R00CPU, R01CPU, and R02CPU.

## How to organize groups

Organize groups considering the following.

### ■Dividing remote stations into groups

- Organizing two or more groups can configure a network with remote stations that occupy 17 or more stations in total.
- By dividing remote stations into groups with similar reference response time, the gap of the response time of each remote station does not badly affect the cyclic transmission. For details on the reference response time, refer to manuals for remote stations used. Link scan times vary from group to group. The link scan time of each group is affected by a remote station that has the longest reference response time in a group. (☞ Page 33 Data flow of cyclic transmission)

### ■Merging remote stations into one group

- To perform cooperating operation between remote stations, merge them into the same group.
- When the line load is large, merging remote stations into the fewest number of groups as possible according to the number of remote stations connected to the master station is recommended. For example, merge remote stations into one group if the remote stations are 16 or less. When two or more groups are organized, the master station sends requests to each of them. Since the packets of the cyclic transmissions performed for each group flow on the line, the more groups are organized, the larger the line load becomes.

## Data flow of cyclic transmission

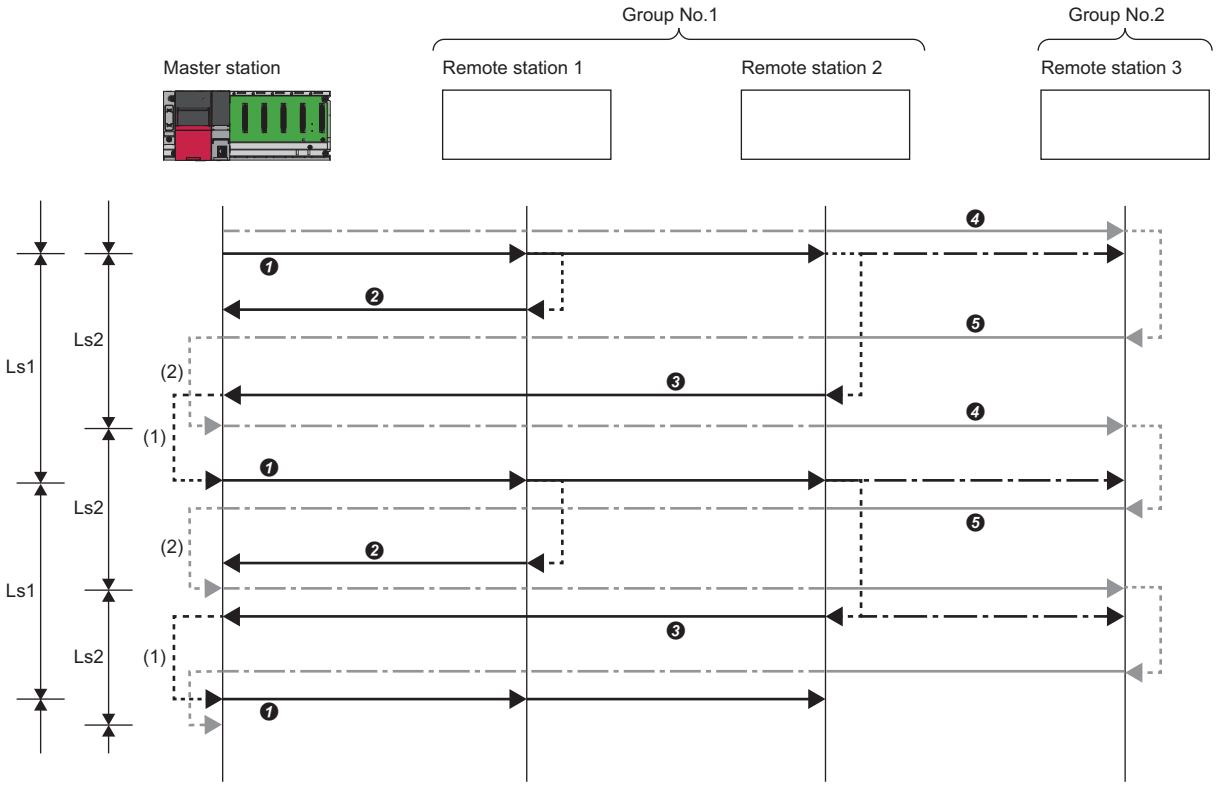
The following describes the data flow of cyclic transmission of when the group number setting is used.

### ■Basic operation

The master station sends requests, that vary from a group to group, to all remote stations. Although remote stations receive multiple request messages from the master station, each remote station handles a request message for a group where each remote stations belong to.

After receiving responses from all the remote stations in a group, the master station starts sending another request to the group. For this reason, link scan times vary from group to group.

Since the link scan setting can be configured for each group, the setting can be according to response processing times of each group. (☞ Page 42 Link Scan Setting)




Ls1: Link scan of group 1

Ls2: Link scan of group 2

❶ The master station sends requests to remote station 1 and remote station 2 that belong to group 1.

❷ Remote station 1 sends a response to the master station.

❸ Remote station 2 sends a response to the master station.

❹ The master station sends requests to remote station 3 that belongs to group 2.

❺ Remote station 3 sends a response to the master station.

(1) Once the master station has received responses from remote station 1 and remote station 2, the master station starts sending another request.

(2) Once the master station has received a response from remote station 3, the master station starts sending another request.

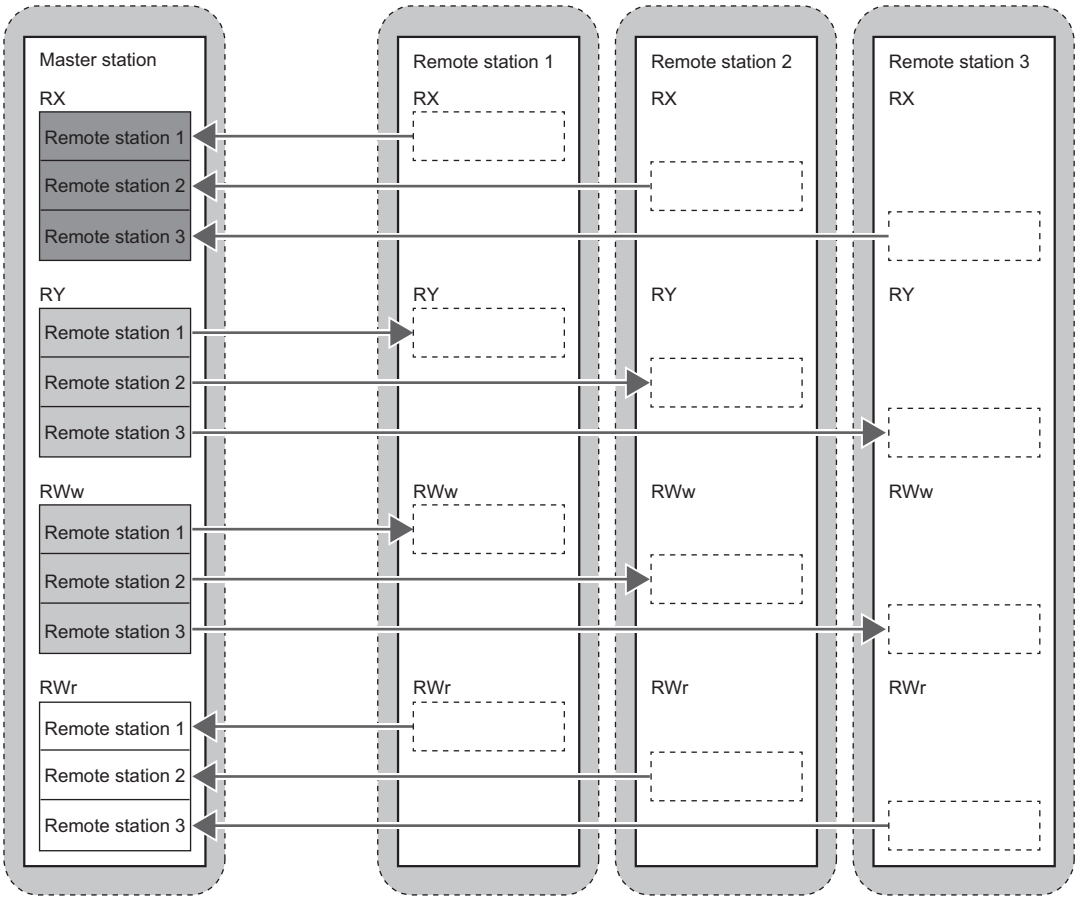
## Setting method

The group number setting is configured in "Network Configuration Settings". (☞ Page 38 Network Configuration Settings)

# Input and output status when failure occurs

This section describes the status of input from a data link faulty station and output status of cyclic data if a stop error occurs in the CPU module.

| Status | Operation |
|---|---|
| Input status from data link faulty station | RX is cleared. Regarding RWr, the data before an error occurs is held. |
| Cyclic data output when a stop error occurs in the CPU module | • MELSEC iQ-R, MELSEC iQ-L, MELSEC-Q, MELSEC-L: Data is held.<br>• MELSEC iQ-F: Data is cleared. |




: Area where the input from a faulty station is cleared
: Area where the operation (clear/hold) differs depending on the CPU module
: Area where data is held
: Area where the operation depends on the settings on the remote station side

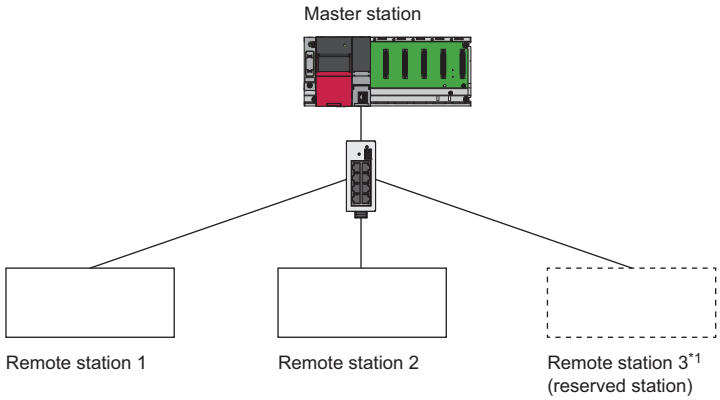
# Output status for CPU STOP

The following are cyclic data outputs when the CPU module is in the STOP state.

- MELSEC iQ-R, MELSEC iQ-L, MELSEC-Q, MELSEC-L: Data is held. However, when the device set to perform link refresh is Y device, the data is cleared.
- MELSEC iQ-F: Data is cleared.

# 7.2 Reserved Station Specification

This functions reserves a station (a station not actually connected but counted as a connected station) for future use. A reserved station is not detected as a faulty station even though it is not actually connected.




*1 The station is not actually connected.

**Point**

A reserved station is also included in the refresh range.

## Setting method

Specify a remote station as a reserved station in the network configuration settings. (☞ Page 38 Network Configuration Settings)

**Point**

Items such as the number of occupied stations and IP address can be set for a reserved station.

# 8 PARAMETER SETTINGS

This chapter describes the parameter settings for the master station.

## 8.1 Settings for MELSEC iQ-R/MELSEC iQ-L/MELSEC iQ-F

Use GX Works3 for master station settings.

When the C Controller module is used, refer to the following.

MELSEC iQ-R C Controller Module User's Manual

When the FX5-ENET is used, refer to the following.

MELSEC iQ-F FX5-ENET User's Manual

## CC-Link IEF Basic settings

### IP address settings

The IP address settings for the master station must be configured before configuring the CC-Link IEF Basic settings.

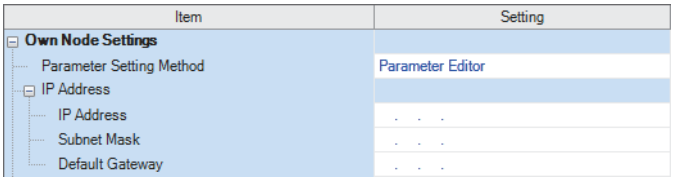
- MELSEC iQ-R, MELSEC iQ-L

[Navigation window] ⇨ [Parameter] ⇨ [CPU module model name] ⇨ [Module Parameter] ⇨ [Basic Settings] ⇨ [Own Node Settings]

- MELSEC iQ-F

[Navigation window] ⇨ [Parameter] ⇨ [CPU module model name] ⇨ [Module Parameter] ⇨ [Ethernet Port] ⇨ [Basic Settings] ⇨ [Own Node Settings]

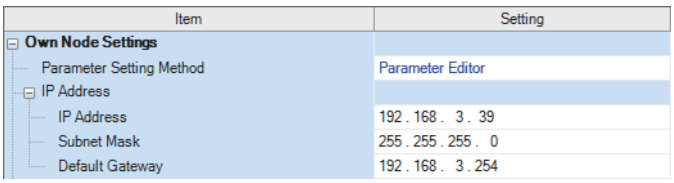
#### Window




#### Displayed items

| Item | Setting range |
|---|---|
| IP Address | 0.0.0.1 to 223.255.255.254 |
| Subnet Mask | 0.0.0.1 to 255.255.255.255<br>When there is no value to set, any one of the following recommended values.<br>• 255.0.0.0 (For the IP address whose first octet is 127 or less)<br>• 255.255.0.0 (For the IP address whose first octet is between or equal to 128 and 191)<br>• 255.255.255.0 (For the IP address whose first octet is 192 or greater) |
| Default Gateway | 0.0.0.1 to 223.255.255.254<br>When there is no value to set, use an IP address that is not used for the network. |

Ex.



## CC-Link IEF Basic settings

This section describes how to configure the basic settings such as whether to use CC-Link IE Field Network Basic.

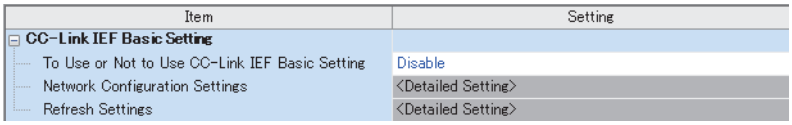
- MELSEC iQ-R, MELSEC iQ-L

[Navigation window] ⇨ [Parameter] ⇨ [CPU module model name] ⇨ [Module Parameter] ⇨ [Basic Settings]

- MELSEC iQ-F

[Navigation window] ⇨ [Parameter] ⇨ [CPU module model name] ⇨ [Module Parameter] ⇨ [Ethernet Port] ⇨ [Basic Settings]

### Window



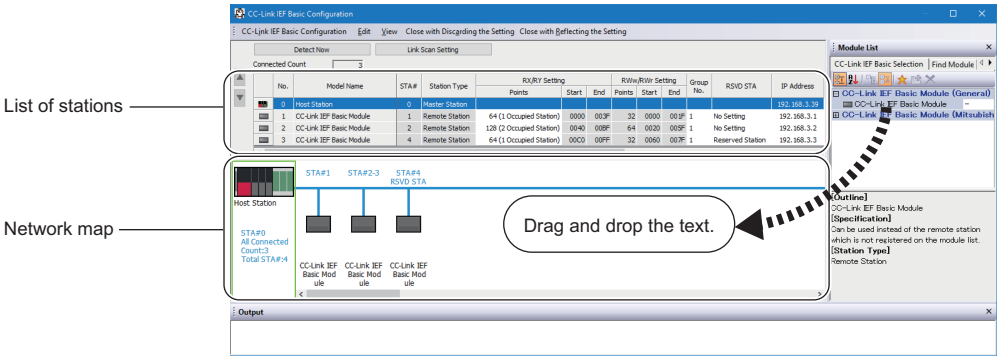

### Displayed items

| Item | Description | Setting range | Default |
|---|---|---|---|
| To Use or Not to Use CC-Link IEF Basic Setting | Set whether to use CC-Link IE Field Network Basic. | • Enable<br>• Disable | Disable |
| Network Configuration Settings | Set the information of the remote station to the master station. Moreover, configure link scan settings (timeout time and number of retries for remote station disconnection detection). (☞ Page 38 Network Configuration Settings) | — | — |
| Refresh Settings | Configure the settings to automatically link refresh RX/RY/RWr/RWw data to the devices. (☞ Page 44 Refresh Settings) | — | — |

# Network Configuration Settings

Set the network configuration.

## Window




## Displayed items

| Item | | Description | Setting range | Default |
|---|---|---|---|---|
| [Detect Now] button | | Connected devices are automatically detected. (☞ Page 39 Automatic detection of connected device) | — | — |
| [Link Scan Setting] button | | Configure link scan settings. (☞ Page 42 Link Scan Setting) | — | — |
| Connected Count | | The total number of connected remote stations is displayed. | — | — |
| No. | | The station number of the remote station is displayed. | — | — |
| Model Name | | Module model name is displayed.<br>When there is no module information, "Module With No Profile Found" is displayed. | — | — |
| STA# | | The start station number of the remote station is displayed. | — | — |
| Station Type | | The station type (master station/remote station) is displayed. | — | — |
| RX/RY Setting | Points | Set the assignment of the number of points for RX/RY in increments of 64 points. | • 64 (1 Occupied Station)<br>• 128 (2 Occupied Station)<br>• 192 (3 Occupied Station)<br>• 256 (4 Occupied Station) | 64 (1 Occupied Station) |
| | Start | The start number of RX/RY is displayed. | — | — |
| | End | The end number of RX/RY is displayed. | — | — |
| RWw/RWr Setting | Points | The number of points for the number of stations in increments of 32 points is displayed. | — | — |
| | Start | The start number of RWw/RWr is displayed. | — | — |
| | End | The end number of RWw/RWr is displayed. | — | — |
| Group No. | | Set group numbers of remote stations. | 1 to 4*1 | 1 |
| RSVD STA | | Set whether to set the remote station as a reserved station. | • No Setting<br>• Reserved Station | No Setting |
| IP Address | | Specify the IP address of the remote station. | 0.0.0.1 to 223.255.255.254 | • First to third octet: first to third octet of the IP address of the master station<br>• Fourth octet: automatically numbered from the number not in use from 1 to 254 in ascending order |
| Subnet Mask | | Specify the subnet mask of the remote station. | 0.0.0.1 to 255.255.255.255 | Subnet mask of the master station |
| MAC Address | | The MAC address of the remote station is displayed. | — | — |
| Comment | | The information entered in "Comment1" on the "Properties" window displayed by right-clicking the module in the list of stations or the network map is displayed. | Up to 32 one-byte characters/ 16 two-byte characters | (Empty) |

*1 Groups do not need to be numbered serially. For example, setting group No.2 only (number of groups: one) and setting group No.1 and No.3 (number of groups: two) are both possible.
For the CPU module that does not support the group number setting function, however, group No. is fixed to 1. (☞ Page 65 Added and Enhanced Functions)

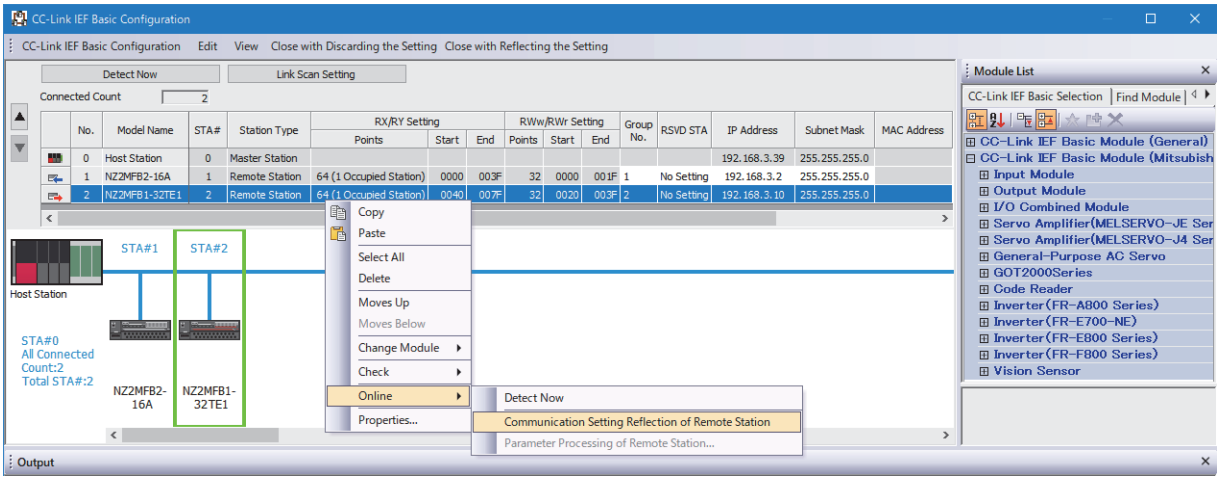
## ■Automatic detection of connected device

Actually connected remote stations are detected and reflected in the network configuration setting.

In the network configuration setting, communication settings such as IP addresses and subnet masks can be configured for the detected remote stations.

Parameters that are inherent in the remote stations can also be read/written from/to the network configuration setting. (Some remote stations do not support these features.)

Various settings of all remote stations can be configured in parameters of the master station (the settings do not need to be configured in each individual remote station) and therefore the man-hour for the setting will be reduced.




Follow the operating procedure below to use the automatic detection of connected device.

1. Start up a new project in GX Works3/GX Works2 and execute the automatic detection of connected device.
2. Detected remote stations are reflected in the network configuration setting. Change the items such as the connection order and numbers of occupied stations and set station numbers.
3. Configure IP addresses and subnet masks of remote stations in the network configuration setting. And then, reflect the settings to the remote stations.

Select a module on the list of stations or the network map ⇨ [Online] ⇨ [Communication Setting Reflection of Remote Station]

4. Parameters that are inherent in the remote stations can be read/written from/to the network configuration setting.*1 For details on the parameters inherent in each remote station, refer to the manuals of the remote station used.

Select a module on the list of stations or the network map ⇨ [Online] ⇨ [Parameters Processing of Remote Station]

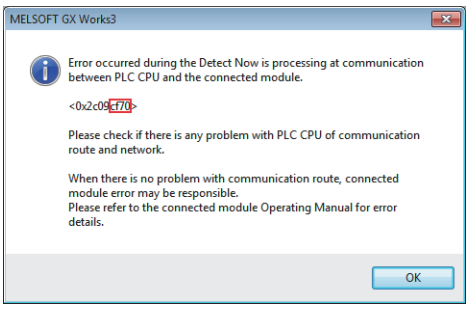
*1 To read parameters, select "Parameter read" from "Method selection" and click the [Execute] button. Parameters read are displayed in the column of "Read Value". To write parameters, select "Parameter write" from "Method selection", input data to the column of "Write Value", and then click the [Execute] button.

**Point**

Remote station settings in the network configuration setting must be configured after executing the automatic detection of connected device.

If not, contents of setting items that have been already configured in the network configuration setting are overwritten by ones detected by the automatic detection. Detected remote stations are reflected in the network configuration setting in ascending order of MAC address and values such as the number of occupied stations becomes initial value.

If an error occurs while the automatic detection of connected device is being executed, the window shown below appears.




Each of the error codes listed below fills the last four digits of <0x2c09****>.

| Error code | Error details and cause | Action |
|---|---|---|
| 480CH | The specified command cannot be executed because the automatic detection of connected device is being executed. | After the automatic detection of connected devices is completed, execute the command again. |
| 480DH | • The specified command cannot be executed because the communication setting reflection of remote station is being executed.<br>• Communication timeout has occurred. | • After the communication setting reflection of remote station is completed, execute the command again.<br>• Check and correct the communication time check setting value using the engineering tool. |
| 480EH | • The specified command cannot be executed because the parameters processing of remote station is being executed.<br>• Communication timeout has occurred. | • Execute the command again after a while.<br>• Check and correct the communication time check setting value using the engineering tool. |
| C055H and C056H | System error | • Check the precautions for the function executed.<br>• Check the operating status and connection status of the target device.<br>• Check the connection of an Ethernet cable and a hub.<br>• Check the line status of Ethernet.<br>• Reset the CPU module and target device, and execute the function again.<br>If the above actions do not solve the problem, contact the manufacturer of the target device. |
| C059H | The function which is not supported by the target device was executed. | Check whether the function executed is supported by the target device. |
| C05CH | • The setting value of the communication setting is out of range.<br>• Items of communication setting which cannot be set on the target device are set.<br>• The required setting items have not been set to the target device. | Correct the setting details, and retry the operation. |
| C061H | System error | • Check the precautions for the function executed.<br>• Check the operating status and connection status of the target device.<br>• Check the connection of an Ethernet cable and a hub.<br>• Check the line status of Ethernet.<br>• Reset the CPU module and target device, and execute the function again.<br>If the above actions do not solve the problem, contact the manufacturer of the target device. |
| CEE0H | The detection or another online function was executed by another peripheral. | Execute the other function after the automatic detection of connected devices is completed. |
| CEE1H and CEE2H | System error | • Check the precautions for the function executed.<br>• Check the operating status and connection status of the target device.<br>• Check the connection of an Ethernet cable and a hub.<br>• Check the line status of Ethernet.<br>• Reset the CPU module and target device, and execute the function again.<br>If the above actions do not solve the problem, contact the manufacturer of the target device. |
| CF10H | System error | |
| CF20H | • The setting value of the communication setting is out of range.<br>• Items of communication setting which cannot be set on the target device are set.<br>• The required setting items have not been set to the target device. | Correct the setting details, and retry the operation. |
| CF30H | The parameter which is not supported by the target device was specified. | Check the version of the target device. |

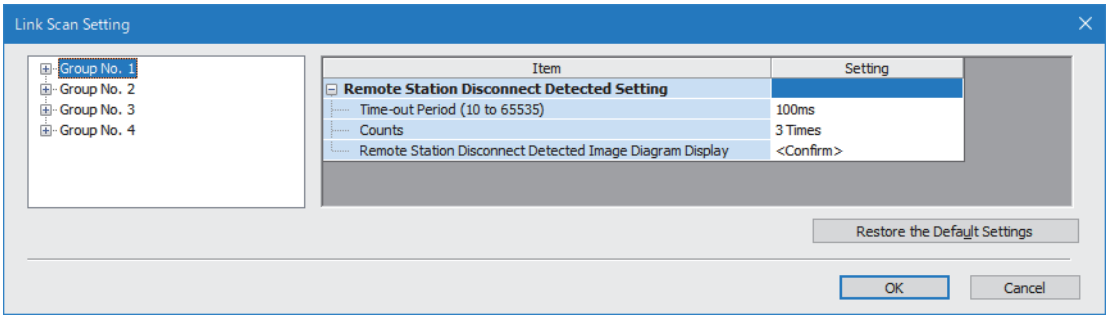
| Error code | Error details and cause | Action |
|---|---|---|
| CF31H | System error | • Check the precautions for the function executed.<br>• Check the operating status and connection status of the target device.<br>• Check the connection of an Ethernet cable and a hub.<br>• Check the line status of Ethernet.<br>• Reset the CPU module and target device, and execute the function again.<br>If the above actions do not solve the problem, contact the manufacturer of the target device. |
| CF50H | System error | • Check the precautions for the function executed.<br>• Check the operating status and connection status of the target device.<br>• Check the connection of an Ethernet cable and a hub.<br>• Check the line status of Ethernet.<br>• Reset the CPU module and target device, and execute the function again.<br>If the above actions do not solve the problem, contact the manufacturer of the target device. |
| CF51H | The function cannot be executed because the function from another peripheral is being executed. | Execute the function again after a while. |
| CF53H to CF56H | System error | • Check the precautions for the function executed.<br>• Check the operating status and connection status of the target device.<br>• Check the connection of an Ethernet cable and a hub.<br>• Check the line status of Ethernet.<br>• Reset the CPU module and target device, and execute the function again.<br>If the above actions do not solve the problem, contact the manufacturer of the target device. |
| CF70H | An error has occurred on the Ethernet communication path. | • Check the operation of the target device.<br>• Check if the connection cable is disconnected. |
| CF71H | Timeout error | • Check the precautions for the function executed.<br>• Check the operation of the target device.<br>• Since there may be congestion of packets on the line, send data after a certain period of time. |

## ■Link Scan Setting

• MELSEC iQ-R, MELSEC iQ-L

Set the timeout time and the number of retries for remote station disconnection detection.

### Window




### Displayed items

| Item | | Description | Setting range | Default |
|---|---|---|---|---|
| Remote Station Disconnect Detected Setting | Time-out Period (10 to 65535) | Set the timeout time (ms) for remote station disconnection detection.*1 (☞ Page 25 Data flow of cyclic transmission) | 10 to 65535 | 100*3 |
| | Counts | Set the number of retries for remote station disconnection detection.*1*2 | 3, 5, 10 | 3 |
| | Remote Station Disconnect Detected Image Diagram Display | The operation image regarding the remote station disconnection detection period is displayed. Refer to this at the setting of "Time-out Period". | — | — |

*1 The timeout time and the number of disconnection detections are counted for each remote station.

*2 Disconnection occurs in the event that no response is received from the remote station for the specified number of times in succession within the timeout time.

*3 In GX Works3 with version earlier than "1.035M" or GX Works2 with version earlier than "1.565P", the default value is 500.

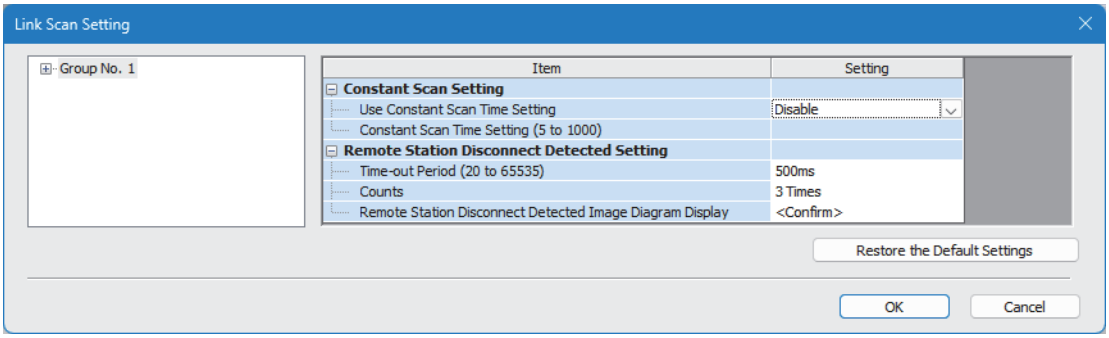
**Point**

- Set an appropriate timeout time according to the actual system. (☞ Page 26 No response received from a remote station)
- Time-out Period and Counts can be set for each group.

• MELSEC iQ-F

Set the constant link scan time, disconnection detection timeout time, and the number of disconnection detection retries for the remote station.

## Window




## Displayed items

| Item | | Description | Setting range | Default |
|---|---|---|---|---|
| Constant Scan Setting | Use Constant Scan Time Setting | Set whether to use the constant link scan time setting. | • Disable*1*2<br>• Enable*3 | Disable |
| | Constant Scan Time Setting (5 to 1000) | Set the constant link scan time (ms).*4 | 5 to 1000 | 20 |
| Remote Station Disconnect Detected Setting | Time-out Period (20 to 65535) | Set the timeout time (ms) for remote station disconnection detection.*5 (☞ Page 25 Data flow of cyclic transmission) | 20 to 65535 | 500 |
| | Counts | Set the number of retries for remote station disconnection detection.*5*6 | 3, 5, 10 | 3 |
| | Remote Station Disconnect Detected Image Diagram Display | The operation image regarding the remote station disconnection detection period is displayed. Refer to this at the setting of "Time-out Period". | — | — |

*1 When the communication interval setting (SM9400) is set to enable, the value set in communication interval setting value (SD9400) is enabled.

*2 When the communication interval setting (SM9400) is set to disable, communication operates with the minimum link scan on the system environment.

*3 Set the constant link scan time so that it is shorter than the timeout time.

*4 Set a time longer than the sequence scan time.

*5 The timeout time and the number of disconnection detections are counted for each remote station.

*6 Disconnection occurs in the event that no response is received from the remote station for the specified number of times in succession within the timeout time.

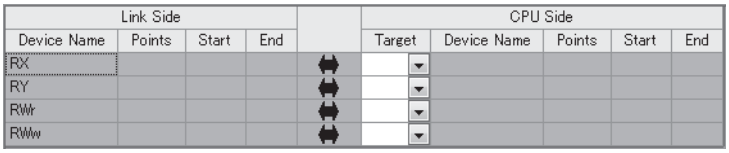
**Point**

- For setting of timeout time, specify an adequate value according to the actual system used. (☞ Page 26 No response received from a remote station)
- Time-out Period and Counts can be set for each group.

## Refresh Settings

Set refresh parameters.

### Window




### Displayed items

| Item | | Description | Setting range | Default |
|---|---|---|---|---|
| Link Side | | The number of points for the link devices (RX/RY, RWr/RWw) for the number of occupied stations and start/end device number set in the network configuration settings are displayed. | — | — |
| CPU Side | Target | The target destination to be link refreshed is displayed. | Specify Device | (Empty) |
| | Device Name | Set the device of the link refresh target. | X, Y, M, L, B, D, W, R, ZR*1, RD*1 | (Empty) |
| | Points | The number of device points for the link refresh target is displayed. (The same value as the number of points on the link side is displayed.) | — | — |
| | Start | Set the start device number within the link refresh range. | Follow the device settings of the CPU parameters. (📖 Each user's manual) | (Empty) |
| | End | The end device number within the link refresh range is displayed. | — | — |

*1 These devices cannot be set for the MELSEC iQ-F.

# 8.2 Settings for MELSEC-Q/MELSEC-L

Use GX Works2 for master station settings.

## CC-Link IEF Basic settings

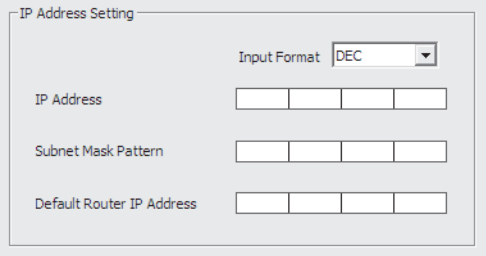
### IP address settings

To display the "CC-Link IEF Basic Setting" window, set "IP Address", "Subnet Mask Pattern", and "Default Router IP Address" in the "IP Address Setting" window in advance.

After that, click the [CC-Link IEF Basic Setting] button and the "CC-Link IEF Basic Setting window" appears.

[Project window] ⇨ [Parameter] ⇨ [PLC Parameter] ⇨ [Built-in Ethernet Port Setting] tabs

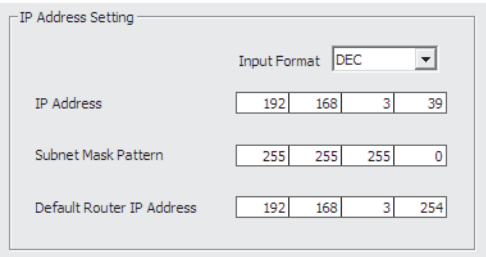
#### Window




#### Displayed items

| Item | Setting range |
|---|---|
| IP Address | 0.0.0.1 to 223.255.255.254 |
| Subnet Mask Pattern | 0.0.0.1 to 255.255.255.255<br>When there is no value to set, any one of the following recommended values.<br>• 255.0.0.0 (For the IP address whose first octet is 127 or less)<br>• 255.255.0.0 (For the IP address whose first octet is between or equal to 128 and 191)<br>• 255.255.255.0 (For the IP address whose first octet is 192 or greater) |
| Default Router IP Address | 0.0.0.1 to 223.255.255.254<br>When there is no value to set, use an IP address that is not used for the network. |

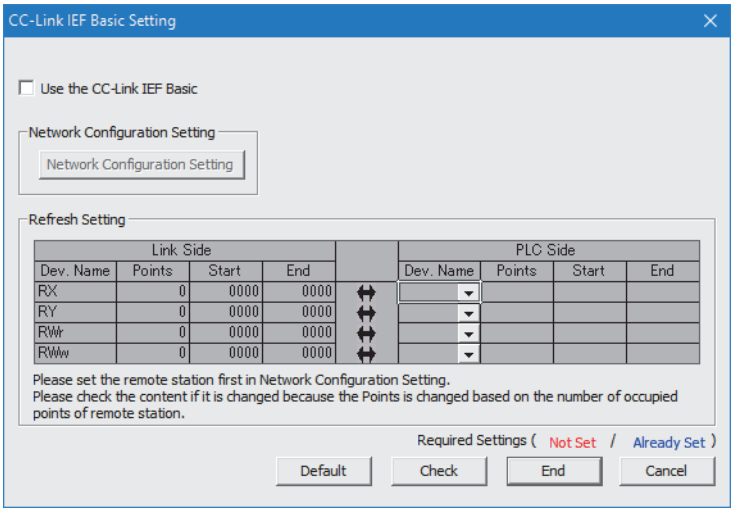
Ex.



## CC-Link IEF Basic settings

This section describes how to configure whether to use CC-Link IE Field Network Basic and the settings of the refresh parameters.

### Window




### Displayed items

| Item | | | Description | Setting range | Default |
|---|---|---|---|---|---|
| Use the CC-Link IEF Basic | | | Set whether to use CC-Link IE Field Network Basic. | • Checked<br>• Unchecked | Unchecked |
| Network Configuration Settings | [Network Configuration Settings] button | | Set the information of the remote station to the master station. Setting items are the same as GX Works3. (☞ Page 38 Network Configuration Settings) | — | — |
| Refresh Settings | Link Side | | The number of points for the link devices (RX/RY, RWr/RWw) for the number of occupied stations and start/end device number set in the network configuration settings are displayed. | — | — |
| | CPU Side | Device Name | Set the device of the link refresh target. | X, Y, M, L, B, D*1, W*1, R, ZR | (Empty) |
| | | Points | The number of device points for the link refresh target is displayed. (The same value as the number of points on the link side is displayed.) | — | — |
| | | Start | Set the start device number within the link refresh range. | Follow the device settings of the CPU parameters. | (Empty) |
| | | End | The end device number within the link refresh range is displayed. | — | — |

*1 Extended data register (D) and extended link register (W) are also included.

# 8.3 Settings for MELIPC

Refer to the following.

MELIPC MI5000 Series User's Manual (Application)

# 9 TROUBLESHOOTING

This chapter describes troubleshooting of CC-Link IE Field Network Basic.
When the MELIPC is used, refer to the following.
MELIPC MI5000 Series User's Manual (Application)

## 9.1 CC-Link IE Field Network Basic Diagnostics

Perform troubleshooting by executing the CC-Link IE Field Network Basic diagnostics and checking the network status and error details.
When the C Controller module is used, refer to the following.
MELSEC iQ-R C Controller Module User's Manual
When the FX5-ENET is used, refer to the following.
MELSEC iQ-F FX5-ENET User's Manual

### How to execute diagnostics

Execute the CC-Link IE Field Network Basic diagnostics, following the procedure below.

1. Connect GX Works3/GX Works2 to the CPU module on the master station.
2. Start the CC-Link IE Field Network Basic diagnostics.

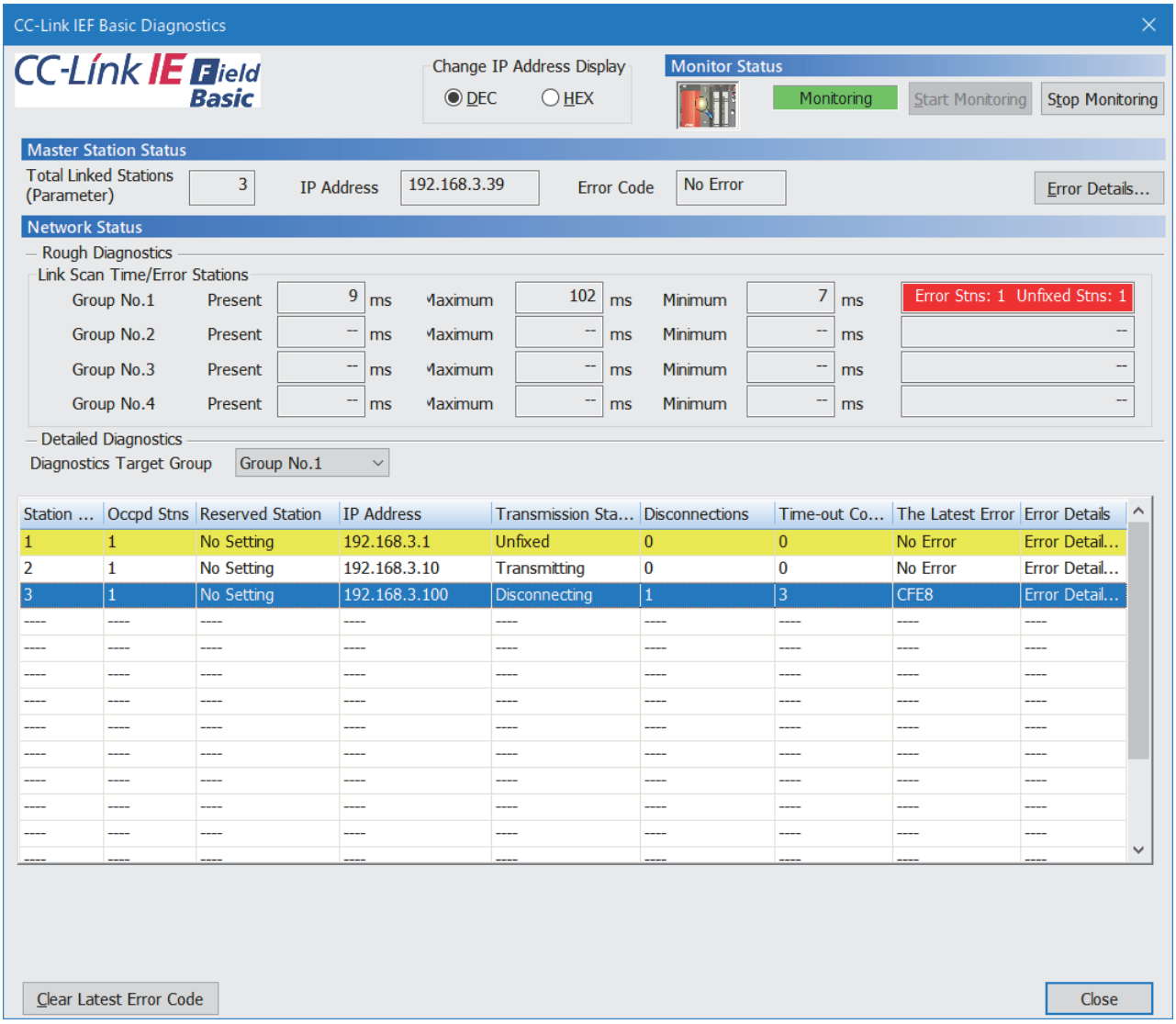
[Diagnostics] ⇨ [CC-Link IEF Basic Diagnostics]

## Diagnostic window

The status of the master station is checked in "Master Station Status".

The network status including remote stations is checked in "Network Status".

### Window



## Displayed items

| Item | Description |
|---|---|
| Total Linked Stations (Parameter) | The total number of remote stations set in parameter is displayed. |
| IP Address | The IP address of the master station is displayed. The display can be switched between decimals and hexadecimals in "Change IP Address Display". |
| Error Code | The error code of the master station is displayed. |
| [Error Details] button | The description of the error and the actions to be taken are displayed. |
| Link Scan Time/Error Stations | Link scan time (present, maximum, minimum) and number of error stations/unfixed stations of each group is displayed.<br>Error stations (Error Stns) and unfixed stations (Unfixed Stns) refers the following state.<br>• Error Stns: Stations where an error has been occurred<br>• Unfixed Stns: Stations (not including reserved stations) where the transmission status has not been fixed |
| Diagnostics Target Group | Select a group to display its diagnostic information list. |
| Station No. | The station number of the remote station is displayed. |
| Occpd Stns | The number of occupied stations set in parameter is displayed. |
| Reserved Station | The reserved station status set in parameter is displayed. |
| IP Address | The IP address set in parameter is displayed.<br>"-" is displayed when the station is a reserved station and an IP address has not been set. |
| Transmission Status | The transmission status of the remote station is displayed.<br>• Unfixed: Communications with the master station not established*1<br>• Transmitting: Cyclic transmission being performed<br>• Disconnecting: Disconnected from the master station |
| Disconnections | The accumulated number of disconnection detection is displayed.<br>• 0: No disconnections<br>• 1 to 65535: Number of disconnection detection (accumulated number)*3 |
| Time-out Count | The accumulated number of timeouts is displayed.<br>• 0: No timeouts<br>• 1 to 65535: Number of timeouts (accumulated number)*3 |
| The Latest Error | The latest error code*4 is displayed an error on the transmission status between the master station and remote stations detected by the master station or an error which has occurred in a remote station. When the remote station is disconnected, an error occurs. After that, even when the disconnected remote station returns to the system, the error is held. When another error occurs, the latest error will be updated (overwritten).<br>When both errors occur, the priority of errors to be displayed is as follows.<br>(1) An error which has occurred in a remote station<br>(2) An error on the transmission status between the master station and remote stations detected by the master station<br>For an error of the remote station, check 'Diagnostic information 2' (Un\G1068 to Un\G1077). (☞ Page 54 Acquiring Diagnostic Information of Remote Stations) |
| Error Details... | The description of the error and the actions to be taken are displayed. |
| [Clear Latest Error Code] button | The error code is cleared.*2 The button can be clicked only during monitoring. |

*1 The possible reasons include that the remote station set in parameter has not started up, a cable between the master station and the remote station is disconnected, or the setting of an IP address or a subnet mask of the master/remote station is incorrect.
*2 Take actions and eliminate the error cause first. Then, clear the error code.
*3 When the count exceeds 65535, counting is continued from 1 again.
*4 For details on an error of the remote station, GX Works3 of "1.040S" or later supports. (☞ Page 65 Added and Enhanced Functions)

**Point**

For the error codes, refer to the manuals of each series.
📖 MELSEC iQ-R CPU Module User's Manual (Application)
📖 MELSEC iQ-F FX5 User's Manual (Application)
📖 QCPU User's Manual (Hardware Design, Maintenance and Inspection)
📖 MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)

**Point**

The following indicates that the disconnection has occurred due to no cyclic transmission caused by the cable disconnection of the master station side. In this case, the previous cyclic transmission time (just before the disconnection) is displayed on the link scan time.
• "CFE8" is displayed as the latest error for all remote stations. (No response received from a remote station)
• "No Error" is displayed on the error code of the master station.

# 9.2 Troubleshooting by Symptom



This section describes the troubleshooting by symptom. If the CC-Link IE Field Network Basic diagnostics does not solve the problem, perform this troubleshooting.

When the FX5-ENET is used, refer to the following.

MELSEC iQ-F FX5-ENET User's Manual

## When the transmission status is disconnected or unfixed

Check the following:

### ■Ethernet

| Check item | Action |
|---|---|
| Are the IP address and subnet mask of the master station/remote stations correctly set? | Check and correct the IP address and subnet mask of the master station/ remote stations. |
| Is the IP address already in use?<br>Is there any device having the same IP address as the master station/remote stations within the same network address? | Set a unique IP address to the master station/remote stations. |
| Is the same network address set to the master station and remote stations? | • Check and correct the IP address and subnet mask so that the network addresses of the master station and remote stations match.<br>• Check and correct the subnet mask of the master station and remote stations so that they match as normal values. |
| Is an access blocked? | Check the security settings such as a firewall. |
| Is any access from remote stations blocked in "IP Filter Settings" of the master station. | Allow an access from the IP address of the corresponding remote station. |
| Before an error was detected, has any device on the line, such as the master station, remote station, or hub, been replaced with a device having the same IP address as that of the device before replacement? | Take either of the following actions:<br>• Wait until the ARP cache is updated. (The waiting time varies depending on the device.)*1<br>• Restart all devices on the line. |

*1 Devices on Ethernet have a table of IP addresses and their corresponding MAC address, called the ARP cache. When a device on the line is replaced with a device having the same IP address, the MAC address in the ARP cache becomes different from that of the replaced device. This may cause incorrect data communications. The ARP cache is updated by resetting a device or after a certain time has elapsed. The time varies depending on the device.

### ■CC-Link IE Field Network Basic

| Check item | Action |
|---|---|
| Are the devices specified in the refresh settings for the master station correct? | Check and correct the refresh settings. |
| Are the devices specified in the refresh settings for the master station used in other applications? | Check the settings and programs for the master station/remote stations, and correct them if they are incorrect. |

## When cyclic data cannot be read/written from/to the remote station correctly

Check the following:

### ■CC-Link IE Field Network Basic

| Check item | Action |
|---|---|
| Is a remote station specified as a reserved station in "Network Configuration Settings" of "Basic Settings" for the master station? | Cancel the reserved station setting. (☞ Page 36 PARAMETER SETTINGS) |
| Has the accumulated number of timeouts of the remote station considered abnormal been counted up?*1 | Check the following and take actions.<br>☞ Page 52 When a station is repeatedly disconnected and reconnected |
| Has the accumulated number of disconnection detection of the remote station considered abnormal been counted up?*1 | |

*1 The accumulated number of timeouts and the accumulated number of disconnection detection can be checked in diagnostic information 1. For programs to acquire diagnostic information, refer to the following.
☞ Page 54 Acquiring Diagnostic Information of Remote Stations

## When a station is repeatedly disconnected and reconnected

Check the following:

### ■Ethernet

| Check item | Action |
|---|---|
| Are the Ethernet cables inserted to each slot until they click? | • Lock the Ethernet cables securely.<br>• Check that the Ethernet cables are correctly connected to the external devices and hubs. |
| Do the used cables conform to the Ethernet standard? | Check the specifications of the Ethernet cables used. |
| Is any Ethernet cable disconnected? | Replace the disconnected Ethernet cable. |
| Is there any source of noise near the Ethernet cables?*1 | Keep the Ethernet cables away from the source of noise. Or, use the cables resistant to noise. |
| Are there any external devices or hubs having an error? Or, is there any lost packet?*2 | • Reduce the number of cascade connections to three or less.<br>• Take actions, referring to the manual for the device having an error or packet loss.*3 |
| Is a correct hub, which is compatible with the communication speed of the connected master station/remote stations, used? | Replace the hub with a correct one. |
| Is the response of built-in Ethernet functions such as FTP, socket communications, and SLMP communications slow, an error, or not returned?*4 | • Stop the function. Or, modify settings. For example, extend the execution interval and decrease the execution frequency of the function.<br>• Change UDP/IP communications to TCP/IP communications, or add resend processing. |

*1 Check the communication status of Ethernet by referring to the areas for storing such as the CRC error count and the received packet checksum error discard count. For details, refer to the manuals of each series.

*2 If the load is heavy, data communications may stop depending on the hub. In that case, consult the manufacturer of the device used.

*3 When a personal computer and CPU module have been reconnected to the switching hub, or the switching hub has been replaced, it may take some time to read the MAC address. In this case, retry the transmission later or power on the hub again.

*4 Check the communication status of Ethernet by referring to the areas for storing such as the simultaneous transmission error detection count and the number of times that data are not read due to receive buffer full. For details, refer to the manuals of each series.

### ■CC-Link IE Field Network Basic

| Check item | Action |
|---|---|
| Is the timeout time setting of the master station too short? | Increase the timeout time of the master station. |
| Are there any remote stations having an error? | Perform troubleshooting for the remote station having an error. |
| Is CC-Link IE Field Network Basic being simultaneously executed at a different network address on the same line? | Separate the network and configure two CC-Link IE Field Network Basic lines. |
| Are data communications with other Ethernet devices being performed on the same line? | Separate the network for other Ethernet devices from the CC-Link IE Field Network Basic line and configure the CC-Link IE Field Network Basic line. |
| Is any of the following function being executed?<br>• Access from GX Works3/GX Works2 (such as ladder monitor)<br>• Latch function<br>• Data logging function | Stop the function. Or, modify settings. For example, extend the execution interval, decrease the execution frequency, or reduce the range of the function. |
| Are remote stations divided into too many groups? | Reduce the number of groups as much as possible (for example, organizing remote stations of 16 or less into one group). |
| Is a remote station that the response is slow belonged to a group of shorter link scan time? Or, is a remote station that the response is fast belonged to a group of longer link scan time? | Refer to manuals for remote stations used to check their reference response times.<br>Check and correct the group number of the corresponding remote station in the network configuration setting. |

## When the link scan time delays

Refer to the following.

☞ Page 52 When a station is repeatedly disconnected and reconnected

## When access to the CPU module is slow

Check the following (especially when an error is returned or a response is not returned):

| Check item | Action |
|---|---|
| Is any of the following function being executed?<br>• Access from GX Works3/GX Works2 (such as ladder monitor)<br>• Latch function<br>• Data logging function | Stop the function. Or, modify settings. For example, extend the execution interval, decrease the execution frequency, or reduce the range of the function. |
| Is the response of built-in Ethernet functions such as FTP, socket communications, and SLMP communications slow, an error, or not returned?*1 | • Stop the function. Or, modify settings. For example, extend the execution interval and decrease the execution frequency of the function.<br>• Change UDP/IP communications to TCP/IP communications, or add resend processing. |
| Is CC-Link IE Field Network Basic being simultaneously executed at a different network address on the same line? | Separate the network and configure two CC-Link IE Field Network Basic lines. |
| Are data communications with other Ethernet devices being performed on the same line? | Separate the network for other Ethernet devices from the CC-Link IE Field Network Basic line. |

*1 Check the communication status of Ethernet by referring to the areas for storing such as the simultaneous transmission error detection count and the number of times that data are not read due to receive buffer full. For details, refer to the manuals of each series.

## When cyclic transmission of the master station stops

Check the following:

| Check item | Action |
|---|---|
| Is the transmission status of remote stations normal? | • If there are any disconnected remote stations, take actions according to the error details.<br>• If there are no disconnected remote stations, check the network connection. A problem may stem from a device other than those set in the master station. |

# 9.3 Acquiring Diagnostic Information of Remote Stations

If an error occurs in a remote station or the cyclic data cannot be read or written correctly, the status of each remote station by executing a program for acquiring diagnostic information of remote stations can be checked.
When the C Controller module is used, refer to the following.
📖 MELSEC iQ-R C Controller Module User's Manual

## How to acquire diagnostic information

Acquire diagnostic information using the special relay (SM)/special register (SD)/buffer memory. (☞ Page 59 List of SM/SD/Buffer Memory Areas for CC-Link IE Field Network Basic)

1. Set the information acquisition target station number in 'Diagnostic request information' (Un\G1051).
2. Turn on 'Diagnostic information display request' (Un\G1050.0).Diagnostic information is stored in 'Diagnostic information 1' (Un\G1053 to Un\G1064) and 'Diagnostic information 2' (Un\G1068 to Un\G1077). ('Diagnostic information display request' (Un\G1050.0) turns off when diagnostic information is stored.)

## Program for acquiring diagnostic information

Use the following program to acquire diagnostic information.

### MELSEC iQ-R, MELSEC iQ-L, MELSEC iQ-F

A program example created by GX Works3 is provided below.

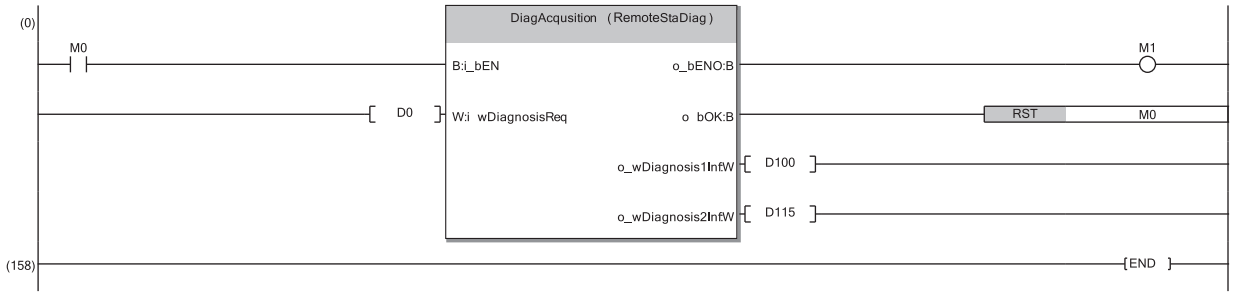
#### ■Program for acquiring diagnostic information

Store the diagnostic information acquisition target station number in D0 and turn on M0. Diagnostic information 1 is transferred and stored in the area starting from D100 and diagnostic information 2 is transferred and stored in the area starting from D115 by the function block for diagnostic information acquisition (Remote station diagnostics).

• Devices used in the program

| Device | Data type | Description |
|---|---|---|
| D0 | Word | Information acquisition target station number |
| M0 | Bit | A flag for starting diagnostic information acquisition processing |
| M1 | Bit | A flag that indicates the acquisition processing is being performed |
| D100 | Word | A start device for storing diagnostic information 1 |
| D115 | Word | A start device for storing diagnostic information 2 |

• Program example



## ■Function block (FB) for diagnostic information acquisition (Remote station diagnostics)

Store the diagnostic information acquisition target station number in the diagnostic request information and turn on the diagnostic information display request. Diagnostic information 1 and 2 is transferred when the request flag turns off.

• Labels to be defined (details on FB inputs and outputs)

| Label Name | Data Type | | Class |
|---|---|---|---|
| i_bEN | Bit | ... | VAR_INPUT |
| i_wDiagnosisReq | Word [Signed] | ... | VAR_INPUT |
| o_bENO | Bit | ... | VAR_OUTPUT |
| o_bOK | Bit | ... | VAR_OUTPUT |
| o_wDiagnosis1Inf | Word [Signed] | ... | VAR_OUTPUT |
| o_wDiagnosis2Inf | Word [Signed] | ... | VAR_OUTPUT |

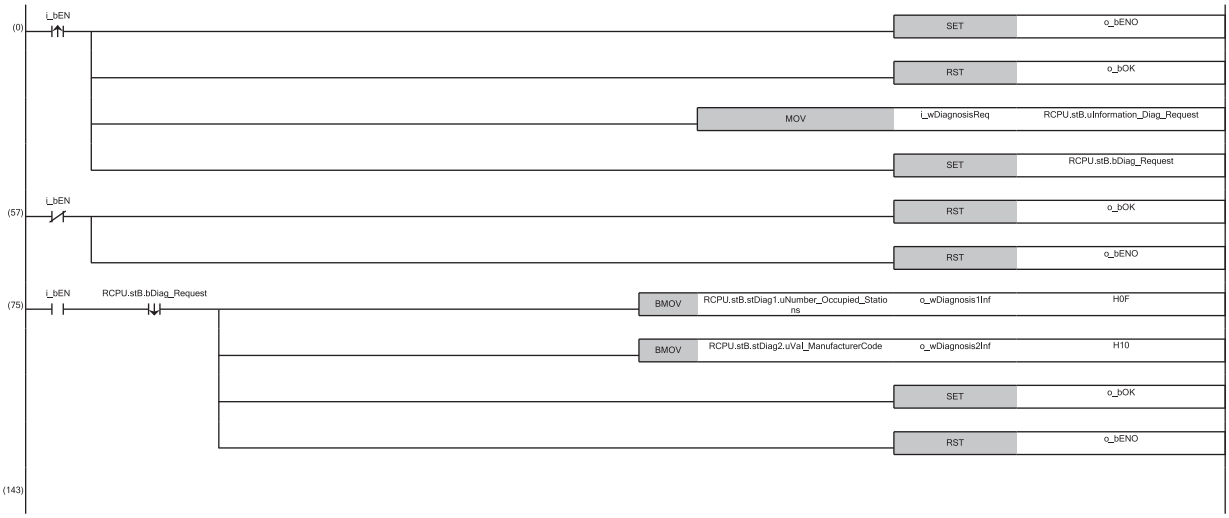
| Label name | Description |
|---|---|
| i_bEN | A trigger (on input) for starting diagnostic information acquisition processing |
| i_wDiagnosisReq | A value stored in the diagnostic request information. Enter the information acquisition target station number. |
| o_bENO | A flag that indicates the acquisition processing is being performed. The on status indicates that the processing is being performed. |
| o_bOK | A flag that indicates the acquisition processing has completed |
| o_wDiagnosis1Inf | A start device for storing diagnostic information 1. Diagnostic information 1, for 15 words starting from the specified device, is stored. |
| o_wDiagnosis2Inf | A start device for storing diagnostic information 2. Diagnostic information 2, for 16 words starting from the specified device, is stored. |

• Module labels used in the program

| Series | Module label | Description | Device |
|---|---|---|---|
| MELSEC iQ-R | RCPU.stB.bDiag_Request | Diagnostic information display request | Un\G1050.0 |
| | RCPU.stB.uInformation_Diag_Request | Diagnostic request information | Un\G1051 |
| | RCPU.stB.stDiag1.uNumber_Occupied_Stations | Number of occupied stations (start device of diagnostic information 1) | Un\G1053 |
| | RCPU.stB.stDiag2.uVal_ManufacturerCode | Manufacturer code (start device of diagnostic information 2) | Un\G1068 |
| MELSEC iQ-L | LHCPU.stB.bDiag_Request | Diagnostic information display request | Un\G1050.0 |
| | LHCPU.stB.uInformation_Diag_Request | Diagnostic request information | Un\G1051 |
| | LHCPU.stB.stDiag1.uNumber_Occupied_Stations | Number of occupied stations (start device of diagnostic information 1) | Un\G1053 |
| | LHCPU.stB.stDiag2.uVal_ManufacturerCode | Manufacturer code (start device of diagnostic information 2) | Un\G1068 |
| MELSEC iQ-F | FX5CPU.stB.bDiag_Request | Diagnostic information display request | SD11126.0 |
| | FX5CPU.stB.uInformation_Diag_Request | Diagnostic request information | SD11127 |
| | FX5CPU.stB.stDiag1.uNumber_Occupied_Stations | Number of occupied stations (start device of diagnostic information 1) | SD11129 |
| | FX5CPU.stB.stDiag2.uVal_ManufacturerCode | Manufacturer code (start device of diagnostic information 2) | SD11144 |

• Program example

The following is a program example of MELSEC iQ-R series.




(0) Check the on status of the diagnostic information display request and store the information acquisition target station number.
(57) Check the off status of the diagnostic information display request.
(75) Store diagnostic information 1 and diagnostic information 2.

## MELSEC-Q, MELSEC-L

A program example created by GX Works2 is provided below.

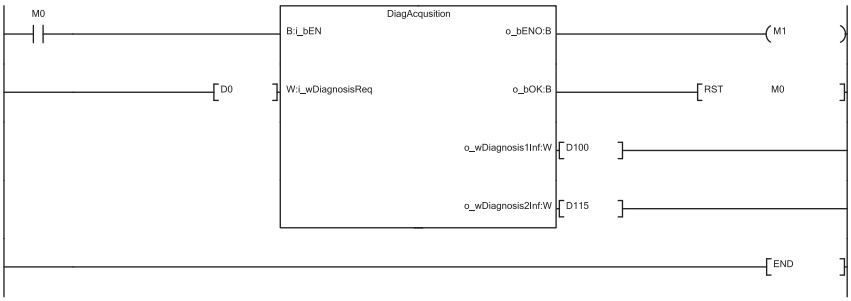
### ■Program for acquiring diagnostic information

Store the diagnostic information acquisition target station number in D0 and turn on M0. Diagnostic information 1 is transferred and stored in the area starting from D100 and diagnostic information 2 is transferred and stored in the area starting from D115 by the function block for diagnostic information acquisition.

• Devices used in the program

| Device | Data type | Description |
|---|---|---|
| D0 | Word | Information acquisition target station number |
| M0 | Bit | A flag for starting diagnostic information acquisition processing |
| M1 | Bit | A flag that indicates the acquisition processing is being performed |
| D100 | Word | A start device for storing diagnostic information 1 |
| D115 | Word | A start device for storing diagnostic information 2 |

• Program example



## ■Function block (FB) for diagnostic information acquisition

Store the diagnostic information acquisition target station number in the diagnostic request information and turn on the diagnostic information display request. Diagnostic information 1 and 2 is transferred when the request flag turns off.

• Labels to be defined (details on FB inputs and outputs)

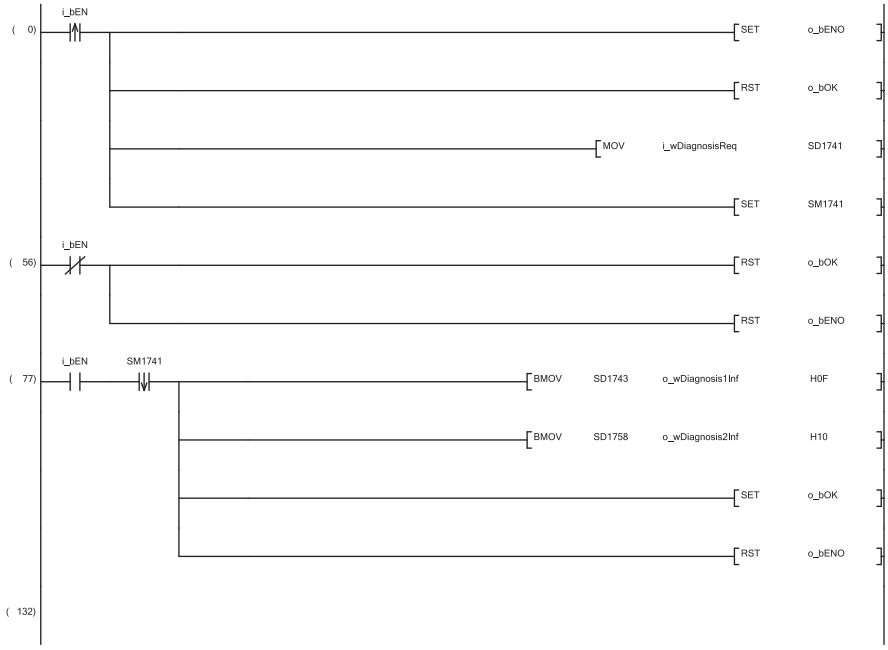
| Label name | Data type | Class | Description |
|---|---|---|---|
| i_bEN | Bit | VAR_INPUT | A trigger (on input) for starting diagnostic information acquisition processing |
| i_wDiagnosisReq | Word | VAR_INPUT | A value stored in the diagnostic request information. Enter the information acquisition target station number. |
| o_bENO | Bit | VAR_OUTPUT | A flag that indicates the acquisition processing is being performed. The on status indicates that the processing is being performed. |
| o_bOK | Bit | VAR_OUTPUT | A flag that indicates the acquisition processing has completed |
| o_wDiagnosis1Inf | Word | VAR_OUTPUT | A start device for storing diagnostic information 1. Diagnostic information 1, for 15 words starting from the specified device, is stored. |
| o_wDiagnosis2Inf | Word | VAR_OUTPUT | A start device for storing diagnostic information 2. Diagnostic information 2, for 16 words starting from the specified device, is stored. |

• Devices used in the program

| Device | Description |
|---|---|
| SM1741 | Diagnostic information display request |
| SD1741 | Diagnostic request information |
| SD1743 | Number of occupied stations (start device of diagnostic information 1) |
| SD1758 | Manufacturer code (start device of diagnostic information 2) |

• Program example

The following is a program example of MELSEC-Q series.




(0) Check the on status of the diagnostic information display request and store the information acquisition target station number.
(56) Check the off status of the diagnostic information display request.
(77) Store diagnostic information 1 and diagnostic information 2.

# APPENDICES

## Appendix 1 List of SM/SD/Buffer Memory Areas for CC-Link IE Field Network Basic

The special relay (SM)/special register (SD) numbers and the buffer memory addresses for CC-Link IE Field Network Basic differ depending on the series of the programmable controller used. The following is the comparison table of the corresponding numbers and addresses.

When the FX5-ENET is used, refer to the following.

MELSEC iQ-F FX5-ENET User's Manual

When the MELIPC is used, refer to the following.

MELIPC MI5000 Series User's Manual (Application)

| Name | Description | SM/SD/Buffer memory | | |
|---|---|---|---|---|
| | | MELSEC iQ-R, MELSEC iQ-L | MELSEC iQ-F | MELSEC-Q, MELSEC-L |
| Cyclic transmission status | This relay turns on when the cyclic transmission starts. | SM1536 | SM1536 | SM1700 |
| Data link status | This relay turns on when an error exists even in one remote station. | SM1540 | SM1540 | SM1704 |
| Reserved station specification status | The reserved station specification status of the remote station specified in parameter is stored. | Un\G1025.0 | SD11101.0 | SM1718 |
| Diagnostic information display request | The bit is turned on to read the diagnostic information of the specified remote station. | Un\G1050.0 | SD11126.0 | SM1741 |
| Cyclic transmission status of each station | The cyclic transmission status of each station is stored. (1 to 16 stations) | SD1536 | SD1536 | SD1700 |
| | The cyclic transmission status of each station is stored. (17 to 32 stations) | SD1537 | — | SD1701*1 |
| | The cyclic transmission status of each station is stored. (33 to 48 stations) | SD1538 | — | SD1702*1 |
| | The cyclic transmission status of each station is stored. (49 to 64 stations) | SD1539 | — | SD1703*1 |
| Data link status of each station | The data link status of each station is stored. (1 to 16 stations) | SD1540 | SD1540 | SD1704 |
| | The data link status of each station is stored. (17 to 32 stations) | SD1541 | — | SD1705*1 |
| | The data link status of each station is stored. (33 to 48 stations) | SD1542 | — | SD1706*1 |
| | The data link status of each station is stored. (49 to 64 stations) | SD1543 | — | SD1707*1 |
| Total number of connected stations | The total number of connected stations set in parameter is stored. | Un\G1024 | SD11100 | SD1716 |
| Reserved station specification status of each station | The reserved station specification status is stored. (1 to 16 stations) | Un\G1026 | SD11102 | SD1718 |
| | The reserved station specification status is stored. (17 to 32 stations) | Un\G1027 | — | SD1719*1 |
| | The reserved station specification status is stored. (33 to 48 stations) | Un\G1028 | — | SD1720*1 |
| | The reserved station specification status is stored. (49 to 64 stations) | Un\G1029 | — | SD1721*1 |

| Name | | Description | SM/SD/Buffer memory | | |
|---|---|---|---|---|---|
| | | | MELSEC iQ-R, MELSEC iQ-L | MELSEC iQ-F | MELSEC-Q, MELSEC-L |
| Link scan information | Group No.1 maximum link scan time | The maximum link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1030 | SD11106 | SD1722 |
| | Group No.1 minimum link scan time | The minimum link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1031 | SD11107 | SD1723 |
| | Group No.1 current link scan time | The current link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1032 | SD11108 | SD1724 |
| | Group No.2 maximum link scan time | The maximum link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1034 | — | SD1726*1 |
| | Group No.2 minimum link scan time | The minimum link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1035 | — | SD1727*1 |
| | Group No.2 current link scan time | The current link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1036 | — | SD1728*1 |
| | Group No.3 maximum link scan time | The maximum link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1038 | — | SD1730*1 |
| | Group No.3 minimum link scan time | The minimum link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1039 | — | SD1731*1 |
| | Group No.3 current link scan time | The current link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1040 | — | SD1732*1 |
| | Group No.4 maximum link scan time | The maximum link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1042 | — | SD1734*1 |
| | Group No.4 minimum link scan time | The minimum link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1043 | — | SD1735*1 |
| | Group No.4 current link scan time | The current link scan time value during cyclic transmission is stored. (Unit: ms) | Un\G1044 | — | SD1736*1 |
| Diagnostic request information | | The diagnostic information display target remote station is specified. | Un\G1051 | SD11127 | SD1741 |
| Diagnostic information status flag | | The diagnostic information status (valid or invalid) of the specified remote station is stored. | Un\G1052 | SD11128 | SD1742 |
| Diagnostic information 1 | Number of occupied stations | The number of occupied stations of the specified remote station is stored. | Un\G1053 | SD11129 | SD1743 |
| | Group number | The group number of the specified remote station is stored. | Un\G1054 | SD11130 | SD1744 |
| | IP address (lower) | The IP address (lower) of the specified remote station is stored. | Un\G1055 | SD11131 | SD1745 |
| | IP address (upper) | The IP address (upper) of the specified remote station is stored. | Un\G1056 | SD11132 | SD1746 |
| | Accumulated number of timeouts | The accumulated number of timeouts of the specified remote station is stored. | Un\G1063 | SD11139 | SD1753 |
| | Accumulated number of disconnection detections | The accumulated number of disconnection detections of the specified remote station is stored. | Un\G1064 | SD11140 | SD1754 |

| Name | | Description | SM/SD/Buffer memory | | |
|---|---|---|---|---|---|
| | | | MELSEC iQ-R, MELSEC iQ-L | MELSEC iQ-F | MELSEC-Q, MELSEC-L |
| Diagnostic information 2 | Manufacturer code | The manufacturer code of the specified remote station is stored. | Un\G1068 | SD11144 | SD1758 |
| | Model code (lower) | The model code (lower) of the specified remote station is stored. | Un\G1070 | SD11146 | SD1760 |
| | Model code (upper) | The model code (upper) of the specified remote station is stored. | Un\G1071 | SD11147 | SD1761 |
| | Device version | The device version of the specified remote station is stored. | Un\G1072 | SD11148 | SD1762 |
| | Module information | The module information of the specified remote station is stored. | Un\G1074 | SD11150 | SD1764 |
| | Error code | The code corresponding to the latest error occurred in the specified remote station is stored. | Un\G1075 | SD11151 | SD1765 |
| | Detailed module information (lower) | The detailed module information (lower) of the specified remote station is stored. | Un\G1076 | SD11152 | SD1766 |
| | Detailed module information (upper) | The detailed module information (upper) of the specified remote station is stored. | Un\G1077 | SD11153 | SD1767 |

*1 These areas are not applicable to the MELSEC-L series CPU module.

**Point**

For details on the special relay (SM), special register (SD), and buffer memory, refer to the following.

- MELSEC iQ-R CPU Module User's Manual (Application)
- MELSEC iQ-R C Controller Module User's Manual
- MELSEC iQ-F FX5 User's Manual (Application)
- QCPU User's Manual (Hardware Design, Maintenance and Inspection)
- MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)

A

# Appendix 2 Processing Time

The processing time of CC-Link IE Field Network Basic consists of the time components below.

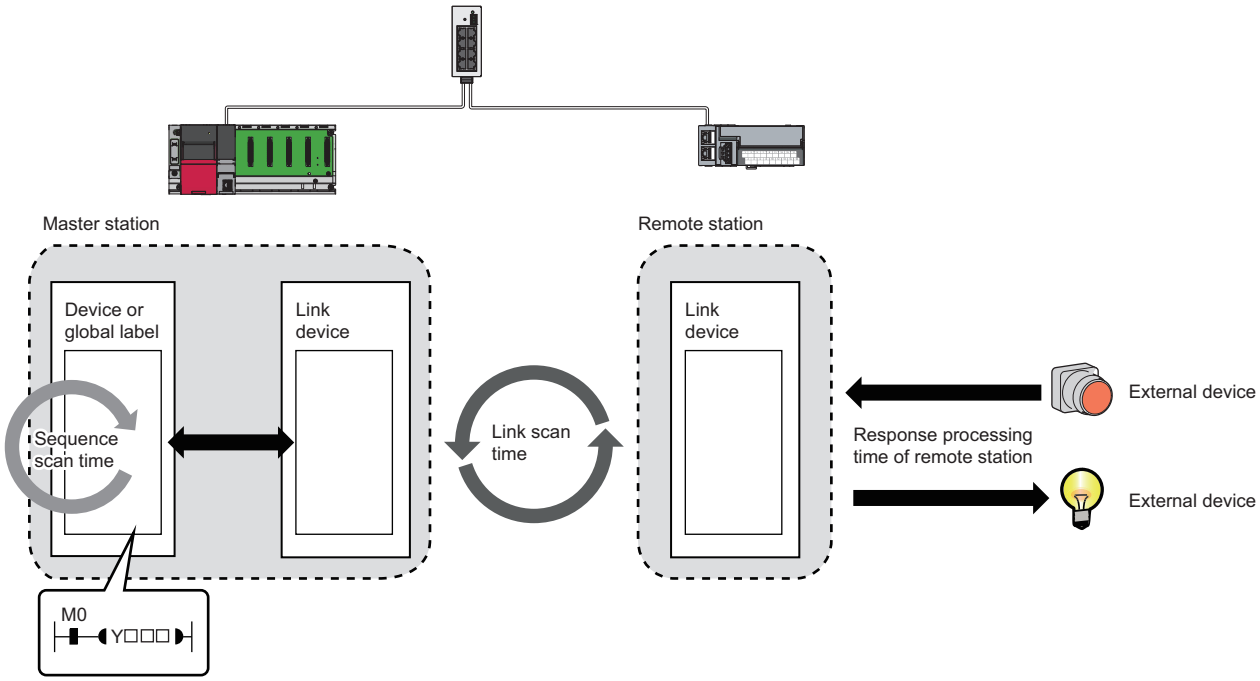
Sequence scan time + Link scan time + Remote station response processing time = Transmission delay time

When the C Controller module is used, refer to the following.

📖 MELSEC iQ-R C Controller Module User's Manual

When the MELIPC is used, refer to the following.

📖 MELIPC MI5000 Series User's Manual (Application)




- Sequence scan time: Refer to the following.

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

📖 MELSEC iQ-F FX5 User's Manual (Application)

📖 QnUCPU User's Manual (Function Explanation, Program Fundamentals)

📖 MELSEC-L CPU Module User's Manual (Function Explanation, Program Fundamentals)

- Link scan time: ☞ Page 63 Link scan time
- Remote station response processing time: 📖 Manual for the remote station used
- Transmission delay time: ☞ Page 64 Transmission delay time

# Link scan time

Use the following formulas to calculate the link scan time.

## MELSEC iQ-R, MELSEC iQ-L, MELSEC-Q, MELSEC-L

Use the following formula to calculate the link scan time (Ls).

Ls[*1] = Ns + Nm

Nm = KM1 + (KM2 × (N - 1))

| Item | Description |
|---|---|
| Ls | Link scan time [ms] |
| Ns | Processing time required for the remote station to respond to a request from the master station (reference response time)[*2] [ms] |
| Nm | Processing time required for the master station to send a request upon receiving a response from the remote station [ms] |
| N | Number of remote stations connected |
| KM1, KM2 | Constant (☞ Page 63 Constant values) |

*1 When a timeout or disconnection has been detected, the timeout time set in the link scan setting parameter will be the link scan time. (☞ Page 26 No response received from a remote station)

*2 The time indicates the reference response time of the slowest remote station among all of the connected remote stations. Note, however, that the timeout time set in parameter will be the processing time of the remote station when a timeout occurs.

### ■Constant values

The following table lists the constant values for each series.

| Constant | Constant value | | | |
|---|---|---|---|---|
| | MELSEC iQ-R, MELSEC iQ-L | MELSEC-Q | MELSEC-L | |
| | | | L02CPU, L02CPU-P | L06CPU, L06CPU-P, L26CPU, L26CPU-P, L26CPU-BT, L26CPU-PBT |
| KM1 | 6.66 | 6.66 | 6.8 | 6.7 |
| KM2 | 0.22[*1] | 0.22 | 0.42 | 0.38 |

*1 When the number of connected remote stations increases, the value may be doubled (0.44) at most.

## MELSEC iQ-F

Use the following formula to calculate the link scan time (Ls).

Ls[*1] = SM × n1

n1 = Value obtained by rounding up the calculated value of ((Ns + Nm) ÷ SM) to the nearest whole number

| Item | Description |
|---|---|
| Ls | Link scan time [ms] |
| SM | Sequence scan time [ms] |
| Ns | Processing time required for the remote station to respond to a request from the master station (reference response time)[*2] [ms] |
| Nm | Processing time required for the master station to send a request upon receiving a response from the remote station[*3] [ms] |

*1 When a timeout or disconnection has been detected, the timeout time set in the link scan setting parameter will be the link scan time. (☞ Page 26 No response received from a remote station)

*2 The time indicates the reference response time of the slowest remote station among all of the connected remote stations. Note, however, that the timeout time set in parameter will be the processing time of the remote station when a timeout occurs.

*3 The time depends on the processing time of programs. (☞ Page 31 MELSEC iQ-F)

# Transmission delay time

A transmission delay time includes an input transmission delay time and an output transmission delay time.

## Input transmission delay time

The input transmission delay time means the following.

- Time between when a signal (RX) is input to the remote station and when a device of the master station turns on or off
- Time between data (RWr) is input to the remote station and when the data is stored in a device of the master station

### ■MELSEC iQ-R, MELSEC iQ-L, MELSEC-Q, MELSEC-L

Input transmission delay time (maximum) = SM + Ls × 2 + SS [ms]

| Item | Description |
|---|---|
| SM | Sequence scan time [ms] |
| Ls | Link scan time [ms] |
| SS | Processing time required for the remote station to reflect the input [ms] (📖 Manual for the remote station used) |

### ■MELSEC iQ-F

Input transmission delay time (maximum) = SM + Ls + SS [ms]

| Item | Description |
|---|---|
| SM | Sequence scan time [ms] |
| Ls | Link scan time [ms] |
| SS | Processing time required for the remote station to reflect the input [ms] (📖 Manual for the remote station used) |

## Output transmission delay time

The output transmission delay time means the following.

- Time between when a device of the master station turns on or off and when the output (RY) of the remote station turns on or off
- Time between when data is set to a device of the master station and when the data (RWw) is output to the remote station

### ■MELSEC iQ-R, MELSEC iQ-L, MELSEC-Q, MELSEC-L

Output transmission delay time (maximum) = SM + Ls + SS [ms]

| Item | Description |
|---|---|
| SM | Sequence scan time [ms] |
| Ls | Link scan time [ms] |
| SS | Processing time required for the remote station to reflect the output [ms] (📖 Manual for the remote station used) |

### ■MELSEC iQ-F

Output transmission delay time (maximum) = Ls + SS [ms]

| Item | Description |
|---|---|
| Ls | Link scan time [ms] |
| SS | Processing time required for the remote station to reflect the output [ms] (📖 Manual for the remote station used) |

# Appendix 3 Added and Enhanced Functions

This section shows added and enhanced functions of CC-Link IE Field Network Basic, as well as the software versions of GX Works3/GX Works2 and the firmware versions/serial numbers (first five digits) of the modules/devices that can be used as the master station that support those functions.

## MELSEC iQ-R

### ■R00CPU, R01CPU, R02CPU

| Added or enhanced function | CPU module firmware version | GX Works3 software version | Reference |
|---|---|---|---|
| CC-Link IE Field Network Basic | "01" or later | "1.040S" or later | — |
| Error details information of the remote station in CC-Link IE Field Network Basic diagnostics | — | | Page 48 CC-Link IE Field Network Basic Diagnostics |

### ■Rn(EN)CPU (except for the R00CPU, R01CPU, and R02CPU)

| Added or enhanced function | CPU module firmware version | GX Works3 software version | Reference |
|---|---|---|---|
| CC-Link IE Field Network Basic | "25" or later | "1.030G" or later | — |
| Group number setting | "28" or later | "1.035M" or later | Page 32 Group number setting |
| Automatic detection of connected device | — | | Page 39 Automatic detection of connected device |
| Error details information of the remote station in CC-Link IE Field Network Basic diagnostics | — | "1.040S" or later | Page 48 CC-Link IE Field Network Basic Diagnostics |

### ■C Controller module

For the C Controller module firmware version and CW Configurator software version, refer to the following.

MELSEC iQ-R C Controller Module User's Manual

CW Configurator Operating Manual

## MELSEC iQ-L

| Added or enhanced function | CPU module firmware version | GX Works3 software version | Reference |
|---|---|---|---|
| CC-Link IE Field Network Basic | "01" or later | "1.060N" or later | — |

## MELSEC iQ-F

### ■FX5S CPU module

| Added or enhanced function | CPU module firmware version | GX Works3 software version | Reference |
|---|---|---|---|
| CC-Link IE Field Network Basic | "1.000" or later | "1.080J" or later | — |
| Automatic detection of connected device | — | "1.080J" or later | Page 39 Automatic detection of connected device |
| Error details information of the remote station in CC-Link IE Field Network Basic diagnostics | — | "1.080J" or later | Page 48 CC-Link IE Field Network Basic Diagnostics |

### ■FX5UJ CPU module

| Added or enhanced function | CPU module firmware version | GX Works3 software version | Reference |
|---|---|---|---|
| CC-Link IE Field Network Basic | "1.000" or later | "1.060N" or later | — |
| Automatic detection of connected device | — | "1.060N" or later | Page 39 Automatic detection of connected device |
| Error details information of the remote station in CC-Link IE Field Network Basic diagnostics | — | "1.060N" or later | Page 48 CC-Link IE Field Network Basic Diagnostics |

### ■FX5U CPU module, FX5UC CPU module

| Added or enhanced function | CPU module firmware version | GX Works3 software version | Reference |
|---|---|---|---|
| CC-Link IE Field Network Basic | "1.040" or later | "1.030G" or later | — |
| Automatic detection of connected device | — | "1.035M" or later | Page 39 Automatic detection of connected device |
| Error details information of the remote station in CC-Link IE Field Network Basic diagnostics | — | "1.040S" or later | Page 48 CC-Link IE Field Network Basic Diagnostics |

### ■FX5-ENET

For the CPU module firmware version and GX Works3 software version that support the FX5-ENET, refer to the following.

📖 MELSEC iQ-F FX5 User's Manual (Application)

## MELSEC-Q

### ■QnUDVCPU, QnUDPVCPU

| Added or enhanced function | CPU module serial number (first five digits) | GX Works2 software version | Reference |
|---|---|---|---|
| CC-Link IE Field Network Basic | "18112" or later | "1.555D" or later | — |
| Group number setting | "19042" or later | "1.565P" or later | Page 32 Group number setting |
| Automatic detection of connected device | — | | Page 39 Automatic detection of connected device |

## MELSEC-L

| Added or enhanced function | CPU module serial number (first five digits) | GX Works2 software version | Reference |
|---|---|---|---|
| CC-Link IE Field Network Basic | "18112" or later | "1.555D" or later | — |
| Automatic detection of connected device | — | "1.565P" or later | Page 39 Automatic detection of connected device |

## MELIPC

For the firmware version and MI Configurator software version of the MELIPC, refer to the following.

📖 MELIPC MI5000 Series User's Manual (Application)

📖 MI Configurator Operating Manual

# MEMO

A

# INDEX


**A**

Access range . . . . . 17
Assignment range . . . . . 18

**E**

Ethernet cable . . . . . 20

**H**

Hub . . . . . 20

**I**

IP address . . . . . 38

**L**

Link refresh . . . . . 28
Link scan . . . . . 30

**N**

Network topology . . . . . 16
Number of link points . . . . . 18

**P**

Program example . . . . . 22,23

**R**

Reserved station . . . . . 38
Reserved station specification . . . . . 35

**S**

Station number . . . . . 18,38
Subnet mask . . . . . 38

# MEMO

# REVISIONS

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

| Revision date | *Manual number | Description |
|---|---|---|
| October 2016 | SH(NA)-081684ENG-A | First edition |
| April 2017 | SH(NA)-081684ENG-B | ■Added or modified parts<br>Section 2.1, Chapter 3, 4, Section 7.1, 8.1, 9.1, 9.2, Appendix 1, 2, 3 |
| October 2017 | SH(NA)-081684ENG-C | ■Added or modified parts<br>Section 2.1, Chapter 3, Section 5.2, Chapter 6, 7, Section 8.1, 9.1, 9.3, Appendix 1, 2, 3 |
| May 2018 | SH(NA)-081684ENG-D | ■Added or modified parts<br>SAFETY PRECAUTIONS, CONDITIONS OF USE FOR THE PRODUCT, INTRODUCTION, TERMS, Section 1.1, 2.1, Chapter 3, 4, Section 5.1, 5.2, Chapter 6, 7, Section 8.3, Chapter 9, Appendix 1, 2, 3 |
| October 2019 | SH(NA)-081684ENG-E | ■Added or modified parts<br>Section 2.1, Chapter 3, 4, Section 5.2, Chapter 6, Section 6.1, Chapter 7, Section 7.1, Chapter 8, Section 8.1, 8.2, Chapter 9, Section 9.3, Appendix 1, 2, 3 |
| November 2021 | SH(NA)-081684ENG-F | ■Added or modified parts<br>CONDITIONS OF USE FOR THE PRODUCT, Section 1.1, 2.1, 5.1, 7.1, Appendix 3 |
| April 2022 | SH(NA)-081684ENG-G | ■Added or modified parts<br>Section 2.1, 5.2, 7.1, Appendix 3 |
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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.

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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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(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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