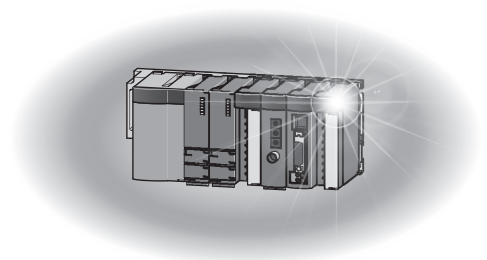# MITSUBISHI ELECTRIC

Mitsubishi Programmable Controller

MELSEC Q series

MELSEC-Q EtherNet/IP Network Interface Module User's Manual

-QJ71EIP71
-SW1DNC-EIPUTL-E

●SAFETY PRECAUTIONS●

(Read these precautions before using this product.)

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

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

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences.
Observe the precautions of both levels because they are important for personal and system safety.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠WARNING

● When connecting a peripheral with the programmable controller CPU or connecting a personal computer with an intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the sequence program to ensure that the entire system will always operate safely.
For other forms of control (such as program modification or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding.
Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.

● Do not write any data to the "system area" in the buffer memory of the intelligent function module. Also, do not use any "use prohibited" signal as an output signal from the CPU module to the intelligent function module.
Doing these operations may cause malfunctions to the programmable controller system.

● Provide security measures on user side that prevent unauthorized access from outside via network as necessary.

[Installation Precautions]

⚠CAUTION
● Use the programmable controller in an environment that meets the general specifications in the user's manual for the CPU module used. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product. ● To mount the module, while pressing the module mounting lever located in the lower part of the module, fully insert the module fixing projection(s) into the hole(s) in the base unit and press the module until it snaps into place. Incorrect mounting may cause malfunction, failure or drop of the module. When using the programmable controller in an environment of frequent vibrations, fix the module with a screw. Tighten the screws within the specified torque range. Undertightening can cause drop of the screw, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction. ● Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may result in damage to the product. ● Do not directly touch any conductive parts and electronic components of the module. Doing so can cause malfunction or failure of the module.

[Wiring Precautions]

⚠WARNING

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

● Connectors for external devices must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered.
  Incomplete connections may cause short circuit, fire, or malfunction.

⚠CAUTION

● Securely connect the connector to the module.

● Place the communication cable or power cable in a duct or clamp it.
  If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.

● Check the type of the interface to be connected before wiring the modules.
  Connecting to a wrong interface or incorrect wiring may cause a fire or failure.

● When disconnecting a communication cable or power cable from the module, do not pull the cable part.
  For the cable with connector, hold the connector part of the cable.
  Pulling the cable connected to the module may result in malfunction or damage to the module or cable.

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

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

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

[Startup and Maintenance Precautions]

⚠WARNING

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

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

⚠CAUTION

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

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

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

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

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

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

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

[Startup and Maintenance Precautions]

⚠**WARNING**	A - 5

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

● Do not write any data to the "system area" in the buffer memory of the intelligent function module. Also, do not use any "use prohibited" signal as an output signal from the CPU module to the intelligent function module.
Doing these operations may cause malfunctions to the programmable controller system.

[Disposal Precautions]

⚠**CAUTION**

● When disposing of this product, treat it as industrial waste.
When disposing of batteries, separate them from other wastes according to the local regulations.
(For the Battery Directive in EU member states, refer to Appendix 2.)

[Transportation Precautions]

⚠**CAUTION**

● When transporting lithium batteries, follow the transportation regulations. (For details of the regulated models, refer to Appendix 1.)

●CONDITIONS OF USE FOR THE PRODUCT●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
   i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
   ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
   MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
   ("Prohibited Application")
   Prohibited Applications include, but not limited to, the use of the PRODUCT in;
   • Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
   • Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
   • Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

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

REVISIONS

Print date	*Manual number	Revision
July 2013	SH(NA)-081157ENG-A	First edition
February 2015	SH(NA)-081157ENG-B	■Added function Setting of a tag name with 41 or more characters ■Added or modified parts GENERIC TERMS AND ABBREVIATIONS, Section 3.1, 3.3.1, 3.3.4, 3.3.5, 4.2, 5.2.1, 7.2.1, 7.2.2, 7.2.3, 7.6, 7.9.1, 7.9.2, 7.9.3, 7.9.4, 7.12, 8.3, 9.4.1, Appendix 5

INTRODUCTION

Thank you for purchasing the MELSEC-Q series programmable controller.
Before using the equipment, please read this manual carefully to develop full familiarity with the functions and
performance of the Q series programmable controller you have purchased, so as to ensure correct use.
Please forward a copy of this manual to the end user.

CONTENTS

CHAPTER 4 FUNCTION

CHAPTER 5 PRE-OPERATION PROCEDURES

CHAPTER 8 PROGRAMMING 8 - 1 to 8 - 18

CHAPTER 9 TROUBLESHOOTING 9 - 1 to 9 - 21

APPENDICES APPX - 1 to APPX - 15

INDEX INDEX - 1 to INDEX - 3

COMPLIANCE WITH THE EMC AND LOW VOLTAGE DIRECTIVES

(1) For programmable controller system

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

• QCPU User's Manual (Hardware Design, Maintenance and Inspection)
• Safety Guidelines
(This manual is included with the CPU module or base unit.)

The CE mark, indicating compliance with the EMC and Low Voltage Directives, is printed on the rating plate of the programmable controller.

(2) For the product

For the compliance of this product with the EMC and Low Voltage Directives, refer to the following precautions.

(a) Twisted pair cable

Always use shielded twisted pair cables for connection to 10BASE-T/100BASE-TX connectors.

For the shielded twisted pair cable, remove a part of the cable sheath as shown below and ground the exposed shield section to the ground as much as possible.

Shielded twist pair cable
Shield
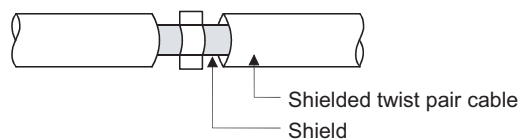
For grounding of the shield, refer to the following.

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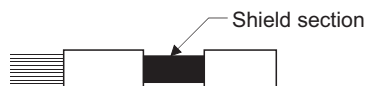
Shield section

Shield section to expose

Screw

Clamp fitting

Masked from paint
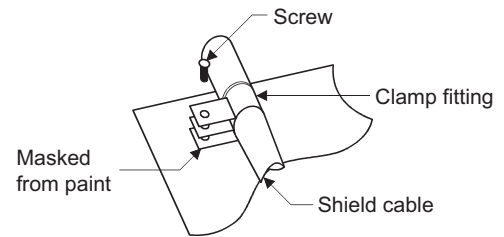
Shield cable

Grounding of the shield

⊠**POINT**

The method of grounding with a vinyl-coated wire soldered onto the shield section of the shielded cable is not recommended. High-frequency impedance will rise, resulting in loss of shielding effect.

Shield cable
Wire
Solderless terminal

A - 13
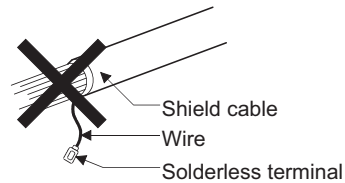
HOW TO READ THIS MANUAL

Reference

A reference section or reference manual is shown with ☞ .

Chapter heading

The index on the right side of the page simply shows the chapter of the open page.

---

1 OVERVIEW

MELSEC **Q** series

1.1 Features

This section explains the features of the EtherNet/IP module.

(1) Connectivity to the EtherNet/IP network

    (a) Communications using tags (Tag communication)
    Communications with the target device are available when the tag name is matched.
    Since the communication target can be specified in the tag name, no consideration of the target memory address is needed. (☞ (1) (b) Cyclic Transmission (Class1 Tag communication) in this section)

    (b) Cyclic Transmission (Class1 Tag communication)
    Cyclic communications are performed between Producer (Producer Tag) and Consumer (Consumer Tag).
    (☞ Section 4.2.1 Class1 Tag communication)

Producer Tag			Consumer Tag	
Tag name	Class1_Data1		Tag name	Class1_Data1

Connection establishment
Producer Tag ▶ Consumer Tag
Tag name must be matched.

Consumer Tag			Producer Tag	
Tag name	Class1_Data2		Tag name	Class1_Data2

Connection establishment
Consumer Tag ◀ Producer Tag
Tag name must be matched.

Figure 1.2 Class1 Tag communication

Chapter index:
1 OVERVIEW
2 SYSTEM CONFIGURATION
3 SPECIFICATIONS
4 FUNCTION
5 PRE-OPERATION PROCEDURES
6 PARAMETER
7 UTILITY PACKAGE (SW1DNC-SEIF-E)
8 PROGRAMMING

1.1 Features

1 - 2

Section title

The section number and title of the open page is shown.

This page is for reference only.

The following table shows the marks used in this manual.

Mark	Description
[ ]	Indicates menus shown in software. Example: [Online]→[Transfer Setup] menu
" "	Indicates window titles and setting items shown in software. Example: the "Basic" window
Detail View	Indicates the buttons shown in software. Example: Detail View button

HOW TO USE THIS MANUAL

This manual describes the specifications, operating procedure, functions, and troubleshooting of the QJ71EIP71 EtherNet/IP network interface module.
This manual consists of the following chapters. Refer to each chapter according to the intended purpose.

Item	Description
CHAPTER 1	Explains the features of the EtherNet/IP network interface module.
CHAPTER 2	Explains the system configuration and components for network configuration with the EtherNet/IP network interface module.
CHAPTER 3	Explains the specifications, I/O signals, and buffer memory of the EtherNet/IP network interface module.
CHAPTER 4	Explains the functions of the EtherNet/IP network interface module.
CHAPTER 5	Explains the procedure for system operation using the EtherNet/IP network interface module.
CHAPTER 6	Explains the parameters of the EtherNet/IP network interface module.
CHAPTER 7	Explains the installation, functions, and operation of Utility Package (SW1DNC-EIPUTL-E) for the EtherNet/IP network interface module.
CHAPTER 8	Explains the examples of parameter setting and programming for the EtherNet/IP network interface module.
CHAPTER 9	Explains the troubleshooting and error codes.
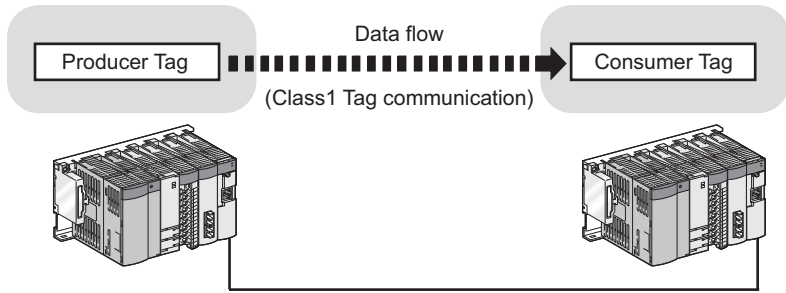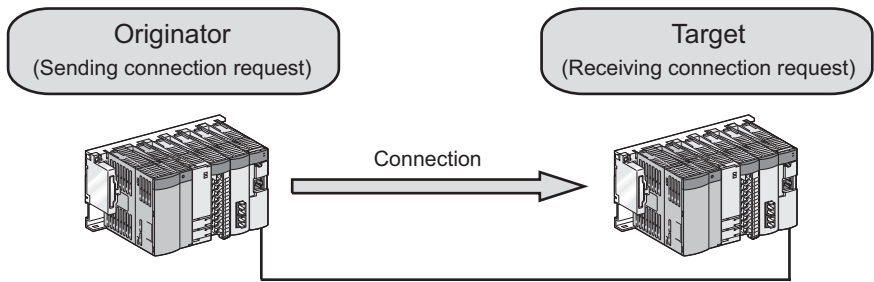
GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual describes the QJ71EIP71 EtherNet/IP network interface module using the following items.

Generic term and abbreviation	Description
Ethernet	A generic term for 100BASE-TX, 10BASE-T network systems
Built-in Ethernet port QCPU	A generic term for the Q03UDVCPU, Q03UDECPU, Q04UDVCPU, Q04UDEHCPU, Q06UDVCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDVCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDVCPU, Q26UDEHCPU, Q50UDEHCPU, Q100UDEHCPU
GX Developer	A generic product name for SWnD5C-GPPW-E, SWnD5C-GPPW-EA, SWnD5C-GPPW-EV, SWnD5C-GPPW-EVA. ("n" means version 4 or later.) "-A "and "-V" mean "volume license product" and "version-upgrade product" respectively.
GX Works2	A generic product name for SWnDNC-GXW2 (n represents the version.)
QCPU	A generic term for the Basic model QCPU, High Performance model QCPU, Process CPU, and Universal model QCPU
EtherNet/IP module	The abbreviation for the QJ71EIP71 EtherNet/IP network interface module
Tag Parameter	A generic term for Class1 Tag Parameter and Class3/UCMM Tag Parameter
Tag communication	A generic term for Class1, Class3, and UCMM Tag communications (DEFINITIONS OF TERMINOLOGY)
Windows$^®$ 7	A generic term for Microsoft$^®$ Windows$^®$ 7 Professional Operating System, Microsoft$^®$ Windows$^®$ 7 Ultimate Operating System
Windows Vista$^®$	A generic term for Microsoft$^®$ Windows Vista$^®$ Business Operating System and Microsoft$^®$ Windows Vista$^®$ Ultimate Operating System
Windows$^®$ XP	The abbreviation for Microsoft$^®$ Windows$^®$ XP Professional Operating System
High Performance model QCPU	A generic term for the Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU
Process CPU	A generic term for the Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU
Basic model QCPU	A generic term for the Q00JCPU, Q00CPU, Q01CPU
Utility Package	A generic product name for SWnDNC-EIPUTL-E (n represents the version.)
Universal model QCPU	A generic term for the Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q03UDVCPU, Q03UDECPU, Q04UDHCPU, Q04UDVCPU, Q04UDEHCPU, Q06UDHCPU, Q06UDVCPU, Q06UDEHCPU, Q10UDHCPU, Q10UDEHCPU, Q13UDHCPU, Q13UDVCPU, Q13UDEHCPU, Q20UDHCPU, Q20UDEHCPU, Q26UDHCPU, Q26UDVCPU, Q26UDEHCPU, Q50UDEHCPU, Q100UDEHCPU

DEFINITIONS OF TERMINOLOGY

Definitions of the terms used in this manual are explained below.

Term	Description
ACK	ACK (an abbreviation for Acknowledgement) is a message indicating successful data reception, which is sent from receiving device (destination) back to the sending device (source).
Application Trigger	The trigger used to send/receive data at any given timing.
Class1 Tag communication	A communication method by which cyclic data transmission is performed between Producer (Producer Tag) and Consumer (Consumer Tag). (☞ Section 4.2.1 Class1 Tag communication)
Class3 Tag communication	A communication method using read or write request. (☞ Section 4.2.2 Class3 Tag communication)
Consumer Tag	Tag used for Class1 Tag communication (☞ Section 4.2.1 Class1 Tag communication) Data are sent from Producer Tag to Consumer Tag.
DHCP	DHCP (an abbreviation for Dynamic Host Configuration Protocol) is a protocol, which automatically assigns parameters such as IP addresses to the devices connected to the network.
Ethernet address (MAC address)	A unique address used to distinguish the target device from another in a network. MAC is an abbreviation for Media Access Control. The Ethernet address (MAC address) of the EtherNet/IP module can be checked in either of the following. •MAC ADD field on the rating plate •Buffer memory of the EtherNet/IP module (☞ Section 3.3.2 Setting status)
Originator	Originator is a device that sends a request for establishing a connection on the EtherNet/IP network. Target is a device that receives a connection request from Originator.
Producer Tag	☞ in this section Consumer Tag
RPI	The abbreviation for Requested Packet Interval, indicating the time interval at which Target sends data to Originator. (For Class1 Tag communication, this applies to the time interval from Producer Tag to Consumer Tag.)

Term	Description
Tag	Set of parameters for which data are stored. On the EtherNet/IP network, data are transmitted between devices that have the same Tag name (the same parameter settings).
Target	☞ in this section Originator
UCMM Tag communication	A communication method using read or write request. Without establishing a connection, an asynchronous communication is performed. UCMM is an abbreviation for Unconnected Communication Message Manager.
Connection	The status that is established before data transfer, and in which communication is available with a physically connected device.

PACKING LIST

The following are included in the package.

Model name	Product Name	Quantity
QJ71EIP71	QJ71EIP71 EtherNet/IP network interface module	1
	Battery (Q6BAT)	1
SW1DNC-EIPUTL-E	Utility Package for the EtherNet/IP network interface module	1

CHAPTER 1   OVERVIEW

This manual describes the specifications, pre-operation procedures, functions, and troubleshooting of the MELSEC-Q series QJ71EIP71 EtherNet/IP network interface module (hereinafter referred to as EtherNet/IP module).
The EtherNet/IP module allows MELSEC-Q series modules to connect to the EtherNet/IP network.

When applying program examples introduced in this manual into the actual system, fully examine the applicability and confirm that it will not cause system control problems.
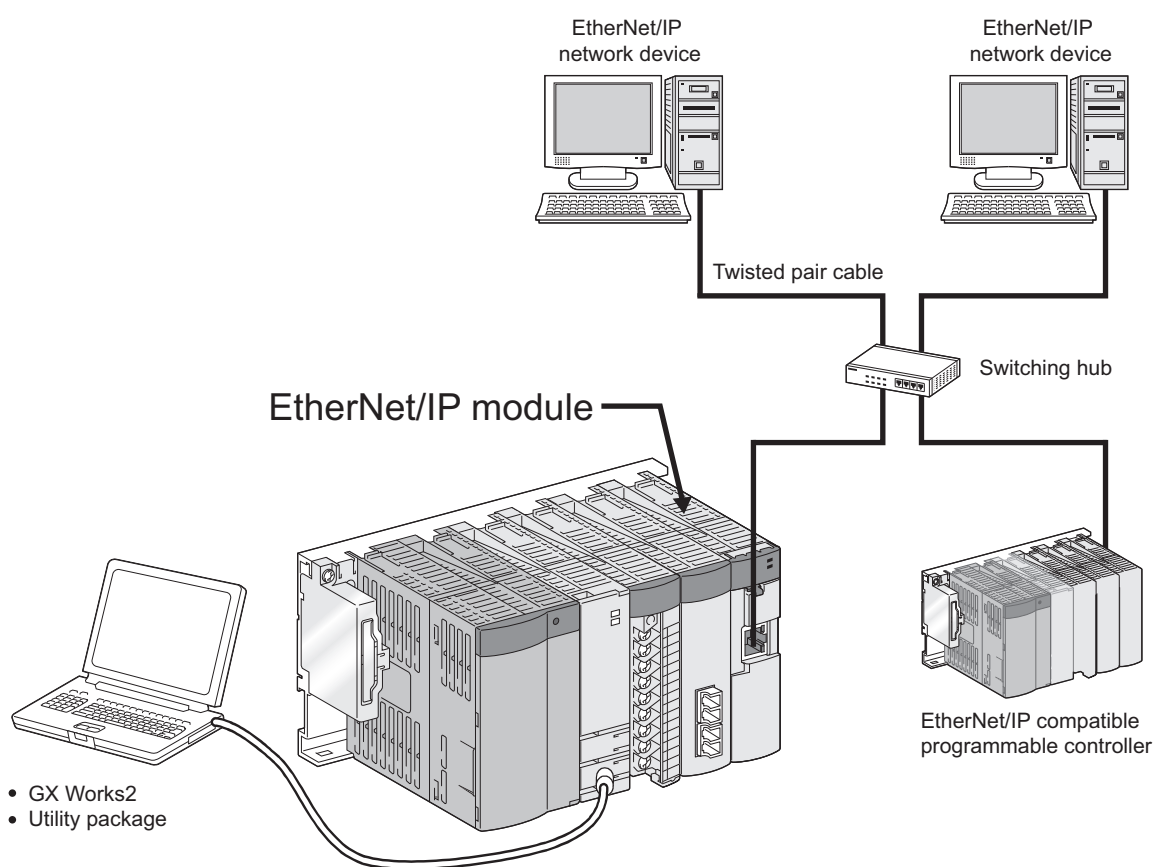
Figure 1.1 EtherNet/IP network

1.1   Features

This section describes the features of the EtherNet/IP module.

(1) Connectivity to the EtherNet/IP network

(a) Communications using tags (Tag communication)
Communications with the target device are available when the tag name is matched.
Since the communication target can be specified in the tag name, no consideration of the target memory address is needed. (☞ (1) (b) Cyclic Transmission (Class1 Tag communication) in this section)

(b) Cyclic Transmission (Class1 Tag communication)
Cyclic communications are performed between Producer (Producer Tag) and Consumer (Consumer Tag).
(☞ Section 4.2.1 Class1 Tag communication)
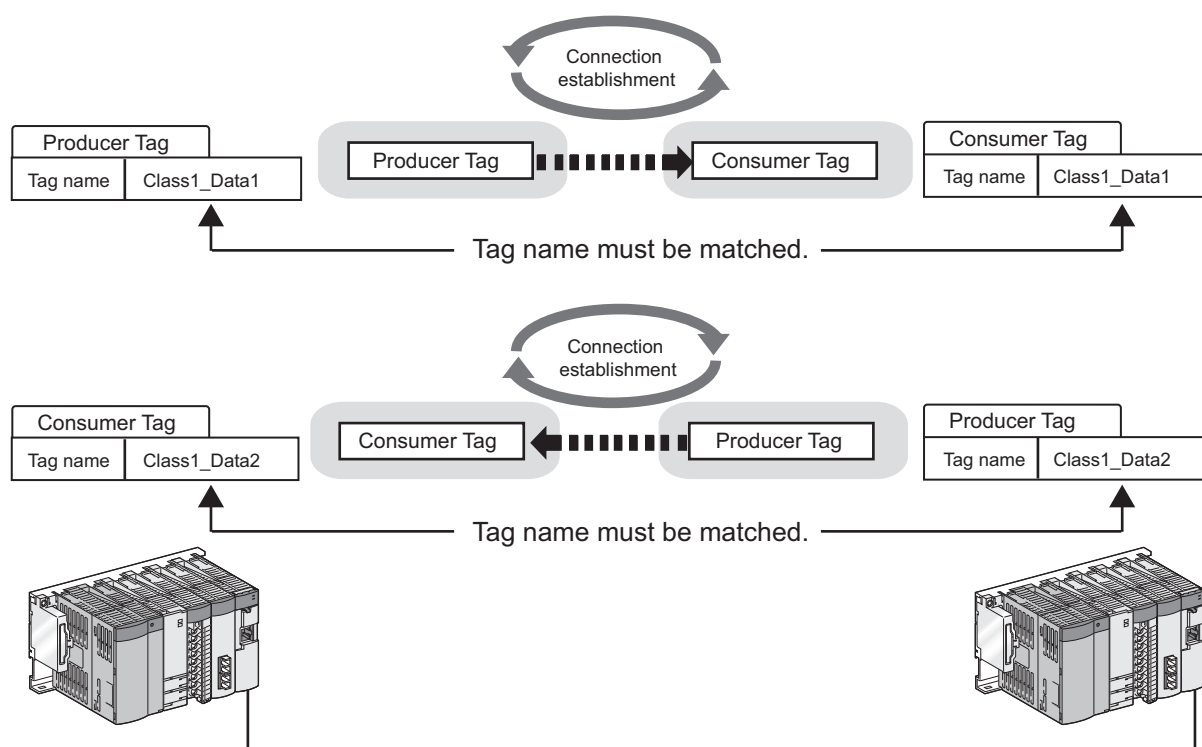
Figure 1.2 Class1 Tag communication

(c) Communications using read/write requests (Class3 Tag communication)
Communication can be performed by sending a read or write request.
(☞ Section 4.2.2 Class3 Tag communication)
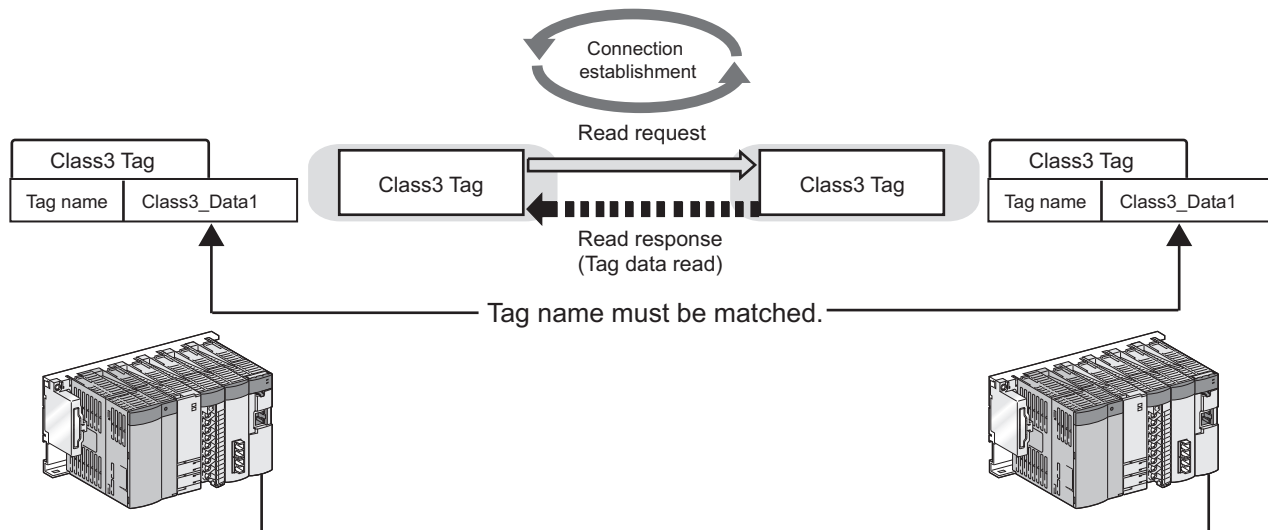
Figure 1.3 Class3 Tag communication

(d) Asynchronous communication without establishing a connection (UCMM Tag communication)
Communication using a read or write request is available without establishing a connection prior to communication.
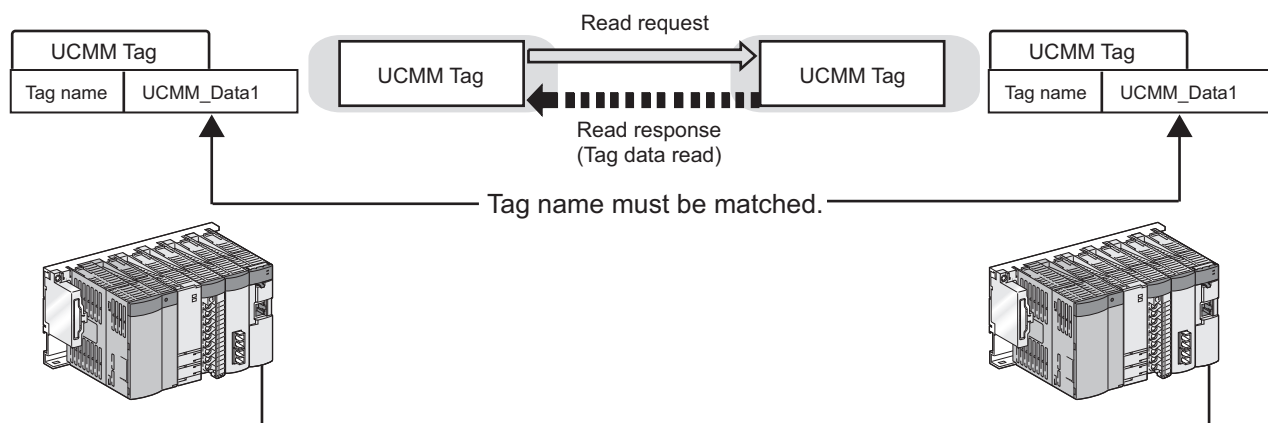
Figure 1.4 UCMM Tag communication

(2) Tag communication that does not need programming

    (a) Tag communication by Utility Package setting only
        Tag communication is available only by setting data such as IP addresses and tag names in Utility Package. (☞ Section 4.2 Tag Communication Function, Section 7.9 "Setting" Tab (Parameter Settings))
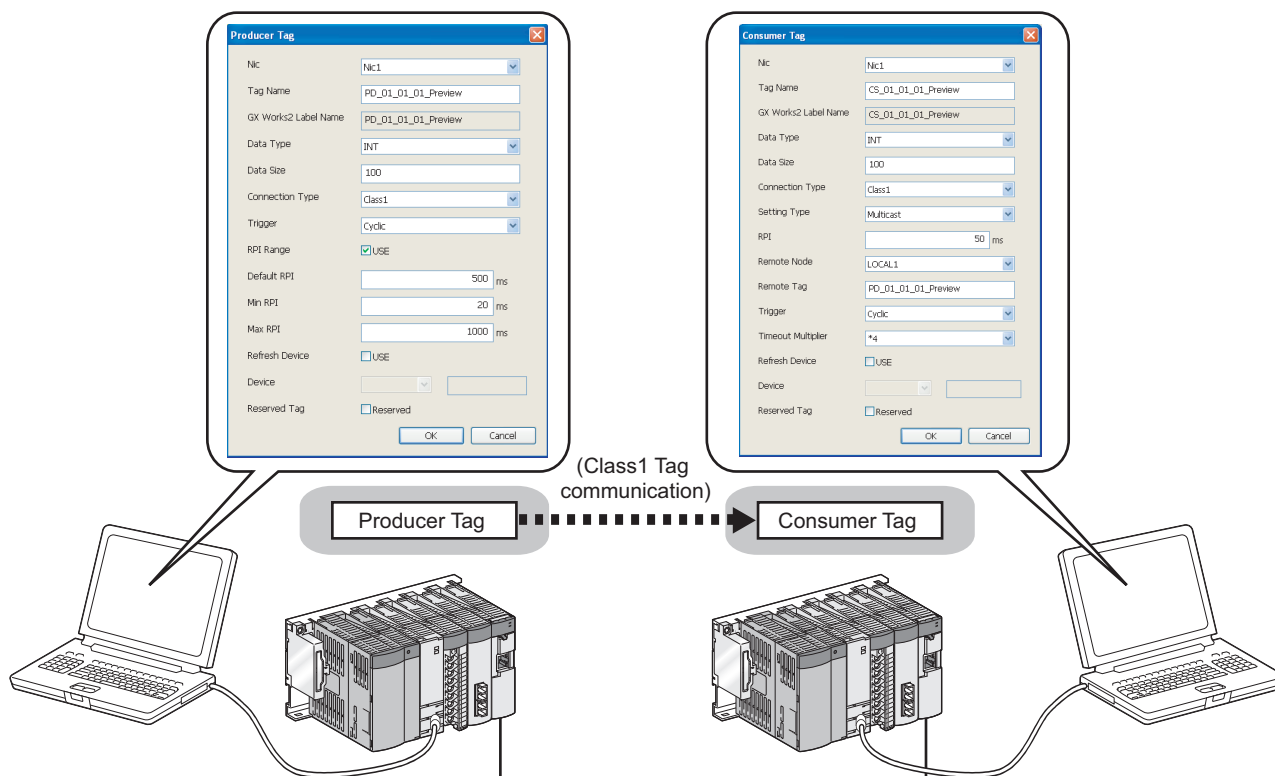
Figure 1.5 Tag communication without programming

(b) Automatic refresh of tag data to QCPU devices

Tag data can be automatically refreshed into devices of a QCPU only by configuring auto refresh settings in Utility Package.

(☞ Section 7.9 "Setting" Tab (Parameter Settings))
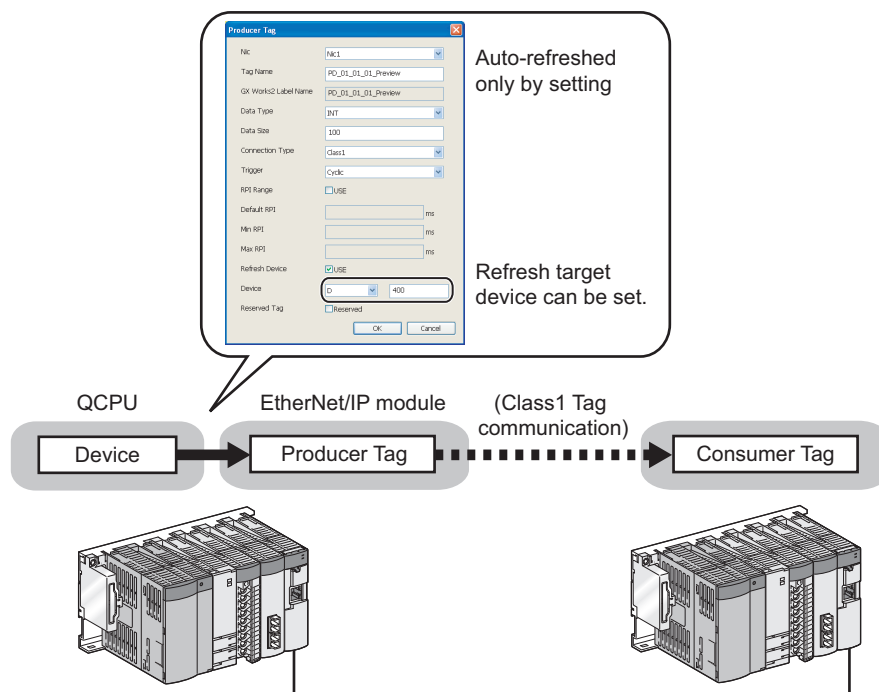
Figure 1.6 Setting example for auto refresh

OVERVIEW

SYSTEM CONFIGURATION

SPECIFICATIONS

FUNCTION

PRE-OPERATION PROCEDURES

PARAMETER

UTILITY PACKAGE (SW1DNC-EIPUTL-E)

PROGRAMMING

(3) Easy parameter setting

Utility Package allows easy parameter setting for the EtherNet/IP module.
(☞ Section 7.9 "Setting" Tab (Parameter Settings))

The setting items are useful when the system is started up because they can be checked in the list window (or list display).
When multiple EtherNet/IP modules are connected to one CPU module, settings can be performed simultaneously for four modules per project.

Figure 1.7 Setting example of parameters

(4) Easy checking of errors and communication states

Errors and communication states can be easily checked with Utility Package.
(☞ Section 7.6 "Main" Tab (Module Status Display))
The status of each tag can be viewed as well as the overall system status.
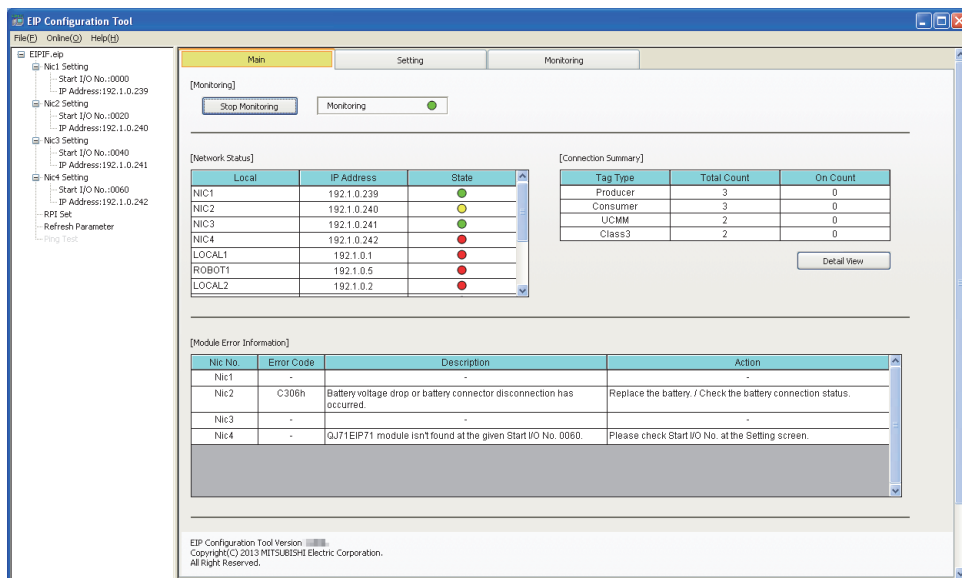
Figure 1.8 Checking errors and communication states

(5) Tag communication status setting for a CPU stop error

The Tag communication status can be set to stop or continue in case a CPU stop error occurs in the QCPU module mounted with the EtherNet/IP module.
(☞ Section 4.3 Tag Communication Status Setting Function for CPU Stop Error)

Continue

or   can be set!

Stop

Stop error occurred
(ERR.LED of CPU module flashes.)
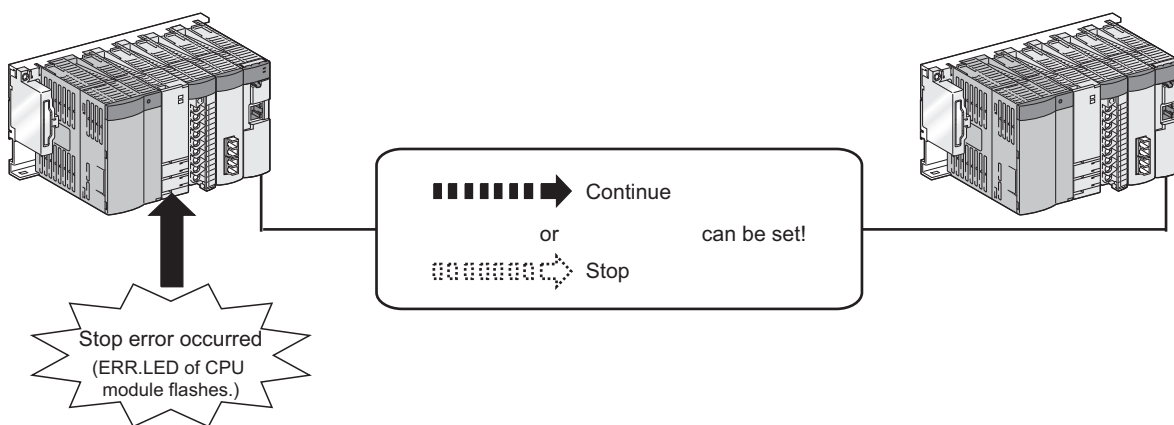
Figure 1.9 Tag communication for CPU stop error

CHAPTER 2   SYSTEM CONFIGURATION

This chapter describes system configuration of the EtherNet/IP module.

2.1   Applicable Systems

This section describes the applicable systems

(1) Applicable modules and base units, and No. of modules

(a) When mounted with a CPU module
The following table lists the CPU modules and base units applicable to the
EtherNet/IP module and quantities for each CPU model.
Depending on the combination with other modules or the number of mounted
modules, power supply capacity may be insufficient.
Check the power supply capacity before mounting modules.
If the power supply is insufficient, change the combination of the modules.

2 SYSTEM CONFIGURATION

Table 2.1 Applicable modules and base units, and No. of modules

Applicable CPU module		No. of modules *1	Base unit*2	
CPU type	CPU model		Main base unit	Extension base unit
Programmable controller CPU — Basic model QCPU	Q00JCPU	Up to 8	○	○
	Q00CPU	Up to 24		
	Q01CPU			
High Performance model QCPU	Q02CPU	Up to 64	○	○
	Q02HCPU			
	Q06HCPU			
	Q12HCPU			
	Q25HCPU			
Process CPU	Q02PHCPU	Up to 64	○	○
	Q06PHCPU			
	Q12PHCPU			
	Q25PHCPU			
Redundant CPU	Q12PRHCPU	×	×	×
	Q25PRHCPU			
Universal model QCPU	Q00UJCPU	Up to 8	○	○
	Q00UCPU	Up to 24		
	Q01UCPU			
	Q02UCPU	Up to 36		
	Q03UDCPU	Up to 64		
	Q04UDHCPU			
	Q06UDHCPU			
	Q10UDHCPU			
	Q13UDHCPU			
	Q20UDHCPU			
	Q26UDHCPU			
	Q03UDECPU			
	Q04UDEHCPU			
	Q06UDEHCPU			
	Q10UDEHCPU			
	Q13UDEHCPU			
	Q20UDEHCPU			
	Q26UDEHCPU			
	Q50UDEHCPU			
	Q100UDEHCPU			
	Q03UDVCPU			
	Q04UDVCPU			
	Q06UDVCPU			
	Q13UDVCPU			
	Q26UDVCPU			
Safety CPU	QS001CPU	×	×	×*3
C Controller module	Q06CCPU-V	×	×	×
	Q06CCPU-V-B			
	Q12DCCPU-V			
	Q24DHCCPU-V			

○: Applicable, ×: N/A

* 1　Limited within the range of I/O points for the CPU module.
* 2　Can be installed to any I/O slot of a base unit.
* 3　Extension base unit cannot be installed to a safety CPU.

(b) Mounting to a MELSECNET/H remote I/O station
The EtherNet/IP module cannot be mounted to any MELSECNET/H remote I/O station.
Mount it together with a CPU module.

(2) Support of the multiple CPU system
When using the EtherNet/IP module in the multiple CPU system, refer to the following manual first.
☞ QCPU User's Manual (Multiple CPU System)

(a) Applicable EtherNet/IP module
The function version of the EtherNet/IP module has been "B" from the first release, which supports the multiple CPU system.

(b) Parameter writing from Utility Package
Write parameters only to the control CPU of the EtherNet/IP module.

(3) Applicable software packages
Systems using the EtherNet/IP module and applicable software versions are shown below.
- GX Developer or GX Works2 (Required)
  For setting parameters to a QCPU and creating sequence programs.
- Utility Package (SW1DNC-EIPUTL-E) (Required)
  For setting parameters and monitoring.

Table 2.2 Software packages

Item		Software version		
		GX Developer	GX Works2	Utility Package (SW1DNC-EIPUTL-E)
Q00J/Q00/Q01CPU	Single CPU system	Version 7 or later	Version 1.15R or later	Version 1.00A or later
	Multiple CPU system	Version 8 or later		
Q02/Q02H/Q06H/Q12H/Q25HCPU	Single CPU system	Version 4 or later		
	Multiple CPU system	Version 6 or later		
Q02PH/Q06PHCPU	Single CPU system	Version 8.68W or later	Version 1.87R or later	
	Multiple CPU system			
Q12PH/Q25PHCPU	Single CPU system	Version 7.10L or later		
	Multiple CPU system			
Q02U/Q03UD/Q04UDH/Q06UDHCPU	Single CPU system	Version 8.48A or later	Version 1.15R or later	
	Multiple CPU system			
Q13UDH/Q26UDHCPU	Single CPU system	Version 8.62Q or later		
	Multiple CPU system			
Q03UDE/Q04UDEH/Q06UDEH/Q13UDEH/Q26UDEHCPU	Single CPU system	Version 8.68W or later		
	Multiple CPU system			
Q00UJ/Q00U/Q01U/Q10UDH/Q20UDH/Q10UDEH/Q20UDEHCPU	Single CPU system	Version 8.76E or later		
	Multiple CPU system			
Q50UDEH/Q100UDEHCPU	Single CPU system	Cannot be used	Version 1.31H or later	
	Multiple CPU system			
Q03UDV/Q04UDV/Q06UDV/Q13UDV/Q26UDVCPU	Single CPU system		Version 1.98C or later	
	Multiple CPU system			

2 SYSTEM CONFIGURATION

2.2 Network Configuration and Components

This section describes the configuration and components of the EtherNet/IP network.

2.2.1 Network configuration

The following is a typical network structure where the EtherNet/IP module is used.
Connect the EtherNet/IP module to a 100BASE-TX or 10BASE-T network.
Network installation must be performed by a qualified professional since sufficient safety
measures are needed.

EtherNet/IP
network device

EtherNet/IP
network device

Twisted pair cable

Switching hub

EtherNet/IP module

EtherNet/IP compatible
programmable controller

- GX Works2
- Utility package
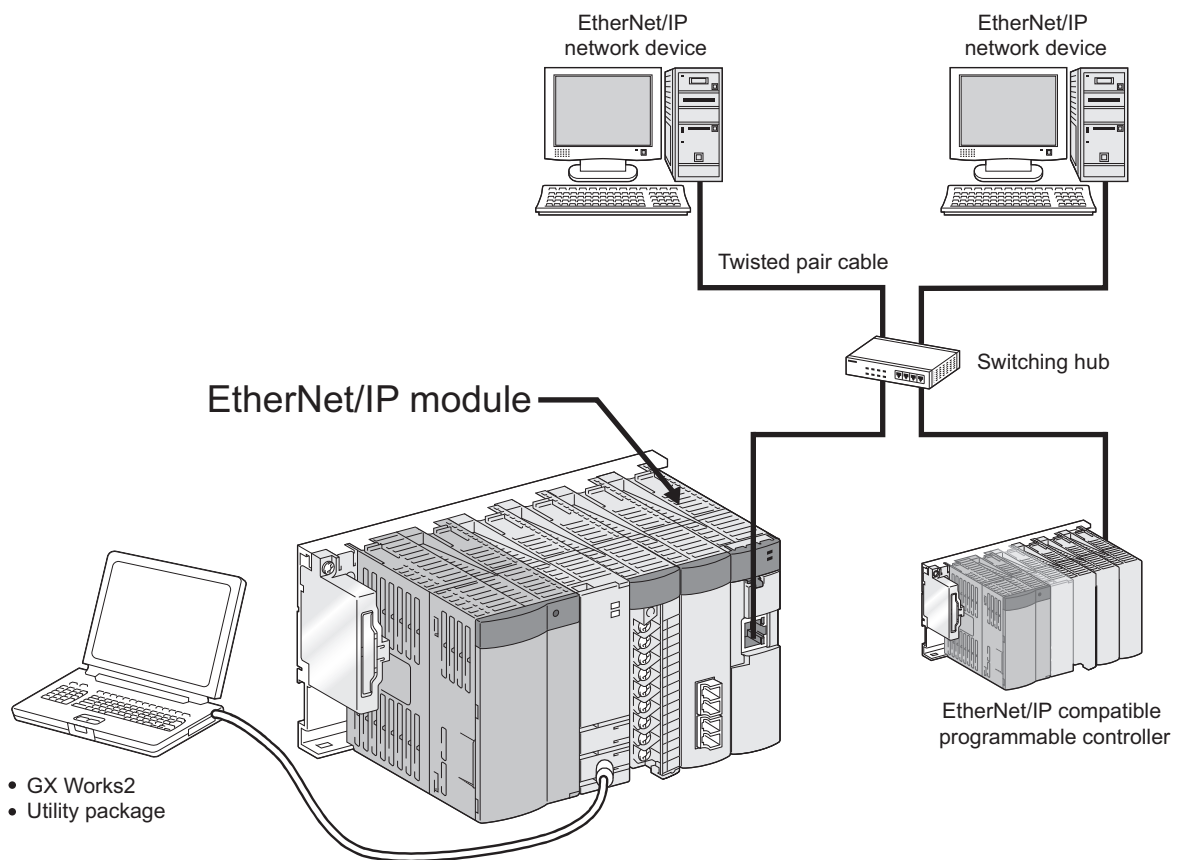
Figure 2.1 Network configuration

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

2.2.2　Network components of the EtherNet/IP network

This section describes components used for the EtherNet/IP network configuration.

(1) Twisted pair cable (sold separately)
Use twisted pair cables that meet IEEE802.3 100BASE-TX/10BASE-T standards.

(a) At 100Mbps

Table 2.3 Cables for 100Mbps

Applicable cable	Remarks
Straight cable of shielded twist pair (STP) cable	•Category 5 or higher, RJ45 Jack •Operation is not guaranteed when crossing cables are used.

(b) At 10Mbps

Table 2.4 Cables for 10Mbps

Applicable cable	Remarks
Straight cable of shielded twist pair (STP) cable	•Category 3 (4,5), RJ45 Jack
Straight cable of unshielded twisted pair (UTP) cable	•Operation is not guaranteed when crossing cables are used.

Remark ●

For details of wiring, refer to the following.

☞ Section 5.7 Wiring

● ●

(2) Switching hub
The EtherNet/IP module automatically distinguishes between 100BASE-TX and 10BASE-T according to the switching hub being used.

(a) Cascade connection
For details on the maximum number of levels in the cascade connection, check with the manufacturer of the switching hub being used.

(b) When the switching hub does not have the auto-negotiation function
Set the hub to Half-duplex communication mode.

2 SYSTEM CONFIGURATION

2.3 Operating Environment for Utility Package

This section describes the operating environment for Utility Package.

Table 2.5 Operating Environment for Utility Package

Item		Peripheral
Computer		Personal computer running Windows®
	CPU	Refer to Table 2.6 "Operating systems and personal computer requirements"
	Memory	
Disk space		100MB or more
Drive		CD-ROM drive
Display		Resolution 1024×768 dots or more
Operating system		Microsoft® Windows® XP Professional Operating System (Japanese version/English version) [1]
		Microsoft® Windows Vista® Business Operating System (Japanese version/English version)
		Microsoft® Windows Vista® Ultimate Operating System (Japanese version/English version)
		Microsoft® Windows® 7 Professional Operating System (Japanese version/English version)
		Microsoft® Windows® 7 Ultimate Operating System (Japanese version/English version)

* 1 For Microsoft® Windows® XP Professional, Service Pack2 or later is required.

Table 2.6 Operating systems and personal computer requirements

Operating system	Personal computer requirement	
	CPU	Memory
Windows® XP Professional	Pentium® 300MHz or more	128MB or more
Windows Vista® Business	Pentium® 1GHz or more	1GB or more
Windows Vista® Ultimate	Pentium® 1GHz or more	1GB or more
Windows® 7 Professional	Pentium® 1GHz or more	1GB or more
Windows® 7 Ultimate	Pentium® 1GHz or more	1GB or more

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

⊠POINT

(1) When using Windows® XP or Windows Vista®, the following functions cannot be used.
If any of the following functions is used, this product may not operate properly.
- Application startup in Windows® Compatibility Mode
- Fast User Switching
- Remote Desktop
- Large fonts (detailed setting in the window properties)
- DPI setting other than 100%

Also, 64-bit versions of Windows® XP and Windows Vista® are not supported.

(2) In addition, the following functions cannot be used when the computer is running under Windows® 7.
- Windows XP Mode
- Windows Touch

Also, 64-bit version of Windows® 7 is not supported.

(3) For Windows Vista® and Windows® 7, an authority of USER or higher must be used.

2 SYSTEM CONFIGURATION

2.4 Checking the Function Version and Serial Number

The function version and serial number of the EtherNet/IP module can be checked on the rating plate and system monitor in GX Works2.

(1) Confirming the serial number on the rating plate
The rating plate is situated on the side face of the EtherNet/IP module.
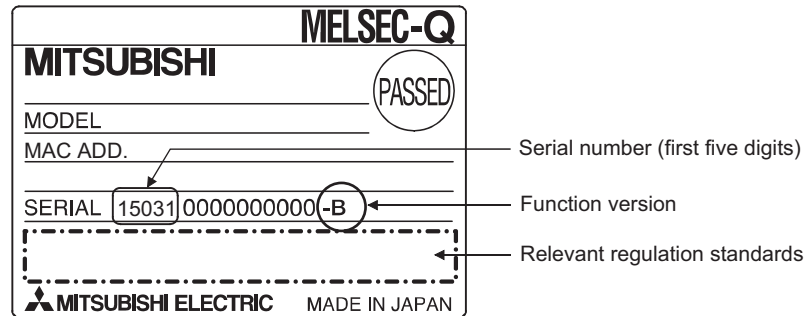
Figure 2.2 Rating plate

(2) Checking on the front of the module
The serial No. and function version on the rating plate are also indicated on the front of the module (lower part).
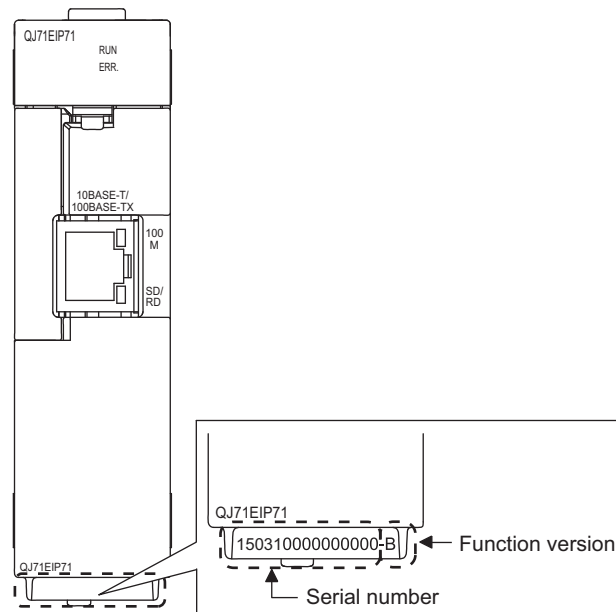
Figure 2.3 Front face of EtherNet/IP module

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

(3) Confirming the serial number on the system monitor (Product Information List)
To display the system monitor, select [Diagnostics] → [System Monitor] →
| Product Information List | button of GX Works2.

Function version

Serial number   Production number
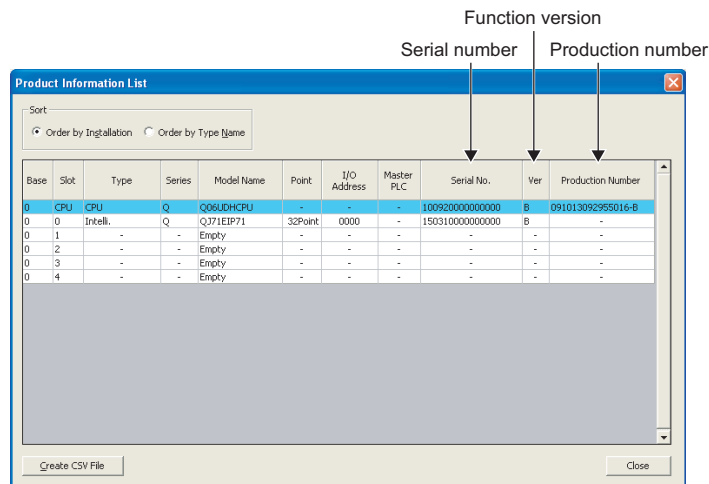
Figure 2.4 "Product Information List" window

1) Production number display
Since the EtherNet/IP module does not support the production number display,
"-" is displayed.

☒POINT

The serial number on the rating plate may not match the one displayed in the
Product Information List of GX Works2.

- The serial No. on the rating plate indicates the management information
  of the product.
- The serial number displayed in the Product Information List of GX Works2
  indicates functional information of the product.
  The functional information of the product is updated when a new function
  is added.

CHAPTER 3   SPECIFICATIONS

This chapter describes the performance specifications, input/output signals, and buffer memory of the EtherNet/IP module.
For general specifications, refer to the following manual.

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

3.1   Performance Specifications

The following table lists the specifications of the EtherNet/IP module.

Table 3.1 Performance Specifications

Item		Specifications	
Ethernet	Interface	10BASE-T	100BASE-TX
	Data transmission speed	10Mbps	100Mbps
	Transmission method	Base band	
	No. of cascade bases		
		Check with the manufacturer of the switching hub to be used	
	Maximum node-to-node distance	200m (For one hub)	
	Maximum segment length	100m (Distance between hub and node)	
	Connection cable	Cables that meet IEEE802.3 10BASE-T standards (Shielded twisted pair (STP) cable, or Unshielded twisted pair (UTP) cable, category 3(4,5))	Cables that meet IEEE802.3 100BASE-TX standards (Shielded twisted pair (STP) cable, category 5 or higher)
Class1 Tag communication	Maximum count of tags[2]	256 tags[1]	
	Maximum number of characters in a tag name	100 characters[5]	
	Max. send/receive data size[2]	For one tag: 722 words Total count of all tags: 32768 words[1]	
Class3/UCMM Tag communication [3]	Maximum count of tags[2]	256 tags[1]	
	Maximum number of characters in a tag name	100 characters[4][5]	
	Max. send/receive data size[2]	•For one tag: 252 words[4] •Total count of all tags: 32768 words[1]	
Number of writes to flash ROM		Maximum 100000 times	
Number of occupied I/O points		32 points (I/O assignment: intelli 32points)	
Internal current consumption (5VDC)		0.65A	
External dimensions		98(H) × 27.4(W) × 90(D)[mm]	
Weight		0.16kg	

* 1   Total of the Class1 Tag communication and the Class3/UCMM Tag communication.
* 2   The number of tags and the data size for Class1 or Class3/UCMM Tag communication can be changed from the default value in "Common Parameter" of the "Add Own Nic" window.
($\Box$ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window)
* 3   In the EtherNet/IP module, the buffer memory area used for communication data storage is common to Class3 and UCMM Tag communications. ($\Box$ Section 3.3.1 Buffer memory list)
* 4   This number is an overall size of a CIP data.
The maximum actual data size differs depending on the service to be executed since this is an overall size which includes a header.
[For Tag communication]
• For write service: Maximum (241 - Number of characters in a tag name) words

1 OVERVIEW
2 SYSTEM CONFIGURATION
3 SPECIFICATIONS
4 FUNCTION
5 PRE-OPERATION PROCEDURES
6 PARAMETER
7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)
8 PROGRAMMING

• For read service: Maximum 249 words

Table 3.2 Maximum actual data size

Item		Size
Class3 Tag communication	Read request	248 words
	Write request	$246 \text{ words} - \dfrac{\text{No. of letters in Tag name}}{2}$ words (Round up after the decimal point)
UCMM Tag communication	Read request	249 words
	Write request	$240 \text{ words} - \dfrac{\text{No. of letters in Tag name}}{2}$ words (Round up after the decimal point)

* 5 To use a tag name with 41 or more characters, the setting in "Add Own Nic" window is required.

(☞ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window)

The availability of a tag name with 41 or more characters differs depending on the version of the

EtherNet/IP module and Utility Package. (☞ Appendix 5 Added and enhanced Functions)

3 SPECIFICATIONS

3.2 I/O Signals for the QCPU

This section describes the I/O signals of the EtherNet/IP module.

3.2.1 I/O signal list

The following I/O signal assignment is based on the case where the start I/O No. of the EtherNet/IP module is "0000" (installed to slot 0 of the main base unit).
Device X represents input signals from the EtherNet/IP module to the QCPU.
Device Y represents output signals from the QCPU to the EtherNet/IP module.
The following shows the I/O signals to/from the QCPU.

Table 3.3 I/O signal list

Signal direction: EtherNet/IP module→QCPU		Signal direction: QCPU→EtherNet/IP module	
Device No.	**Signal name**	**Device No.**	**Signal name**
X00	Tag communication start process completion	Y00	Tag communication start request
X01	Use prohibited	Y01	Use prohibited
X02	PING test completion	Y02	PING test execution request
X03	Use prohibited	Y03	Use prohibited
X04		Y04	
X05		Y05	
X06	Flash ROM access completion	Y06	Flash ROM access request
X07	Flash ROM access error completion	Y07	Use prohibited
X08	TCP/UDP/IP parameter change completion	Y08	TCP/UDP/IP parameter change request
X09	Use prohibited	Y09	Use prohibited
X0A		Y0A	
X0B		Y0B	
X0C		Y0C	
X0D	Acquiring IP address	Y0D	
X0E	Own station error	Y0E	Own station error clear request
X0F	Module READY	Y0F	
X10	Use prohibited	Y10	Use prohibited
X11		Y11	
X12		Y12	
X13		Y13	
X14		Y14	
X15		Y15	
X16		Y16	
X17		Y17	
X18		Y18	
X19		Y19	
X1A		Y1A	
X1B		Y1B	
X1C		Y1C	
X1D		Y1D	
X1E		Y1E	
X1F	Watchdog timer error	Y1F	

⊠**POINT**

Do not output (turn ON) any of "Use prohibited" signals.
Doing so may cause malfunction of the programmable controller system.

1 OVERVIEW
2 SYSTEM CONFIGURATION
3 SPECIFICATIONS
4 FUNCTION
5 PRE-OPERATION PROCEDURES
6 PARAMETER
7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)
8 PROGRAMMING

3.2.2 Tag communication start request (Y00), Tag communication start process completion (X00)

These signals are used to start and stop a Tag communication.
The start timing of Tag communication after the Tag communication start request (Y00) is turned on varies by tag type.

Table 3.4 Start timing of Tag communication after the Tag communication start request (Y00) is turned on.

Tag type		Tag communication start timing
Class1 Tag communication	Producer Tag	Tag communication is executed when a request from the corresponding device is received.
	Consumer Tag	Tag communication starts upon completion of the processing for Tag communication start of the EtherNet/IP module.
Class3 Tag communication	Target	Tag communication is executed when a request from the corresponding device is received.
	Originator	Tag communication starts upon completion of the processing for Tag communication start of the EtherNet/IP module.
UCMM Tag communication	Target	Tag communication is executed when a request from the corresponding device is received.
	Originator	Tag communication starts when an Application Trigger request (Class3/UCMM) is turned on.

For details of Tag communications, refer to the following.
☞ Section 4.2 Tag Communication Function

(1) Operation

    (a) Write parameters to the EtherNet/IP module using Utility Package.

    (b) Confirm that all of the following signals are off before turning on the Tag communication start request (Y00).
        • PING test execution request (Y02)
        • Flash ROM access request (Y06)
        • TCP/UDP/IP parameter change request (Y08)
        • Acquiring IP address (X0D)

    (c) When Tag communication is started normally, the start addresses of send/receive data and the status of reserved tags are stored in the following areas, and the Tag communication start process completion (X00) is turned on.
        • Class1 send/receive data start address (Un\G25856 to Un\G26367)
        • Class3/UCMM send/receive data start address (Un\G26368 to Un\G26879)
        • Reserved tag (Class1)(Un\G27168 to Un\G27183)
        • Reserved tag (Class3/UCMM)(Un\G27216 to Un\G27231)
Upon completion of storing data in the above areas, Tag communication is started.
The status and data of the Tag communication are stored in the following areas.
        • Communication Status (Class1)(Un\G27136 to Un\G27151)
        • Communication Status (Class3/UCMM)(Un\G27184 to Un\G27199)
        • Input Area (Un\G0 to Un\G8191)
        • Output Area (Un\G8192 to Un\G16383)

(d) When a Tag communication fails to start, the Tag communication start process completion (X00) is turned on and the ERR. LED flashes.

Check the error code in any of the following areas and take corrective actions.

Table 3.5 Corrective actions for Tag communication start failure

Item	Action
Checking in Utility Package	Check the error on the "Main" tab and take corrective actions. (☞ Section 7.6 "Main" Tab (Module Status Display))
Checking in buffer memory	Check the error code in any of the following areas and take corrective actions. (☞ Section 9.4 Error Code) •Own station error status (Un\G27264) •Class1 Diagnostics Information (Un\G27392 to Un\G27647) •Class3/UCMM Diagnostics Information (Un\G27648 to Un\G27903)

(e) Check that the Tag communication start process completion (X00) is on, and then turn off the Tag communication start request (Y00).

The following signals turn off and the Tag communication stops.

- Tag communication start process completion (X00)
- Own station error (X0E)

Subsequently, the following buffer memory areas are cleared.

- Class1 send/receive data start address (Un\G25856 to Un\G26367)
- Class3/UCMM send/receive data start address (Un\G26368 to Un\G26879)
- Communication status (Class1)(Un\G27136 to Un\G27183)
- Communication status (Class3/UCMM)(Un\G27184 to Un\G27231)

⊠**POINT**

By using the Tag com. continue setting (Un\G16634), Tag communication can be continued when the Tag communication start request (Y00) is turned off.

(☞ Section 3.3.6 Tag communication continue setting)

3.2 I/O Signals for the QCPU
3.2.2 Tag communication start request (Y00), Tag communication start process completion (X00)

3 - 5

(2) Timing chart

(a) When Tag communication started (Normal)

⎯⎯⎯⎯▶	Performed by user
- - - - - - -▶	Performed by the EtherNet/IP module
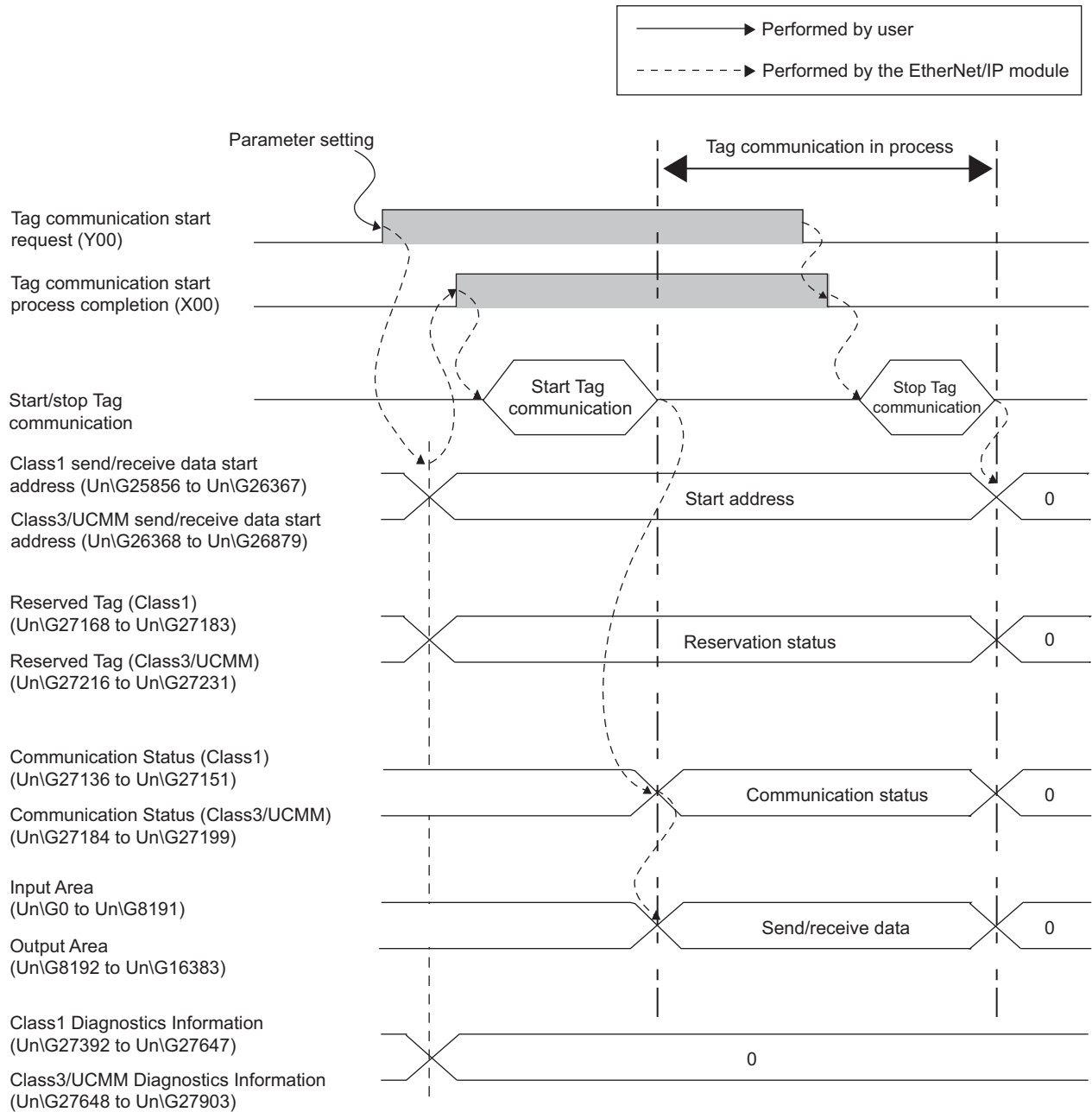
Figure 3.1 When Tag communication started (Normal)

Remark •

For details of the handshaking for read/write of send/receive data, refer to the following.

☞ Section 4.2.1 Class1 Tag communication
☞ Section 4.2.2 Class3 Tag communication
☞ Section 4.2.3 UCMM Tag communication

• •

(b) When Tag communication does not start (Error)
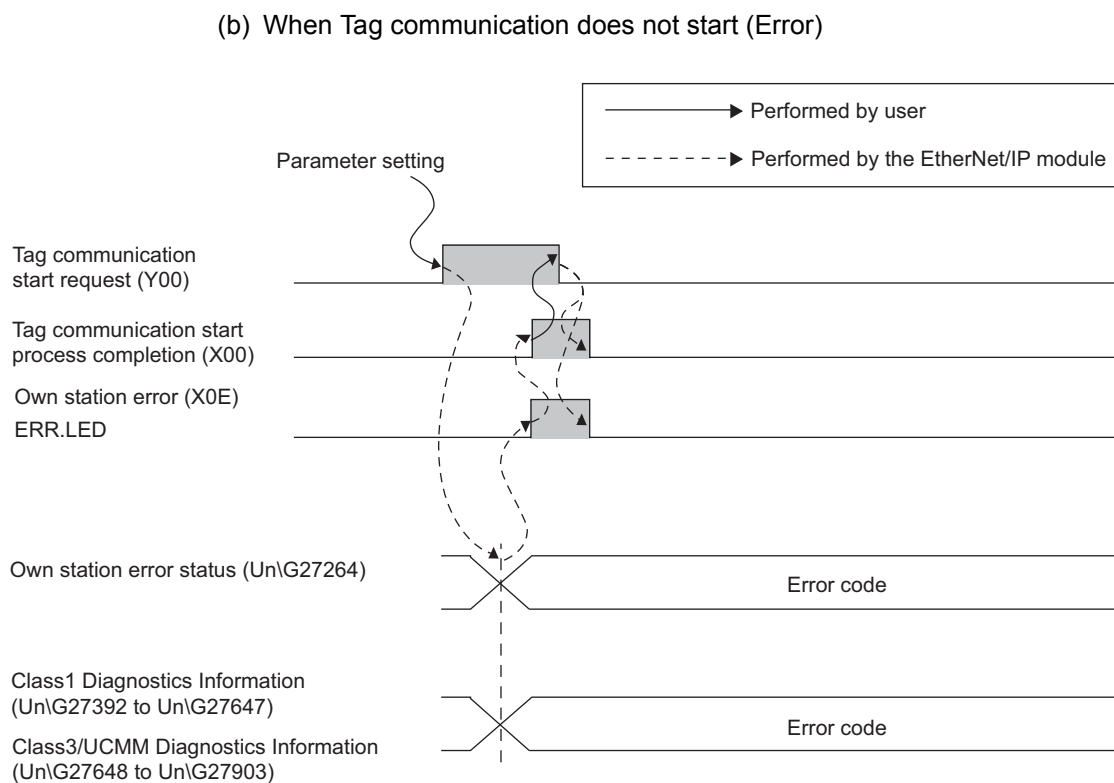
Figure 3.2 When Tag communication does not start (Error)

3.2 I/O Signals for the QCPU
3.2.2 Tag communication start request (Y00), Tag communication start process completion (X00)

3 - 7

1
OVERVIEW

2
SYSTEM CONFIGURATION

3
SPECIFICATIONS

4
FUNCTION

5
PRE-OPERATION PROCEDURES

6
PARAMETER

7
UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8
PROGRAMMING

3.2.3　PING test execution request (Y02), PING test completion (X02)

PING test can be executed from Utility Package.
The signals introduced in this section are used in a sequence program to perform a PING test.
For details and a program example of the PING test, refer to the following.
☞ Section 5.8 PING Test

(1) Operation

(a) Conditions for PING test are stored into the PING test request area (Un\G27904 to Un\G27907).

⊠**POINT**

Before turning on PING test execution request (Y02), check that the following conditions are met.
- Acquiring IP address (X0D) is off.
- Tag communication start request (Y00) is off.
- TCP/UDP/IP parameter change request (Y08) is off.
- The "Main" tab and "Monitoring" tab are not displayed on Utility Package.
- The PING test has not been executed on Utility Package.

(b) Turning on the PING test execution request (Y02) executes the PING test.

(c) When the PING test is completed normally, the test result is stored into the PING test result area (Un\G27908 to Un\G27911) and the PING test completion (X02) turns on.

(d) If the PING test fails, an error code is stored into the PING test result area (Un\G27908 to Un\G27911), and the PING test completion (X02) turns on.
Check the error code and take corrective actions. (☞ Section 9.4 Error Code)

(e) Check that the PING test completion (X02) is on, and turn off the PING test execution request (Y02).

(f) The PING test completion (X02) turns off.

3.2.4 Flash ROM access request (Y06)/Access completion (X06)/Access error completion (X07)

These signals are for saving parameters in the flash ROM.

(1) Operation

(a) Turning on the Flash ROM access request (Y06) starts saving.

⊠**POINT**

Before turning on Flash ROM access request (Y06), check that the following conditions are met.
- Tag communication start request (Y00) is off.
- PING test execution request (Y02) is off.
- TCP/UDP/IP parameter change request (Y08) is off.
- The "Main" tab and "Monitoring" tab are not displayed on Utility Package.
- The PING test has not been executed on Utility Package.

(b) Upon completion of saving, the Flash ROM access completion (X06) is turned on. When saving completed normally, the saved IP address automatically validated.

(c) If it fails, the following signals are turned on and the ERR. LED flashes rapidly.
- Own station error (X0E)
- Flash ROM access completion (X06)
- Flash ROM access error completion (X07)

Check the error code in any of the following areas and take corrective actions.

Table 3.6 When failed to save parameters

Item	Action
Checking in Utility Package	Check the error on the "Main" tab and take corrective actions. (⊂𝄐 Section 7.6 "Main" Tab (Module Status Display))
Checking in buffer memory	Check the error code in the Own station error status (Un\G27264) and take corrective actions. (⊂𝄐 Section 9.4 Error Code) For a parameter error, the error details are stored in the following buffer memory areas. [When a TCP/UDP/IP parameter is invalid] •TCP/UDP/IP parameter error information (Un\G27265 to Un\G27267) [When Tag Parameter data is invalid] •Class1 Diagnostics Information (Un\G27392 to Un\G27647) •Class3/UCMM Diagnostics Information (Un\G27648 to Un\G27903)

(d) Check that the Flash ROM access completion (X06) is on and turn off the Flash ROM access request (Y6).
The following signals will turn off.
- Flash ROM access completion (X06)
- Flash ROM access error completion (X07)

(e) The EtherNet/IP module starts its operation according to the parameters updated on the flash ROM.

3.2 I/O Signals for the QCPU
3.2.4 Flash ROM access request (Y06)/Access completion (X06)/Access error completion (X07)

3 - 9

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

3.2.5 TCP/UDP/IP parameter change request (Y08), TCP/UDP/IP parameter change completion (X08)

TCP/UDP/IP parameters can be set in Utility Package.
Use this signal when setting parameters such as IP addresses in the TCP/UDP/IP parameter (Un\G16385 to Un\G16387).

(1) Program example of parameter change request
A request for parameter change is executed by the following sequence program.
In the following example, the start I/O No. of the EtherNet/IP module is set to "0000".
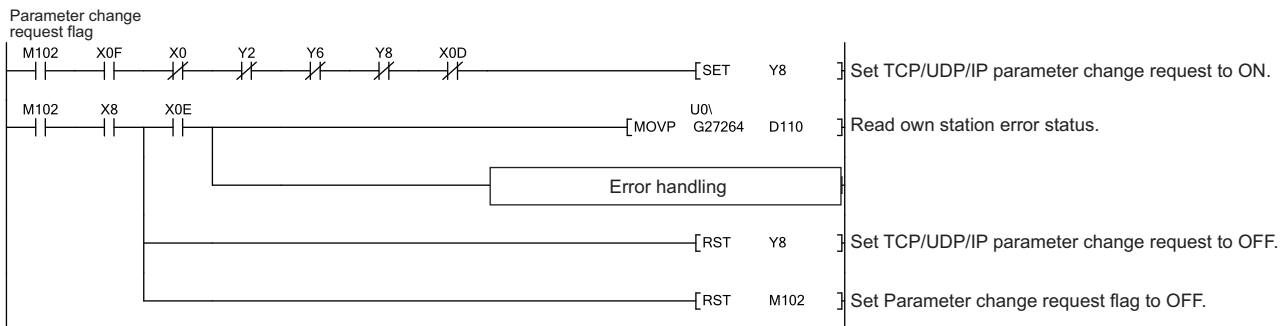
Figure 3.3 Program example of parameter change request

☒**POINT**

(1) Data such as changed IP addresses can be checked on the "Main" tab of Utility Package. (☞ Section 7.6 "Main" Tab (Module Status Display))
(2) To keep the parameters unchanged after turning off the programmable controller or resetting the CPU module, save the parameters in the flash ROM. (☞ Section 6.2 Access to the Flash ROM)

(2) Operation

(a) Turning on the TCP/UDP/IP parameter change request (Y08) sends a parameter change request.

⊠POINT

Before turning on TCP/UDP/IP parameter change request (Y08), check that the following conditions are met.
- Tag communication start request (Y00) is off.
- PING test execution request (Y02) is off.
- TCP/UDP/IP parameter change request (Y08) is off.
- The "Main" tab and "Monitoring" tab are not displayed on Utility Package.
- The PING test has not been executed on Utility Package.

(b) When parameter change is completed normally, the TCP/UDP/IP parameter change completion (X08) turns on.

(c) If parameter change fails, the following signals are turned on, and the ERR. LED flashes rapidly.
- Own station error (X0E)
- TCP/UDP/IP parameter change completion (X08)

Check the error code in any of the following areas and take corrective actions.

Table 3.7 When failed to change parameters

Item	Action
Checking in Utility Package	Check the error on the "Main" tab and take corrective actions. (☞ Section 7.6 "Main" Tab (Module Status Display))
Checking in buffer memory	Check the error code in the Own station error status (Un\G27264) and take corrective actions. (☞ Section 9.4 Error Code) The parameters with error can be checked in the TCP/UDP/IP parameter error information (Un\G27265 to Un\G27267).

(d) Check that the TCP/UDP/IP parameter change completion (X08) is on, and turn off the TCP/UDP/IP parameter change request (Y08).
The TCP/UDP/IP parameter change completion (X08) turns off.

1

OVERVIEW

2

SYSTEM CONFIGURATION

3

SPECIFICATIONS

4

FUNCTION

5

PRE-OPERATION PROCEDURES

6

PARAMETER

7

UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8

PROGRAMMING

3.2 I/O Signals for the QCPU
3.2.5 TCP/UDP/IP parameter change request (Y08), TCP/UDP/IP parameter change completion (X08)

3 - 11

3.2.6 Acquiring IP address (X0D)

This signal turns on while the EtherNet/IP module is acquiring an IP address from the DHCP server.

This signal turns on only when the DHCP client function of the EtherNet/IP module is set to "Use".

For details of the DHCP client function, refer to the following.

☞ Section 4.5 DHCP Client Function

3.2.7 Own station error clear request (Y0E), Own station error (X0E)

These signals are used to check for a station error of the EtherNet/IP module and to clear the error.

(1) Operation

 (a) If an error occurs in the EtherNet/IP module, the Own station error (X0E) is set to on and the ERR. LED turns on or flashes.

 (b) An error code is stored into the Own station error status (Un\G27264).
  For details of error code checking, refer to the following.
  ☞ Section 9.4.1 How to check error codes

 (c) Turning on the Own station error clear request (Y0E) after removing the error cause clears the error.
  The ERR. LED and the Own station error (X0E) turn off.
  Also, the Own station error status (Un\G27264) turns off.

 (d) After clearing the own station error, turn off the Own station error clear request (Y0E).
  The following states remain unchanged while the Own station error clear request (Y0E) is on.
   • The ERR. LED is off
   • The Own station error (X0E) is off
   • The Own station error clear status (Un\G27264) is cleared

(2) Timing chart

| | Performed by user |
| | Performed by the EtherNet/IP module |

Own station error clear
request (Y0E)

Own station error (X0E)

ERR. LED

Error
occurrence

Error cause
resolved

Own station error status
(Un\G27264)

| 0 | Error code | 0 |
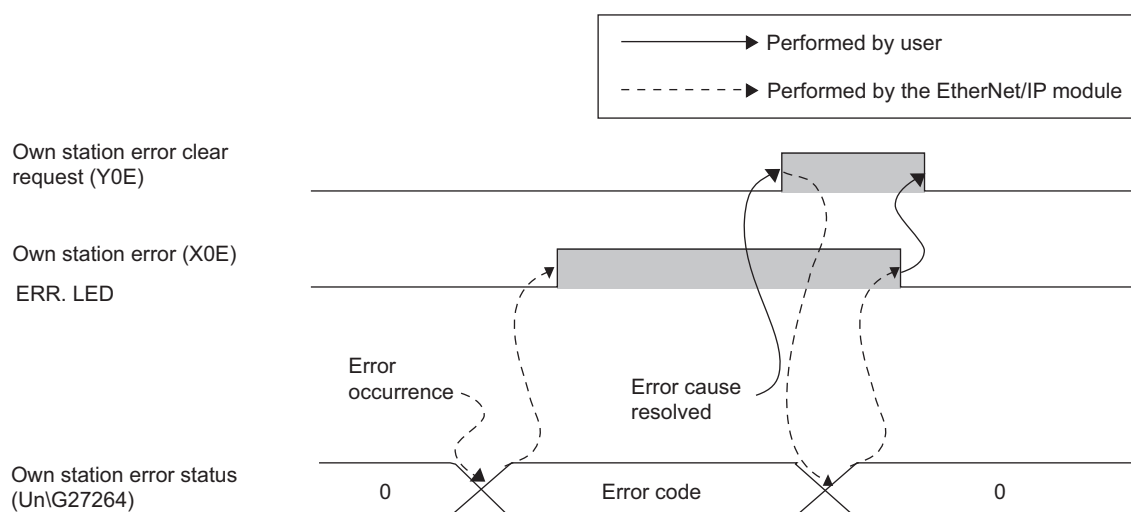
Figure 3.4 Own station error

Remark •

(1) For the timing charts for errors that may occur when starting Tag
communication, accessing the flash ROM, and changing TCP/UDP/IP
parameters, refer to the following.

☞ Section 3.2.2 Tag communication start request (Y00), Tag
communication start process completion (X00)

☞ Section 3.2.4 Flash ROM access request (Y06)/Access completion
(X06)/Access error completion (X07)

☞ Section 3.2.5 TCP/UDP/IP parameter change request (Y08),
TCP/UDP/IP parameter change completion (X08)

(2) For error codes and the ERR. LED, refer to the following.

☞ Section 9.2 Checking Errors by the LED and Corrective Actions

☞ Section 9.4 Error Code

• •

3.2.8   Module READY (X0F)

This signal turns on when the EtherNet/IP module is started.

   (a) The Module READY (X0F) turns on when the EtherNet/IP module is started.

   (b) It turns off when the EtherNet/IP module goes down.
      The signal also turns off when:
        • The CPU module is reset.
        • When the Watchdog timer error (X1F) is on.

3.2.9   Watch dog timer error (X1F)

This signal turns on when a watchdog timer error occurs in the EtherNet/IP module.

   (a) The Watchdog timer error (X1F) turns on when a watchdog timer error occurs in the EtherNet/IP module.

   (b) The Watchdog timer error (X1F) will not turn off until either of the following operations is performed.
        • Power off and then on the programmable controller.
        • Resetting the CPU module.

If the above operations do not function, please consult your local Mitsubishi representative.

3 - 14
    3.2 I/O Signals for the QCPU
    3.2.8 Module READY (X0F)

3.3 Buffer Memory

This chapter describes the buffer memory of the EtherNet/IP module.

3.3.1 Buffer memory list

The following table lists the buffer memory areas used for data communication between the EtherNet/IP module and a CPU module.

Table 3.8 Buffer memory list

Address (Dec.(Hex.))	Application	Name		Initial value	Read/write *1	Reference section
0 to 4095[*2] (0H to FFFH)	Input Area	Class1 Input Area		0	R	Section 3.3.9
4096 to 8191[*2] (1000H to 1FFFH)		Class3/UCMM Input Area		0	R	
8192 to 12287[*2] (2000H to 2FFFH)	Output Area	Class1 Output Area		0	R/W	Section 3.3.10
12288 to 16383[*2] (3000H to 2FFFH)		Class3/UCMM Output Area		0	R/W	
16384 (4000H)	Use prohibited	System area		-	-	-
16385 (4001H)	TCP/UDP/IP parameter	DHCP setting		0	R/W	Section 3.3.3
16386 to 16387 (4002H to 4003H)		IP Address		C00100FEH	R/W	
16388 to 16632 (4004H to 40F8H)	Use prohibited	System area		-	-	-
16633 (40F9H)	Battery checking	Battery error detection setting		0	R/W	Section 3.3.18
16634 (40FAH)	Tag com. continue setting	Tag com. continue setting		0	R/W	Section 3.3.6
16635 (40FBH)		Tag com. continue setting status		0	R	
16636 (40FCH)	Common parameter	Class1 Tag Counts		128	R	Section 3.3.4
16637 to 16639 H to 40FFH)	Use prohibited	System area		-	-	-
16640 to 16653[*3] (4100H to 410DH)	Class1 Tag parameter	Tag No.1	System area	-	-	-
16654[*3] (410EH)			Data Size	0	R	Section 3.3.5
16655 to 16674[*3] (410FH to 4122H)			System area	-	-	-
16675 to 21119[*3] (4123H to 527FH)		Tag No.2 to No.128	Same as Tag No.1			Section 3.3.5
21120 to 25727[*3] (5280H to 647FH)	Use prohibited	System area		-	-	-
25728 (6480H)	Setting status	Intelligent function module switch status		0	R	Section 3.3.2
25729 to 25732 (6481H to 6484H)	Use prohibited	System area		-	-	-

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

Table 3.8 Buffer memory list (Continued)

Address (Dec.(Hex.))	Application	Name	Initial value	Read/write *1	Reference section
25733 to 25735 (6485H to 6487H)	Setting status	Ethernet address (MAC address)	Module unique	R	Section 3.3.2
25736 to 25782 (6488H to 64B6H)	Use prohibited	System area	-	-	-
25783 (64B7H)	Battery checking	Battery status	0	R	Section 3.3.18
25784 to 25855 (64B8H to 64FFH)	Use prohibited	System area	-	-	-
25856 to 26111 (6500H to 65FFH)	Class1 send/receive data start address	Class1 receive data start address	FFFFH	R	Section 3.3.7
26112 to 26367 (6600H to 66FFH)		Class1 send data start address	FFFFH	R	
26368 to 26623 (6700H to 67FFH)	Class3/UCMM send/receive data start address	Class3/UCMM receive data start address	FFFFH	R	Section 3.3.8
26624 to 26879 (6800H to 68FFH)		Class3/UCMM send data start address	FFFFH	R	
26880 to 27007 (6900H to 697FH)	Use prohibited	System area	-	-	-
27008 to 27023 (6980H to 698FH)	Application Trigger (Class1)	Application Trigger request (Class1)	0	R/W	Section 3.3.11
27024 to 27039 (6990H to 699FH)		Application Trigger acceptance (Class1)	0	R	
27040 to 27055 (69A0H to 69AFH)		Application Trigger completion (Class1)	0	R	
27056 to 27071 (69B0H to 69BFH)	Use prohibited	System area	-	-	-
27072 to 27087 (69C0H to 69CFH)	Application Trigger (Class3/UCMM)	Application Trigger request (Class3/UCMM)	0	R/W	Section 3.3.12
27088 to 27103 (69D0H to 69DFH)		Application Trigger acceptance (Class3/UCMM)	0	R	
27104 to 27119 (69E0H to 69EFH)		Application Trigger completion (Class3/UCMM)	0	R	
27120 to 27135 (69F0H to 66FFH)	Use prohibited	System area	-	-	-
27136 to 27151 (6A00H to 6A0FH)	Communication status (Class1)	Communication Status (Class1)	0	R	Section 3.3.14
27152 to 27167 (6A10H to 6A1FH)		Communication Error (Class1)	0	R	
27168 to 27183 (6A20H to 6A2FH)		Reserved tag (Class1)	0	R	
27184 to 27199 (6A30H to 6A3FH)	Communication status (Class3/UCMM)	Communication Status (Class3/UCMM)	0	R	Section 3.3.15
27200 to 27215 (6A40H to 6A4FH)		Communication Error (Class3/UCMM)	0	R	
27216 to 27231 (6A50H to 6A5FH)		Reserved tag (Class3/UCMM)	0	R	
27232 to 27263 (6A60H to 6A7FH)	Use prohibited	System area	-	-	-
27264 (6A80H)	Own station error information	Own station error status	0	R	Section 3.3.16
27265 to 27267 (6A81H to 6A83H)		TCP/UDP/IP parameter error information	0	R	
27268 (6A84H)		Self-diagnostics execution result	0	R	

Table 3.8 Buffer memory list (Continued)

Address (Dec.(Hex.))	Application	Name		Initial value	Read/write *1	Reference section
27269 to 27391 (6A85H to 6AFFH)	Use prohibited	System area		-	-	-
27392 (6B00H)	Operation status	Class1 Diagnostics Information	Tag No.1	0	R	Section 3.3.13
27393 to 27647 (6B01H to 6BFFH)			Tag No.2 to No.256	0	R	
27648 (6C00H)		Class3/UCMM Diagnostics Information	Tag No.1	0	R	
27649 to 27903 (6C01H to 6CFFH)			Tag No.2 to No.256	0	R	
27904 (6D00H)	PING test	PING test request area	Communication time check	0	R/W	Section 3.3.17
27905 (6D01H)			Transmission count	0	R/W	
27906 to 27907 (6D02H to 6D03H)			IP address	0	R/W	
27908 (6D04H)		PING test result area	Execution result	0	R	
27909 (6D05H)			Total packet transmission count	0	R	
27910 (6D06H)			Success count	0	R	
27911 (6D07H)			Failure count	0	R	
27912 to 32767 (6D08H to 7FFFH)	Use prohibited	System area		-	-	-

* 1 Indicates whether reading or writing can be performed.
R: Read only, W: Write only, R/W: Both read from and write in available
* 2 The addresses are applicable when the Common Parameter is set by default.
The addresses change depending on the Common Parameter setting.
(☞ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window)
* 3 When using a tag name with 41 or more characters, the addresses are as follows.

Table 3.9 Addresses when using a tag name with 41 or more characters

Address (Dec.(Hex.))	Application	Name	
16640 to 16653 (4100H to 410DH)	Class1 Tag parameter	Tag No.1	System area
16654 (410EH)			Data Size
16655 to 16704 (410FH to 4140H)			System area
16705 to 20799 (4141H to 513FH)		Tag No.2 to No.64	Same as Tag No.1
20800 to 25727 (5140H to 647FH)	Use prohibited	System area	

⊠**POINT**

Do not write any data in the system area (use prohibited).
Doing so may cause malfunction of the programmable controller system.

1
OVERVIEW

2
SYSTEM CONFIGURATION

3
SPECIFICATIONS

4
FUNCTION

5
PRE-OPERATION PROCEDURES

6
PARAMETER

7
UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8
PROGRAMMING

3.3.2 Setting status

Intelligent function module switch setting and Ethernet address are stored in this area.

(1) Intelligent function module switch status (Un\G25728)
The setting of the Intelligent function module switch 1 for the EtherNet/IP module is stored.
For details of the Intelligent function module switch setting, refer to the following.
☞ Section 5.5.2 Switch setting for the intelligent function module

(2) Ethernet address (MAC address)(Un\G25733 to Un\G25735)
The Ethernet address of the EtherNet/IP module is stored.
The Ethernet address data are stored in order from the least significant word.

Example: When the Ethernet address is "08-00-70-00-1A-34".

Table 3.10 When the Ethernet address is "08-00-70-00-1A-34".

Address	Stored value	
Un\G25733	1A34H	5th and 6th octet of the Ethernet address
Un\G25734	7000H	3rd and 4th octet of the Ethernet address
Un\G25735	0800H	1st and 2nd octet of the Ethernet address

3.3.3 TCP/UDP/IP parameter

Parameters such as IP address of the EtherNet/IP module are stored in this area.
TCP/UDP/IP parameters can be set in Utility Package.
This area is used when setting TCP/UDP/IP parameters by sequence program.
The parameters set in this area are reflected into the EtherNet/IP module by either of the following signals.

- When saving parameters to flash ROM
  Flash ROM access request (Y06)
  (☞Section 3.2.4 Flash ROM access request (Y06)/Access completion (X06)/Access error completion (X07))

- When not saving parameters to flash ROM
  TCP/UDP/IP parameter change request (Y08)
  (☞Section 3.2.5 TCP/UDP/IP parameter change request (Y08), TCP/UDP/IP parameter change completion (X08))

(1) DHCP setting (Un\G16385)
   Select "Use" or "Not use" for the DHCP client function of the EtherNet/IP module.
   - 0: Not use
   - 1: Use

   For details of the DHCP client function, refer to the following.
   ☞Section 4.5 DHCP Client Function

(2) IP Address (Un\G16386 to Un\G16387)
   Set the IP address of the EtherNet/IP module.
   IP address data are stored in order from the least significant word.

   When the IP address is "192.168.0.1"

   Table 3.11 IP Address "192.168.0.1"

Address		Stored value
Un\G16386	0001H	3rd and 4th octet of the Ethernet address
Un\G16387	C0A8H	1st and 2nd octet of the Ethernet address

3.3.4 Common parameter

Common parameter must be set in Utility Package.
This area is used for checking the number of tags in a sequence program.
(☞ Section 8.4.1 Program example of Tag communication)

(1) Class1 Tag Counts (Un\G16636)
The number of tags used for Class1 Tag communication is stored.

Table 3.12 Class1 Tag Counts

Bit	Description	Stored value
b0 to b14	Class1 Tag Counts	0 to 256
b15	System area	-

The number of tags used in Class3/UCMM Tag communication is automatically
calculated with the value set in this area and the result is displayed in the Utility
Package setting window.
(☞ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window)

3.3.5 Class1 Tag parameter

Class1 Tag Parameter must be set in Utility Package.
This area is used for checking the data size for each tag No. in a sequence program.
(☞ Section 8.4.1 Program example of Tag communication)

(1) Data Size (Un\G16654 and later)
Set the data size of each tag.
• Setting range: 0 to 722 words

The following list shows the data size area address for each tag No.

Table 3.13 Data Size area address for each tag No.

Tag No.	Up to 40 characters in a tag name	41 or more characters in a tag name
No.1	Un\G16654	Un\G16654
No.2	Un\G16689	Un\G16719
No.3	Un\G16724	Un\G16784
No.4	Un\G16759	Un\G16849
No.5	Un\G16794	Un\G16914
:	:	:

3.3.6 Tag communication continue setting

This area is used to set whether to stop or continue the Tag communication when the Tag communication start request (Y00) is turned off after on.

(1) Tag com. continue setting (Un\G16634)

Set whether to stop or continue the Tag communication when the Tag communication start request (Y00) is turned off.

This setting is useful for continuing Tag communication in the case of CPU module stop.

Table 3.14 Tag com. continue setting (Un\G16634)

Setting value	Description
0000H	Stops Tag communication when the Tag communication start request (Y00) is turned off.
0010H	Continues Tag communication when the Tag communication start request (Y00) is turned off.

Settings of the Tag com. continue setting (Un\G16634) are reflected into the EtherNet/IP module when the Tag communication start request (Y00) is turned on.

(2) Tag com. continue setting status (Un\G16635)

The setting status of the Tag com. continue setting (Un\G16634) is stored.

Table 3.15 Tag com. continue setting status (Un\G16635)

Stored value	Description
0000H	The setting of the Tag com. continue setting (Un\G16634) has not been updated in the EtherNet/IP module.
0001H	Continues Tag communication when the Tag communication start request (Y00) is turned off.
0002H	Stops Tag communication when the Tag communication start request (Y00) is turned off.

3.3.7 Class1 send/receive data start address

Start addresses of Class1 Tag communication data are stored in this area.
For details of the timing chart, refer to the following.

☞ Section 3.2.2 (2) Timing chart

(1) Class1 receive data start address (Un\G25856 to Un\G26111)
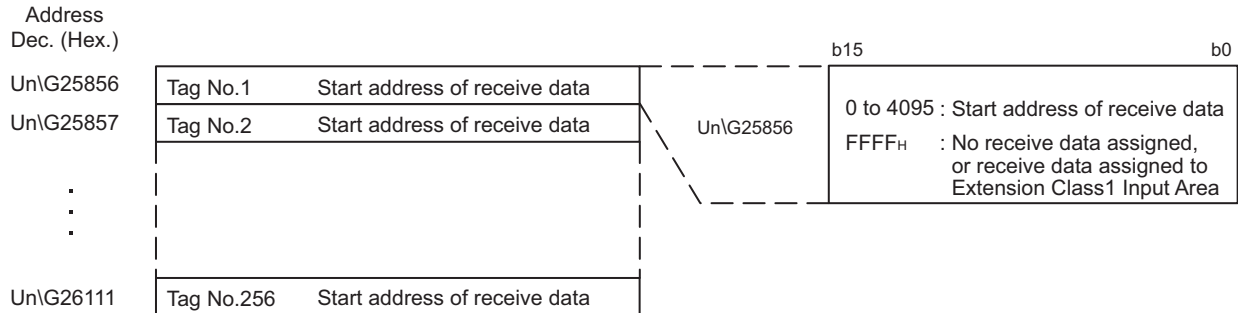Start addresses of Consumer Tags in Class1 Tag communication are stored.

Address Dec. (Hex.)				b15		b0
Un\G25856	Tag No.1	Start address of receive data				
Un\G25857	Tag No.2	Start address of receive data	Un\G25856	0 to 4095 : Start address of receive data		
⋮				FFFF$_H$	: No receive data assigned, or receive data assigned to Extension Class1 Input Area	
Un\G26111	Tag No.256	Start address of receive data				

Figure 3.5 Class1 receive data start address (Un\G25856 to Un\G26111)

(2) Class1 send data start address (Un\G26112 to Un\G26367)
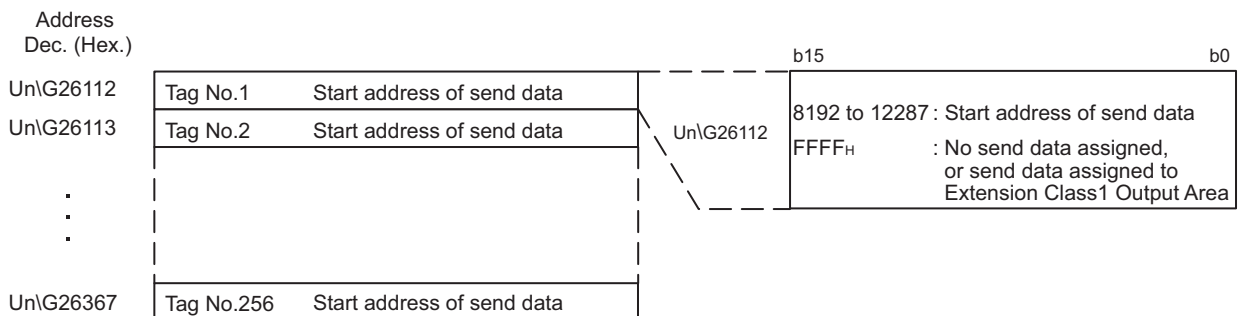Start addresses of Producer Tags in Class1 Tag communication are stored.

Address Dec. (Hex.)				b15		b0
Un\G26112	Tag No.1	Start address of send data				
Un\G26113	Tag No.2	Start address of send data	Un\G26112	8192 to 12287 : Start address of send data		
⋮				FFFF$_H$	: No send data assigned, or send data assigned to Extension Class1 Output Area	
Un\G26367	Tag No.256	Start address of send data				

Figure 3.6 Class1 send data start address (Un\G26112 to Un\G26367)

Remark •

Start addresses of Class1 communication data can be checked in Utility Package.

Start address of send/receive data
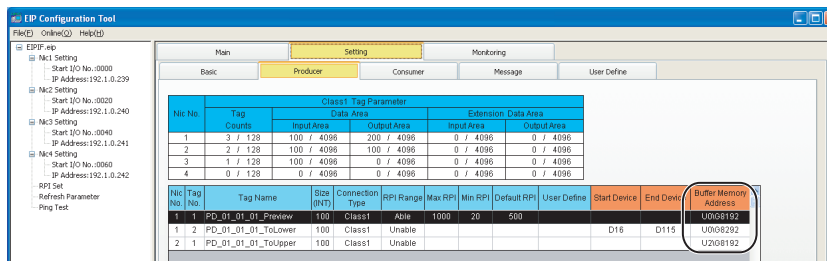
Figure 3.7 Checking with Utility Package

• •

3.3.8 Class3/UCMM send/receive data start address

Start addresses of Class3/UCMM Tag communication data are stored in this area.
For details of the timing chart, refer to the following.

☞ Section 3.2.2 (2) Timing chart

(1) Class3/UCMM receive data start address (Un\G26368 to Un\G26623)
Start addresses of receive data in Class3/UCMM Tag communication are stored in this area.
The following tag data are stored.

Table 3.16 Receive data of Class3/UCMM Tag

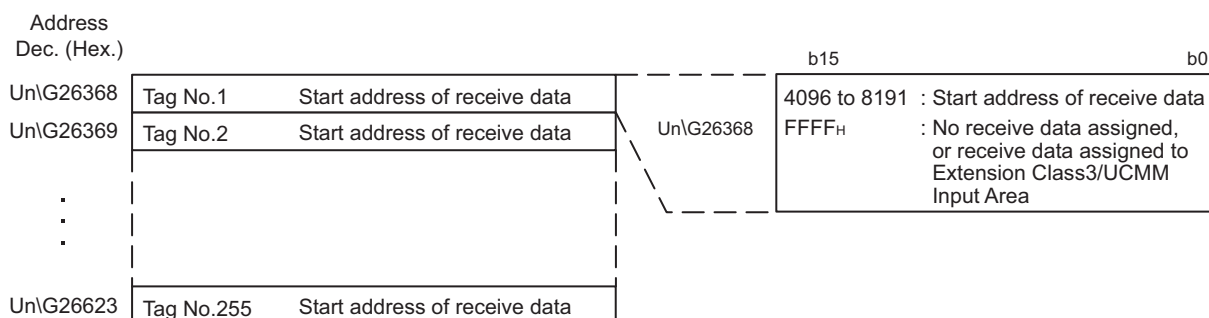| Item	Class3/UCMM Tag setting in EtherNet/IP module	
	Target/Originator	Read/Write
Data read out from the target device by read request	Originator	Read
Data written by write request from the target device	Target	Write

Figure 3.8 Class3/UCMM receive data start address (Un\G26368 to Un\G26623)

(2) Class3/UCMM send data start address (Un\G26624 to Un\G26879)
Start addresses of send data in Class3/UCMM Tag communication are stored in this area.
The following tag data are stored.

Table 3.17 Send data of Class3/UCMM Tag

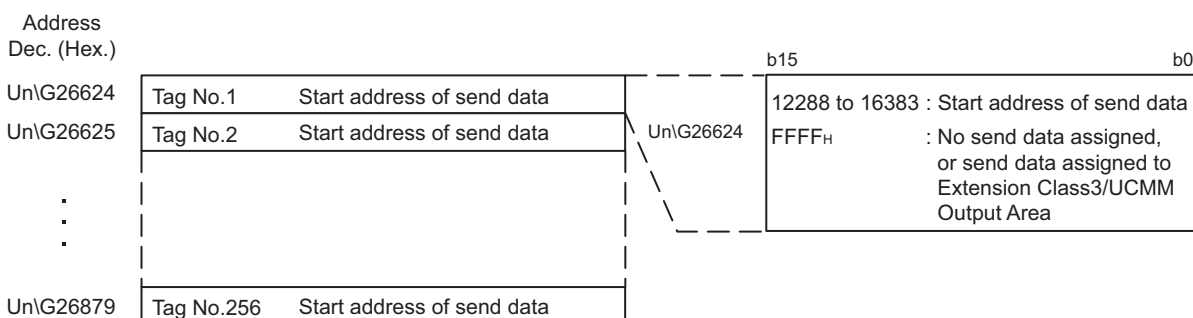| Item	Class3/UCMM Tag setting in EtherNet/IP module	
	Target/Originator	Read/Write
Data to be written to the target device Tag by write request	Originator	Write
Data to be read out from the target device by read request	Target	Read

Figure 3.9 Class3/UCMM send data start address (Un\G26624 to Un\G26879)

Remark •

Start addresses of Class3/UCMM communication data can be checked in Utility Package.
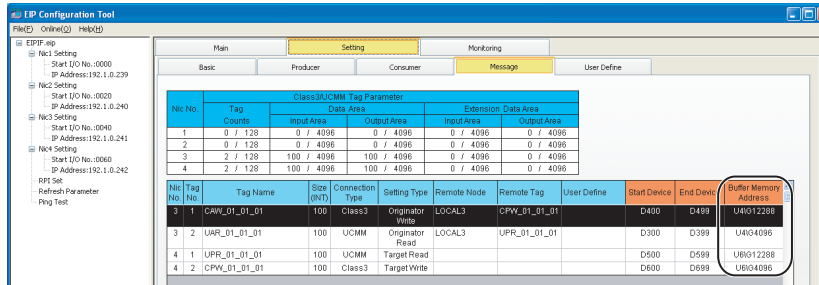
Start address of send/receive data

Figure 3.10 Checking with Utility Package

• •

3.3.9 Input Area

Data received by Tag communication are stored in this area.
For details of the timing chart, refer to the following.
☞ Section 3.2.2 (2) Timing chart

(1) Class1 Input Area (Un\G0 to Un\G4095)
The data received in Class1 communication are stored.
The data that Consumer Tag received from Producer Tag are stored.

(a) Storage location for each tag
The start addresses of data storage locations can be checked by either of the following methods.

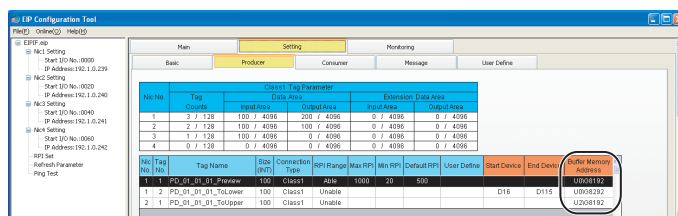1) When checking in Utility Package

Figure 3.11 Checking storage location

Storage location is displayed per Tag.

2) When checking in the buffer memory
☞ Section 3.3.7 Class1 send/receive data start address

(b) Data length and storing order
The data length value set in Utility Package is applied. (☞ Section 7.9.2 (2)
Display and settings of the "Producer Tag" window)
Data are stored in ascending order of tag No. (☞ Figure 3.11)
The following is an example in which data lengths of tag No.1 and tag No.2 are set to "6" and "2" respectively.

Figure 3.12 Assignment example of Class1 input area

(2) Class3/UCMM Input Area (Un\G4096 to Un\G8191)
Data received in the Class3/UCMM communication are stored.
The storage location and data length are checked or stored in a similar way to the Class1 Input Area (Un\G0 to Un\G4095).

⊠**POINT**

(1) The addresses described in this section are applicable when the Common Parameter is set by default. (☞ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window)
The addresses change depending on the Common Parameter setting.
Confirm the addresses in Utility Package or the buffer memory when configuring the system.

(2) To receive data exceeding 16384 points, select "Extension Data Area" for "Common Parameter" in the "Add Own Nic" window of Utility Package.
Set the auto refresh because the "Extension Data Area" data are not stored in the buffer memory. (☞ Section 7.9.7 "Refresh Parameter" window)

3.3.10 Output Area

The data to be sent by Tag Communication are stored in this area.
For details of the timing chart, refer to the following.
☞ Section 3.2.2 (2) Timing chart
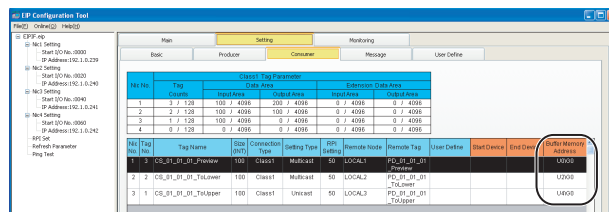
(1) Class1 Output Area (Un\G8192 to Un\G12287)

The data sent in Class1 communication are stored.
The data that the Producer (Producer Tag) sends to Consumer (Consumer Tag) are stored.

(a) Storage location for each tag

The start addresses of data storage locations can be checked by either of the following methods.

1) When checking in Utility Package

Storage location is displayed per Tag.

Figure 3.13 Checking storage location

2) When checking in the buffer memory

☞ Section 3.3.7 Class1 send/receive data start address

(b) Data length and storing order

The data length value set in Utility Package is applied. (☞ Section 7.9.2 (2) Display and settings of the "Producer Tag" window)

Data are stored in ascending order of tag No. (☞ Figure 3.13)

The following is an example in which data lengths of tag No.1 and tag No.2 are set to "4" and "2" respectively.

Address Dec. (Hex.)	
Un\G8192 ⋮ Un\G8195	Producer Tag No.1 send data
Un\G8196 Un\G8197	Producer Tag No.2 send data

Figure 3.14 Assignment example of Class1 output area

(2) Class3/UCMM Output Area (Un\G12288 to Un\G16383)

The data sent in Class3/UCMM communication are stored.
The storage location and data length are checked or stored in a similar way to the Class1 Output Area (Un\G8192 to Un\G12287).

⊠POINT

(1) The addresses described in this section are applicable when the Common Parameter is set by default. (☞ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window)

The addresses change depending on the Common Parameter setting. Confirm the addresses in Utility Package or the buffer memory when configuring the system.

(2) To receive data exceeding 16384 points, select "Extension Data Area" for "Common Parameter" in the "Add Own Nic" window of Utility Package.

Set the auto refresh because the "Extension Data Area" data are not stored in the buffer memory. (☞ Section 7.9.7 "Refresh Parameter" window)

3.3.11 Application Trigger (Class1)

This area is used for the Application Trigger request setting and status check in Class1 Tag communication.

(1) Application Trigger request (Class1)(Un\G27008 to Un\G27023)

Set an Application Trigger request for each tag No. in Class1 Tag communication.
- 0: Not requested
- 1: Requested

An Application Trigger request is ignored if the tag No. is not for Producer Tag.
For details of area assignment and timing chart, refer to the following.

(2) Application Trigger acceptance (Class1)(Un\G27024 to Un\G27039)

The acceptance status of Application Trigger is stored for each tag No.
- 0: No acceptance
- 1: Accepted

For details of area assignment and timing chart, refer to the following.

(3) Application Trigger completion (Class1)(Un\G27040 to Un\G27055)

The completion status of Application Trigger is stored for each tag No.
- 0: Not completed
- 1: Completed

(a) Area assignment

Address Dec.

Each bit indicates a Tag No.

Application Trigger request (Class1)	Application Trigger acceptance (Class1)	Application Trigger completion (Class1)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G27008	Un\G27024	Un\G27040	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G27009	Un\G27025	Un\G27041	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G27010	Un\G27026	Un\G27042	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G27011	Un\G27027	Un\G27043	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G27012	Un\G27028	Un\G27044	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G27013	Un\G27029	Un\G27045	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G27014	Un\G27030	Un\G27046	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G27015	Un\G27031	Un\G27047	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113
Un\G27016	Un\G27032	Un\G27048	144	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129
Un\G27017	Un\G27033	Un\G27049	160	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145
Un\G27018	Un\G27034	Un\G27050	176	175	174	173	172	171	170	169	168	167	166	165	164	163	162	161
Un\G27019	Un\G27035	Un\G27051	192	191	190	189	188	187	186	185	184	183	182	181	180	179	178	177
Un\G27020	Un\G27036	Un\G27052	208	207	206	205	204	203	202	201	200	199	198	197	196	195	194	193
Un\G27021	Un\G27037	Un\G27053	224	223	222	221	220	219	218	217	216	215	214	213	212	211	210	209
Un\G27022	Un\G27038	Un\G27054	240	239	238	237	236	235	234	233	232	231	230	229	228	227	226	225
Un\G27023	Un\G27039	Un\G27055	256	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241

Figure 3.15 Application Trigger (Class1)

(b) Timing chart

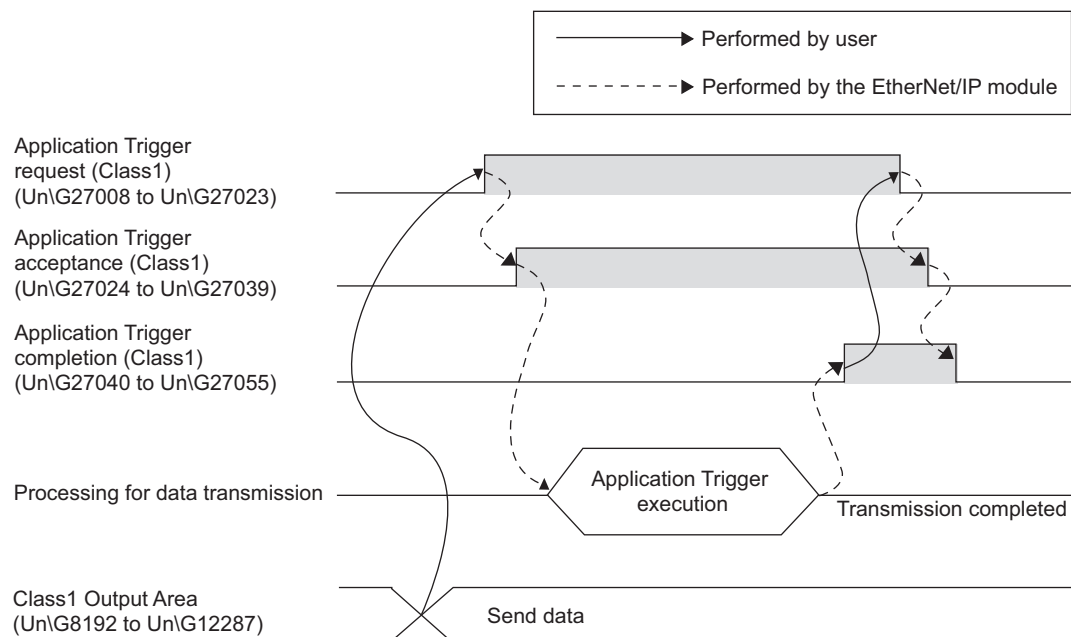1) When Application Trigger is executed

Figure 3.16 When Application Trigger is executed (Normal)

2) When the Application Trigger request is turned off before the Application Trigger completion turns on

   • When the Application Trigger request is turned off before the Application Trigger acceptance turns on,
     Application Trigger is not executed.

   • When the Application Trigger request is turned off after the Application Trigger acceptance turns on
     Application Trigger is executed.

☒POINT

A maximum of 10ms is required between the Application Trigger request (Class1)(Un\G27008 to Un\G27023) is set to on and the data is transmitted.

3.3.12 Application Trigger (Class3/UCMM)

This area is used for the Application Trigger request setting and status check in Class3/UCMM Tag communication.

(1) Application Trigger request (Class3/UCMM)(Un\G27072 to Un\G27087)
Set an Application Trigger request for each tag No. in Class3/UCMM Tag communication.
- 0: Not requested
- 1: Requested

For details of area assignment and timing chart, refer to the following.

☞ (3) Application Trigger completion (Class3/UCMM)(Un\G27104 to Un\G27119) in this section

(2) Application Trigger acceptance (Class3/UCMM)(Un\G27088 to Un\G27103)
The acceptance status of Application Trigger is stored for each tag No.
- 0: No acceptance
- 1: Accepted

For details of area assignment and timing chart, refer to the following.

☞ (3) Application Trigger completion (Class3/UCMM)(Un\G27104 to Un\G27119) in this section

(3) Application Trigger completion (Class3/UCMM)(Un\G27104 to Un\G27119)
The completion status of Application Trigger is stored for each tag No.
- 0: Not completed
- 1: Completed

(a) Area assignment

| | | | | | | | | | | | | | | | | | | | | Each bit indicates a Tag No. |
Application Trigger request (Class3/UCMM)	Application Trigger acceptance (Class3/UCMM)	Application Trigger completion (Class3/UCMM)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G27072	Un\G27088	Un\G27104	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G27073	Un\G27089	Un\G27105	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G27074	Un\G27090	Un\G27106	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G27075	Un\G27091	Un\G27107	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G27076	Un\G27092	Un\G27108	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G27077	Un\G27093	Un\G27109	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G27078	Un\G27094	Un\G27110	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G27079	Un\G27095	Un\G27111	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113
Un\G27080	Un\G27096	Un\G27112	144	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129
Un\G27081	Un\G27097	Un\G27113	160	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145
Un\G27082	Un\G27098	Un\G27114	176	175	174	173	172	171	170	169	168	167	166	165	164	163	162	161
Un\G27083	Un\G27099	Un\G27115	192	191	190	189	188	187	186	185	184	183	182	181	180	179	178	177
Un\G27084	Un\G27100	Un\G27116	208	207	206	205	204	203	202	201	200	199	198	197	196	195	194	193
Un\G27085	Un\G27101	Un\G27117	224	223	222	221	220	219	218	217	216	215	214	213	212	211	210	209
Un\G27086	Un\G27102	Un\G27118	240	239	238	237	236	235	234	233	232	231	230	229	228	227	226	225
Un\G27087	Un\G27103	Un\G27119	256	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241

Address Dec.

Figure 3.17 Application Trigger (Class3/UCMM)

(b) Timing chart

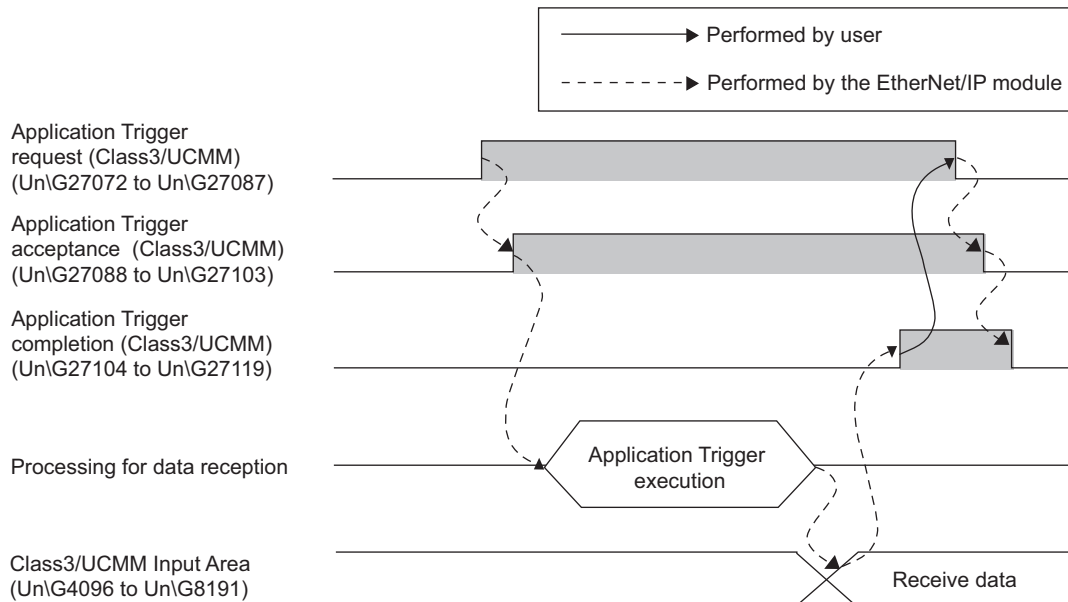1) When sending a read request to the target device tag (Normal)

Figure 3.18 When sending a read request to the target device tag (Normal)

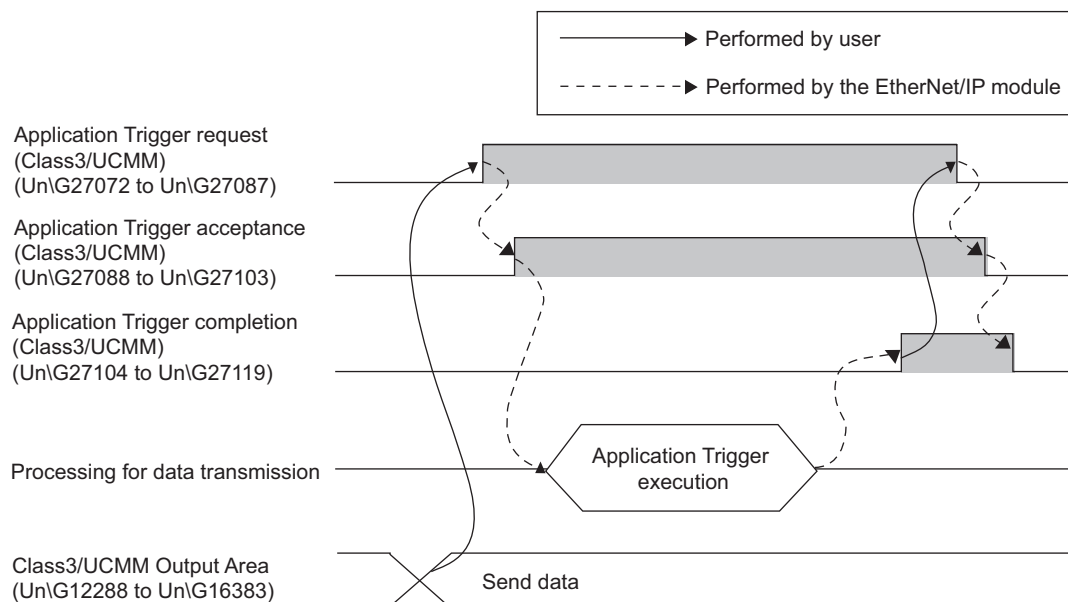2) When sending a write request to the target device tag (Normal)

Figure 3.19 When sending a write request to the target device tag (Normal)

⊠**POINT**

A maximum of 10ms is required between the Application Trigger request (Class3/ UCMM)(Un\G27072 to Un\G27087) is set to on and the request is transmitted.

3) When Application Trigger was not executed (Error)
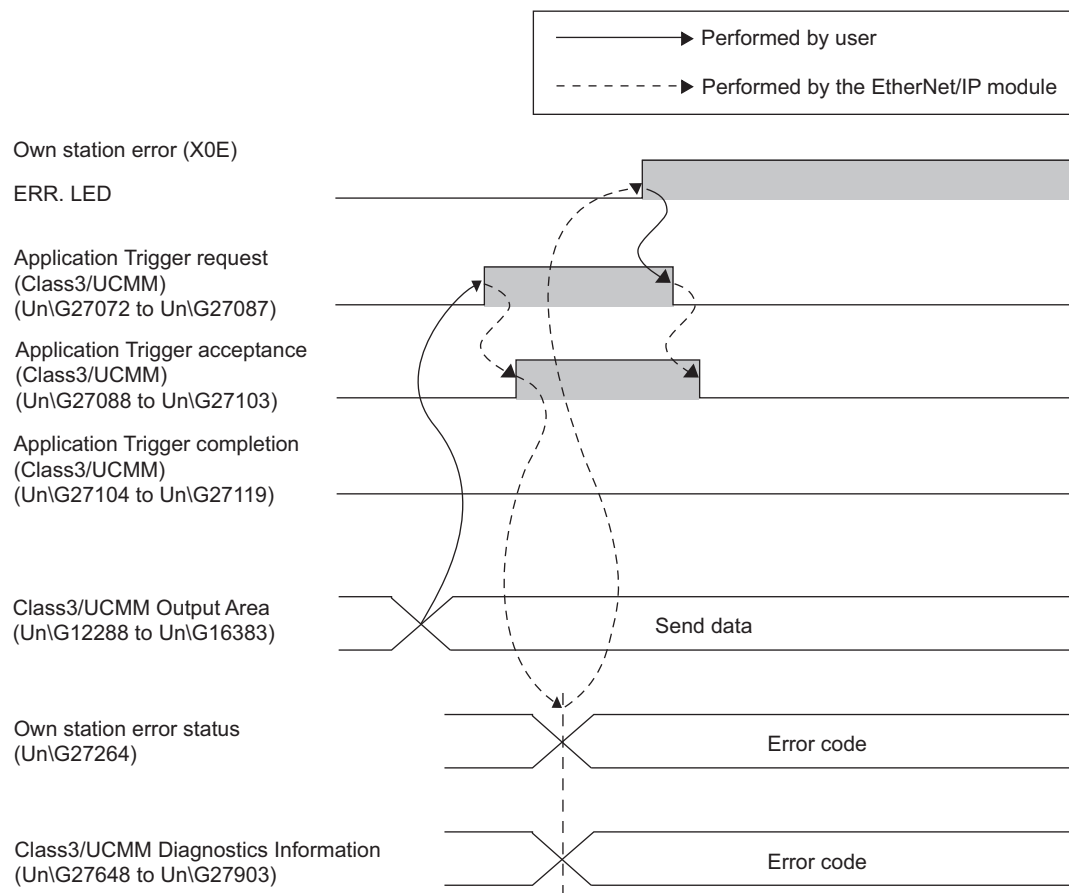
Figure 3.20 When Application Trigger was not executed (Error)

3.3.13　Operation status

Error codes relevant to Tag communication are stored.
For details of the timing chart, refer to the following.
☞ Section 3.2.2 (2) Timing chart

☒**POINT**

> The error codes stored in this area are automatically cleared when the error is resolved.

(1)　Class1 Diagnostics Information (Un\G27392 to Un\G27647)
　　　Error codes relevant to Class1 Tag communication are stored for each tag No.
　　　　• 0 : No error
　　　　• Other than 0: Error code (☞ Section 9.4 Error Code)

```
Address
Dec. (Hex.)

Un\G27392    ┌─────────────────────────────┐
             │ Error code of Tag No.1      │
Un\G27393    ├─────────────────────────────┤
             │ Error code of Tag No.2      │
             ├                             ┤
   ·         │                             │
   ·         │                             │
   ·         │                             │
Un\G27647    ├─────────────────────────────┤
             │ Error code of Tag No.256    │
             └─────────────────────────────┘
```

Figure 3.21 Class1 Diagnostics Information (Un\G27392 to Un\G27647)

(2)　Class3/UCMM Diagnostics Information (Un\G27648 to Un\G27903)
　　　Error codes relevant to Class3/UCMM Tag communication are stored for each tag No.
　　　　• 0 : No error
　　　　• Other than 0: Error code (☞ Section 9.4 Error Code)

```
Address
Dec. (Hex.)

Un\G27648    ┌─────────────────────────────┐
             │ Error code of Tag No.1      │
Un\G27649    ├─────────────────────────────┤
             │ Error code of Tag No.2      │
             ├                             ┤
   ·         │                             │
   ·         │                             │
   ·         │                             │
Un\G27903    ├─────────────────────────────┤
             │ Error code of Tag No.256    │
             └─────────────────────────────┘
```

Figure 3.22 Class3/UCMM Diagnostics Information (Un\G27648 to Un\G27903)

3.3.14 Communication status (Class1)

The communication status, error status, and reserved tag setting of Class1 Tag communication are stored in this area.
For details of the timing chart, refer to the following.

☞ Section 3.2.2 (2) Timing chart

(1) Communication status (Class1)(Un\G27136 to Un\G27151)

The Class1 Tag communication status is stored for each tag No.
- 0: Not communication, Communication error, Reserved tag, No setting for tag
- 1: Normal communication

After recovering from a communication error, the status is automatically changed to on (1: Normal communication).

For details of area assignment, refer to the following.

☞ (3) Reserved tag (Class1)(Un\G27168 to Un\G27183) in this section

⊠**POINT**

When one Producer Tag is connected to multiple Consumer Tags in multicast communication, even one normal communication will set this status area to on (1: Normal communication).

Example: In the following example, the Communication status (Class1)(Un\G27136 to Un\G27151) is set to on (1: Normal communication).
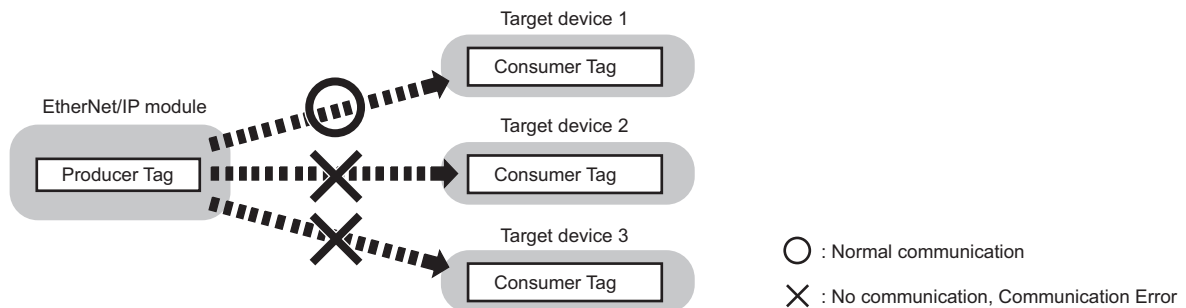
Figure 3.23 Example that the status is set to on (1: Normal communication)

When no communications or communication errors occur in all connections to Consumer Tags, this status area is set to off (0: Not communicating, Communication error, Reserved tag, No setting for tag).

(2) Communication error (Class1)(Un\G27152 to Un\G27167)

The error status of Class1 Tag communication is stored for each tag No.
- 0: Normal communication, No setting for Tag
- 1: Communication error, Response error [1]

* 1 For Producer Tag, this status area is set to on (1: Communication error, Response error) only when all the communications with connected Consumer Tags are stopped.

If recovered from a communication or response error, the status is automatically changed to on (0: Normal communication, No setting for Tag).
For details of area assignment, refer to the following.

☞ (3) Reserved tag (Class1)(Un\G27168 to Un\G27183) in this section

1 OVERVIEW
2 SYSTEM CONFIGURATION
3 SPECIFICATIONS
4 FUNCTION
5 PRE-OPERATION PROCEDURES
6 PARAMETER
7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)
8 PROGRAMMING

(3) Reserved tag (Class1)(Un\G27168 to Un\G27183)

The reserved tag setting status for Class1 Tag communication is stored for each tag No.

- 0: No reserved tag
- 1: Reserved tag

Address Dec.

Each bit indicates a Tag No.

Communication Status (Class1)	Communication Error (Class1)	Reserved Tag (Class1)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G27136	Un\G27152	Un\G27168	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G27137	Un\G27153	Un\G27169	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G27138	Un\G27154	Un\G27170	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G27139	Un\G27155	Un\G27171	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G27140	Un\G27156	Un\G27172	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G27141	Un\G27157	Un\G27173	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G27142	Un\G27158	Un\G27174	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G27143	Un\G27159	Un\G27175	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113
Un\G27144	Un\G27160	Un\G27176	144	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129
Un\G27145	Un\G27161	Un\G27177	160	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145
Un\G27146	Un\G27162	Un\G27178	176	175	174	173	172	171	170	169	168	167	166	165	164	163	162	161
Un\G27147	Un\G27163	Un\G27179	192	191	190	189	188	187	186	185	184	183	182	181	180	179	178	177
Un\G27148	Un\G27164	Un\G27180	208	207	206	205	204	203	202	201	200	199	198	197	196	195	194	193
Un\G27149	Un\G27165	Un\G27181	224	223	222	221	220	219	218	217	216	215	214	213	212	211	210	209
Un\G27150	Un\G27166	Un\G27182	240	239	238	237	236	235	234	233	232	231	230	229	228	227	226	225
Un\G27151	Un\G27167	Un\G27183	256	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241

Figure 3.24 Communication status (Class1)

3.3.15 Communication status (Class3/UCMM)

The communication status, error status, and reserved tag setting of Class3/UCMM Tag communication are stored in this area.
For details of the timing chart, refer to the following.
☞ Section 3.2.2 (2) Timing chart

(1) Communication status (Class3/UCMM)(Un\G27184 to Un\G27199)
The Class3/UCMM Tag communication status is stored for each tag No.
  • 0: Not communicating, Communication error, Reserved tag, No setting for tag
  • 1: Normal communication
After recovering from a communication error, the status is automatically changed to on (1: Normal communication).
For details of area assignment, refer to the following.
☞ (3) Reserved tag (Class3/UCMM)(Un\G27216 to Un\G27231) in this section

(2) Communication error (Class3/UCMM)(Un\G27200 to Un\G27215)
The error status of Class3/UCMM Tag communication is stored for each tag No.
  • 0: Normal communication, Normal response, No response, No setting for tag
  • 1: Communication error, Response error
When recovered from a communication or response error, the status is automatically changed to on (0: Normal communication, Response error, No response, or No setting for tag).
For details of area assignment, refer to the following.
☞ (3) Reserved tag (Class3/UCMM)(Un\G27216 to Un\G27231) in this section

(3) Reserved tag (Class3/UCMM)(Un\G27216 to Un\G27231)
The reserved tag setting status for Class3/UCMM Tag communication is stored for each tag No.
  • 0: No reserved tag
  • 1: Reserved tag

Communication Status (Class3/UCMM)	Address Dec. Communication Error (Class3/UCMM)	Reserved Tag (Class3/UCMM)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Un\G27184	Un\G27200	Un\G27216	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Un\G27185	Un\G27201	Un\G27217	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Un\G27186	Un\G27202	Un\G27218	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
Un\G27187	Un\G27203	Un\G27219	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
Un\G27188	Un\G27204	Un\G27220	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Un\G27189	Un\G27205	Un\G27221	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
Un\G27190	Un\G27206	Un\G27222	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
Un\G27191	Un\G27207	Un\G27223	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113
Un\G27192	Un\G27208	Un\G27224	144	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129
Un\G27193	Un\G27209	Un\G27225	160	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145
Un\G27194	Un\G27210	Un\G27226	176	175	174	173	172	171	170	169	168	167	166	165	164	163	162	161
Un\G27195	Un\G27211	Un\G27227	192	191	190	189	188	187	186	185	184	183	182	181	180	179	178	177
Un\G27196	Un\G27212	Un\G27228	208	207	206	205	204	203	202	201	200	199	198	197	196	195	194	193
Un\G27197	Un\G27213	Un\G27229	224	223	222	221	220	219	218	217	216	215	214	213	212	211	210	209
Un\G27198	Un\G27214	Un\G27230	240	239	238	237	236	235	234	233	232	231	230	229	228	227	226	225
Un\G27199	Un\G27215	Un\G27231	256	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241

Each bit indicates a Tag No.

Figure 3.25 Communication status (Class3/UCMM)

3.3.16 Own station error information

Error information on the EtherNet/IP module and the result of the self-diagnostics are stored in this area.
For details of the timing chart, refer to the following.
☞ Section 3.2.7 (2) Timing chart

(1) Own station error status (Un\G27264)
An error code of the EtherNet/IP module is stored in this area.
(☞ Section 9.4 Error Code)
Read the error code while the Own station error (X0E) is on.

(2) TCP/UDP/IP parameter error information (Un\G27265 to Un\G27267)
Error information on the TCP/UDP/IP parameter is stored.
   • 0: Within the range (no error)
   • 1: Outside the range (error)
For details of the timing chart, refer to the following.
☞ Section 3.2.7 (2) Timing chart

Table 3.18 TCP/UDP/IP parameter error information

Address	Bit	Description
Un\G27265	b0	DHCP client function invalid
	b1	Own station IP address invalid
	b2 to b7	Fixed to 0
	b8 to b10	System error
	b11 to b15	Fixed to 0
Un\G27266	b0 to b2	System error
	b3 to b7	Fixed to 0
	b8	Router relay function setting outside the range
	b9	Subnet mask outside the range
	b10	Default gateway outside the range
	b11	System error
	b12 to b15	Fixed to 0
Un\G27267	b0	Router information 1 (Subnet address outside the range)
	b1	Router information 1 (Router IP address outside the range)
	b2	Router information 2 (Subnet address outside the range)
	b3	Router information 2 (Router IP address outside the range)
	b4	Router information 3 (Subnet address outside the range)
	b5	Router information 3 (Router IP address outside the range)
	b6	Router information 4 (Subnet address outside the range)
	b7	Router information 4 (Router IP address outside the range)
	b8	Router information 5 (Subnet address outside the range)
	b9	Router information 5 (Router IP address outside the range)
	b10	Router information 6 (Subnet address outside the range)
	b11	Router information 6 (Router IP address outside the range)
	b12	Router information 7 (Subnet address outside the range)
	b13	Router information 7 (Router IP address outside the range)
	b14	Router information 8 (Subnet address outside the range)
	b15	Router information 8 (Router IP address outside the range)

(3) Self-diagnostics execution result (Un\G27268)
Execution result of self-diagnostics is stored in this area.
(☞ Section 9.4 Error Code)

3.3.17 PING test

The settings and result of the PING test are stored in this area.

(1) PING test request area (Un\G27904 to Un\G27907)
The set values for the PING test are stored.

(a) Communication time check (Un\G27904)
Set the waiting time for PING test completion.

Table 3.19 Setting value for the Communication time check (Un\G27904)

Setting value	Description
0	Set to 1 second.
1 to 5	Set to the specified value. (Unit: second)
6 or more	Set to 5 seconds.

(b) Transmission count (Un\G27905)
Set a transmission count for the PING test.

Table 3.20 Setting value for the Transmission count (Un\G27905)

Setting value	Description
0	Fixed to 1 time.
1 to 10	Set to the specified value. (Unit: time)
11 or more	Fixed to 10 times.

(c) IP Address (Un\G27906 to Un\G27907)
Set the IP address of the target device.
IP address data are stored in order from the least significant word.

Example: When the IP address is "192.168.0.5"

Table 3.21 When the IP address is "192.168.0.5"

Address	Setting value	
Un\G27906	0005H	Least significant word of the IP address
Un\G27907	C0A8H	Most significant word of the IP address

(2) PING test result area (Un\G27908 to Un\G27911)

(a) Execution result (Un\G27908)
PING test result is stored.
- 0400H : Normal completion
- 0400H Other than: Error completion (☞ Section 9.4 Error Code)

(b) Total packet transmission count (Un\G27909)
Total number of packet transmissions in the PING test execution is stored.

(c) Success count (Un\G27910)
The number of times the PING test was completed successfully is stored.

(d) Failure count (Un\G27911)
The number of times the PING test failed is stored.

1

OVERVIEW

2

SYSTEM CONFIGURATION

3

SPECIFICATIONS

4

FUNCTION

5

PRE-OPERATION PROCEDURES

6

PARAMETER

7

UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8

PROGRAMMING

3.3.18 Checking the battery

The following areas are used for battery error detection setting and battery error checking.

(1) Battery error detection setting (Un\G16633)

Set whether to detect a battery error or not.
- 0: Not detect a battery error
- 1: Detect a battery error

(2) Battery status (Un\G25783)

Whether a battery error exists or not is stored.
- 0 : No battery error
- 1 : Battery error

When the status is (1: Battery error), replace the battery or check the connection status referring to the following.

☞ Section 5.4 Battery

CHAPTER 4   FUNCTION

This chapter describes functions of the EtherNet/IP module.

4.1   Function List

The following table lists the functions of the EtherNet/IP module.

Table 4.1 Function List

Functions		Description	Reference section
Tag communication		Communication can be performed between tags of the same name and the same data size.	Section 4.2
	Class1 Tag communication	Cyclic communication between Producer (Producer Tag) and Consumer (Consumer Tag)	Section 4.2.1
	Class3 Tag communication	Communication made by a read or write request	Section 4.2.2
	UCMM Tag communication	Communication made by a read or write request Connection is not established prior to communication.	Section 4.2.3
Tag communication status setting function for CPU stop error		For each module, this function sets whether to stop or continue the Tag communication when a stop error occurs in the CPU module mounted with the EtherNet/IP module.	Section 4.3
Monitoring function		This function monitors error codes and Tag communication states.	Section 4.4
DHCP client function		This function allows the EtherNet/IP module to acquire data such as an IP address from the DHCP server.	Section 4.5

1

OVERVIEW

2

SYSTEM CONFIGURATION

3

SPECIFICATIONS

4

FUNCTION

5

PRE-OPERATION PROCEDURES

6

PARAMETER

7

UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8

PROGRAMMING

4.2 Tag Communication Function

The Tag communication function enables communication between tags of the same name and the same data size.
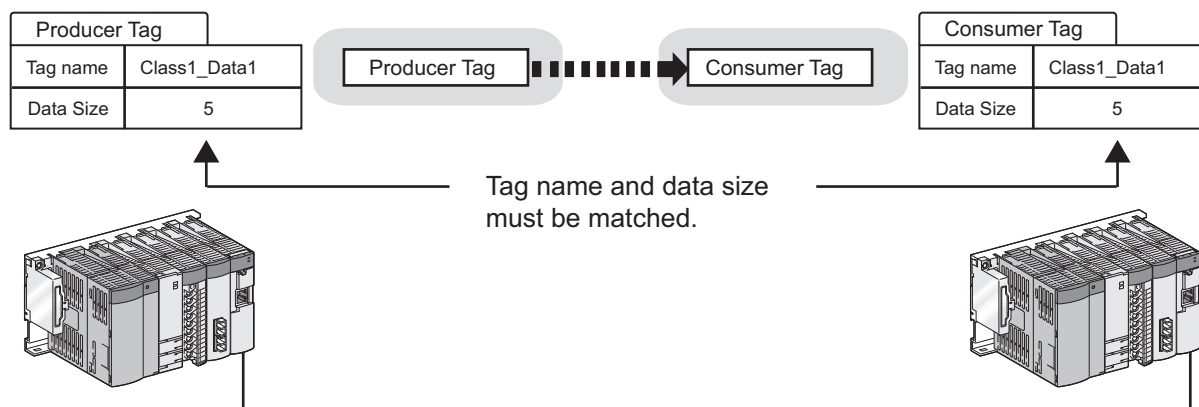
Figure 4.1 Tag communication (example of Class1 Tag communication)

(1) Tag communication type

Tag communications are available in the following types.
Select an appropriate one depending on the purpose.

Table 4.2 Tag communication type

Tag communication	Tag to be used	Description	Reference section
Class1 Tag communication	Producer Tag, Consumer Tag	Cyclic communications are performed between Producer (Producer Tag) and Consumer (Consumer Tag).	Section 4.2.1
Class3 Tag communication	Class3 Tag	Communicates by a read and write request.	Section 4.2.2
UCMM Tag communication	UCMM Tag	Communicates by a read and write request. Connection is not established prior to communication.	Section 4.2.3

(2) Number of tags, number of characters in a tag name, and data size

For the number of tags, number of characters in a tag name, and data size that can be set for the EtherNet/IP module, refer to the following.

☞ Section 3.1 Performance Specifications

(3) How to start Tag communication

1) Set parameters in Utility Package and write them to the EtherNet/IP module. For required parameters and setting details, refer to the following.

☞ CHAPTER 6 PARAMETER

☞ Section 7.9 "Setting" Tab (Parameter Settings)

☞ CHAPTER 8 PROGRAMMING

2) Turn on the Tag communication start request (Y00) to start Tag communication.

☞ Section 4.2.1 Class1 Tag communication

☞ Section 4.2.2 Class3 Tag communication

☞ Section 4.2.3 UCMM Tag communication

4.2.1 Class1 Tag communication

Cyclic communications are performed between Producer (Producer Tag) and Consumer (Consumer Tag).
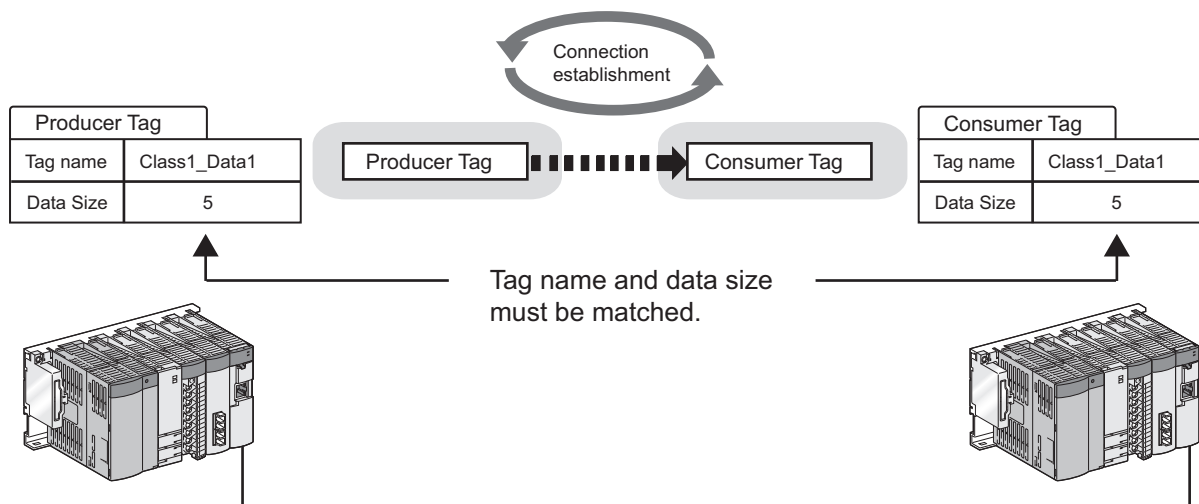
Figure 4.2 Class1 Tag communication

(1) Tags used for Class1 Tag communication

The following tags are used for Class1 Tag communication.

Table 4.3 Tag type

Tag	Description
Producer Tag	Receives a connection request from Consumer (Consumer Tag) of the target device and sends data to the Consumer (Consumer Tag).
Consumer Tag	Sends a connection request to Producer (Producer Tag) of the target device and receives data from the Producer (Producer Tag).
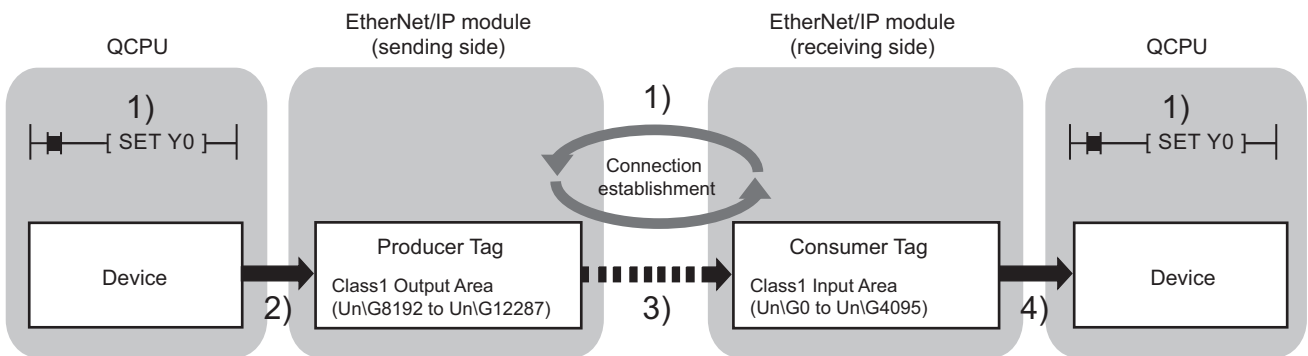
Figure 4.3 Tags used for Class1 Tag communication

1) The Tag communication start request (Y00) is set to on.
   A connection is established between the Consumer (Consumer Tag) and Producer (Producer Tag) to start Tag communication.

2) Device data are stored into the Class1 Output Area (Un\G8192 to Un\G12287).

3) Producer Tag data are sent to the Consumer (Consumer Tag) at RPI intervals.
   (☞ (2) Timing of Class1 Tag communication in this section)
   Whether communication is normal or not can be checked in the Communication Status (Class1)(Un\G27136 to Un\G27151).

4) Data in the Class1 Input Area (Un\G0 to Un\G4095) are stored to the device.

⊠**POINT**

When Extension Class1 Input/Output Area is used, the steps 2) and 4) above are performed by the auto refresh. (☞ Section 7.9.7 "Refresh Parameter" window)

(2) Timing of Class1 Tag communication

The Producer (Producer Tag) sends data at intervals of RPI that is set in the Consumer Tag.
In "Trigger" of the Consumer Tag, "Cyclic" or "Application Trigger" can be selected for the communication timing.

☒POINT

For Class1 Tag communication, the transmission interval of Producer (Producer Tag) is set on the Consumer (Consumer Tag) side.

(a) Cyclic (cyclic communication)
Use this to send data only at RPI intervals.

Enter a value for "Requested Packet Interval (RPI)".

Select "Cyclic" for "Trigger".
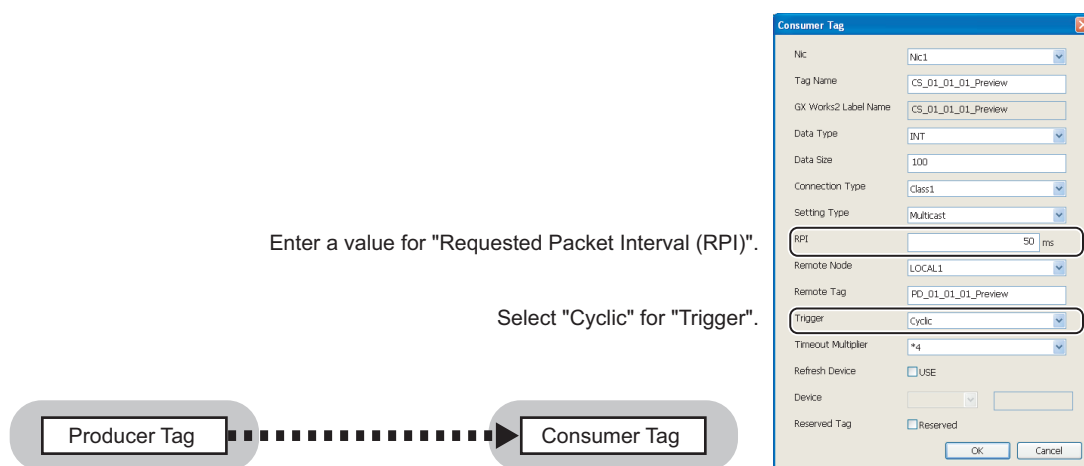
Figure 4.4 Cyclic (cyclic communication) setting

(b) Application Trigger (communication at any specified timing)
Use this to allow data communication at any specified timing during communication at RPI.
Example: On the system with a long RPI setting, communication can be performed temporarily at shorter intervals.
Communication can be performed at the timing that the Application Trigger request (Class1)(Un\G27008 to Un\G27023) is set to on.
If no Application Trigger communication has performed for a period longer than RPI, the communication interval will return to RPI.

Enter a value for "Requested Packet Interval (RPI)".

On the Producer Tag side, set Application Trigger request (Class1) (Un\G27008 to Un\G27023) to on.

Select the "Application Trigger" for "Trigger".
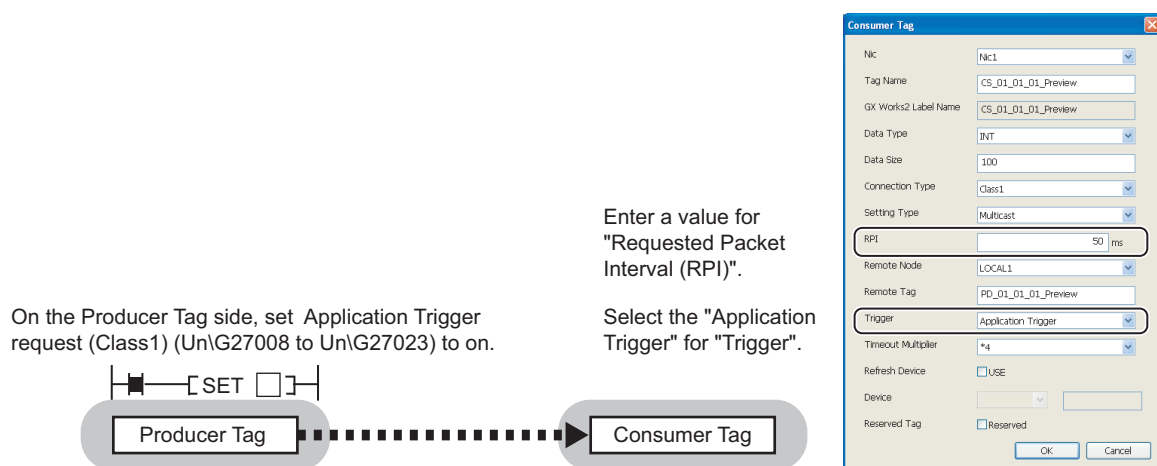
Figure 4.5 Application Trigger (communication at any specified timing) setting

(3) Parameter setting and program example

Complete the setting of Class1 Tag Parameter in Utility Package.

Select the "Producer" or "Consumer" window on the "Setting" tab and set the details in the "Producer Tag" or "Consumer Tag" window that is displayed when a blank line in the Tag Parameter list is double-clicked.

Figure 4.6 Window for Class1 Tag parameter setting of Utility Package

For details, refer to the following.

☞ Section 7.9.2 (2) Display and settings of the "Producer Tag" window

☞ Section 7.9.3 (2) Display and settings of the "Consumer Tag" window

☞ CHAPTER 8 PROGRAMMING

(4) Reserved tag

Tags can be reserved.

A tag set as a reserved tag is not used to perform Tag communication. It is used only to reserve input area and output area.

(a) Application

Adding a tag (canceling the reserved tag setting) does not require a sequence program change since input area and output area remain unchanged.

A sequence program change is not necessary by setting (not deleting) the tag as a reserved tag when a tag is no longer used.

(b) Setting method

Select "Reserved Tag" in the "Producer Tag" or "Consumer Tag" window of Utility Package. (☞ (3) Parameter setting and program example in this section)

(c) Checking reserved tag settings in the buffer memory

The reserved tag setting status can be checked in Reserved tag(Class1)(Un\G27168 to Un\G27183)

(5) Precautions

(a) When the target device does not support the INT data type

Adjust the setting as shown below so that the number of bytes is matched with that of the target device.

Example: When DINT is set for Data Type of the corresponding device.

Table 4.4 When DINT is set for Data Type of the corresponding device.

Setting	Data type	Data size	Byte
Target device	DINT	5	20 bytes
EtherNet/IP module	INT	10	20 bytes
	Define and register in the "User Define" window	10	20 bytes

(b) When multiple Consumers (Consumer Tags) establish connections to one Producer (Producer Tag)

1) RPI value

Set the same RPI value to all of the Consumer Tags.
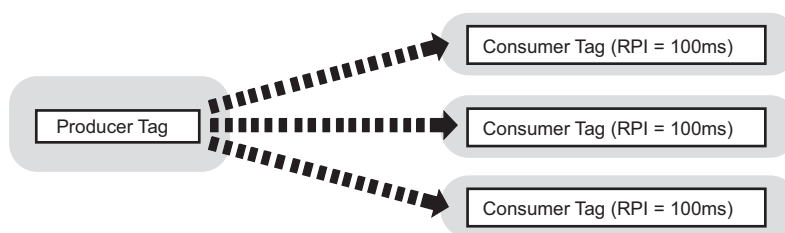
Figure 4.7 RPI for multiple connections

2) When different RPI values are set
If different values are set to multiple Consumers (Consumer Tags), the
EtherNet/IP module sends data at the smallest RPI. (Data are sent at the same
intervals to all of the Consumer Tags.)
The RPI may change every time a connection is established.
Example: When connections are established in the order of 1) → 2) → 3) as
shown below

1)

| Producer Tag |

Consumer Tag (RPI = 100ms)
Consumer Tag (RPI = 150ms)   Transmission interval: 100ms
Consumer Tag (RPI = 50ms)

2)

| Producer Tag |

Consumer Tag (RPI = 100ms)
Consumer Tag (RPI = 150ms)   Transmission interval: 100ms
Consumer Tag (RPI = 50ms)

3)

| Producer Tag |

Consumer Tag (RPI = 100ms)
Consumer Tag (RPI = 150ms)   Transmission interval: 50ms
Consumer Tag (RPI = 50ms)
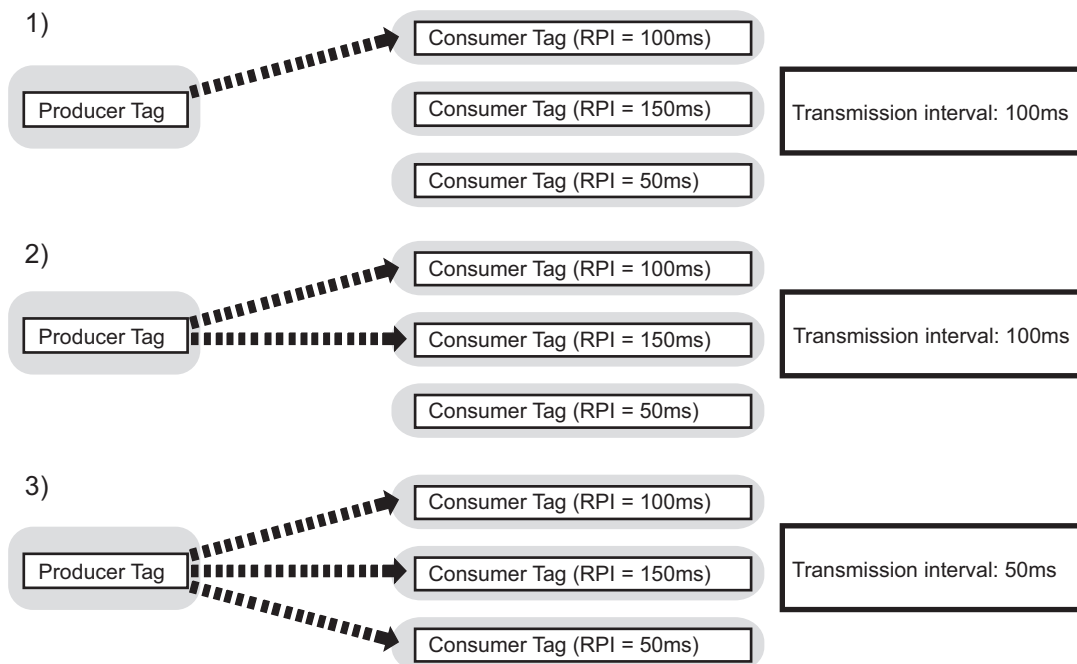
Figure 4.8 RPI change for multiple connections

3) Timeout time applied when RPI is changed
The Timeout time value is calculated with the changed RPI.

Timeout time =
(changed RPI) × (Time Out Multiplier set in Consumer Tag)

Remark •

The RPI can be checked in the "Connection" window on the "Monitoring" tab of Utility Package.
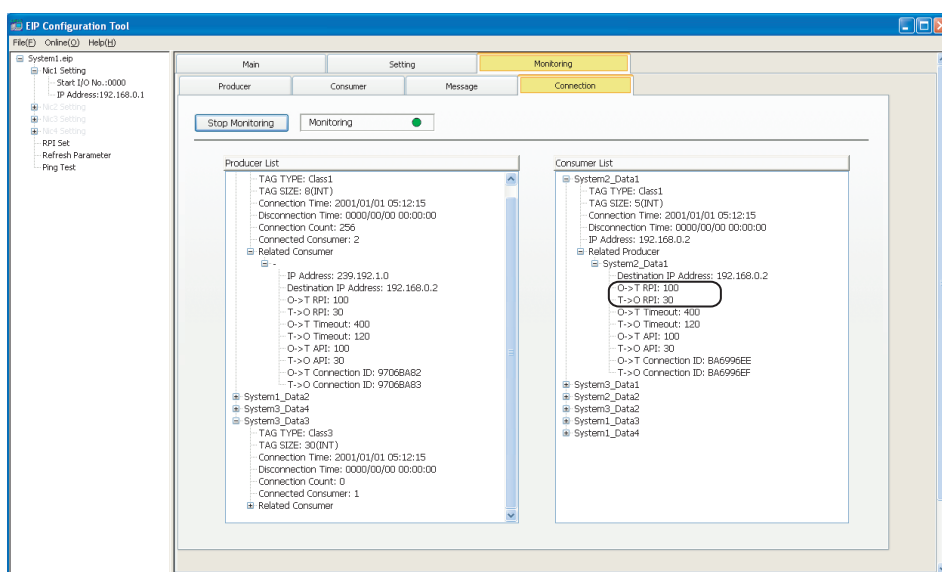
Figure 4.9 RPI checking

• •

(c) Time required to recognize the Application Trigger request (Class1)(Un\G27008 to Un\G27023)
A maximum of 10ms is required after the Application Trigger request (Class1)(Un\G27008 to Un\G27023) is set to on.

(d) When requesting a connection to the same Producer Tag from multiple Consumer Tags
The connection can be made only with the type of connection (Multicast/Point to Point) that is established first.
After that, an error occurs if a connection is requested with a different connection type.

4.2.2 Class3 Tag communication

Communication is performed by a read and write request.
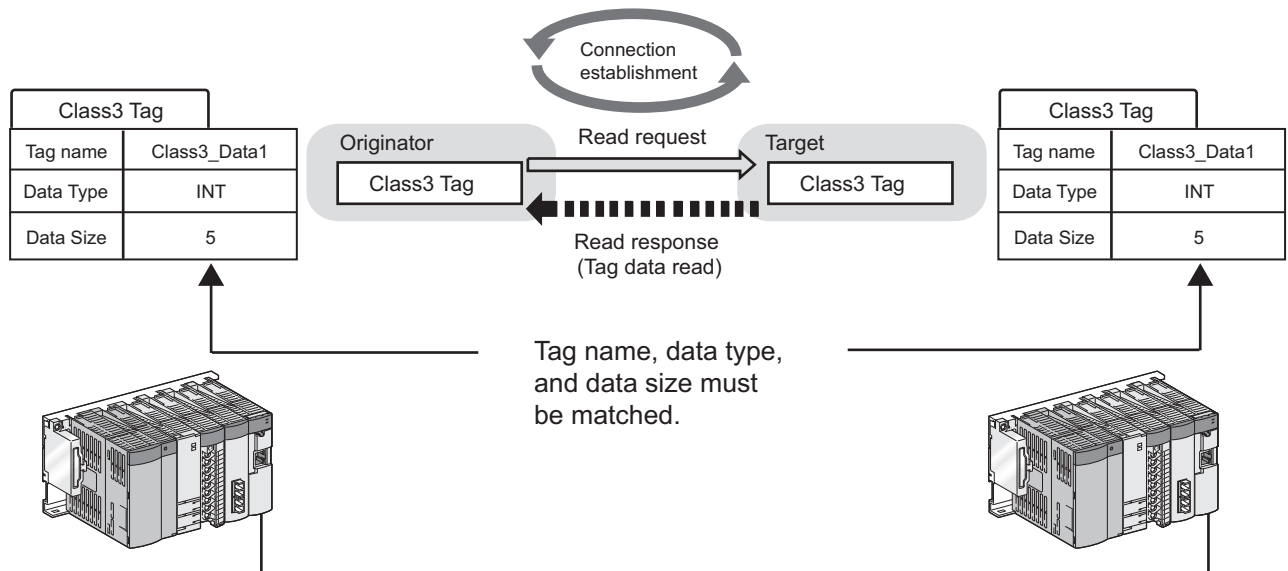
Figure 4.10 Class3 Tag communication

(1) Tags used for Class3 Tag communication
The following tags are used for Class3 Tag communication.

Table 4.5 Tag type

Tag			Description
Class3 Tag	Originator	Read	Sends a read request to a tag of the target device. (Reads the data from the Tag of the corresponding device.)
		Write	Sends a write request to a tag of the target device. (Writes data to a tag of the target device.)
	Target	Read	Accepts a read request from the target device.
		Write	Accepts a write request from the target device.
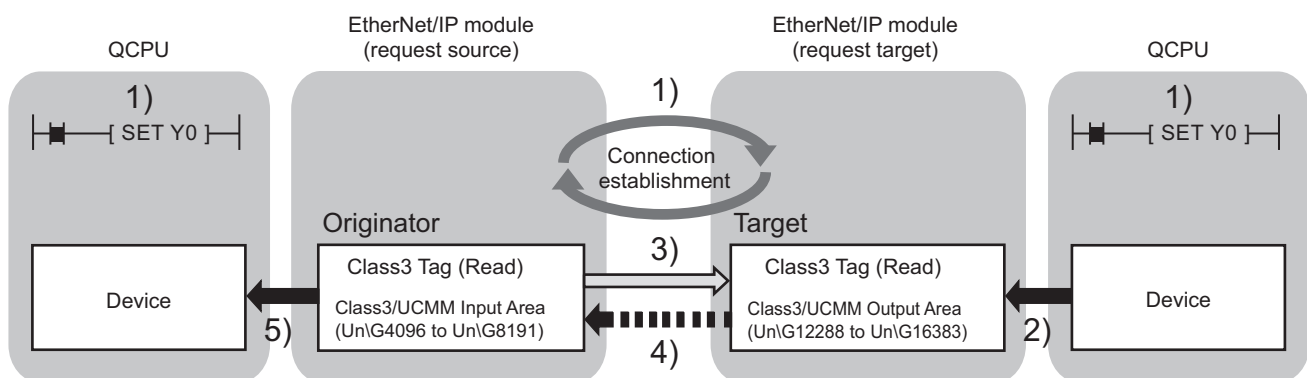
(a) Read request

Figure 4.11 Tags used for Class3 Tag communication (read request)

1) The Tag communication start request (Y00) is set to on.
A connection is established.

2) Device data are stored in the Class3/UCMM Output Area (Un\G12288 to Un\G16383).

3) A read request is sent.
(☞ (2) Timing of the Class3 Tag communication in this section)
Whether communication is normal or not can be checked in the following.
   • The Communication Status (Class3/UCMM)(Un\G27184 to Un\G27199) is on.
   • The Communication Error (Class3/UCMM)(Un\G27200 to Un\G27215) is off.

4) Tag data are read out.

5) Data in the Class3/UCMM Input Area (Un\G4096 to Un\G8191) are stored in the device.

☒**POINT**

When Extension Class3/UCMM Output Area is used, the steps 2) and 4) above are performed by the auto refresh. (☞ Section 7.9.7 "Refresh Parameter" window)
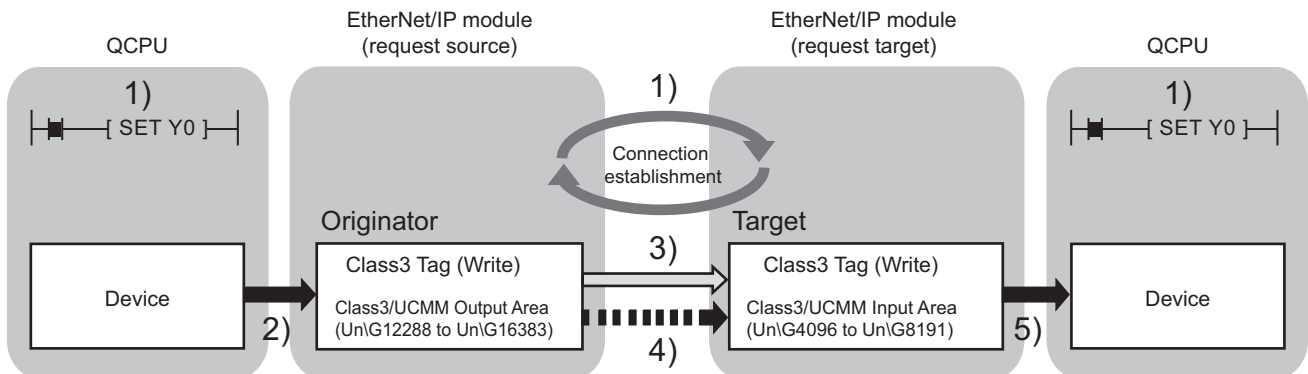
(b) Write request

Figure 4.12 Tags used for Class3 Tag communication (write request)

1) The Tag communication start request (Y00) is set to on.
   A connection is established.

2) Device data are stored in the Class3/UCMM Output Area (Un\G12288 to Un\G16383).

3) A write request is sent.
   (☞ (2) Timing of the Class3 Tag communication in this section)
   Whether communication is normal or not can be checked in the following.
   • The Communication Status (Class3/UCMM)(Un\G27184 to Un\G27199) is on.
   • The Communication Error (Class3/UCMM)(Un\G27200 to Un\G27215) is off.

4) Tag data are written.

5) Data in the Class3/UCMM Input Area (Un\G4096 to Un\G8191) are stored in the device.

⊠**POINT**

When Extension Class3/UCMM Input Area is used, the steps 2) and 4) above are performed by the auto refresh. (☞ Section 7.9.7 "Refresh Parameter" window)

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

(2) Timing of the Class3 Tag communication
"Application Trigger" or "Cyclic" can be selected for the communication timing.

(a) Application Trigger (communication at any specified timing)
A read or write request can be sent only while the Application Trigger request (Class3/UCMM)(Un\G27072 to Un\G27087) is on.

Select "Application Trigger" for "Trigger".

Turn on the Application Trigger request (Class3/UCMM) (Un\G27072 to Un\G27087) on the Originator side

Figure 4.13 Application Trigger (communication at any specified timing)

(b) Cyclic (cyclic communication)
Select this when sending a read or write request at intervals of RPI.
A request can be also sent when the Application Trigger request (Class3/UCMM)(Un\G27072 to Un\G27087) is turned on.
If no Application Trigger request has been sent for a period longer than RPI, the communication interval will return to RPI.

Select "Cyclic" for "Trigger".

Turn on the Application Trigger request (Class3/UCMM) (Un\G27072 to Un\G27087) on the Originator side

Figure 4.14 Cyclic (cyclic communication)

Remark ●

For details of the Application Trigger request (Class3/UCMM)(Un\G27072 to Un\G27087), refer to the following.

☞ Section 3.3.12 Application Trigger (Class3/UCMM)

● ●

(3) Parameter setting and program example

Complete the setting of Class3 Tag parameter in Utility Package.
Select the "Message" window on the "Setting" tab and set the details in the "Message Tag" window that is displayed when a blank line in the Tag Parameter list is double-clicked.

Figure 4.15 Window for Class3/UCMM Tag parameter setting of Utility Package

For details, refer to the following.
☞ Section 7.9.4 (2) Display and settings of the "Message Tag" window
☞ CHAPTER 8 PROGRAMMING

(4) Reserved tag

Tags can be reserved.
A tag set as a reserved tag is not used to perform Tag communication. It is used only to reserve input area and output area.

(a) Application

Adding a tag (canceling the reserved tag setting) does not require a sequence program change since input area and output area remain unchanged.
A sequence program change is not necessary by setting (not deleting) the tag as a reserved tag when a tag is no longer used.

(b) Setting method

Select "Reserved Tag" in the "Message Tag" window of Utility Package. (☞ (3) Parameter setting and program example in this section)

(c) Checking reserved tag settings in the buffer memory

The reserved tag setting status can be checked in Reserved tag(Class3/UCMM)(Un\G27216 to Un\G27231).

(5) Precautions

(a) Data type of the target device
The data type of the EtherNet/IP module must match that of the target device.
For the Data Type other than INT or DINT, register and set it using the "User Define" window. (☞ Section 7.9.5 "User Define" window)

(b) Tags that can receive read or write requests
Only the tags set as "Target" in "Class3/UCMM Tag Parameter" can accept the requests.
Tags set as "Originator" do not accept any request from the other device.

(c) When "Application Trigger" is set for "Trigger" in "Class3/UCMM Tag Parameter":
Send a read or write request within the following timeout time.[1]

Timeout time = RPI × Time Out Multiplier

When the target device failed to receive a request within the timeout time, a timeout is detected and the connection is disrupted.

* 1 Considering possible transmission delay on the Ethernet network, make the request interval shorter than the timeout time.

(d) Time required to recognize the Application Trigger request
(Class3/UCMM)(Un\G27072 to Un\G27087)
A maximum of 10ms is required after the Application Trigger request
(Class3/UCMM)(Un\G27072 to Un\G27087) is set to on.

(e) When the data transmission delay is lengthened
When the line is highly-loaded or unstable, the ACK of TCP from the target device may not be receivable.
In this case, the EtherNet/IP module sends the data after 10 seconds which lengthen the transmission delay time by 10 seconds from normal delay time.
If the above case frequently occurs, check the connectivity of cables and take measures such as reducing the line load by increasing the setting value of RPI.

4.2.3 UCMM Tag communication

Communication is performed by a read and write request.
Connection is not established prior to communication.
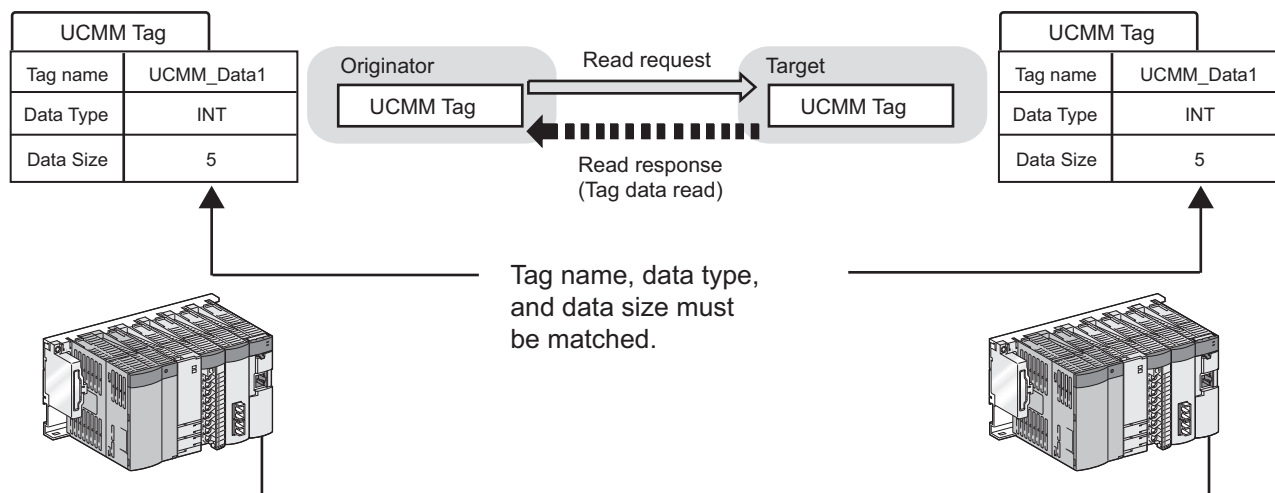
Figure 4.16 UCMM Tag communication

(1) Tags used for the UCMM Tag communication

The following tags are used for UCMM Tag communication.

Table 4.6 Tag type

Tag			Description
UCMM Tag	Originator	Read	Sends a read request to a tag of the target device. (Reads the data from the Tag of the corresponding device.)
		Write	Sends a write request to a tag of the target device. (Writes data to a tag of the target device.)
	Target	Read	Accepts a read request from the target device.
		Write	Accepts a write request from the target device.

(a) Read request

Figure 4.17 Tags used for UCMM Tag communication (read request)

1) The Tag communication start request (Y00) is set to on.

2) Device data are stored in the Class3/UCMM Output Area (Un\G12288 to Un\G16383).

3) The Application Trigger request (Class3/UCMM)(Un\G27072 to Un\G27087) is turned on to send a read request.

   (☞ (2) Timing of the UCMM Tag communication in this section)
   Whether communication is normal or not can be checked in the following.
   - Application Trigger completion (Class3/UCMM)(Un\G27104 to Un\G27119) is on.
   - The Communication Error (Class3/UCMM)(Un\G27200 to Un\G27215) is off.

4) Tag data are read out.

5) Data in the Class3/UCMM Input Area (Un\G4096 to Un\G8191) are stored in the device.

⊠POINT

When Extension Class3/UCMM Output Area is used, the steps 2) and 4) above are performed by the auto refresh. (☞ Section 7.9.7 "Refresh Parameter" window)
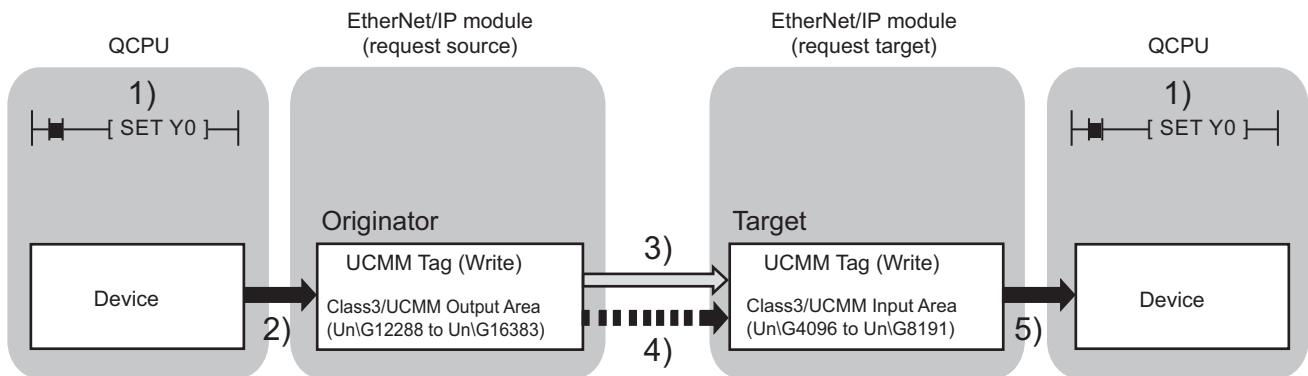
(b) Write request

Figure 4.18 Tags used for UCMM Tag communication (write request)

1) The Tag communication start request (Y00) is set to on.

2) Device data are stored in the Class3/UCMM Output Area (Un\G12288 to Un\G16383).

3) The Application Trigger request (Class3/UCMM)(Un\G27072 to Un\G27087) is turned on to send a write request.
   (☞(2) Timing of the UCMM Tag communication in this section)
   Whether communication is normal or not can be checked in the Communication Status (Class3/UCMM)(Un\G27184 to Un\G27199).

4) Tag data are written.

5) Data in the Class3/UCMM Input Area (Un\G4096 to Un\G8191) are stored in the device.

⊠POINT

When Extension Class3/UCMM Input Area is used, the steps 2) and 4) above are performed by the auto refresh. (☞Section 7.9.7 "Refresh Parameter" window)

(2) Timing of the UCMM Tag communication
A read or write request can be sent only while the Application Trigger request (Class3/UCMM)(Un\G27072 to Un\G27087) is on.

Turn on the Application Trigger request (Class3/UCMM)
(Un\G27072 to Un\G27087) on the Originator side.
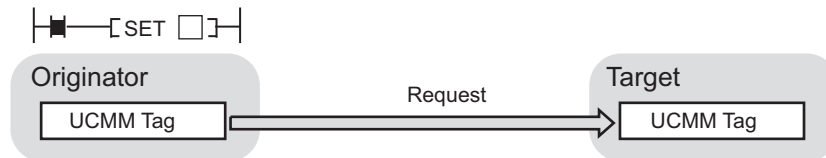
Figure 4.19 Timing of the UCMM Tag communication

Remark •

For details of the Application Trigger request (Class3/UCMM)(Un\G27072 to Un\G27087), refer to the following.

☞ Section 3.3.12 Application Trigger (Class3/UCMM)

• •

(3) Parameter setting and program example
Complete the setting of UCMM Tag parameter in Utility Package.
Select the "Message" window on the "Setting" tab and set the details in the window that is displayed when a blank line in the Tag Parameter list is double-clicked.

Figure 4.20 Window for Class3/UCMM Tag parameters setting of Utility Package

For details, refer to the following.

☞ Section 7.9.4 (2) Display and settings of the "Message Tag" window

☞ CHAPTER 8 PROGRAMMING

(4) Reserved tag

Tags can be reserved.

A tag set as a reserved tag is not used to perform Tag communication. It is used only to reserve input area and output area.

(a) Application

Adding a tag (canceling the reserved tag setting) does not require a sequence program change since input area and output area remain unchanged.

A sequence program change is not necessary by setting (not deleting) the tag as a reserved tag when a tag is no longer used.

(b) Setting method

Select "Reserved Tag" in the "Message Tag" window of Utility Package. (☞ (3) Parameter setting and program example in this section)

(c) Checking reserved tag settings in the buffer memory

The reserved tag setting status can be checked in Reserved tag(Class3/UCMM)(Un\G27216 to Un\G27231).

(5) Precautions

(a) Data type of the target device

The data type of the EtherNet/IP module must match that of the target device.

For the Data Type other than INT or DINT, register and set it using the "User Define" window. (☞ Section 7.9.5 "User Define" window)

(b) Tags that can receive read or write requests

Only the tags set as "Target" in "Class3/UCMM Tag Parameter" can accept the requests.

Tags set as "Originator" do not accept any request from the other device.

(c) Time required to recognize the Application Trigger request (Class3/UCMM)(Un\G27072 to Un\G27087)

A maximum of 10ms is required after the Application Trigger request (Class3/UCMM)(Un\G27072 to Un\G27087) is set to on.

(d) When the data transmission delay is lengthened

When the line is highly-loaded or unstable, the ACK of TCP from the target device may not be receivable.

In this case, the EtherNet/IP module sends the data after 10 seconds which lengthen the transmission delay time by 10 seconds from normal delay time.

If the above case frequently occurs, check the connectivity of cables and take measures such as reducing the line load by increasing the setting value of RPI.

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

4.3   Tag Communication Status Setting Function for CPU Stop Error

For each module, this function sets whether to stop or continue the Tag communication when a stop error occurs in the CPU module mounted with the EtherNet/IP module.

Figure 4.21 Tag communication status setting function for CPU stop error

This function can be set in "Intelligent Function Module Detailed Settings" of GX Works2. (☞ Section 5.5.1 Intelligent function module detailed setting)
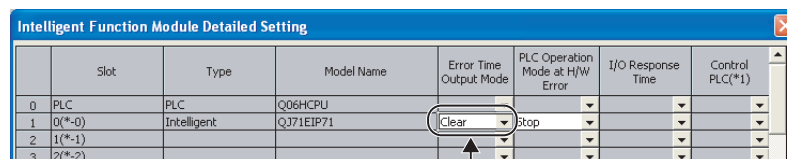
Setting for a CPU stop error

Figure 4.22 "Intelligent Function Module Detailed Setting"

Table 4.7 Description of the "Intelligent Function Module Detailed Setting" window

Item		Description
Error Time Output Mode	Clear	Stops Tag communication when a CPU stop error occurred. (default) The send/receive data before the communication stop are retained in the buffer memory of the EtherNet/IP module.
	Hold	Continues Tag communication when a CPU stop error occurred. Send/receive data are updated in the buffer memory of the EtherNet/IP module.

4.4 Monitoring Function

This function monitors error codes and Tag communication states.

Monitor the error codes on the "Main" tab of Utility Package. (☞ Section 7.6 "Main" Tab (Module Status Display))

Click the | Detail View | button on the "Main" tab to monitor the communication status of each Tag in the "Detail View" window. (☞ Section 7.6 (1) "Detail View" window)
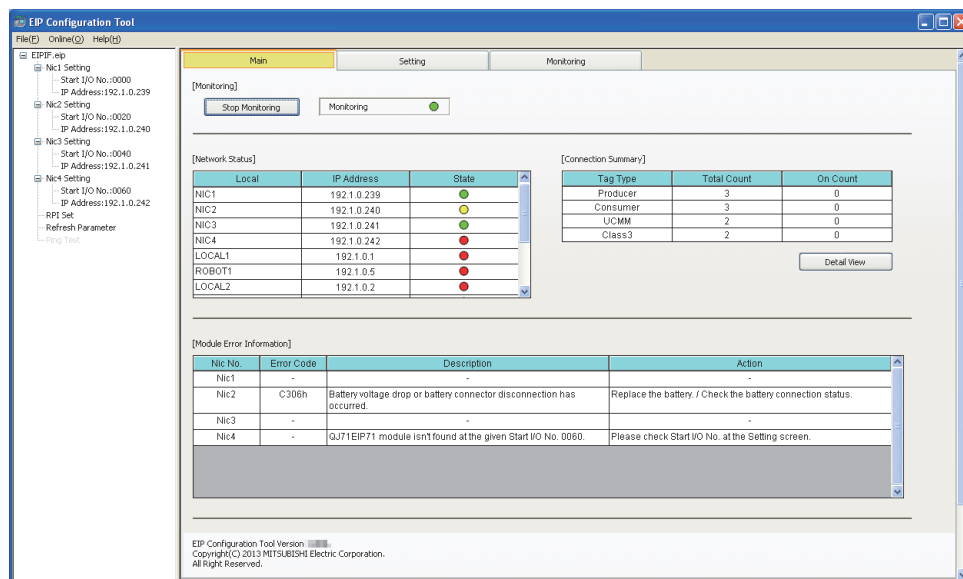
Figure 4.23 "Main" tab

> **Remark** ●
>
> Error codes and Tag communication states can be also monitored in the following buffer memory areas.

Table 4.8 Monitoring in the buffer memory

Description	Buffer Memory
Error status of own station	Own station error status (Un\G27264)
Communication status for each tag	•Communication Status (Class1)(Un\G27136 to Un\G27151) •Communication Error (Class1)(Un\G27152 to Un\G27167) •Reserved tag(Class1)(Un\G27168 to Un\G27183) •Communication Status (Class3/UCMM)(Un\G27184 to Un\G27199) •Communication Error (Class3/UCMM)(Un\G27200 to Un\G27215) •Reserved tag(Class3/UCMM)(Un\G27216 to Un\G27231)
Error status for each tag	•Class1 Diagnostics Information (Un\G27392 to Un\G27647) •Class3/UCMM Diagnostics Information (Un\G27648 to Un\G27903)

● ●

Execute the network diagnostics on the "Monitoring" tab of Utility Package. (☞ Section 7.11 "Monitoring" tab (Network Diagnostics))

1 OVERVIEW
2 SYSTEM CONFIGURATION
3 SPECIFICATIONS
4 FUNCTION
5 PRE-OPERATION PROCEDURES
6 PARAMETER
7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)
8 PROGRAMMING

4.5   DHCP Client Function

This function allows the EtherNet/IP module to acquire data such as an IP address from the DHCP server.
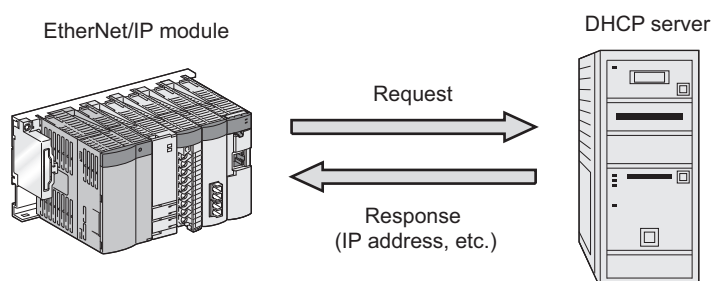
Figure 4.24 DHCP Client Function

(1) Setting
Select "Use" on the "Add Own Nic" window in Utility Package.
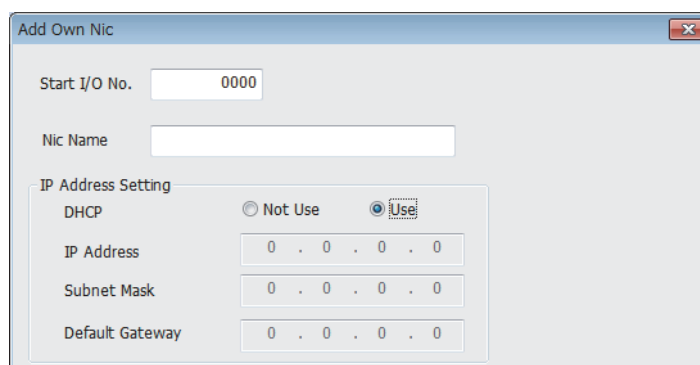
Figure 4.25 "Add Own Nic" window

Remark •

The DHCP setting (Un\G16385) can be also used for the setting.
(☞ Section 3.3.3 (1) DHCP setting (Un\G16385))

• •

(2) Acquiring parameters
Writing the parameter setting in Utility Package turns on the Acquiring IP address (X0D), and parameters can be obtained from the DHCP server.
Upon completion of acquisition, the Acquiring IP address (X0D) turns off.

(3) Checking the acquired parameters
Acquired parameters can be checked on the "Main" tab in Utility Package.
(⭐ Section 7.6 "Main" Tab (Module Status Display))

☒**POINT**

(1) "Not Use" is recommended for the DHCP client function.
To enable the DHCP client function, configure the DHCP server appropriately so that the same IP address is always allocated to the EtherNet/IP module. When the IP address is changed, the IP address must be reconfigured using "[Remote Nic]" in the "Basic" window.

(2) The parameters not specified by the DHCP server are set as the default values of the EtherNet/IP module.
(⭐ Section 7.11 (4) "Connection" window)

CHAPTER 5 PRE-OPERATION PROCEDURES

This chapter describes information including procedures before connecting the EtherNet/IP module to the EtherNet/IP network and wiring.

5.1   Installation

This section describes the handling precautions on the process from unpacking to mounting the EtherNet/IP module.
For details, refer to the following manual.
☞ QCPU User's Manual (Hardware Design, Maintenance and Inspection)

5.1.1   Handling precautions

The following are handling precautions for the EtherNet/IP module itself.

(1) Since the module case is made of resin, do not drop the module or apply a strong impact to it.
Doing so may damage the module.

(2) Do not disassemble or modify the module.
Doing so may cause failure, malfunction, injury, or a fire.

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

(4) Do not remove the printed circuit board of the module from the case.
Doing so may cause a failure.

(5) Tighten the module fixing screws within the following range.

Table 5.1 Screw tightening torque

Screw	Tightening torque range
Module fixing screw (M3 screw)[1]	0.36 to 0.48N•m

* 1   The module can be easily fixed to the base unit using a hook located on the top of the module. However, it is recommended to secure the module with module fixing screws if the module is subject to frequent vibrations.

5.2 Pre-Operation Procedures

This section describes the outline procedure to be taken before operation.

5.2.1 Consideration before configuring the EtherNet/IP network

Consider the items described in this section before configuring the EtherNet/IP network, and start up the system according to the flowchart in Section 5.2.2.

(1) Network configuration and IP address
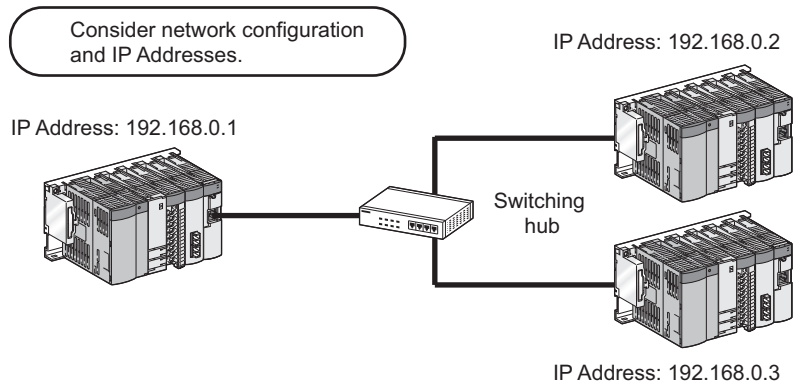
Figure 5.1 Consideration of IP address

(2) Tag types and data sizes
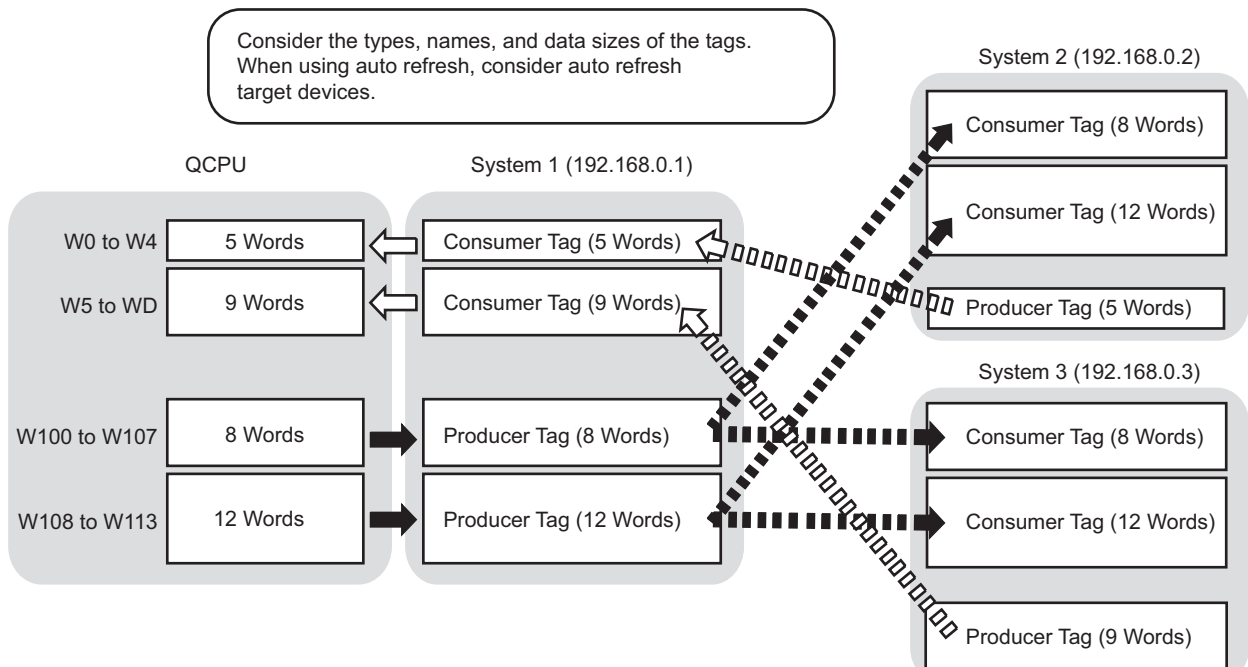
Figure 5.2 Consideration of tag types and data size (for Class1 Tag communication)

Remark •

For details of tag types, refer to the following.
☞ Section 4.2 Tag Communication Function

• •

Program modification steps can be reduced by configuring the system as shown below even when the data size is changed for system expansion or some other purposes.

The following is an example of increasing the data size of Tag No.1 from 5 words to 10 words.

(a) Setting auto refresh for each tag
   Configure the auto refresh settings providing some empty areas as shown in the Figure 5.3 so that no change is required on the settings even when the tag data size is changed.
   In addition, the existing device numbers are not changed.
   The sequence program can be modified only by changing the read or write data size of Tag No.1.

Increasing the data size of ///// from 5 words to 10 words
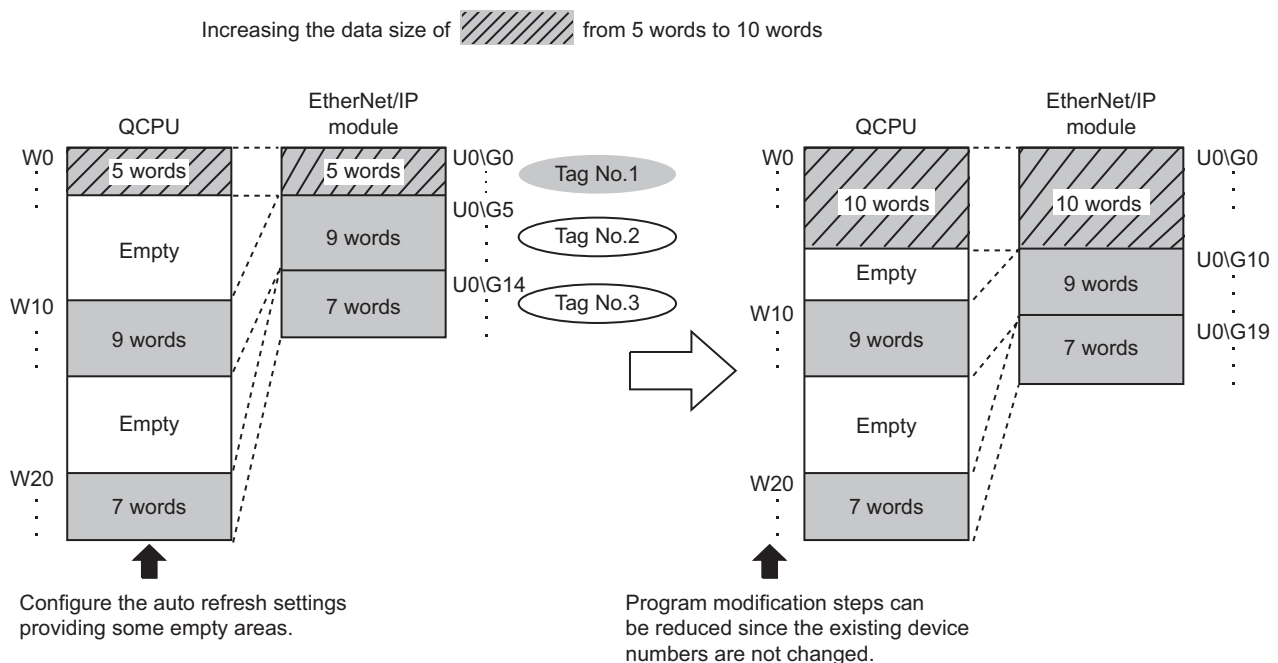
Figure 5.3 Setting auto refresh for each tag

(b) Setting auto refresh for each input/output area or not setting auto refresh

Set Tag No.1 as a reserved tag and create Tag No.4 as shown in the Figure 5.4. Buffer memory addresses for Tag No.2 and Tag No.3 will remain unchanged because the data sizes are not changed.

The sequence program can be modified only by changing the following items of Tag No.1.

- Read or write size
- Buffer memory addresses, that are reallocated due to Tag No. change from 1 to 4

  Example: Input Area (Un\G0 to Un\G4095), Operation status (Un\G27392 to Un\G27903), etc.
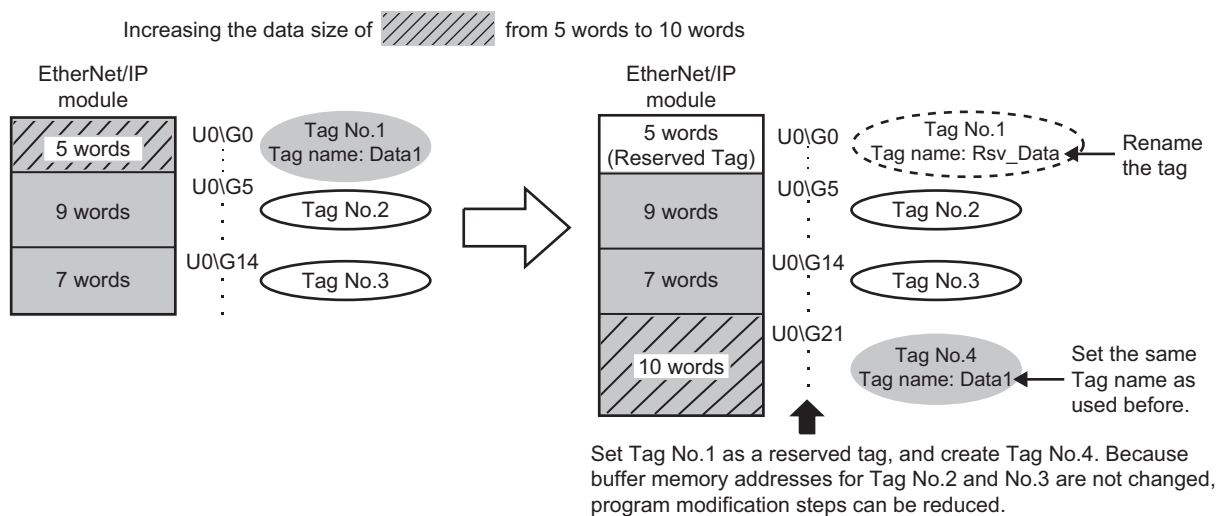
Figure 5.4 Setting auto refresh for each input/output area or not setting auto refresh

⊠POINT

Auto refresh settings for each tag can be set in Tag Parameter.

☞ Section 7.9.2 (2) Display and settings of the "Producer Tag" window

☞ Section 7.9.3 (2) Display and settings of the "Consumer Tag" window

☞ Section 7.9.4 (2) Display and settings of the "Message Tag" window

Auto refresh settings for each input/output area can be set in Refresh Parameter.

☞ Section 7.9.7 "Refresh Parameter" window

(3) Tag names
Name the tags that were considered in (2) in this section.

(a) Number of characters in a tag name
Up to 100 alphanumeric characters can be used for each tag name.
To use a tag name with 41 or more characters, the setting in "Add Own Nic"
window is required. (☞Section 7.9.1 (1) Display and settings of the "Add Own
Nic" window)
The availability of a tag name with 41 or more characters differs depending on the
version of the EtherNet/IP module and Utility Package. (☞Appendix 5 Added
and enhanced Functions)

(b) Tag name
In the EtherNet/IP network, communications are available only among devices
with the same name.
Since each Tag communication is identified by its tag name, the name cannot be
duplicated with that of any other communication.
To avoid tag names from duplicating, consider tag names of the entire EtherNet/IP
network in advance.
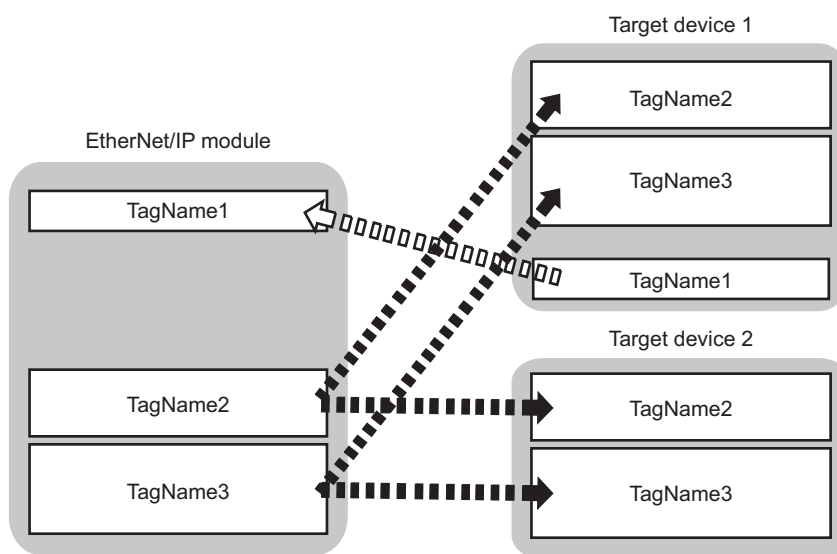
Figure 5.5 Considering tag names

☒**POINT**

If the IP address ("IP Address (Destination)") of the connected device is different,
the same Tag name can be assigned.

(4) The number of tags and data size
Check if the number of tags and the data sizes considered in (2) in this section are within the range of the specifications.
☞ Section 3.1 Performance Specifications

1

OVERVIEW

2

SYSTEM CONFIGURATION

3

SPECIFICATIONS

4

FUNCTION

5

PRE-OPERATION PROCEDURES

6

PARAMETER

7

UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8

PROGRAMMING

5.2.2 Pre-operation procedures

The following flowchart shows the setup and procedures for operation.

Start (continued from Section 5.2.1)

Check box

Install a battery in the EtherNet/IP module.
→ Section 5.4 Battery

Mount the EtherNet/IP module on the base unit.

Set the following in GX Works2.
- I/O assignment
- Intelligent function module detailed setting
→ Section 5.5.1 Intelligent function module detailed setting

Connect the personal computer and the QCPU with a cable.
→ Section 2.3 Operating Environment for Utility Package

Power on the programmable controller.

Write the parameters set in GX Works2.

Power off and then on the programmable controller, or reset the QCPU.

Set the following in Utility package, based on the considerations in Section 5.2.1.
- IP Address
- Common Parameter
- Class1 Tag Parameter
- Class3/UCMM Tag Parameter
- Refresh Parameter
→ Section 4.2 Tag Communication Function
→ CHAPTER 6 PARAMETER
→ Section 7.9 "Setting" Tab (Parameter Settings)

Write the parameters set in Utility package.
→ Section 7.10 Online

Power off and then on the programmable controller, or reset the QCPU.

(To the next page)

Figure 5.6 Pre-operation procedures

5 PRE-OPERATION PROCEDURES

(From the previous page)

Check box

☐	Connect the EtherNet/IP module to the EtherNet/IP network.	☞ Section 5.7 Wiring

☐	Turn on Tag communication start request (Y00), and start Tag communication.	☞ Section 3.2.2 Tag communication start request (Y00), Tag communication start process completion (X00)

☐	Check if Tag communications are normal in the "Main" tab window of the utility package.	☞ Section 7.6 "Main" Tab (Module Status Display)

☐   Is Tag communication normal?   Error → ☞ Section 9.3 When Tag Communication is Disabled

Normal

☐	Programming or debugging	☞ CHAPTER 8 PROGRAMMING

☐ Reset the QCPU, and then set it to RUN.

Completed

Figure 5.6 Pre-operation procedures (continued)

5.3   Part Names

This section describes each part and its name of the EtherNet/IP module.

Figure 5.7 Part Names

Table 5.2 Part name and description

No.	Name	Description
1)	Indicator LED	Indicates the operating status of the EtherNet/IP module. (☞ (1) LED indication in this section)
2)	10BASE-T/100BASE-TX interface connector (RJ45)	Connects the EtherNet/IP module to 10BASE-T/100BASE-TX. The EtherNet/IP module automatically distinguishes between 100BASE-TX and 10BASE-T according to the target device.
3)	Battery	Is for the error logging of the system.
4)	Battery connector pin	Used to connect a lead wire of the battery. Lead wire is disconnected from a connector when shipping to prevent the battery from burning the power.
5)	Serial number plate	Indicates the serial number of the EtherNet/IP module.

(1) LED indication

10BASE-T/
100BASE-TX

QJ71EIP71

RUN
ERR.

100
M

SD/
RD
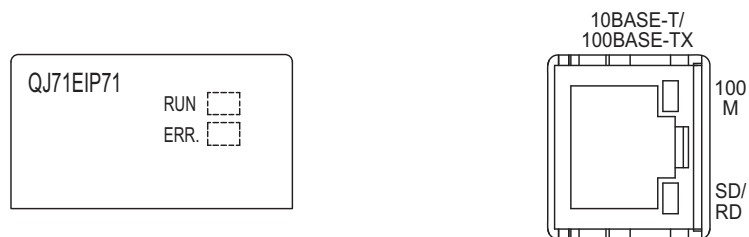
Figure 5.8 LED

Table 5.3 LED indication

Name	LED status	Description
RUN	On	Module is operating normally. It may take time for the RUN LED to light when starting the system.
	Off	Hardware fault or watchdog timer error
ERR.	On	Module stop error (Hardware error, IP Address not set, or others)
	Rapid flashing	Module continuation error. (Parameter error)
	Slow flashing	Module continuation error. (Communication error)
	Off	Normal status, or Tag communication has not started yet.
100M	On	Communicating at 100Mbps
	Off	Communicating at 10Mbps
SD/RD	On	Sending or receiving data
	Off	No data communication

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

5.4 Battery

This section describes installation and replacement of the battery.

5.4.1 Battery specifications

The specifications of the battery for the EtherNet/IP module are shown below.

Table 5.4 Battery specifications

Item	Description
	Q6BAT
Type	Manganese dioxide lithium primary battery
Initial voltage	3.0V
Nominal current	1800mAh
Battery life when not used	Actually 5 years (room temperature)
Battery life when used	☞ Section 5.4.3 Detecting a battery error and replacing the battery
Lithium content	0.52g
Application	For error logging

Remark •

For the battery directive in EU member states, refer to Appendix 2.

• •

5.4.2 Installing the battery

Battery connector of the EtherNet/IP module battery is disconnected for shipping.
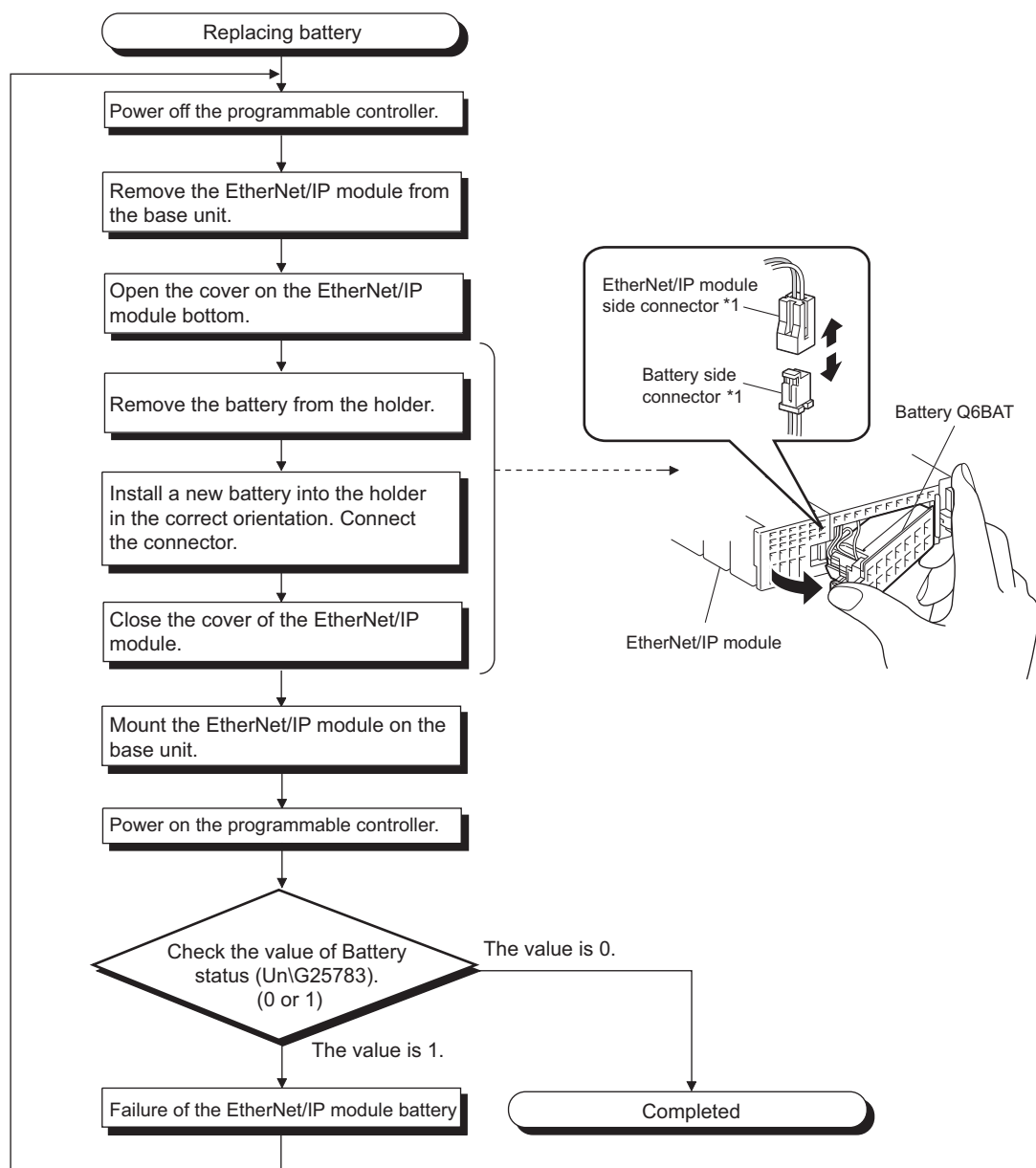Connect the battery connector before using.
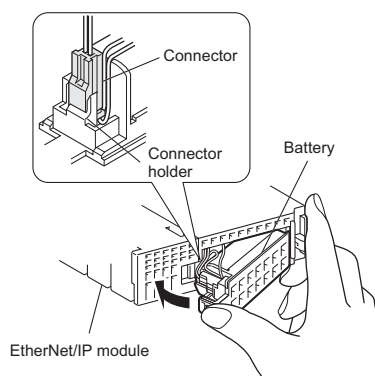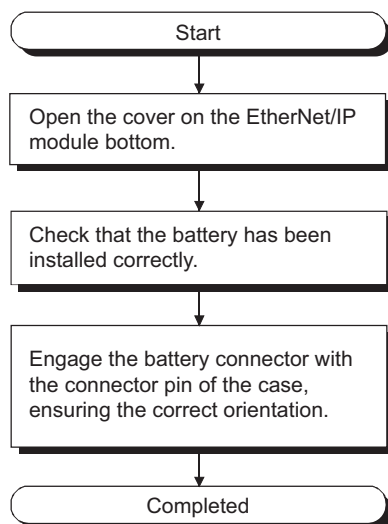
Figure 5.9 Battery installation procedure

⊠POINT

Engage the battery connector vertically to the connector pin of the case.
Failure to do so may cause a deformation of the connector and damage the
battery case.
Securely push in the battery connector.

5.4.3 Detecting a battery error and replacing the battery

This section describes detection of a battery error and how to replace the battery of the EtherNet/IP module.
When the battery voltage has dropped, the battery must be replaced.

(1) Battery error detection of the EtherNet/IP module
The battery of the EtherNet/IP module is used for error logging of the system.
The EtherNet/IP module does not detect a battery error by default.
To detect battery errors, store "1" in the Battery error detection setting (Un\G16633).

(2) Checking for battery voltage drop of the EtherNet/IP module
The contents of the error will not be cleared for a while after a battery error. However, the data may be cleared if the battery error is not noticed.

1) Check for a battery error by either of the following.
   • The ERR. LED and the Own station error (X0E) turns on.
     A battery error (error code C306$_H$) occurs.
   • "1" is stored in the Battery status (Un\G25783).

2) If a battery error has occurred, replace the battery within the guarantee time after the error occurrence. (☞ (3) in this section)

The following is a program example in which Y100 is set to on if a battery error occurs.
In this example, the EtherNet/IP module is mounted in slot 0 of the main base unit, with the start I/O No. set to "0000".

```
 X0E         U0\
─┤ ├──[=    G25783   K1  ]────────────────────────────(Y100  )─   Turns on Y100 when a battery error occurs.
```

Figure 5.10 Battery voltage drop checking

(3) Battery life (Q6BAT)

(a) The table below shows the life of the EtherNet/IP module battery.

Table 5.5 Battery life

Power-on time ratio [1]	Battery life		
	Guaranteed value (MIN) [2]	Actual usage value (TYP) [3]	Guaranteed time after a battery error [4]
0%	26000 hr 2.96 years	43800 hr 5 years	1500 hr 62 days
30%	37142 hr 4.23 years	43800 hr 5 years	1500 hr 62 days
50%	43800 hr 5 years	43800 hr 5 years	1500 hr 62 days
70%	43800 hr 5 years	43800 hr 5 years	1500 hr 62 days
100%	43800 hr 5 years	43800 hr 5 years	1500 hr 62 days

* 1 The power-on time ratio indicates the percentage of the power-on time per day (24hours).
(In the case of 12 hours of power on and 12 hours of power off, the power-on time ratio is 50%.)

* 2 The guaranteed value is a battery life at 70°C, which is guaranteed based on the characteristics of the parts manufacturer-supplied memory (SRAM), assuming that the battery is stored within the ambient temperature range from -25°C to 75°C (or used within the ambient temperature range from 0°C to 55°C).

* 3 The actual usage value (reference value) is a battery life calculated based on the actual values measured at a storage ambient temperature of 40°C. This value is for reference only because it varies depending on the characteristic variations of the components.

* 4 In the following states, the guaranteed time after power off is three minutes.
The battery connector is disconnected.
The lead wire of the battery is cut off.

(b) The life of the battery (Q6BAT) is 5 years if it is not connected to the EtherNet/IP module.

(c) After the Battery status (Un\G25783) turns on, replace the battery quickly even though the data will be retained for a certain period of time.
Periodical battery replacement is recommended according to the operating condition even before occurrence of a battery error.

☒**POINT**

The error log may be cleared if the battery is not replaced after a battery error occurs.

(4) Replacement of the EtherNet/IP module battery

At the end of battery life, replace the battery according to the procedure in Figure 5.11. Keep the programmable controller on at least 10 minutes before removing the battery. Replace the battery quickly even though the memory will be retained for a while after removal of the battery. If the replacement time exceeds the guaranteed value shown below, the error contents may be cleared.

Table 5.6 Operation retention time for electric outage

Operation retention time for electric outage
3 minutes

Figure 5.11 Battery replacement procedure

* 1　Engage or remove the battery connector vertically to the connector pin of the case.
　　Failure to do so may cause a deformation of the connector and damage the battery case.

OVERVIEW 1

SYSTEM CONFIGURATION 2

SPECIFICATIONS 3

FUNCTION 4

PRE-OPERATION PROCEDURES 5

PARAMETER 6

UTILITY PACKAGE (SW1DNC-EIPUTL-E) 7

PROGRAMMING 8

5.5   Setting from GX Works2

This section describes the GX Works2 settings required to operate the EtherNet/IP module. When using GX Developer, refer to the following.

☞ Appendix 3 When Using GX Developer

5.5.1   Intelligent function module detailed setting

Set the Tag communication status for a CPU stop error.
For details of Tag communication for a CPU stop error, refer to the following.

☞ Section 4.3 Tag Communication Status Setting Function for CPU Stop Error

1) Double-click "PLC Parameter" in the project window in GX Works2.

2) Click the "I/O Assignment" tab.

3) Set the following items for the slot where the EtherNet/IP module is mounted, and then click ｜Detailed Setting｜ .
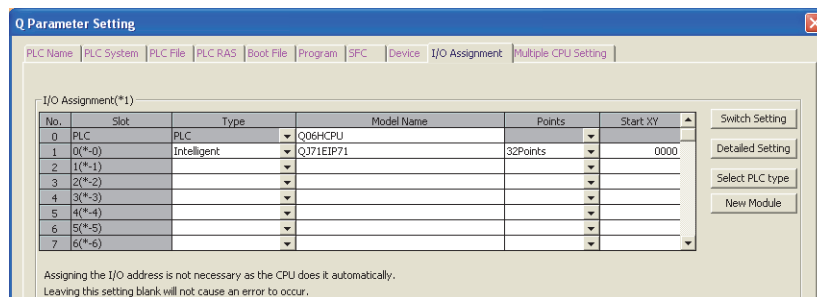
Figure 5.12 "I/O Assignment"

Table 5.7 Setting items on the "I/O Assignment" tab

Item	Description
Type	Select "Intelligent".
Model Name	Enter the model name of the module.
Points	Select "32points".
Start XY	Enter the start I/O number of the EtherNet/IP module.

4) Clicking ｜Detailed Setting｜ displays the "Intelligent Function Module Detailed Setting" window.
   Refer to the following and complete the setting.
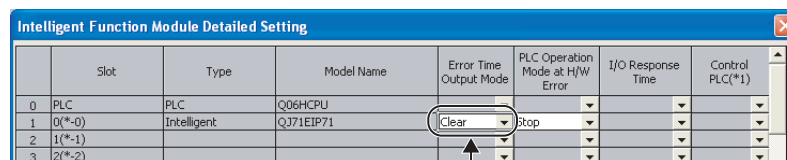
Setting for a CPU stop error

Figure 5.13 "Intelligent Function Module Detailed Setting"

Table 5.8 Setting description in "Intelligent Function Module Detailed Setting"

Item	Description
Error Time Output Mode	Clear: Stops Tag communication when a CPU stop error occurred. (default)
	Hold: Continues Tag communication when a CPU stop error occurred.

5.5.2   Switch setting for the intelligent function module

In the intelligent function module switch setting for the EtherNet/IP module, hardware test and self-loopback test can be set.
No setting is required when not using the hardware test and self-loopback test.

For details of the hardware and self-loop back test, refer to the following.
☞ Section 5.6.1 Hardware test
☞ Section 5.6.2 Self-loopback test

1) Configure the settings on "I/O Assignment" of GX Works2.
(☞ Section 5.5.1 Intelligent function module detailed setting)
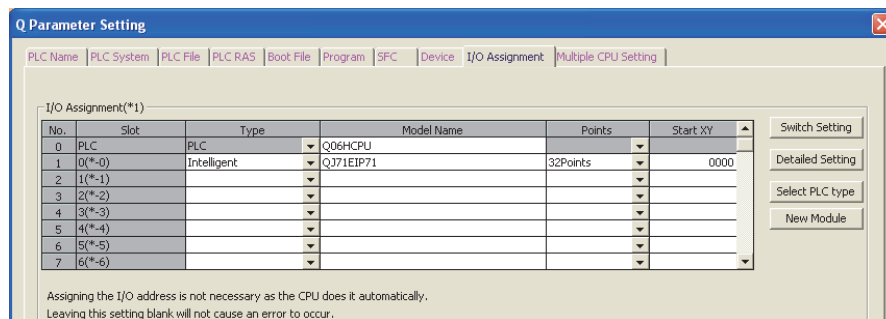
Figure 5.14 "I/O Assignment"

2) Clicking Switch Setting displays the "Switch Setting for I/O and Intelligent Function Module" window.
Refer to the following and complete the setting.
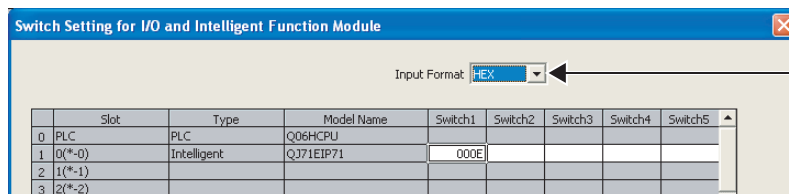
Select "HEX".

Figure 5.15 "Switch Setting for I/O and Intelligent Function Module"

Table 5.9 Setting items in "Switch Setting for I/O and Intelligent Function Module"

Item	Description
Switch 1	Set the hardware test or self-loopback test. No settings (blank): Online mode (default) 000D$_H$: Hardware test 000E$_H$: Self-loopback test
Switch 2	No settings (blank) When any item is set, delete the settings and leave the field blank.
Switch 3	
Switch 4	
Switch 5	

3) When the setting is completed, click End .

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

◘ POINT

(1) Switch setting for I/O and intelligent function module takes effect when turning off and on the power or resetting the CPU module after execution of Write to PLC.

(2) When the setting of "Switch Setting for I/O and Intelligent Function Module" is out of range, the ERR. LED turns on and a switch 1 error (error code: C000H) is detected.
After correcting the setting, turn the power off and on or reset the CPU module.

5.6 Self-Diagnostics of the EtherNet/IP Module

This section describes the self-diagnostics of the EtherNet/IP module.

5.6.1 Hardware test

Hardware test checks the RAM and LEDs of the EtherNet/IP module.
The hardware test procedure is shown below.

(1) Setting the EtherNet/IP module

    1) Set the CPU module switch to STOP.

    2) Disconnect the twisted pair cable from the EtherNet/IP module.

    3) Set 000D$_H$ to "Switch 1" on the "Switch Setting for I/O and Intelligent Function Module" window in GX Works2.
    (☞ Section 5.5.2 Switch setting for the intelligent function module)

(2) Executing a hardware test

    1) Turn off and on the power of the programmable controller, or reset the CPU module.

    2) The ERR. LED flashes six times and a hardware test starts.
    When the hardware test is started, the RUN and ERR. LEDs flash.
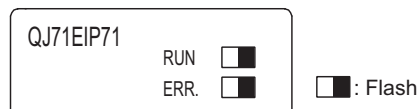
Figure 5.16 Executing a hardware test

(3) Checking the hardware test result

    1) Check the hardware test result by the RUN and ERR. LED states.
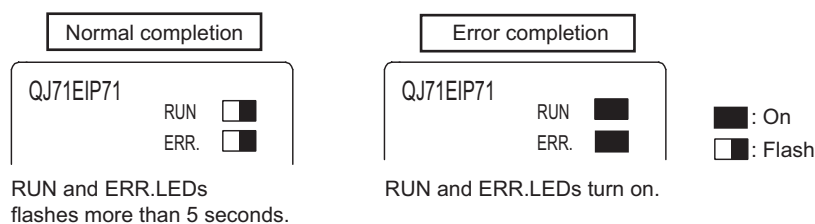
Figure 5.17 Checking the hardware test result

Remark •

The hardware test result is stored in the Self-diagnostics execution result (Un\G27268) as well. (☞ Section 9.4.1 How to check error codes)

• •

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

2) For error completion, check the setting of "Switch Setting for I/O and Intelligent Function Module" and execute the self-loopback test again.

3) If the error is detected again, a hardware failure may have occurred in the EtherNet/IP module.
Please consult your local Mitsubishi representative.

5.6.2 Self-loopback test

It is a test to check the send/receive function of the EtherNet/IP module.
The following is the procedure of a self-loopback test.

(1) Setting the EtherNet/IP module

1) Set the CPU module switch to STOP.

2) Disconnect the twisted pair cable from the EtherNet/IP module.

3) Set 000E$_H$ to "Switch 1" on the "Switch Setting for I/O and Intelligent Function Module" window in GX Works2.
(☞ Section 5.5.2 Switch setting for the intelligent function module)

(2) Executing a self-loopback test

1) Turn off and on the power of the programmable controller, or reset the CPU module.

2) The self-loopback test starts.
The ERR. LED flashes during the test.
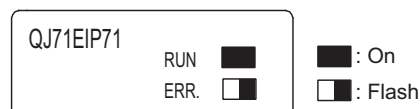
Figure 5.18 Executing a self-loopback test

3) When the self-loopback test is completed, the ERR. LED turns off or flashes.

(3) Checking the result of a self-loopback test

1) Check the result of the self-loopback test by the ERR. LED status.
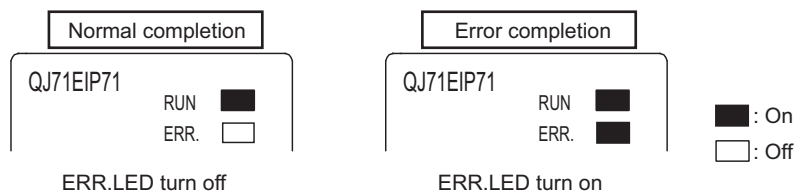
Figure 5.19 Checking the result of a self-loopback test

Remark •

The result of a self-loopback test is stored in the Self-diagnostics execution result (Un\G27268). (☞ Section 9.4.1 How to check error codes)

• •

2) For error completion, check the "Switch Setting for I/O and Intelligent Function Module" for error and execute the self-loopback test again.

3) If the error is detected again, a hardware failure may have occurred in the EtherNet/IP module.
Please consult your local Mitsubishi representative.

Side tab navigation: 1 OVERVIEW · 2 SYSTEM CONFIGURATION · 3 SPECIFICATIONS · 4 FUNCTION · 5 PRE-OPERATION PROCEDURES · 6 PARAMETER · 7 UTILITY PACKAGE (SW1DNC-EIPUTL-E) · 8 PROGRAMMING

5.7 Wiring

This section describes wiring of the EtherNet/IP module.

(1) Components
For details of the components, refer to the following.
☞ Section 2.2.2 Network components of the EtherNet/IP network

(2) Wiring method
Connect the EtherNet/IP module to a switching hub with a twisted pair cable.
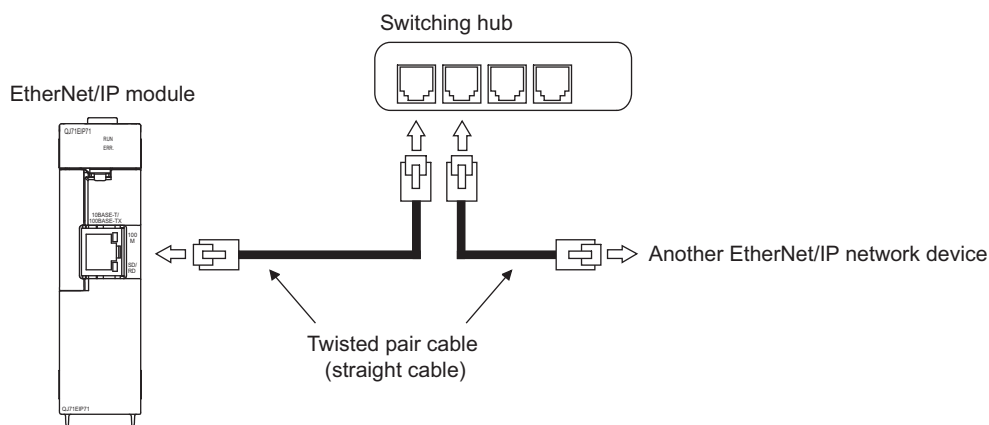
Figure 5.20 Wiring method

(3) Measures for high-speed communication with 100BASE-TX
At the high-speed communication (100Mbps) with 100BASE-TX connection, a communication error may occur due to high frequency noise from the devices other than the programmable controller under some installing environment.
The following measures prevent the EtherNet/IP module from being affected by high frequency noise when configuring a network system.

(a) Cable connection
- Do not install twist pair cables together with the main circuit lines or power cables.
- Place the twisted pair cables in a duct.

(b) 10Mbps transmission
Replace the devices to be connected to the EtherNet/IP module with 10Mbps products and perform data communication at a transmission speed of 10Mbps.

5.7.1 Wiring precautions

Noise resistant wiring is one of the factors for the optimum performance of the EtherNet/IP module and highly reliable system operation.

(1) Installation of 100BASE-TX and 10BASE-T
Sufficient safety measures must be taken when installing 100BASE-TX or 10BASE-T cables.
Consult qualified service personnel for installation, including cable termination and trunk cable wiring.

(2) Connection cable standards
For details of connection cables, refer to the following.
☞ Section 2.2.2 (1) Twisted pair cable (sold separately)

(3) Wiring of control lines and communication cables
Do not install the control lines and/or communication cables together with the main circuit lines or power cables.
Keep a distance of 100mm (3.94 inches) or more between them.

(4) Bending radius of the cable
The bending radius around the connector should be "outside diameter of the cable × 4" or larger.

Outside diameter of cable × 4
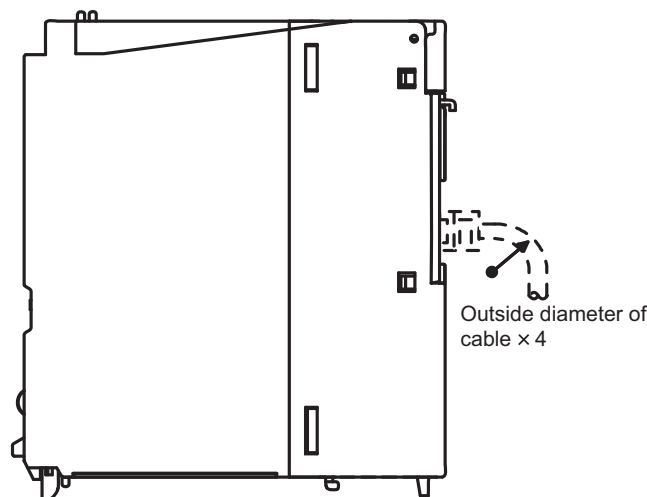
Figure 5.21 Bending radius of the cable

(5) Cable handling
Place the communication cables or power cables in a duct or clamp them.
Failure to do so may cause damage to the modules and/or the cables or malfunction due to unintentional pulling of the cables.

(6) Disconnecting the cable
To disconnect a communication cable or power cable from the module, hold a connector of the cable. Do not pull the cable.
Pulling a cable that is still connected to the module may cause damage to the module and/or the cable or malfunction.

OVERVIEW **1**

SYSTEM CONFIGURATION **2**

SPECIFICATIONS **3**

FUNCTION **4**

PRE-OPERATION PROCEDURES **5**

PARAMETER **6**

UTILITY PACKAGE (SW1DNC-EIP1UTL-E) **7**

PROGRAMMING **8**

5.8   PING Test

This section describes the PING test.
The PING test is used to check the existence of other devices on the same Ethernet (the same subnet address).

(1) How to execute the PING test

    (a) From Utility Package

        1) Double-click "Ping Test" on the selection tree to display the window below.

Figure 5.22 "Ping Test" window

        2) Set the following items.

Table 5.10 Setting items on the "Ping Test" window

Item	Description
Nic No.	Select the module (Nic1 to 4) to be subjected to the PING test.
Communication Time Check	Set the time period to wait for completion.
Transmission Count	Set the transmission counts.
IP Address	Enter the IP Address of the target device.

        3) Click the Ping Test button to execute the test.

        4) Check the displayed test results.

Table 5.11 Test results shown in the "Ping Test" window

Item	Description
Total Packet Transmission Count	After the PING test is completed, the total packet transmission count is displayed.
Success Count	After the PING test is completed, the number of PING test successes is displayed.
Failure Count	After the PING test is completed, the number of PING test failures is displayed.

(b) From a sequence program

The following is a program example in which a PING test is executed in a sequence program.

In the example, a PING test is executed for IP address 192.168.0.2 when the start I/O No. of the EtherNet/IP module is set to "0000".
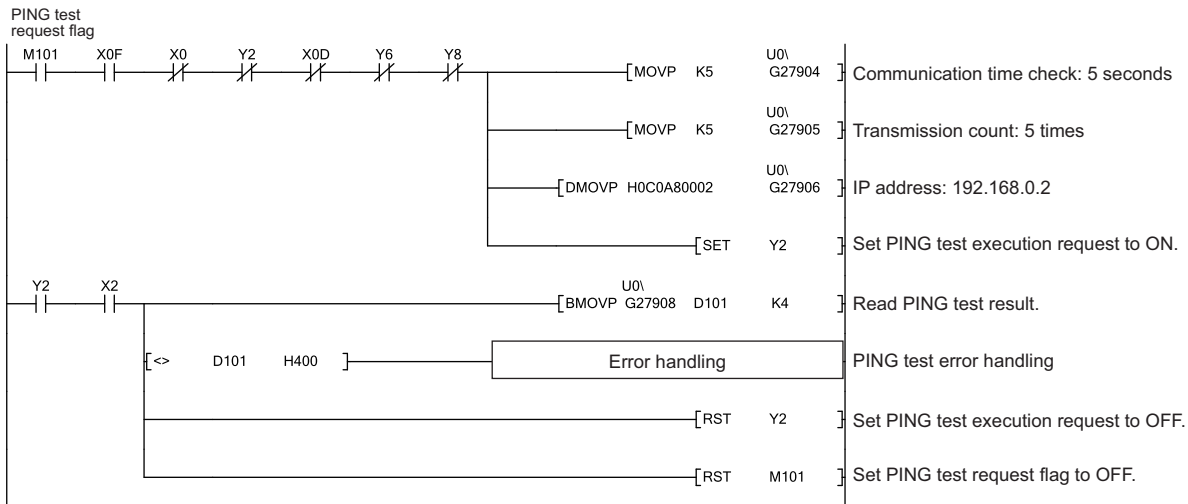
Figure 5.23 Program example of a PING test

(2) When PING test is not available

Check the following and execute the PING test again.

Table 5.12 When PING test is not available

Item	Corrective action
Has an error occurred in the CPU module?	Correct the error of the CPU module. (☞ the manual for the CPU module used)
Is the CPU module switch set to RUN?	Set the CPU module switch to RUN.
Is the intelligent function module switch setting left blank (No setting)?	Delete the settings of the intelligent function module switch setting. (☞ Section 5.5.2 Switch setting for the intelligent function module)
Are the cables connected properly?	Connect the cables properly. (☞ Section 5.7 Wiring)
Are the connected devices and switching hubs on? Or, any error in them?	Power on the connected devices and switching hubs. If an error is identified, check the error detail and take corrective actions.
Is the value stored in the Execution result (Un\G27908) C400$_H$? (When executing from a sequence program)	Correct the IP address (Un\G27906 to Un\G27907) of the connected device.
Is the failure count other than 0?	•Correct the IP address (Un\G27906 to Un\G27907) of the connected device. •Check for noise. (☞ Section 5.7.1 Wiring precautions) •Utility Package: on the "Ping Test" window •Sequence program: the value stored in Un\G27911

CHAPTER 6 PARAMETER

This chapter describes parameters of the EtherNet/IP module.

6.1   Parameter List and Setting Method

(1) Parameter list and setting method

1) Set the following parameters.

Table 6.1 Parameter list and setting method

PARAMETER	Description	Set from:	Reference section
IP Address	Set the IP address of the EtherNet/IP module.	Utility Package	Section 7.9.1
Common Parameter	Set the following items when changing values from default. •Maximum count of tags •Size of the Input Area (Un\G0 to Un\G8191) •Size of Output Area (Un\G8192 to Un\G16383)		
Class1 Tag Parameter	Set tags for Class1 Tag communication.		Section 4.2.1 Section 7.9.2
Class3/UCMM Tag Parameter	Set tags for Class3 and UCMM Tag communication.		Section 4.2.2 Section 4.2.3 Section 7.9.4
Refresh Parameter	Specify the devices where the communication status and own station error are stored.		Section 7.9.7
Intelligent function module detailed setting	Set the Tag communication status for a CPU stop error.	GX Works2	Section 4.3 Section 5.5.1

Table 6.2 Whether the setting is required for each Tag communication

Parameter	Function		
	Class1 Tag communication	Class3 Tag communication	UCMM Tag communication
IP Address	○		
Common Parameter	○		
Class1 Tag Parameter	○	×	×
Class3/UCMM Tag Parameter	×	○	○
Refresh Parameter	△	△	△
Intelligent function module detailed setting	△	△	△

○: Setting required △: Setting required as necessary, × : No setting required

2) Write parameters to the module. (☞ Section 7.10 Online)

3) Power off and then on the programmable controller, or reset the QCPU.

6.2 Access to the Flash ROM

To keep parameters after turning off the programmable controller or resetting the CPU module, save them in the flash ROM.
This section describes how to save or clear parameters in the flash ROM.

(1) Program example

The following is a program example of saving parameters in the flash ROM.
In the following program example, the start I/O No. of the EtherNet/IP module is set to "0000".
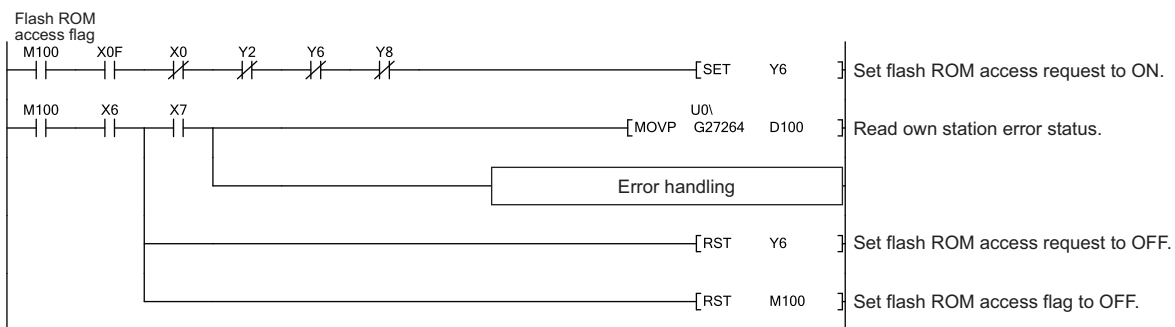
Figure 6.1 Program example of access to the flash ROM

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

CHAPTER 7   UTILITY PACKAGE (SW1DNC-EIPUTL-E)

This chapter describes installing, uninstalling, functions, and usage of Utility Package.

Remark •

For details of connection method and operating environment for Utility Package, refer to the following.

☞ Section 2.3 Operating Environment for Utility Package

• •

7.1 Precautions

(1) The number of auto refresh parameter settings

(a) The number of auto refresh parameters that can be set to a QCPU
When multiple intelligent function modules are mounted with, set parameters within the range shown in the table below.

Table 7.1 Maximum number of auto refresh parameter settings

CPU type	Maximum number of auto refresh parameter settings
Q00J/Q00/Q01CPU	256
Q02/Q02H/Q06H/Q12H/Q25HCPU	
Q02PH/Q06PH/Q12PH/Q25PHCPU	
Q00UJ/Q00U/Q01UCPU	
Q02UCPU	1024
Q03UD/Q04UDH/Q06UDH/Q10UDH/Q13UDH/Q20UDH/Q26UDH/Q03UDE/Q04UDEH/Q06UDEH/Q10UDEH/Q13UDEH/Q20UDEH/Q26UDEH/Q50UDEH/Q100UDEH/Q03UDV/Q04UDV/Q06UDV/Q13UDV/Q26UDVCPU	2048

(b) The number of auto refresh parameters that can be set to the EtherNet/IP module
A maximum of 255 auto refresh parameters can be set.
The displayed numbers are a total of refresh parameters set in each window below.

Figure 7.1 How to count the number of auto refresh settings in "Refresh Parameter" window

The setting for each tag is counted as one setting. Selection of "Not Use" is not included in the number of settings.
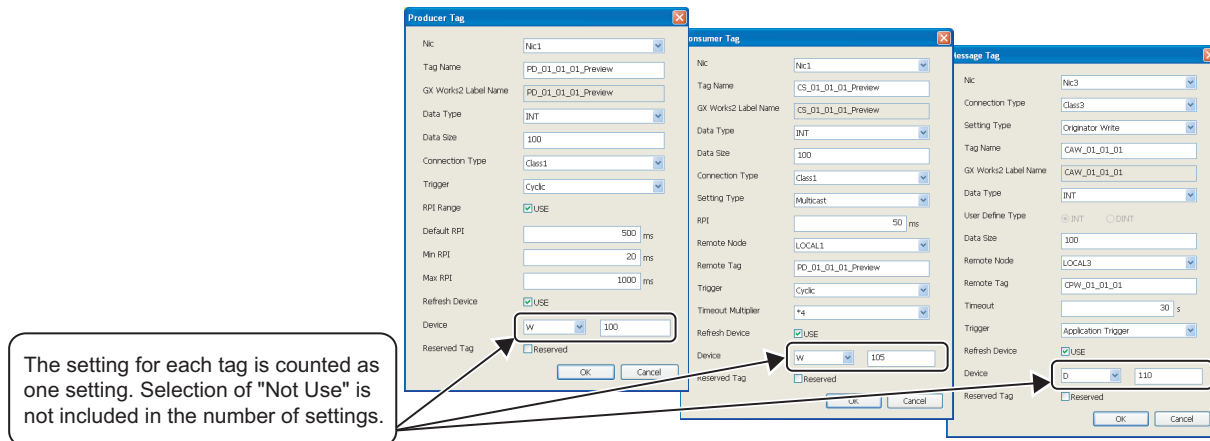
Figure 7.2 How to count the number of auto refresh settings in "Tag Parameter" window

⊠POINT

(1) When the number of auto refresh parameter settings exceeds the range of the QCPU

If the auto refresh is set for each tag, set it on the "Refresh Parameter" window. (☞ Section 7.9.7 "Refresh Parameter" window)

Or refresh them by a sequence program. (☞ Section 8.4.1 Program example of Tag communication)

(2) When the number of auto refresh parameter settings exceeds the range of the EtherNet/IP module

Set the auto refresh on the "Refresh Parameter" window. (☞ Section 7.9.7 "Refresh Parameter" window)

---

(2) Device ranges of auto refresh

Devices can be set within the range shown on the "Device" tab on the "Q Parameter Setting" window in GX Works2.

Note that other modules and EtherNet/IP modules having a different Nic No. must not use the same auto refresh target devices.

The following devices can be set with Utility Package.

Table 7.2 Device ranges that can be set

Device	Setting range
L	0 to 32752
M	0 to 61424
D	0 to 4212735
R	0 to 32767
B	0 to EFF0
W	0 to 4047FF
ZR	0 to 4184063

(3) Terminating Microsoft® Windows®

Do not terminate Microsoft® Windows® while running Utility Package.

7.2 Installing and Uninstalling

7.2.1 Installing

This section describes how to install Utility Package.
Check the following items before installation.

⊠**POINT**

(1) Before installing, terminate all the running applications on Microsoft®
Windows®.
The installer may not function properly while the resident software such as
update programs of the operating system or other manufacturers' software,
such as Windows Update or Java, is automatically running.
If the installer does not function properly, perform the following and start the
installation again.
- Change the settings to disable the automatic start of the resident software
such as update programs.
- Check that there is no file path that does not exist actually in the path to
the Windows environmental variables. If there is any, correct or delete it.

(2) When installing, log on as a user with Administrator attributes.

(3) When installing other version of Utility Package, uninstall the old one first.

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

(Start)

↓
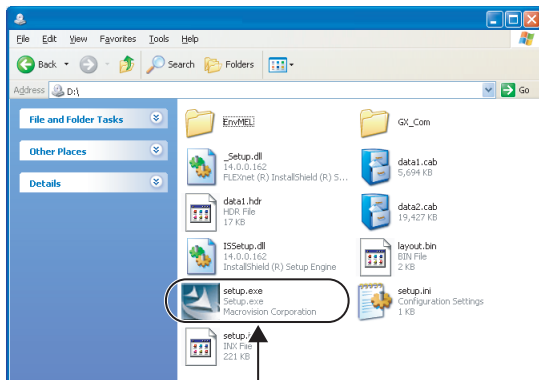
Double-click

1. Start Windows® Explorer and open the drive where the disk is loaded.
   Double-click "setup.exe".

   When using Windows Vista®, the below window is displayed if User Account Control is enabled.
   Select "Allow".
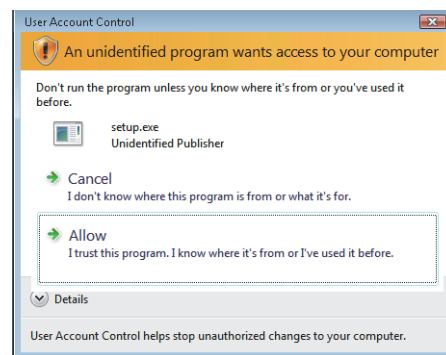
   When using Windows® 7, the below window is displayed if User Account Control is enabled.

   Click the [Yes] button.

↓
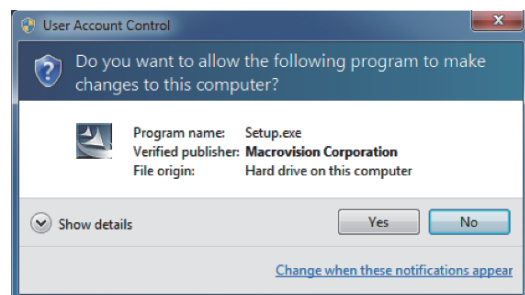
2. When the window shown on the left appears, click [Cancel] and uninstall Utility Package. And then install it all over again. Utility Package may not operate properly if the installation is executed without uninstallation.

↓
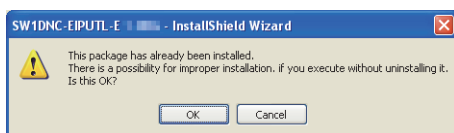
(To the next page)

(From the previous page)

↓
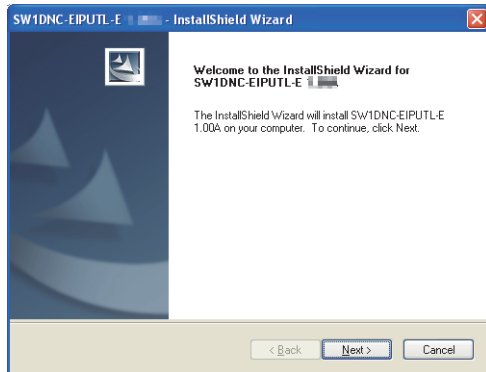
3. Click [Next] when the window shown on the left is displayed.

↓
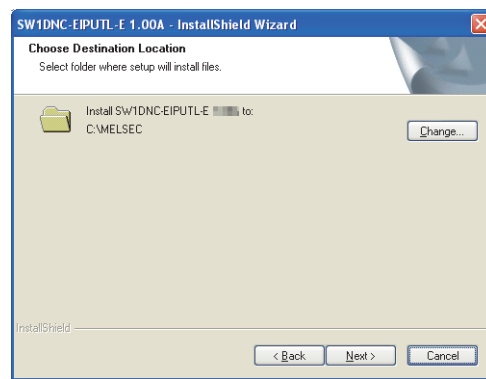
4. Specify the folder where the file is installed and click [Next].

When the below window is displayed on Windows Vista ®, click "Install this driver software anyway"
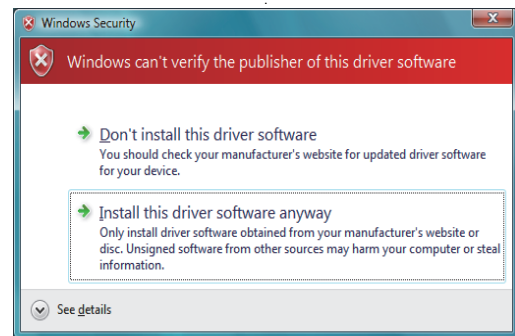
When the below window is displayed on Windows ® 7, click "Install this driver software anyway"

↓

(To the next page)

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING
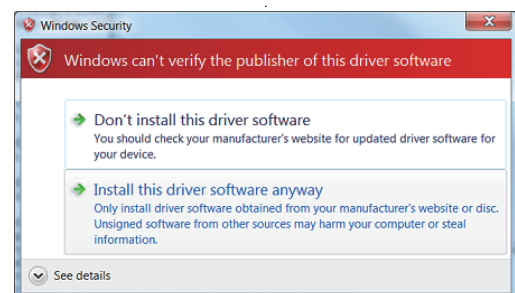
(From the previous page)

↓
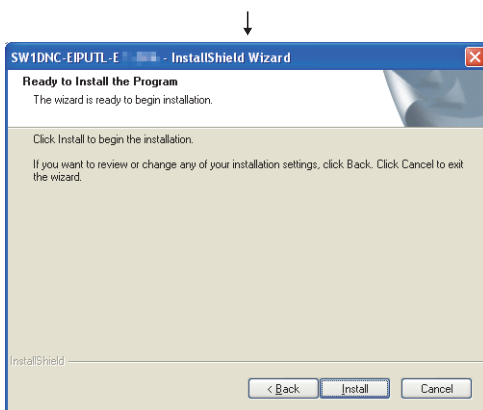
5. Clicking [Install] starts the installation.
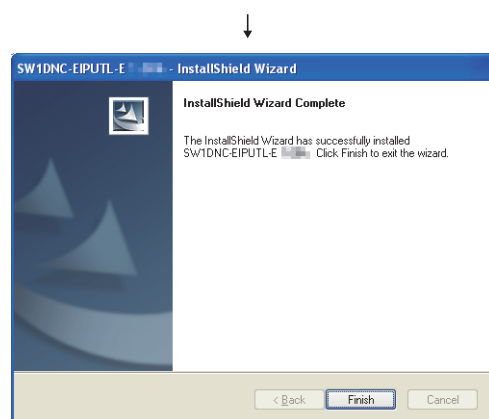
↓

6. The installation is completed when the window shown on the left is displayed.

    Click the [Finish] button.

↓

(End)

When an installation of Utility Package is successfully completed, icons will be created as shown below.
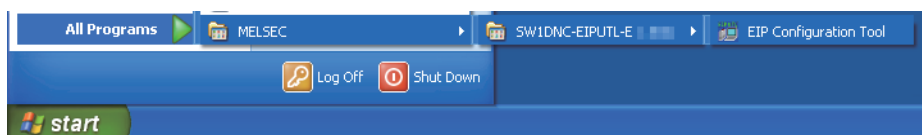
Figure 7.3 Icons to be created

7.2.2 Uninstalling

This section describes how to uninstall Utility Package.

⊠**POINT**

(1) When uninstalling, log on as a user with Administrator attributes.

(2) Start uninstallation from the Control Panel on Windows®.

(3) Do not terminate the uninstallation while it's in process.
If terminated, re-execute the uninstallation.
When uninstallation is disabled, install Utility Package again and then uninstall it.

The following procedure is for Windows® XP.

(Start)

↓
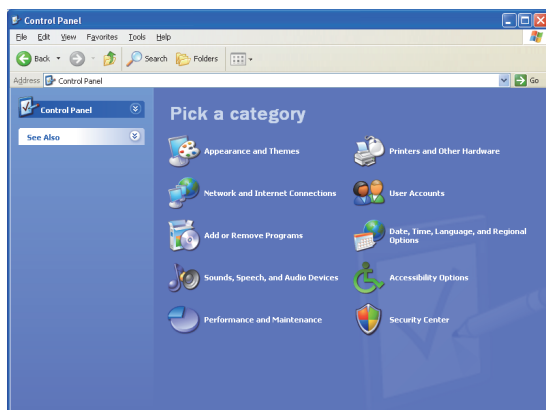
1. Click [start]→[Control Panel] on Windows®.
Click "Add or Remove Programs" in Control Panel.

• For Windows Vista® or Windows® 7
To display Control Panel, click [Start]→[Control Panel].
Click "Uninstall a program" in Control Panel.

↓

(To the next page)

(From the previous page)

↓
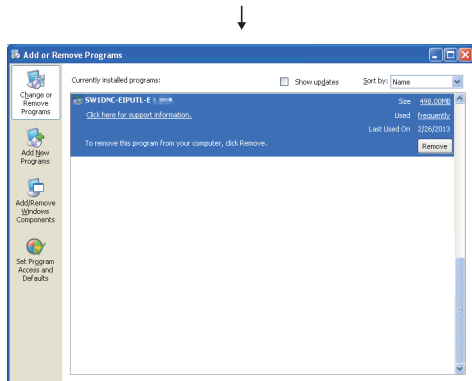
2. Select "SW1DNC-EIPUTL-E" and click [Remove].

•For Windows Vista® or Windows® 7
Select the program to delete in "Uninstall or change a program" and click "Uninstall".

•When the below window is displayed on Windows Vista®, click the [Continue] button.
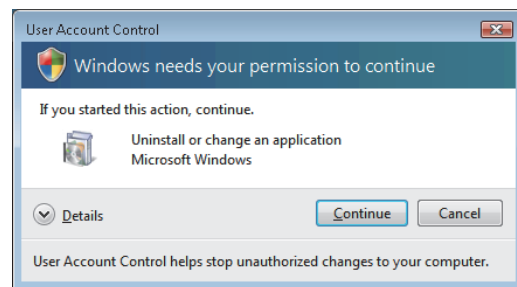
When the below window is displayed on Windows® 7, click the [Yes] button.
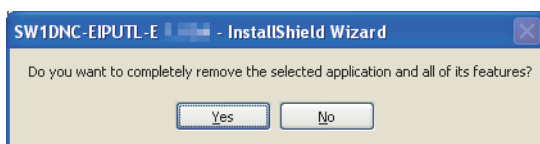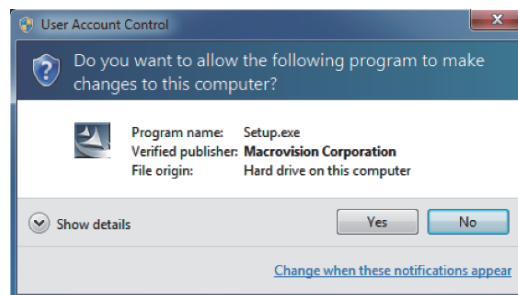
3. Click [Yes] for uninstalling.
Click [No] for not uninstalling.
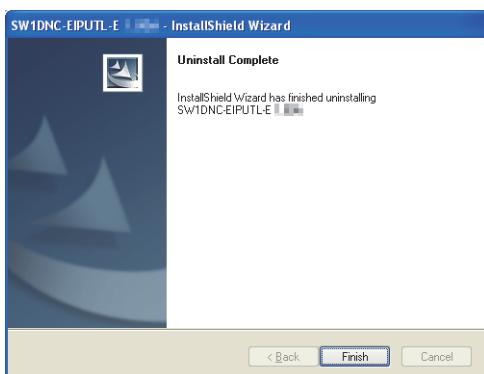
4. The uninstallation is completed when the window shown on the left is displayed.
Click the [Finish] button.

↓

(End)

7.2.3 Installing USB driver

Installation of USB driver is required for accessing to a QCPU via USB.
The following is an installation procedure of USB driver.

⊠**POINT**

When installation of USB driver is disabled, check the following settings.
- To display the "Driver Signing Options" window, click [Control Panel]→[Performance and Maintenance]→[System]→[Hardware]→ [Driver signing].
Complete the following setting before installing USB driver.
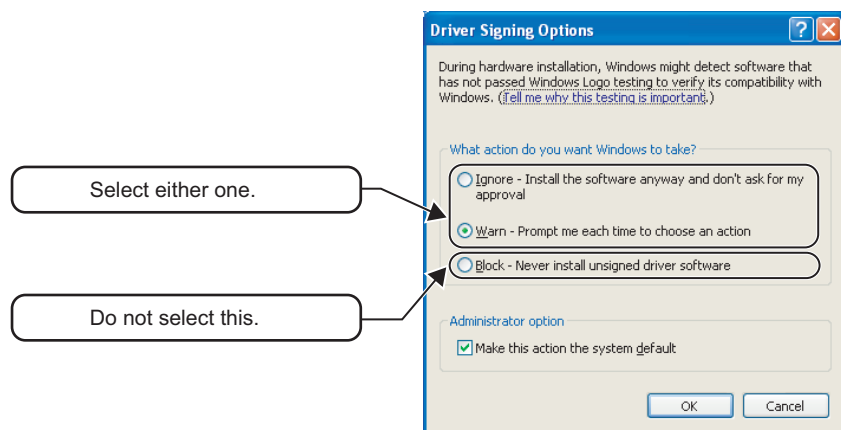
Figure 7.4 "Driver Signing Options" window

(1) For Windows® XP

The following is the installation procedure of USB driver on Windows® XP.

(Start)
↓
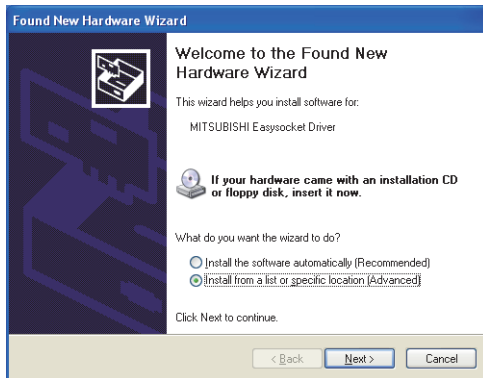
1. Connecting a personal computer and QCPU with a USB cable displays the window shown on the left.
Select "Install from a list or specific location [Advanced]" and click ⌐Next⌐ .

↓
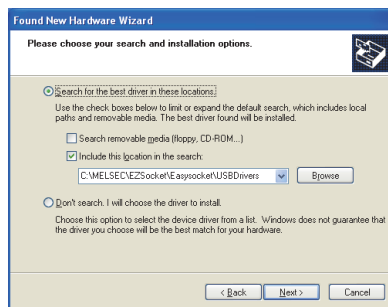
2. Select "Search for the best driver in these locations".
Check "Include this location in the search:" and specify the "EZSocket\Easysocket\USBDrivers" where Utility Package is installed, and click the ⌐Next⌐ button.

↓
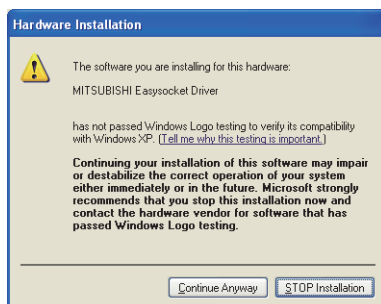
3. Click the ⌐Continue Anyway⌐ button.

No action is required for the message shown on the left since the operation using USB driver on Windows® XP has been tested by Mitsubishi.
No problem should occur after installing USB driver.

↓

4. The installation is completed when the window shown on the left is displayed.
Finish the installation by clicking ⌐ Finish ⌐ .

↓
(End)

(2) For Windows Vista®

The following is the installation procedure of USB driver on Windows Vista®.

(Start)
↓
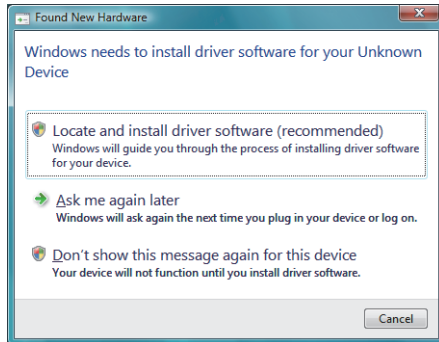
1. Connecting a personal computer and QCPU with a USB cable displays the window shown on the left.
   Select "Locate and install driver software (recommended)" and wait for the location.

   The below window is displayed when User Account control is enabled. Click the Continue buttom.

↓
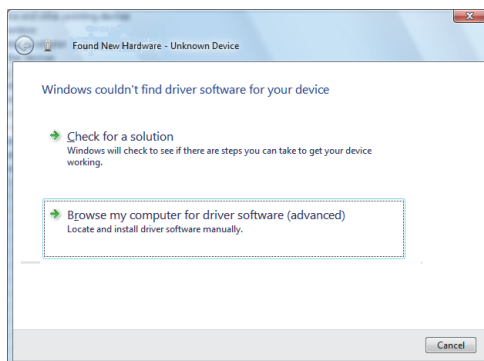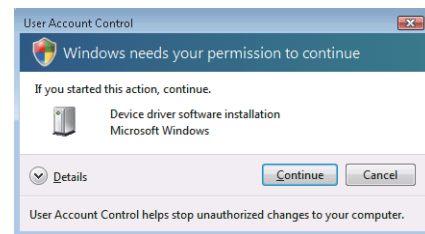
2. Click "Browse my computer for driver software (advanced)".

↓
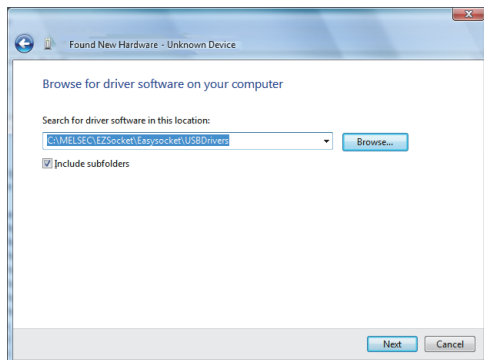
3. Specify the "EZSocket\Easysocket\USBDrivers" where Utility Package was installed, and click the Next button.

↓

(To the next page)

(From the previous page)

↓
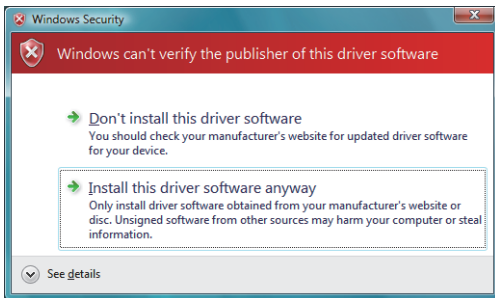
4.   Click "Install this driver software anyway".

↓
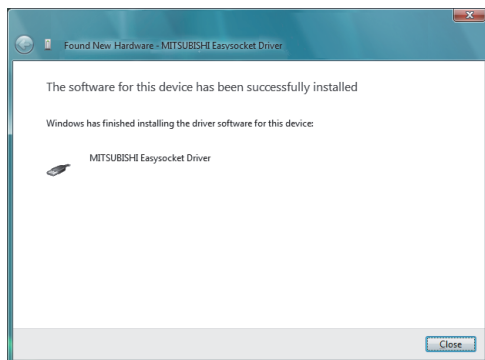
5.   Click the ⬚Close⬚ button.
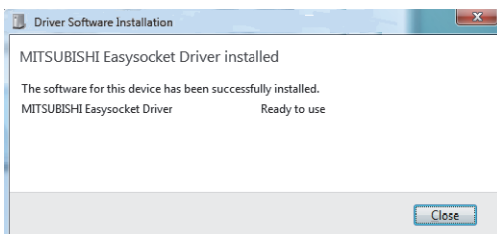
↓

6.   The installation is completed when the window shown on the left is displayed.

Finish the installation by clicking ⬚Close⬚ .

↓

(End)

(3) For Windows® 7

The following is the installation procedure of USB driver on Windows® 7.

(Start)
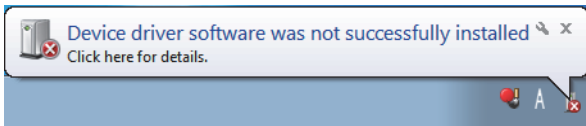
↓

1. Connecting a personal computer and QCPU with a USB cable displays the window shown on the left.

↓
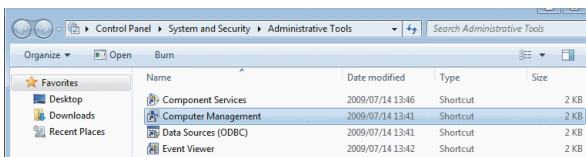
2. Select [Start]→[Control Panel]→[Administrative Tools].
The window shown on the left appears. Select and double-click "Computer Management".

↓
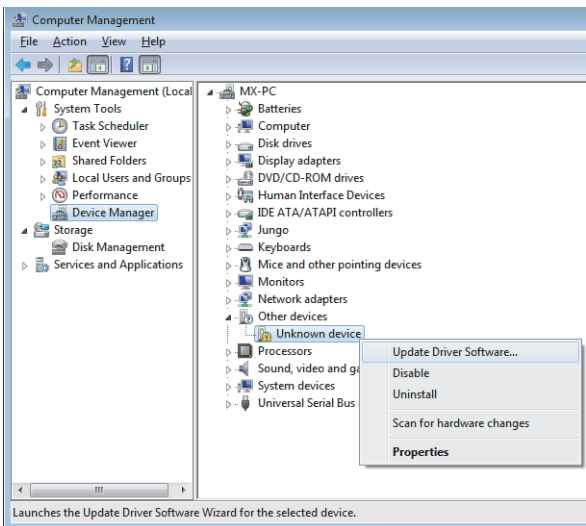
3. The window shown on the left appears. Select "Device Manager", right-click "Unknown Device", and select "Update Driver Software".

↓
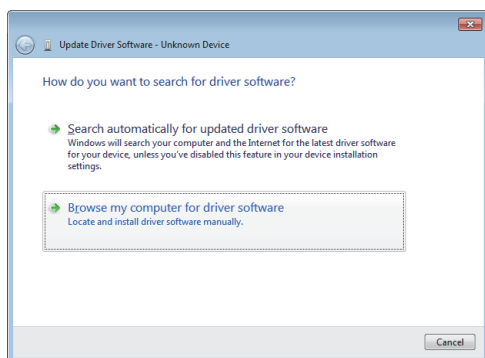
4. The window shown on the left appears. Select "Browse my computer for driver software".

↓

(To the next page)

(From the previous page)

↓
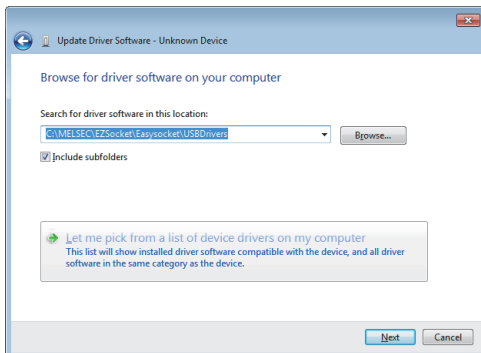
5. The window shown on the left appears. Specify "EZSocket\Easysocket\USBDrivers", where Utility Package has been installed, and click the [Next] button.

↓
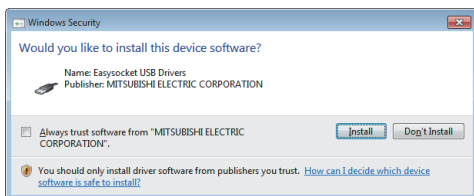
6. The window shown on the left appears. Click the [Install] button.

↓
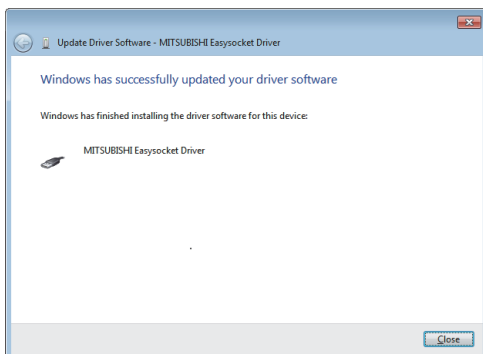
7. The installation is completed when the window shown on the left is displayed.

    Finish the installation by clicking the [Close] button.

↓

(Completed)

7.3 Operating Procedure

The following flowchart shows how to create, edit and write a project to the system.

Check box

Start

Start Utility package.

Create a new project? — No

Check box

Open the existing project. · · · ☞ Section 7.7.2

Yes

Click [File] → [New]. · · · ☞ Section 7.7.1

Change a project? — Yes

No

Complete the IP Address setting. · · · ☞ Section 7.9.1 (1)

Complete the Common Parameter setting. · · · ☞ Section 7.9.1 (1)

Set the following parameters.
· Class1 Tag Parameter
· Class3/UCMM Tag Parameter
· Refresh Parameter
· · · ☞ Section 7.9.2, Section 7.9.3
Section 7.9.4
Section 7.9.7

Configure the Transfer Setup settings. · · · ☞ Section 7.10.1

Write the parameters to the module? — Yes

No

Write the parameters. · · · ☞ Section 7.10.2

Read intelligent function module parameters in GX Works2. · · · ☞ Section 7.10.2 (3) (a)

Monitor the data in the monitoring screen. · · · ☞ Section 7.6, Section 7.11

End

Figure 7.5 Operating Procedure

⊠ **POINT**

The "Transfer Setup" window appears only at the first startup after the installation.
Make settings to connect Utility Package to the CPU module. (☞ Section 7.10.1
Configuring the EtherNet/IP module)

Side tab navigation:
1 OVERVIEW
2 SYSTEM CONFIGURATION
3 SPECIFICATIONS
4 FUNCTION
5 PRE-OPERATION PROCEDURES
6 PARAMETER
7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)
8 PROGRAMMING

7.4 Functions of Utility Package

7.4.1 Function list of Utility Package

The following table lists the functions of Utility Package.

Table 7.3 Utility Package function list

Function	Description	Reference section
PING test	Performs a PING test.	Section 5.8
Importing/exporting setting data	Exports label data that have been configured with Utility Package to a GX Works2 project.	Section 7.8.1
	Exports Tag Parameters that have been configured with Utility Package to a CSV file.	Section 7.8.2
Own Nic setting	Registers EtherNet/IP module information that is configured with Utility Package. When multiple EtherNet/IP modules are connected to one CPU module, settings can be performed simultaneously for four modules per project. •Start I/O No. •IP Address, Subnet Mask, Default Gateway •Common Parameter (The number of connection tags and the size of the storage area for transmitted and received data)	Section 7.9.1 (1)
Producer Tag setting	Makes settings for Producer Tag and the auto refresh target device of the Class1 Tag communications.	Section 7.9.2
Consumer Tag setting	Make settings for Consumer Tag and the auto refresh target device of the Class1 Tag communications.	Section 7.9.3
Message Tag setting	Makes settings for Class3/UCMM Tag and the auto refresh target device.	Section 7.9.4
User Define setting	Arbitrarily defines Data Types other than INT and DINT and registers them.	Section 7.9.5
Refresh parameter setting	Set the refresh target device for the following items. •Send/receive data of Tag communication •Error codes of own station •Communication status of Tag communication •Error code for each tag	Section 7.9.7
Monitoring function	Error code and communication status can be checked for each tag. Network diagnostics can be executed.	Section 7.6 Section 7.11

7.5 Window Structure

This section describes the window structure of Utility Package.

Switching tabs

Menu bar
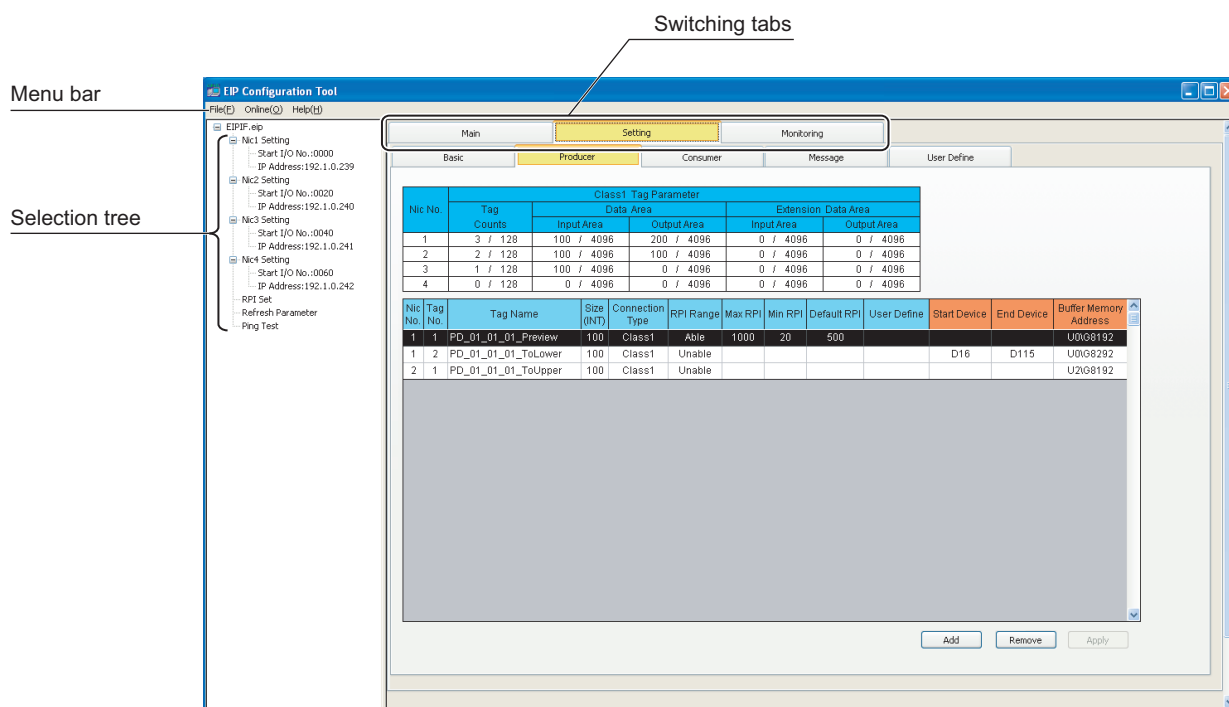
Selection tree

Figure 7.6 Window structure

Table 7.4 Window structure

Function	Description	Reference section
Menu bar	Any of the functions of Utility Package can be selected in the menu bar.	Section 7.5.1
Selection tree	The EtherNet/IP module information that is registered in Utility Package (start I/O No. and IP address) are displayed. Also, settings common to all modules are configured and a PING test is executed.	Section 7.5.2
Window switching tab	Setting windows and monitor windows are switched. •"Main" tab •"Setting" tab •"Monitoring" tab	Section 7.6 Section 7.9 Section 7.11

7.5.1   Menus

(1) File menu
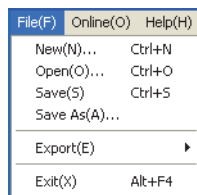
Figure 7.7 File menu
Table 7.5 Description of the file menu

Item		Description	Reference section
New		The following procedure shows how to create a new project.	Section 7.7.1
Open		Finds and opens an existing project.	Section 7.7.2
Save		Overwrites and saves the project.	Section 7.7.3 (1)
Save As		Saves the project with a different file name.	Section 7.7.3 (2)
Export	Producer	Exports the Class1 Tag communications Producer Tag to a CSV file.	Section 7.8.2
	Consumer	Exports the Class1 Tag communications Consumer Tag to a CSV file.	
	Message	Exports the Class3/UCMM Tag to a CSV file.	
	Label	Exports the configured label data to a GX Works2 project.	Section 7.8.1
Exit		Terminates Utility Package.	-

(2) Online menu
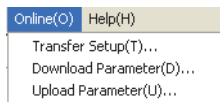
Figure 7.8 Online menu
Table 7.6 Description of the Online menu

Item	Description	Reference section
Transfer Setup	Configure the EtherNet/IP module in connection destination.	Section 7.10.1
Download Parameter	Write the parameters to the EtherNet/IP module.	Section 7.10.2
Upload Parameter	Reads the parameters of the EtherNet/IP module.	Section 7.10.3

(3) Help menu
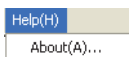
Figure 7.9 Help menu
Table 7.7 Description of the Help menu

Item	Description	Reference section
About	Displays the product information of Utility Package.	Section 7.12

7.5.2 How to use the selection tree

The EtherNet/IP module information that has been configured in Utility Package (start I/O No. and IP address) is displayed.
Also, settings common to all modules are configured and a PING test is conducted.
The operations of the selection tree are listed in the following table.
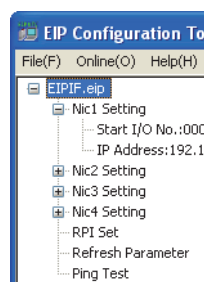
Figure 7.10 Selection tree

Table 7.8 Description of the Selection tree

Item			Description	Reference section
Project			Displays a project name.	-
	Nic1 Setting		Displays the information of the first EtherNet/IP module. It is displayed when [Own Nic] is configured in the "Basic" window on the "Setting" tab.	-
		Start I/O No.:	Displays the Start I/O No. set for the project.	Section 7.9.1
		IP Address:	Displays the IP address set for the project.	Section 7.9.1
	Nic2 Setting		Displays the information of the second to fourth EtherNet/IP modules. The operations and functions are same as those of "NIC1 Setting".	-
	Nic3 Setting			-
	Nic4 Setting			-
	RPI Set		Double-clicking the item displays the "RPI Set" window.	Section 7.9.6
	Refresh Parameter		Double-clicking the item displays the "Refresh Parameter" window.	Section 7.9.7
	Ping Test		Double-clicking the item displays the "Ping Test" window.	Section 5.8

7.6 "Main" Tab (Module Status Display)

The connection status of the modules is displayed.
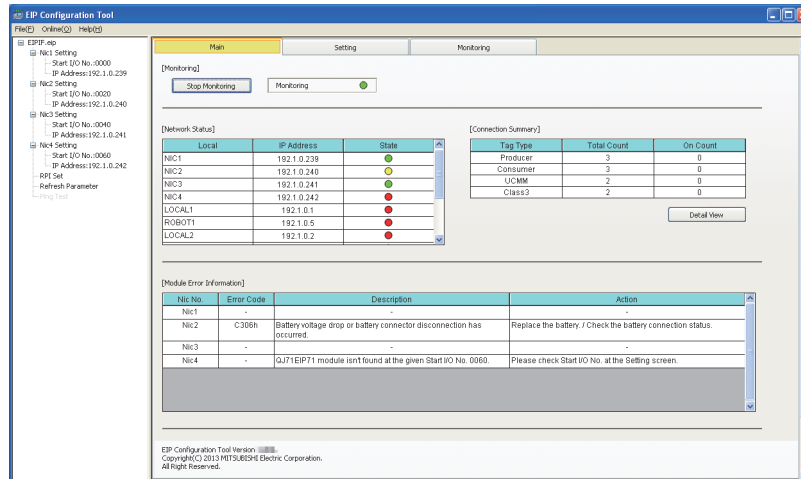
Figure 7.11 "Main" tab

Table 7.9 "Main" tab items

Item		Description
[Monitoring]	Start Monitoring / Stop Monitoring button	The monitoring on the "Main" tab is started or stopped.
	Monitoring/Stop	The monitoring status is displayed. •"Monitoring ● (green)": Monitoring •"Stop ● (red)": Monitoring stopped
[Network Status]	Local	The Nic Name and Node Name of the selected EtherNet/IP module are displayed.
	IP Address	The IP address is displayed.
	State	The status of the modules is displayed. •● (green) Own Nic: Normal module status 　　　　　Remote Nic: Normal communications •● (yellow) Abnormal module status (There is an own station error, but Tag communications can be performed.) 　　　　　Displayed only for Own Nic. •● (red) Own Nic: Abnormal module status (There is an own station error and no Tag communications can be performed.) 　　　　　Remote Nic: Communication failure (PING test results are abnormal.)
[Communication Summary]	Tag Type	Tag types (Producer/Consumer/UCMM/Class3) are displayed.
	Total Count	The total number of Tags registered in all modules is displayed for each Tag type. Example: In the case of the module configuration shown below, 12 is displayed for Producer Tag Type. The numbers of registered Producer Tags are: four for the first module, three for the second module, zero for the third module, and five for the fourth module.
	On Count	Among the Total Count values shown above, the total number of Tags that are communicating normally is displayed.
Detail View button		The details on On Count are displayed. (☞ (1) "Detail View" window in this section) Clicking is disabled when the Total Count values of Communication Summary are all 0.

1

OVERVIEW

2

SYSTEM CONFIGURATION

3

SPECIFICATIONS

4

FUNCTION

5

PRE-OPERATION PROCEDURES

6

PARAMETER

7

UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8

PROGRAMMING

Table 7.9 "Main" tab items

Item		Description
[Module Error Information]	Nic No	Nic1/Nic2/Nic3/Nic4 is displayed.
	Error Code	The latest error code that occurred at the own station is displayed. (☞ Section 9.4.2 Error code list)
	Description	The details of the existing errors are displayed.
	Action	The corrective actions for the existing errors are displayed.

(1) "Detail View" window

Clicking the | Detail View | button will display the window below.
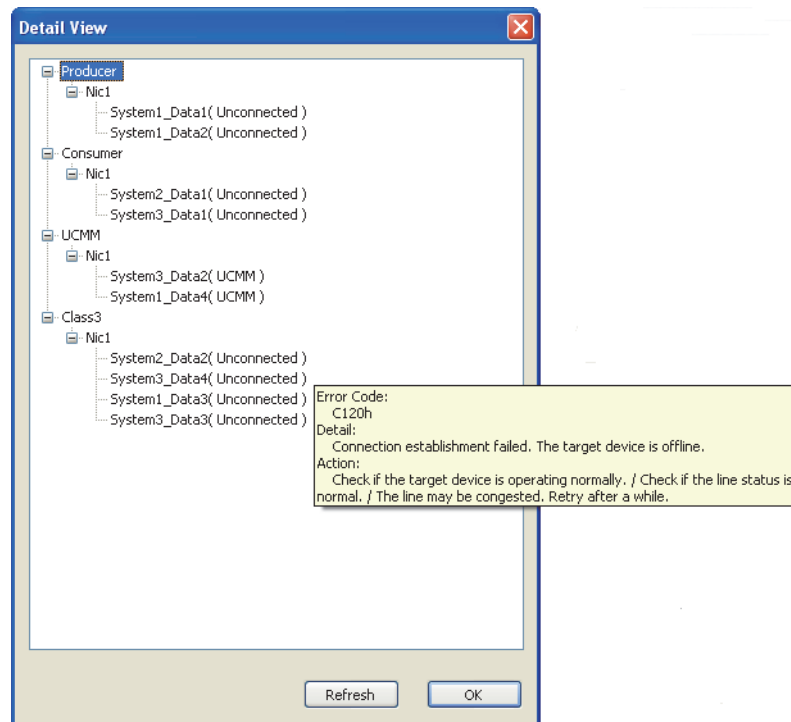
Figure 7.12 "Detail View" window

Table 7.10 "Detail View" window items

Item	Description
Contents for each item	The Tag names assigned to Nic1 to 4 by Tag type (Producer/Consumer/UCMM/Class3) and the communication status below are displayed. •For Producer/Consumer/Class3 Normal: "(Connected)" Abnormal: "(Unconnected)" •For UCMM Normal: "(UCMM)" Abnormal: "(Unconnected)"
Error details	When placing the cursor over where "(Unconnected)" is displayed, the error descriptions appear as balloons. •"Error Code": The latest error code that has been detected at the own station is displayed. •"Detail": The descriptions of the detected error codes are displayed.
	Refresh	button	Tag information displayed in the "Detail View" window is updated.

7.7 Project File

This section describes how to operate project files.

7.7.1 Creating a new project

The following procedure shows how to create a new project.

1) Click [File]→[New].
   The "Main" tab is displayed.

2) Clicking the "Setting" tab will display the "Basic" window below.
   Make settings for [Own Nic], referring to the explanations below.
   ☞ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window
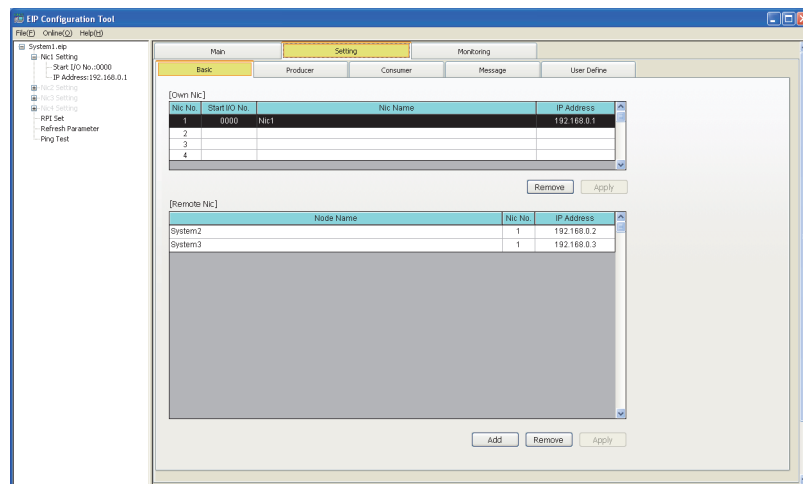
Figure 7.13 Project of Utility Package

3) Complete Tag Parameter and Refresh Parameter by setting the following items.
   - Class1 Tag Parameter setting (☞ Section 7.9.2 (2) Display and settings of the "Producer Tag" window, Section 7.9.3 (2) Display and settings of the "Consumer Tag" window)
   - Class3/UCMM Tag Parameter setting (☞ Section 7.9.4 (2) Display and settings of the "Message Tag" window)
   - Setting Refresh Parameter (☞ Section 7.9.7 "Refresh Parameter" window)

7.7.2　　Opening a project

The following shows how to find and open an existing project.

1) Click [File]→[Open].
   The "Open" window is displayed.

2) Select the items listed in the Table 7.11 and click | Open |.
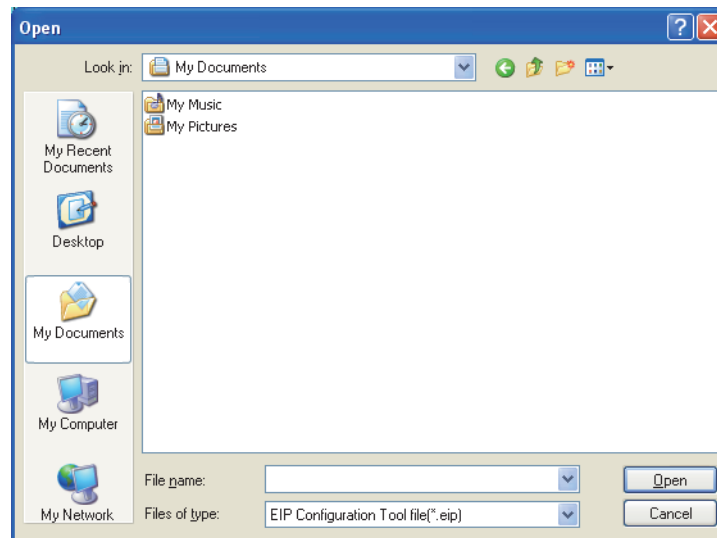
Figure 7.14 "Open" window

Table 7.11 Setting items in the "Open" window

Item	Description
Look in	Select the location of the existing project.
File name	Select the project file name to open.
Files of type	Select the project file type.

3) A project of Utility Package is displayed. (☞ Section 7.5 Window Structure)

7.7.3 Saving a project

The following shows how to save a project.

(1) Saving a project
Click [File]→[Save].

(2) Saving a project with a different name
Click [File]→[Save As].

The "Save As" window is displayed.

Set the items listed in the Table 7.12 and click $\boxed{\text{Save}}$.
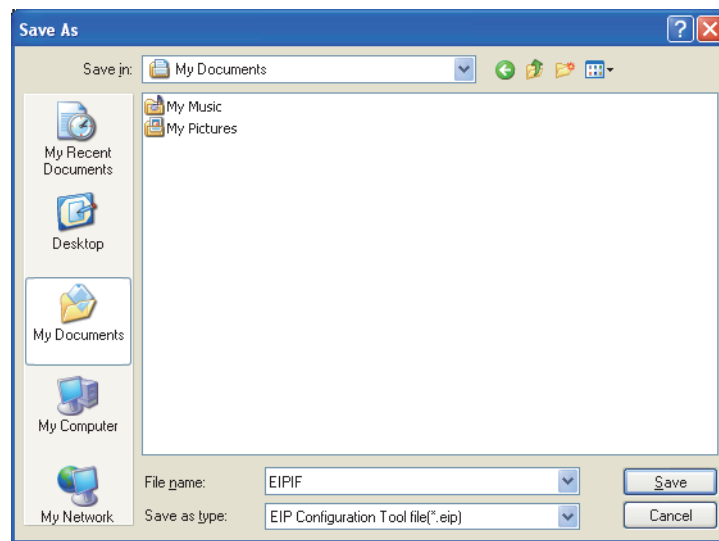
Figure 7.15 "Save As" window

Table 7.12 Setting items in the "Save As" window

Item	Description
Save in	Select the location where the project is to be saved.
File name	Specify the project file name to save.
Save as type	Select a type of the project file to save.

7.8 Exporting Setting Data

Label data for GX Works2 configured with Utility Package can be exported to GX Works2.
(☞ Section 7.8.1)
The following can also be executed with Utility Package.

   • Exporting Tag Parameters (CSV files) (☞ Section 7.8.2)
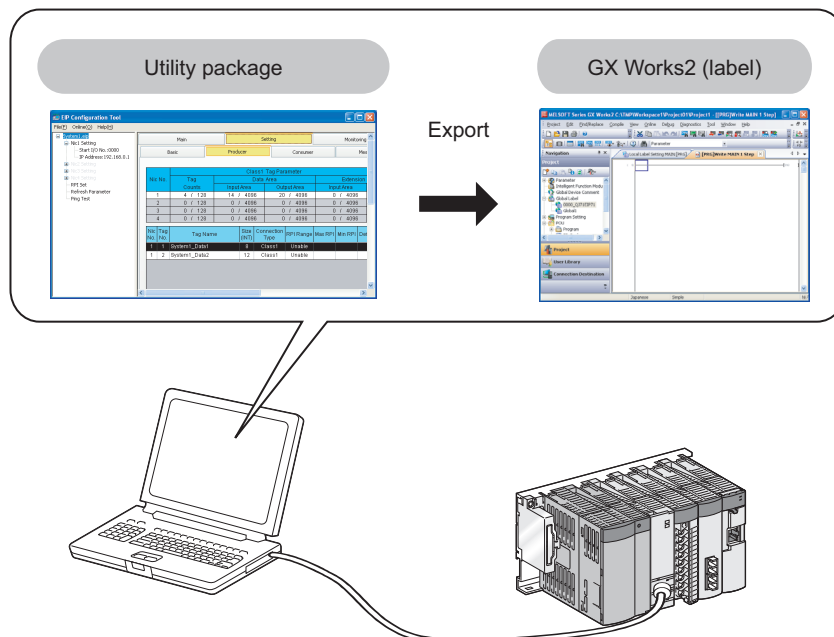
Figure 7.16 Importing and exporting setting data

⊠ POINT

Data cannot be exported when more than one Own Nic has been configured with
Utility Package. Classify Utility Package projects by Nic.

7.8.1 Exporting label data for GX Works2

Export the label data that have been configured with Utility Package to a GX Works2 project.
The label names that have been configured with Utility Package can be used in the programming of GX Works2.

(1) Exporting

1) Select "Use Label" in GX Works2, and create a new project and save it in the workspace format (*.gd2)
For saving the project in the workspace format, refer to the following.
☞ GX Works2 Version 1 Operating Manual (Common)

2) Terminate GX Works2.

3) Select "Label (for GX Works2) Setting Enable" in the "Add Own Nic" window of Utility Package and create a new project.

4) Export the label data that have been configured with Utility Package to a GX Works2 project.
• When [File]→[Export]→[Label] is selected, the "Open" window is displayed.
• Specify the GX Works2 project and click the ⌷Open⌷ button.

5) Start GX Works2.

6) Open the project where the label data for GX Works2 have been exported.

7) Compile the global labels and check that there are no errors in the exported data.

8) Use the global labels to create a program.

"Global Label" ("Structured Data Types") can be managed per module.
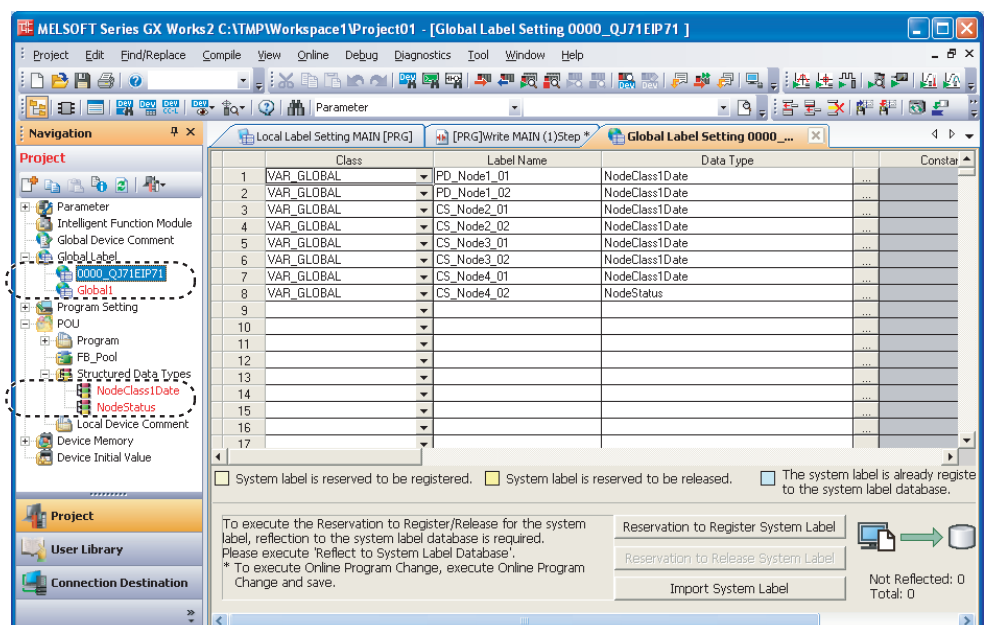
Figure 7.17 Configuring GX Works2 global labels

(2) Precautions

(a) Label names

- Up to 32 characters can be used for a label name.
- Case-sensitive label names cannot be used. (Label names are not case-sensitive.)
- Names of tasks, structures, and program parts cannot be used as label names.
- Structures cannot be used in stages (nesting).
- The first character of a label name should not be a one-byte numeric character.
- Spaces cannot be used in label names.
- There are certain characters that cannot be used in label names.
  ☞ GX Works2 Version 1 Operating Manual (Common)

(b) Label data

- The size of label data is large. Before saving label data in a CPU module, check the memory size of the CPU module first.
- The data types of labels that are compatible with Utility Package are word (INT) and double word (DINT) only.
- When using the Data Type registered in the "User Define" window, ensure that the Data Type contains less than 32 one-byte alphanumeric characters.

(c) Others

- Check that GX Works2 is not activated before the label data in Utility Package are exported.
  Failure to do so, the label data are not exported.

7.8.2   Exporting Tag Parameter

The following shows how to export Tag Parameter set in Utility Package to a CSV file.

(1) Exporting

1) Click [File]→[Export]→[Class1 Tag] or [Class3/UCMM]
The "SaveAs" window is displayed.

2) Set the items listed in the Table 7.13 and click $\boxed{\text{Save}}$.
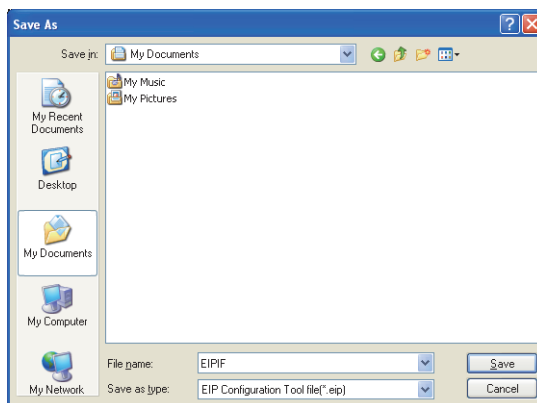
Figure 7.18 "SaveAs" window

Table 7.13 Setting items in the "SaveAs" window

Item	Description
Save in	Select the location where the Tag Parameter is to be exported.
File name	Specify the file name to export.
Save as type	Select a file type to export.

(2) Exported data
The data same as those contained in the "Producer" window, "Consumer" window, and "Message" window on the "Setting" tab of Utility Package are exported.

Displays Tag Counts, Input Area Size, and Output Area Size.

	A	B	C	D	E
1	Class1 Tag Counts	Class1 Input Area Size	Class1 Output Area Size	Extension Class1 Input Area Size	Extension Class1 Output Area Size
2	4/128	14/4096	20/4096	0/4096	0/4096
3	Tag No.	Tag Name	Producer/Consumer	IP Address(Destination)	Type
4	1	System1_Data1	Producer		INT
5	2	System1_Data2	Producer		INT
6					

Displays Tag Parameters set in Utility Package.

Figure 7.19 When Class1 Tag Parameter is exported

For details of the "Producer", "Consumer" and "Message" window, refer to the following.

☞Section 7.9.2 "Producer" window
☞Section 7.9.3 "Consumer" window
☞Section 7.9.4 "Message" window

7.9 "Setting" Tab (Parameter Settings)

This section describes the "Setting" tab where the EtherNet/IP module is configured. When multiple EtherNet/IP modules are connected to one CPU module, settings can be performed simultaneously for four modules per project.

When making the settings, first add the information of the EtherNet/IP module under "[Own Nic]" in the "Basic" window.

7.9.1 "Basic" window

Make the following settings.

- Settings for the parameters to operate the EtherNet/IP module (start I/O No. and IP address)
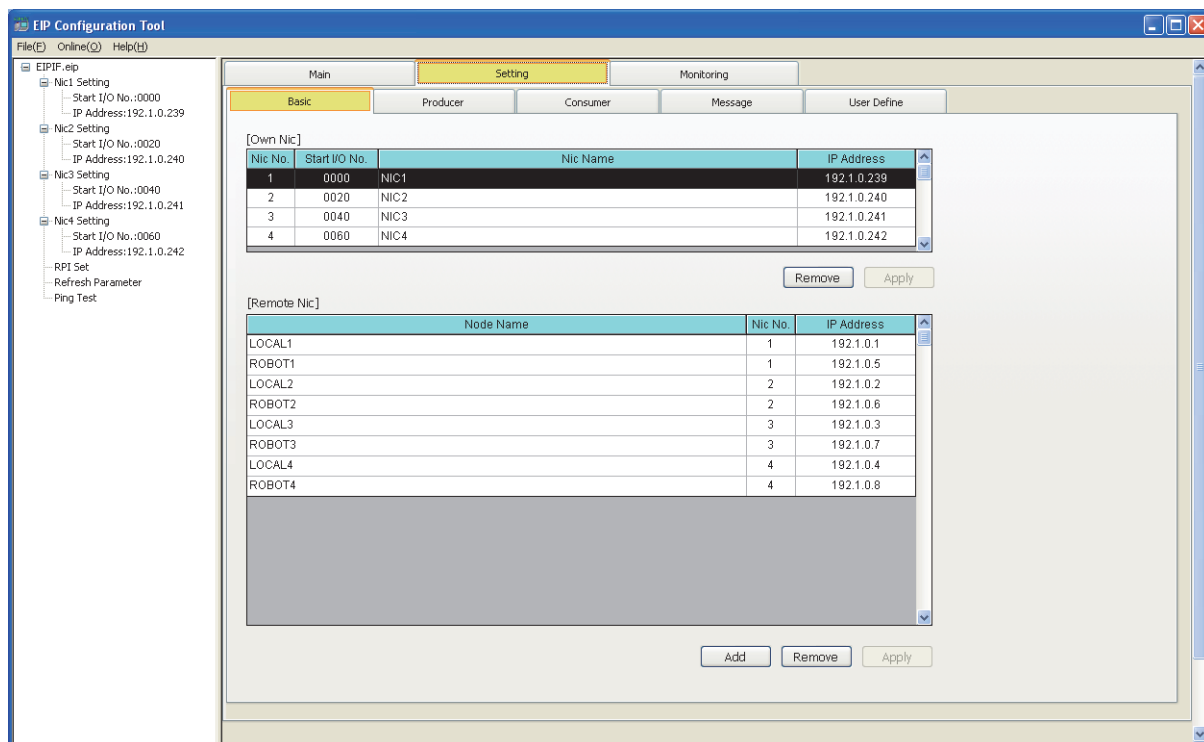
Figure 7.20 "Basic" window

Table 7.14 "Basic" window settings

Item	Description
[Own Nic]	Add the EtherNet/IP module information to the project and edit it. Double-click the cell to add and edit the information. (☞ (1) Display and settings of the "Add Own Nic" window in this section)
Nic No.	The numbers for distinguishing the settings by module are displayed. (Arbitrary settings cannot be made.)
Start I/O No.	The start I/O No. configured in the "Add Own Nic" window is displayed.
Nic Name	The Nic Name configured in the "Add Own Nic" window is displayed.
IP Address	The IP address configured in the "Add Own Nic" window is displayed.
Remove button	Clicking this button after selecting a registered cell will remove the selected row.
Apply button	When this button is clicked, the window for selecting the buttons below will appear. • Download Parameter button: Applies the settings made with [Own Nic] to Utility Package and writes them in the EtherNet/IP module along with other parameters that have been set with Utility Package. • Only Apply button: Applies the settings made with "[Own Nic]" only to Utility Package.
[Remote Nic]	Register the information of the connected device in the project. Up to 256 information settings of the connected device can be configured.
Node Name	Set the name of the connected device. (Up to 40 one-byte alphanumeric characters)
Nic No.	Enter the Nic No. of the EtherNet/IP module to communicate with the connected device from "[Own Nic]".
IP Address	Enter the IP address of the connected device.
Add button	When this button is clicked after a cell is selected, a setting item row will be added below it.
Remove button	Clicking this button after selecting a registered cell will remove the selected row.
Apply button	The items set with "[Remote Nic]" are applied to Utility Package.

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

(1) Display and settings of the "Add Own Nic" window

Figure 7.21 "Add Own Nic" window

Table 7.15 "Add Own Nic" window items

Item	Description
Start I/O No.	Set the start I/O No. of the EtherNet/IP module. (Hexadecimal)
Nic Name	Set the name of the EtherNet/IP module. (Up to 40 one-byte alphanumeric characters)
IP Address Setting	Configure the settings that are required for the network connection of the EtherNet/IP module.
DHCP	Select to enable or disable the DHCP client function. Not Use: disabled (default) Use: enabled
IP Address	Set the IP address of the EtherNet/IP module. Set the IP address in the range below. 0.0.0.1 to 126.255.255.254 128.0.0.1 to 191.255.255.254 192.0.0.1 to 223.255.255.254 Exclude *.0.0.0 and *.255.255.255.
Subnet Mask	Set the subnet mask.
Default Gateway	Set the IP address of the default gateway.

Table 7.15 "Add Own Nic" window items (Continued)

Item			Description
Common Parameter			Set the number of connection tags and the size of the storage area for transmitted and received data.
	Extension Tag Name Setting Enable		When using a tag name with 41 or more characters in various tag setting windows, select the checkbox. The availability of a tag name with 41 or more characters differs depending on the version of the EtherNet/IP module and Utility Package. (☞ Appendix 5 Added and enhanced Functions)
	Tag Counts		Set the number of Tags to be used in the Class1 Tag communications and Class3/UCMM communications. The maximum number of connected Tags is 256. When selecting "Extension Tag Name Setting Enable", the maximum number of connected tags will be 128 tags. The maximum number of connected Tags is the total of those used in the Class1 Tag communications and Class3/UCMM Tag communications.
		Class1 Tag Counts	Set the number of Tags to be used in the Class1 Tag communications. Default setting: 128 Tags
		Class3/UCMM Tag Counts	The number of Tags in the Class3/UCMM Tag communications is displayed. The value is automatically obtained by subtracting the Tag count set in "Class1 Tag Counts" from the maximum number of connected Tags.
	Input/Output Area Size		Set the size of the storage area for transmitted and received data. The maximum data size is 32768 words. The maximum data size is the total size of both "Data Area" and "Extension Data Area".
		Data Area	Set the normal size of the storage area for transmitted and received data. The maximum data size is 16384 words. The maximum data size is the total size of both the Class1 Tag communications and the Class3/UCMM Tag communications.
		Class1 — Input/Output Area Size	Set the total of the sizes of Class1 Input Area and Class1 Output Area. Default setting: 8192 words Maximum data size: 16384 words
		Class1 — Input Area Size	Set the size of Class1 Input Area. Default setting: 4096 words Maximum data size: 16384 words
		Class1 — Output Area Size	The size of Class1 Output Area is displayed. The value is automatically obtained by subtracting the size set in "Input Area Size" from the size set in "Input/Output Area Size" of "Class1".
		Class3/UCMM — Input/Output Area Size	The total of the sizes of Class3/UCMM Input Area and Class3/UCMM Output Area is displayed. The value is automatically obtained by subtracting "Input/Output Area Size" of "Class1" from the maximum data size (16384 words).
		Class3/UCMM — Input Area Size	Set the size of Class3/UCMM Input Area. Default setting: 4096 words Maximum data size: 16384 words
		Class3/UCMM — Output Area Size	The size of Class3/UCMM Output Area is displayed. The value is automatically obtained by subtracting the size set in "Input Area Size" from the size set in "Input/Output Area Size" of "Class3/UCMM".
		Extension Data Area	Set the extended size of the storage area for transmitted and received data. The maximum data size is 16384 words. The maximum data size is the total size of both the Class1 Tag communications and the Class3/UCMM communications.

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

Table 7.15 "Add Own Nic" window items (Continued)

Item			Description
	Class1	Input/ Output Area Size	Set the total of the extended sizes of Class1 Input Area and Class1 Output Area. Default setting: 8192 words Maximum data size: 16384 words
		Input Area Size	Set the extended size of Class1 Input Area. Default setting: 4096 words Maximum data size: 16384 words
		Output Area Size	The extended size of Class1 Output Area is displayed. The value is automatically obtained by subtracting the size set in "Input Area Size" from the size set in "Input/Output Area Size" of "Class1".
	Class3/ UCMM	Input/ Output Area Size	The total of the extended sizes of Class3/UCMM Input Area and Class3/UCMM Output Area is displayed. The value is automatically obtained by subtracting "Input/Output Area Size" of "Class1" from the maximum data size (16384 words).
		Input Area Size	Set the extended size of Class3/UCMM Input Area. Default setting: 4096 words Maximum data size: 16384 words
		Output Area Size	The extended size of the Class3/UCMM Output Area is displayed. The value is automatically obtained by subtracting the size set in "Input Area Size" from the size set in "Input/Output Area Size" of "Class3/UCMM".
Label (for GX Works2) Setting Enable			Enable the setting of the label name in the Tag so that the label data for GX Works2 can be exported. (☞ Section 7.8.1 Exporting label data for GX Works2) Select the checkbox to enable the setting.

7.9.2 "Producer" window

Make settings for the Producer Tag and the auto refresh target device of the Class1 Tag communications.

(1) Display and settings of the "Producer" window

Tag setting status list

Tag Parameter list
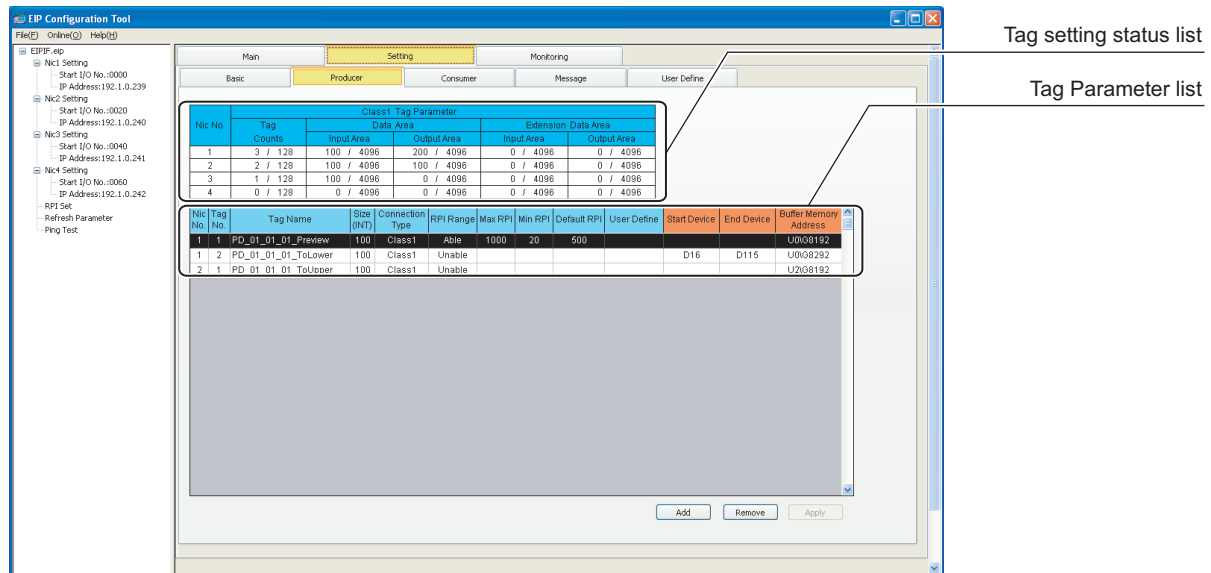
Figure 7.22 "Producer" window

Table 7.16 "Producer" window items

Item	Description
Tag setting status list	The settings of the Class1 Tag communications are displayed. The connected Tag count and the size of the storage area for transmitted and received data are displayed as "Tag Counts" and "Input/Output Area Size" set in the "Add Own Nic" window of the "Basic" window. (⭸ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window) Any row of a Nic No. that has not been set is displayed grey.
Tag Counts	"Number of registered Tags/number of connected Tags" is displayed.
Data Area	"Number of words used/size of the storage area for transmitted and received data" of Data Area is displayed. The number of words used is applied to "Output Area" when "Data Size" is configured in the "Producer Tag" window. (⭸ (2) Display and settings of the "Producer Tag" window in this section)
Extension Data Area	"Number of words used/size of the storage area for transmitted and received data" of Extension Data Area is displayed. Extension Data Area is used when the number of words used exceeds the size of "Data Area".

Table 7.16 "Producer" window items (Continued)

Item	Description
Tag Parameter list	The parameters set in the "Producer Tag" window are displayed. (☞ (2) Display and settings of the "Producer Tag" window in this section)
Nic No.	
Tag Name	The parameters set in the "Producer Tag" window are displayed.
Size(INT)	
Connection Type	
RPI Range	This indicates whether the RPI has been changed from the default value in the "Producer Tag" window. "Able": Changed from the default value "Unable": Not changed from the default value
Max RPI	
Min RPI	The parameters set in the "Producer Tag" window are displayed.
Default RPI	
User Define	When an item other than "INT" has been selected in "Data Type" of the "Producer Tag" window, the Data Type name that has been registered in the "User Define" window is displayed. (☞ Section 7.9.5 "User Define" window)
Start Device	The auto refresh target device set in "Refresh Device" of the "Producer Tag" window is displayed.
End Device	The last device of the auto refresh target is displayed.
Buffer Memory Address	The start address of the buffer memory that the Tag occupies is displayed.
[Add] button	A blank line is added. (Up to 256 Producer/Consumer/Message Tags in total)
[Remove] button	Clicking this button after selecting a Tag-registered row will remove the selected row.
[Apply] button	The configured Producer Tag is applied to Utility Package project. When it is applied, the rows where the Tag has already been registered are sorted in the order of "Nic No.".

(a) How to register a Producer Tag

Execute the following operations.

1) Click the [Add] button.
2) Double-click the blank line that is added.
3) Configure the Tag in the "Producer Tag" window.

(b) How to edit a Producer Tag

Double-click the row where the Tag has already been registered.

(c) How to delete a Producer Tag

Double-click the row where the Tag has already been registered and click the [Remove] button.

Multiple rows cannot be selected simultaneously.

⊠POINT

When deleting a Tag, the start addresses of the transmitted and received data of the subsequent Tags will change.
To keep the start addresses of the transmitted and received data unchanged, handle the Tag to be deleted as a reserved Tag, without deleting it.
A reserved Tag just reserves Data Area and does not communicate actually.

1. Double-click the row to be set as a reserved Tag.
2. The "Producer Tag" window will appear. Select the "Reserved Tag" checkbox.
3. Click the [OK] button.

The row registered as a reserved Tag is displayed yellow.

(2) Display and settings of the "Producer Tag" window

Figure 7.23 "Producer Tag" window

Table 7.17 "Producer Tag" window settings

Item	Description
Nic	Select an Own Nic No.
Tag Name	Set the Tag name. Up to 100 one-byte alphanumeric characters can be used.[1] (Up to 32 alphanumeric characters when using a label)
GX Works2 Label Name	When the "Label (for GX Works2) Setting Enable" checkbox in the "Add Own Nic" window is selected, the Tag name set in "Tag Name" is automatically used as it is.
Data Type	Select one from the following. "INT": 1 word Data Type name registered in the "User Define" window (☞ Section 7.9.5 "User Define" window)
Data Size	Set the data size to be sent to Consumer Tag. (1 to 722 words) When selecting a Data Type name that has been registered in "Data Type" of the "User Define" window, the size of the selected Data Type is automatically set.
Connection Type	Fixed to "Class1" for Producer Tag.
Trigger	Set the conditions for Tag communications. Fixed to "Cyclic" for Producer Tag. Tag communications are performed at the RPI interval.
RPI Range	Select the checkbox and set the receive range of the RPI sent from the connected device (Consumer Tag) in "Default RPI", "Min RPI", and "Max RPI". When the RPI sent from Consumer Tag is within the "Min RPI" and the "Max RPI" ranges, send the data with the RPI that has been set by Consumer Tag.
Default RPI	When the RPI sent from Consumer Tag is not within the "Min RPI" and the "Max RPI" ranges, set the interval for sending the data from Producer Tag. Setting range: 5 to 10000 (Default value: 10000)
Min RPI	Set the minimum value of the receive range for the RPI that is sent from Consumer Tag. Setting range: 5 to 9999 (Default value: 5)
Max RPI	Set the maximum value of the receive range for the RPI that is sent from Consumer Tag. Setting range: 6 to 10000 (Default value: 10000)

Table 7.17 "Producer Tag" window settings (Continued)

Item			Description
Refresh Device			The refresh device can be set with "Device" when the checkbox is selected.
			When auto refresh settings are made in the "Refresh Parameter" window, the settings made here are disabled.
Device			When using the auto refresh function, set the refresh target device and the start number of the device.
			When "Refresh Device" is set in the "Refresh Parameter" window, settings for the refresh target device cannot be made in the this window. (☞ Section 7.9.7 "Refresh Parameter" window)
			To set the refresh target device for each Tag in this window, delete the "Refresh Device" settings in the "Refresh Parameter" window.
	L	0 to 32752	Set the auto refresh target device.
	M	0 to 61424	The settings can be made in the range of "Device" in "Q Parameter Setting" of GX Works2.
	D	0 to 4212735	Note that other modules and EtherNet/IP modules having a different Nic No. must not use the
	R	0 to 32767	same auto refresh target devices.
	B	0 to EFF0	When using a bit device, make settings in 16-point units (such as M16).
	W	0 to 4047FF	
	ZR	0 to 4184063	
Reserved Tag			A reserved Tag can be configured when the checkbox is selected. (☞ Section 4.2.1 (4) Reserved tag)
			A reserved Tag just reserves Data Area and does not communicate actually.

* 1   To use a tag name with 41 or more characters, the setting in "Add Own Nic" window is required.

(☞ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window)

7.9 "Setting" Tab (Parameter Settings)
7.9.2 "Producer" window

7.9.3 "Consumer" window

Make settings for the Consumer Tag and the auto refresh target device of the Class1 Tag communications.

(1) Display and settings of the "Consumer" window

Tag setting status list

Tag Parameter list
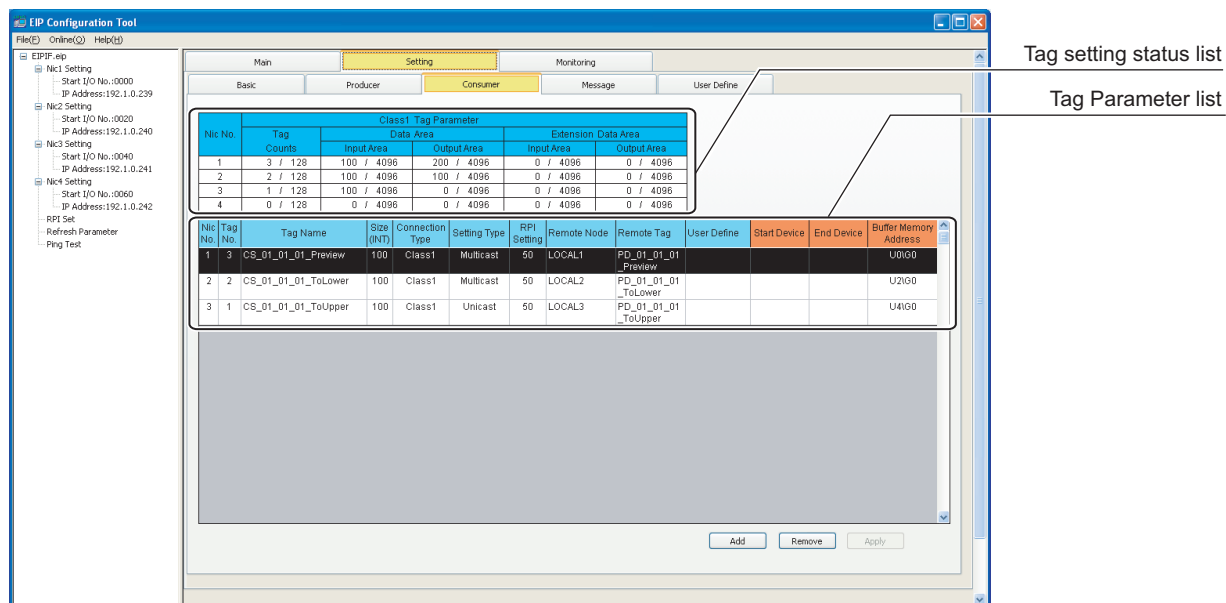
Figure 7.24 "Consumer" window

Table 7.18 "Consumer" window items

Item	Description
Tag setting status list	The settings of the Class1 Tag communications are displayed. The connected Tag count and the size of the storage area for transmitted and received data are displayed as "Tag Counts" and "Input/Output Area Size" set in the "Add Own Nic" window of the "Basic" window. (☞ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window) Any row of a Nic No. that has not been set is displayed grey.
Tag Counts	"Number of registered Tags/number of connected Tags" is displayed.
Data Area	"Number of words used/size of the storage area for transmitted and received data" of Data Area is displayed. The number of words used is applied to "Input Area" when "Data Size" is configured in the "Consumer Tag" window. (☞ (2) Display and settings of the "Consumer Tag" window in this section)
Extension Data Area	"Number of words used/size of the storage area for transmitted and received data" of Extension Data Area is displayed. Extension Data Area is used when the number of words used exceeds the size of "Data Area".

Table 7.18 "Consumer" window items (Continued)

Item	Description
Tag Parameter list	The parameters set in the "Consumer Tag" window are displayed. (☞ (2) Display and settings of the "Producer Tag" window in this section)
Nic No.	The parameters set in the "Consumer Tag" window are displayed.
Tag Name	
Size(INT)	
Connection Type	
Setting Type	
RPI Setting	
Remote Node	
Remote Tag	
User Define	When an item other than "INT" has been selected in "Data Type" of the "Consumer Tag" window, the Data Type name that has been registered in the "User Define" window is displayed. (☞ Section 7.9.5 "User Define" window)
Start Device	The auto refresh target device set in "Refresh Device" of the "Consumer Tag" window is displayed.
End Device	The last device of the auto refresh target is displayed.
Buffer Memory Address	The start address of the buffer memory that the Tag occupies is displayed.
Add button	A blank line is added. (Up to 256 Producer/Consumer/Message Tags in total)
Remove button	Clicking this button after selecting a Tag-registered row will delete the selected row.
Apply button	The configured Consumer Tag is applied to Utility Package project. When it is applied, the rows where the Tag has already been registered are sorted in the order of "Nic No.".

(a) How to register a Consumer Tag
Execute the following operations.

1) Click the Add button.
2) Double-click the blank line that is added.
3) Configure the Tag in the "Consumer Tag" window.

(b) How to edit a Consumer Tag
Double-click the row where the Tag has already been registered.

(c) How to delete a Consumer Tag
Double-click the row where the Tag has already been registered and click the Remove button.
Multiple rows cannot be selected simultaneously.

⊠POINT

When deleting a Tag, the start addresses of the transmitted and received data of the subsequent Tags will change.
To keep the start addresses of the transmitted and received data unchanged, handle the Tag to be deleted as a reserved Tag, without deleting it.
A reserved Tag just reserves Data Area and does not communicate actually.

1. Double-click the row to be set as a reserved Tag.
2. The "Producer Tag" window will appear. Select the "Reserved Tag" checkbox.
3. Click the OK button.

The row registered as a reserved Tag is displayed yellow.

(2) Display and settings of the "Consumer Tag" window

Figure 7.25 "Consumer Tag" window

Table 7.19 "Consumer Tag" window settings

Item	Description
Nic	Select an Own Nic No.
Tag Name	Set the tag name. Up to 100 one-byte alphanumeric characters can be used.[*1] (Up to 32 alphanumeric characters when using a label)
GX Works2 Label Name	When the "Label (for GX Works2) Setting Enable" checkbox in the "Add Own Nic" window is selected, the Tag name set in "Tag Name" is automatically used as it is.
Data Type	Select one from the following. "INT": 1 word The Data Type name registered in the "User Define" window (☞ Section 7.9.5 "User Define" window)
Data Size	Set the data size to be received from Producer Tag. (1 to 722 words) When selecting a Data Type name that has been registered in "Data Type" of the "User Define" window, the size of the selected Data Type is automatically set.
Connection Type	Fixed to "Class1" for Consumer Tag.
Setting Type	Select the type of the connection. "Multicast": Select when the connected device (Producer Tag) communicates with multiple Consumer Tags. (Default) "Point to Point": Select when the connected device (Producer Tag) communicates with one Consumer Tag.
RPI	Set the RPI of Consumer Tag. Setting range: 5 to 10000 (Default: 5) Every RPI of Consumer Tag can be set all at once with "RPI Set" of the selection tree. (☞ Section 7.9.6 "RPI Set" window)
Remote Node	The Node Name that has been set in "[Remote Nic]" in the "Basic" window appears. Select the connected device. (☞ Section 7.9.1 "Basic" window)

Table 7.19 "Consumer Tag" window settings (Continued)

Item			Description
Remote Tag			Set the Producer Tag name of the communication destination. Up to 100 one-byte alphanumeric characters can be used.[1] (Up to 32 alphanumeric characters when using a label)
Trigger			Set the conditions for Class1 Tag communications. (☞ Section 4.2.1 (2) Timing of Class1 Tag communication) "Cyclic": Tag communications are performed at the RPI interval only. (Default) "Application Trigger": Communications are performed at a specified timing even during communications at the RPI interval.
Timeout Multiplier			Select the multiplier of the time-out value. (Default: x4)
Refresh Device			The refresh device can be set with "Device" when the checkbox is selected. When auto refresh settings are made in the "Refresh Parameter" window, the settings made here are disabled.
Device			When using the auto refresh function, set the refresh target device and the start number of the device. When "Refresh Device" is set in the "Refresh Parameter" window, settings for the refresh target device cannot be made in this window. (☞ Section 7.9.7 "Refresh Parameter" window) To set the refresh target device for each Tag in this window, delete the "Refresh Device" settings in the "Refresh Parameter" window.
	L	0 to 32752	Set the auto refresh target device. The settings can be made in the range of "Device" in "Q Parameter Setting" of GX Works2. Note that other modules and EtherNet/IP modules having a different Nic No. must not use the same auto refresh target devices. When using a bit device, make settings in 16-point units (such as M16).
	M	0 to 61424	
	D	0 to 4212735	
	R	0 to 32767	
	B	0 to EFF0	
	W	0 to 4047FF	
	ZR	0 to 4184063	
Reserved Tag			A reserved Tag can be configured when the checkbox is selected. (☞ Section 4.2.1 (4) Reserved tag) A reserved Tag just reserves Data Area and does not communicate actually.

* 1   To use a tag name with 41 or more characters, the setting in "Add Own Nic" window is required.
(☞ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window)

7.9.4 "Message" window

Make settings for the Class3/UCMM Tag and the auto refresh target Tag.

(1) Display and settings of the "Message" window

Tag setting status list

Tag Parameter list
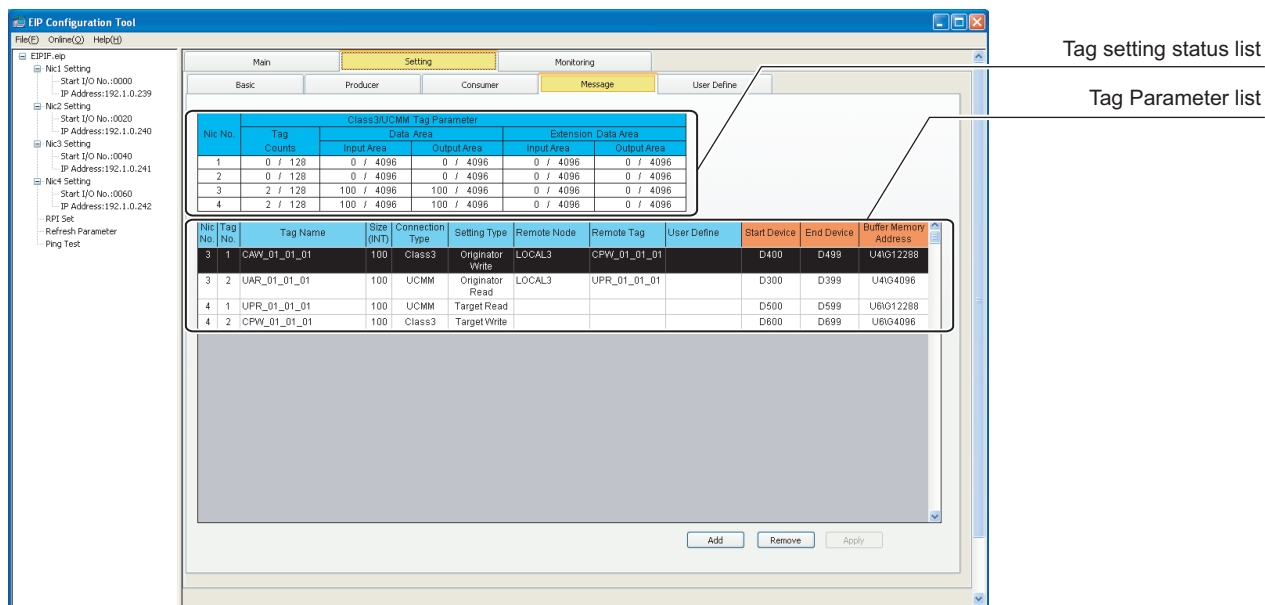
Figure 7.26 "Message" window

Table 7.20 "Message" window items

Item	Description
Tag setting status list	The settings of the Class3/UCMM Tag communications are displayed. The connected Tag count and the size of the storage area for transmitted and received data are displayed as "Tag Counts" and "Input/Output Area Size" set in the "Add Own Nic" window of the "Basic" window. (☞ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window) Any row of a Nic No. that has not been set is displayed grey.
Tag Counts	"Number of registered Tags/number of connected Tags" is displayed.
Data Area	"Number of words used/size of the storage area for transmitted and received data" of Data Area is displayed. The number of words used is applied as shown below when "Setting Type" of the "Message Tag" window is selected and "Data Size" is configured. (☞ (2) Display and settings of the "Message Tag" window in this section) •When "Originator Read" or "Target Write" is selected for setting: Applied to "Input Area". •When "Originator Write" or "Target Read" is selected for setting: Applied to "Output Area".
Extension Data Area	"Number of words used/size of the storage area for transmitted and received data" of Extension Data Area is displayed. Extension Data Area is used when the number of words used exceeds the size of "Data Area".

Table 7.20 "Message" window items (Continued)

Item	Description
Tag Parameter list	The parameters set in the "Message Tag" window are displayed. (☞ (2) Display and settings of the "Message Tag" window in this section)
Nic No.	The parameters set in the "Message Tag" window are displayed.
Tag Name	
Size(INT)	
Connection Type	
Setting Type	
Remote Node	
Remote Tag	
User Define	When an item other than "INT" has been selected in "Data Type" of the "Message Tag" window, the Data Type name that has been registered in the "User Define" window is displayed. (☞ Section 7.9.5 "User Define" window)
Start Device	The auto refresh target device set in "Refresh Device" of the "Message Tag" window is displayed.
End Device	The last device of the auto refresh target is displayed.
Buffer Memory Address	The start address of the buffer memory that the Tag occupies is displayed.
Add button	A blank line is added. (Up to 256 Producer/Consumer/Message Tags in total)
Remove button	Clicking this button after selecting a Tag-registered row will delete the selected row.
Apply button	The configured Message Tag is applied to a Utility Package project. When it is applied, the rows where the Tag has already been registered are sorted in the order of "Nic No.".

(a) How to register a Message Tag
    Execute the following operations.

    1) Click the Add button.
    2) Double-click the blank line that is added.
    3) Configure the Tag in the "Message Tag" window.

(b) How to edit a Message Tag
    Double-click the row where the Tag has already been registered.

(c) How to delete a Message Tag
    Double-click the row where the Tag has already been registered and click the
    Remove button.
    Multiple rows cannot be selected simultaneously.

☒ **POINT**

When deleting a Tag, the start addresses of the transmitted and received data of the subsequent Tags will change.
To keep the start addresses of the transmitted and received data unchanged, handle the Tag to be deleted as a reserved Tag, without deleting it.
A reserved Tag just reserves Data Area and does not communicate actually.

1. Double-click the row to be set as a reserved Tag.
2. The "Producer Tag" window will appear. Select the "Reserved Tag" checkbox.
3. Click the OK button.

The row registered as a reserved Tag is displayed yellow.

(2) Display and settings of the "Message Tag" window

Figure 7.27 "Message Tag" window

Table 7.21 "Message Tag" window settings

Item	Description
Nic	Select an Own Nic No.
Connection Type	Select "Class3" or "UCMM".
Setting Type	Select the Class3/UCMM Tag communications type. •"Originator Read": Requests reading to the Tag of the connected device. (Tag data reading) •"Originator Write": Requests writing to the Tag of the connected device. (Tag data writing) •"Target Read": Receives a reading request from the connected device. •"Target Write": Receives a writing request from the connected device.
Tag Name	Set the tag name. Up to 100 one-byte alphanumeric characters can be used.[1] (Up to 32 alphanumeric characters when using a label)
GX Works2 Label Name	When the "Label (for GX Works2) Setting Enable" checkbox in the "Add Own Nic" window is selected, the Tag name set in "Tag Name" is automatically used as it is.
Data Type	Select one from the following. •"INT": 1 word •"DINT": 2 words •Data Type name registered in the "User Define" window (☞ Section 7.9.5 "User Define" window)
Data Size	Set the data size of the Tag. When selecting a Data Type name that has been registered in "Data Type" of the "User Define" window, the size of the selected Data Type is automatically set.
Remote Node	Select the Node Name of the connected device when selecting "Originator Read" or "Originator Write" in "Setting Type".
Remote Tag	Set the Remote Tag name of the communication destination when selecting "Originator Read" or "Originator Write" in "Setting Type". Up to 100 one-byte alphanumeric characters can be used.[1]

Table 7.21 "Message Tag" window settings (Continued)

Item			Description
Timeout			Set the waiting time for a response to a request from the connected device when selecting "Originator Read" or "Originator Write" in "Setting Type". Setting range: 30 to 10000 (Default: 30)
Trigger			Set the conditions for Class3/UCMM Tag communications when selecting "Originator Read" or "Originator Write" in "Setting Type". •"Cyclic": Tag communications are performed with the connected device periodically. This setting can be selected for Class3 Tag communications only. •"Application Trigger": Tag communications are performed at an arbitrary timing. (Default)
Refresh Device			The refresh device can be set with "Device" when the checkbox is selected. When auto refresh settings are made in the "Refresh Parameter" window, the settings made here are disabled.
Device			When using the auto refresh function, set the refresh target device and the start number of the device. When "Refresh Device" is set in the "Refresh Parameter" window, settings for the refresh target device cannot be made in this window. (⟋☞ Section 7.9.7 "Refresh Parameter" window) To set the refresh target device for each Tag in this window, delete the "Refresh Device" settings in the "Refresh Parameter" window.
	L	0 to 32752	Set the auto refresh target device. The settings can be made in the range of "Device" in "Q Parameter Setting" of GX Works2. Note that other modules and EtherNet/IP modules having a different Nic No. must not use the same auto refresh target devices. When using a bit device, make settings in 16-point units (such as M16).
	M	0 to 61424	
	D	0 to 4212735	
	R	0 to 32767	
	B	0 to EFF0	
	W	0 to 4047FF	
	ZR	0 to 4184063	
Reserved Tag			A reserved Tag can be configured when the checkbox is selected. (⟋☞ Section 4.2.2 (4) Reserved tag) A reserved Tag just reserves Data Area and does not communicate actually.

* 1   To use a tag name with 41 or more characters, the setting in "Add Own Nic" window is required.

(⟋☞ Section 7.9.1 (1) Display and settings of the "Add Own Nic" window)

7.9.5 "User Define" window

Arbitrarily define Data Types other than INT and DINT and register them.

(1) Display and settings of the "User Define" window
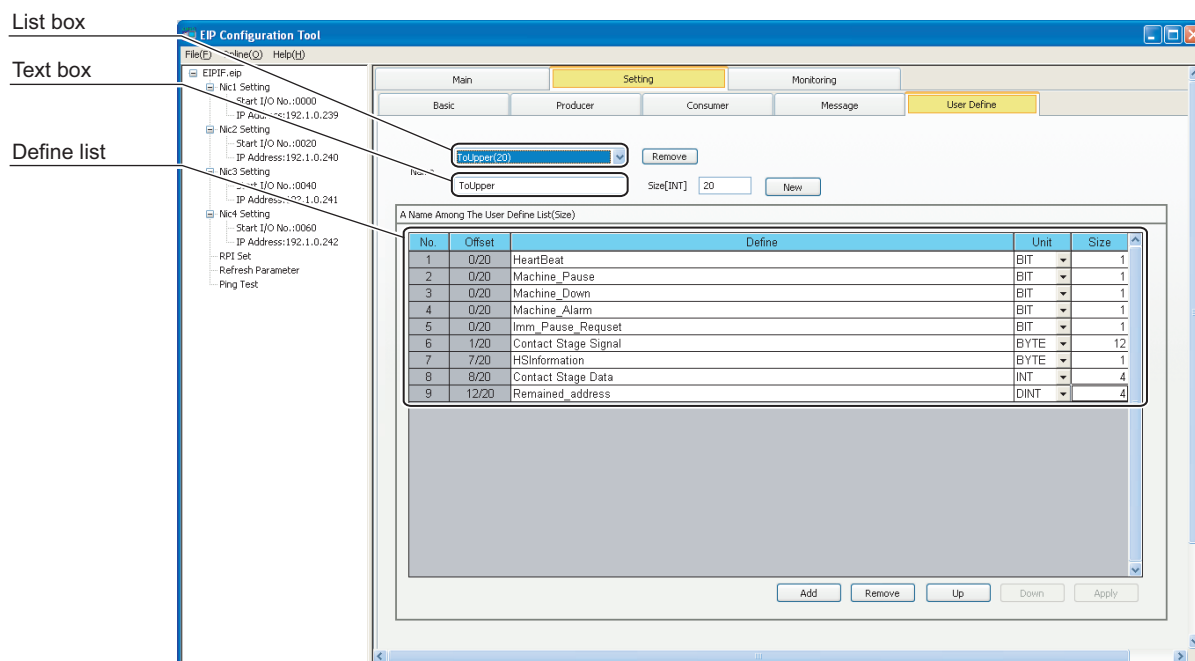
Figure 7.28 "User Define" window

Table 7.22 "User Define" window items

Item	Description
Name	Register Data Types in addition to the predefined Data Types (INT and DINT). Up to 256 Data Types can be registered.
List box	Select a name of the Data Type that has been registered. Use to change the definitions of the Data Types that have been registered. The value in the parentheses displayed after the Data Type name is Data Size (units: words).
Remove button	Clicking this button after selecting a Data Type name in the list box will delete the selected Data Type.
Text box	Set the name of a new Data Type to be registered. (Up to 40 one-byte alphanumeric characters) When a Data Type has been selected in the list box, the selected Data Type name is displayed.
Size[INT]	Set the size of the Data Type. (1 to 722 words) When a Data Type has been selected in the list box, the size of the selected Data Type is displayed.
New button	When clicking this button after setting a Data Type name in the text box and the number of words in "Size [INT]", a new blank define list is created.

Table 7.22 "User Define" window items (Continued)

Item	Description
A Name Among The User Define List (Size)	Define definition (element that configures the Data Type) in the registered Data Type. Up to 256 Defines can be registered per Data Type.
No.	A number is assigned and displayed every time a Define is added.
Offset	The offset (how many words from the start) of Define is displayed. It is displayed as "Offset/Total Number of Words" after the Apply button is clicked.
Define	Set the Define name. (Up to 40 one-byte alphanumeric characters)
Unit	Select the Define unit. "INT": 1 word (2 bytes) "DINT": 2 words (4 bytes) "BYTE": 1 byte "BIT": 1 bit
Size	Set the Define size. •For "INT": 1 to 722 words •For "DINT": 1 to 361 words •For "BYTE": 1 to 1444 words •For "BIT": 1 to 5120 bits
Add button	When a row in the define list is selected and this button is clicked, a new row is added below the selected row. (Up to 256 rows)
Remove button	When a row in the define list is selected and this button is clicked, the selected row is cleared.
Up button	When a row in the define list is selected and this button is clicked, it is switched with the row that is directly above it.
Down button	When a row in the define list is selected and this button is clicked, it is switched with the row that is directly below it.
Apply button	The Data Type name and size in the text box are registered in the list box along with the settings of the define list.

(a) How to register a Data Type
Execute the following operations.
1) Set the Data Type name in the text box.
2) Set the size in "Size [INT]".

3) Click the New button.
4) Make settings for the blank define list that is created.

5) Click the Apply button.
The blank rows in the define list are deleted and the Data Type names are registered in the list box.

(b) How to edit a Data Type
1) Select a name of the Data Type that has been registered in the list box.
2) Edit the define list that is displayed.

3) Click the Apply button.
The edited items are overwritten and reflected.

(c) How to delete a Data Type
1) Select a name of the Data Type in the list box.

2) Click the Remove button on the right of the list box.

7.9.6 "RPI Set" window

Use this window when configuring RPI (Request Packet Interval) of all Tags collectively. This window is displayed when "RPI Set" in the selection tree is double-clicked.

(1) Display and settings of the "RPI Set" window
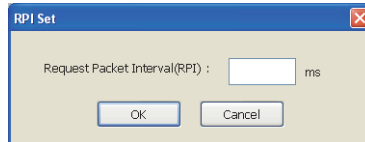
Figure 7.29 "RPI Set" window

Table 7.23 "RPI Set" window items

Item	Description
Request Packet Interval(RPI)	The setting value is applied to "RPI" in the "Consumer Tag" window. For the Class1 Tag communications, this will be the interval of data transmission from Producer Tag to Consumer Tag.

When setting an RPI of Consumer Tag for each Tag, make RPI settings in the "Consumer Tag" window. (☞ Section 7.9.3 (2) Display and settings of the "Consumer Tag" window)

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

7.9.7 "Refresh Parameter" window

Set the refresh target device of the items below for each EtherNet/IP module.
- Send/receive data of Tag communication
- Error codes of own station
- Communication status of Class1 or Class3/UCMM Tag communication
- Error status for each tag

This window is displayed when "Refresh Parameter" in the selection tree is double-clicked.

(1) "Refresh Parameter" window and setting description
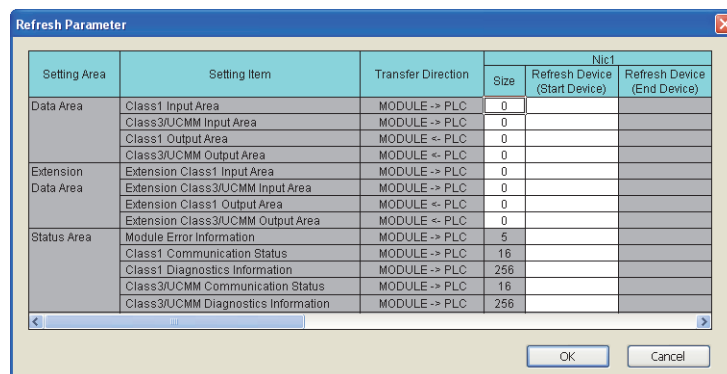
Figure 7.30 "Refresh Parameter" window

Table 7.24 Description of the "Refresh Parameter" window

Item		Description
Setting Area		Displays the data items to refresh. (Data Area) Set the refresh target device for send/receive data of Tag communication for each input/output area. The following are setting items and their buffer memory. •Class1 Input Area (Un\G0 to Un\G4095) •Class3/UCMM Input Area (Un\G4096 to Un\G8191) •Class1 Output Area (Un\G8192 to Un\G12287) •Class3/UCMM Output Area (Un\G12288 to Un\G16383) When setting the refresh target device for each tag, set it in "Refresh Device" of Tag
Setting Item		Parameter. (☞ Section 7.9.2 (2) Display and settings of the "Producer Tag" window, Section 7.9.3 (2) Display and settings of the "Consumer Tag" window) However, "Data Area" on this window and "Refresh Device" on Tag Parameter window cannot be set simultaneously. (Extension Data Area) Set the refresh target of the transmitted and received data of Tag communications for each Extension Input Area or Extension Output Area. The Extension Data Area data are not stored in the buffer memory. (Status Area) Set the refresh target device for items such as error codes of own station. The following are setting items and their buffer memory. •Own station error status (Un\G27264) •Communication Status (Class1)(Un\G27136 to Un\G27151) •Class1 Diagnostics Information (Un\G27392 to Un\G27647) •Communication Status (Class3/UCMM)(Un\G27184 to Un\G27199) •Class3/UCMM Diagnostics Information (Un\G27648 to Un\G27903)
Transfer Direction		Displays the directions of data flow.
Nic1/Nic2/Nic3/Nic4		Configure the auto refresh settings for each EtherNet/IP module. Only the Nic No. that has been configured in the "Add Own Nic" window can be configured.
	Size	Displays or sets the refresh size of the setting items.
	Refresh Device (Start Device)	Enter the QCPU device to auto refresh. •Any of the L/M/D/R/B/W/ZR can be selected. When using the M or B bit device, set the number dividable by 16 (Example: M16). •For the device setting range, refer to the following. ☞ Section 7.1 (2) Device ranges of auto refresh
	Refresh Device (End Device)	Displays the QCPU device to auto refresh.

(2) Adding settings
Set the device and the start address in "Refresh Device (Start Device)" of the "Refresh Parameter" window and click the ⌷ OK ⌷ button.

(3) Deleting the settings
Delete the setting of "Refresh Device (Start Device)" on the "Refresh Parameter" window and click the ⌷ OK ⌷ button.

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

(4) Refreshing send/receive data of Tag communication
Setting is available in either way of the following.

Table 7.25 Send/receive data of Tag communication refreshing

Setting the refresh target device	Description	Setting window
Set for each tag	Refresh target device can be set for each tag. The refresh target devices can be kept unchanged even when Tag Parameter is added or deleted. (☞ Section 5.2.1 (2) Tag types and data sizes) However, the number of settings needs to be checked. (☞ Section 7.1 (1) The number of auto refresh parameter settings)	•"Producer Tag" window •"Consumer Tag" window •"Message Tag" window
Set for each input and output area	Set the refresh target device for each input and output area. Setting can be completed on one window. However, the refresh target devices may change when Tag Parameter is added or deleted. (☞ Section 5.2.1 (2) Tag types and data sizes)	"Refresh Parameter" window

(5) Precautions
The followings are the precautions for setting the refresh target device.
- When setting the size in "Data Area" and "Extension Data Area" of the "Refresh Parameter" window, ensure that it is equal to or smaller than the size set in the "Add Own Nic" window.
- The number of auto refresh parameter settings that can be made is limited.
(☞ Section 7.1 (1) The number of auto refresh parameter settings)

7.10 Online

This section describes the online operations of the EtherNet/IP module connected in a network.

7.10.1 Configuring the EtherNet/IP module

Configure the EtherNet/IP module in connection destination.

(1) Displaying the "Transfer Setup" window
Click [Online]→[Transfer Setup].

(2) "Transfer Setup" window and a setting description
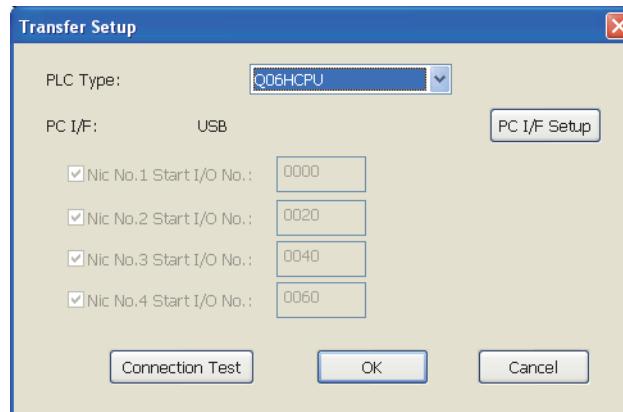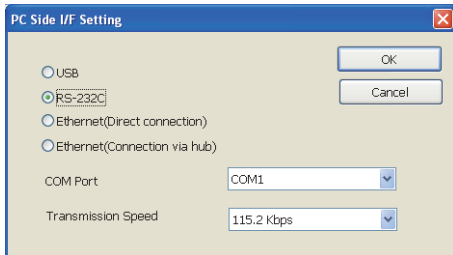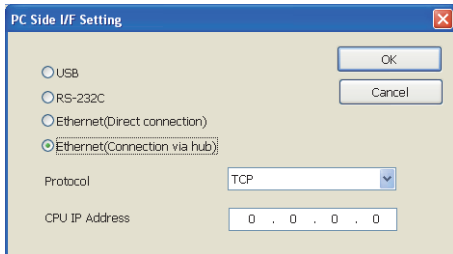
Figure 7.31 "Transfer Setup" window

Table 7.26 Description of the "Transfer Setup" window

Item	Description	Reference section
PLC Type	Select the model name of the QCPU.	-
PC I/F	Clicking the ⟨ PC I/F Setup ⟩ button will display the "PC side I/F Setting" window. Select the connection interface type. The following settings must be made when "RS-232C" or "Ethernet (Connection via hub)" is selected. \<When selecting RS-232C\> \<When selecting Ethernet (Connection via hub)\> <table><tr><th>Item</th><th>Description</th></tr><tr><td>COM Port</td><td>Select the COM port. This item is selectable only when "RS-232C" is selected.</td></tr><tr><td>Transmission Speed</td><td>Select the transmission speed. This item is selectable only when "RS-232C" is selected.</td></tr><tr><td>Protocol</td><td>Select the protocol of the Built-in Ethernet port QCPU from "TCP" or "UDP".</td></tr><tr><td>CPU IP Address</td><td>Enter the IP address of the Built-in Ethernet port QCPU.</td></tr></table>	-
Nic No.1 to 4 Start I/O No.	Set the start I/O No. of the EtherNet/IP module. (Hex.) When there is an Own Nic, the start I/O No. that has been set in the "Add Own Nic" window of the "Basic" window is displayed.	Section 7.9.1 (1)
⟨ Connection Test ⟩ button	Run a test to see if a connection can be made with the CPU module	-

(3) Precautions
The Built-in Ethernet port QCPU is the only CPU that can be used for an Ethernet connection. Connections cannot be made via Ethernet interface module or other modules.

7.10.2 Writing parameters to the EtherNet/IP module

Write the set parameters to the EtherNet/IP module.

(1) Displaying the "Download Parameter" window
Click [Online]→[Download Parameter].

"Transfer Setup" window will be displayed if the above operation is performed without setting the connected EtherNet/IP module.
Refer to the following and complete the setting.
☞Section 7.10.1 Configuring the EtherNet/IP module

(2) "Download Parameter" window and setting description
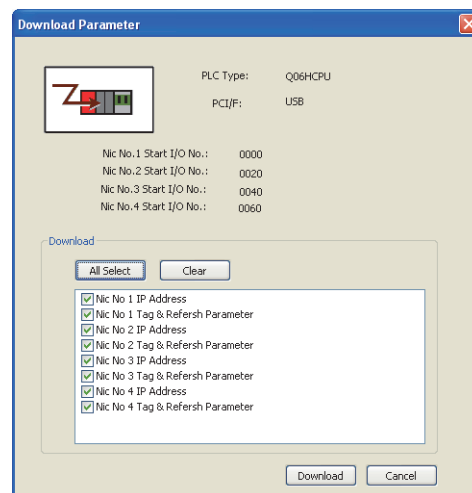
Figure 7.32 "Download Parameter" window

Table 7.27 Description of the "Download Parameter" window

Item	Description	Reference section
PLC Type	Displays the QCPU set on the "Transfer Setup" window.	Section 7.10.1 (2)
PC I/F	Displays the connection interface set on the "PC side I/F Setting" window.	Section 7.10.1 (2)
Nic No.1 to 4 Start I/O No.	Displays the start I/O No. of the EtherNet/IP module at connection destination.	Section 7.9.1 (1)

Table 7.27 Description of the "Download Parameter" window (Continued)

Item	Description	Reference section
Download	Writes the parameters to the EtherNet/IP module. <table><tr><th>Item</th><th>Description</th></tr><tr><td>All Select button</td><td>All checkboxes are selected.</td></tr><tr><td>Clear button</td><td>All checkboxes are cleared.</td></tr><tr><td>Refresh Parameter</td><td>When they are selected, the settings made in the "Refresh Parameter" window are written in the CPU module.</td></tr><tr><td>Nic No.1 to 4 IP Address</td><td>The IP address data that have been set in the "Add Own Nic" window are written into the EtherNet/IP modules with the selected Nic Nos.</td></tr><tr><td>Nic No.1 to 4 Tag Parameter</td><td>The settings made on the "Setting" tab are written into the EtherNet/IP modules with the selected Nic Nos.</td></tr><tr><td>Download button</td><td>The selected parameters are written into their respective EtherNet/IP modules.</td></tr><tr><td>Cancel button</td><td>Clicking the button deletes the settings of the "Download Parameter".</td></tr></table>	-

(3) Precautions

(a) Perform either of the operation below when writing intelligent function module parameters other than those of the EtherNet/IP module to a QCPU through GX Works2.

• After writing auto refresh parameters in Utility Package, read the intelligent function module parameters by "Read form PLC" of GX Works2.
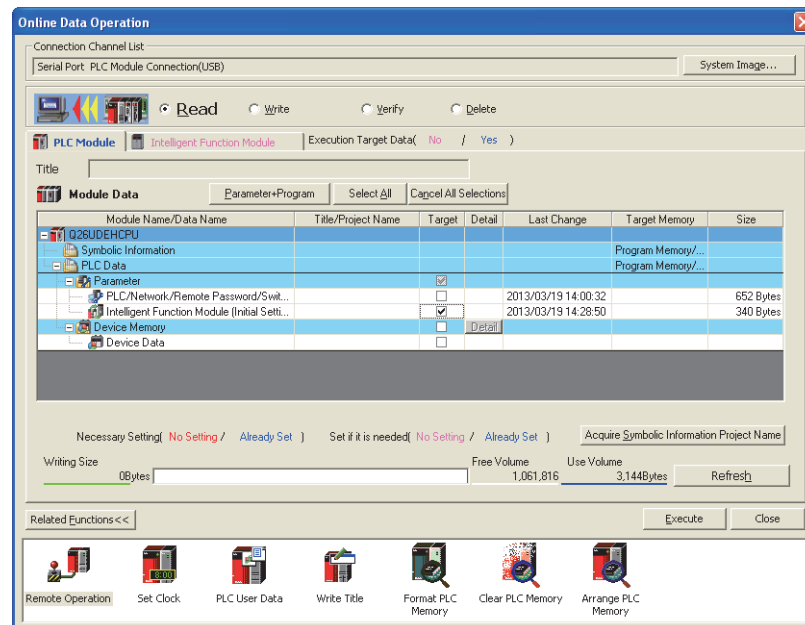
Figure 7.33 "Read from PLC" window of GX Works2

• After writing intelligent function module parameters other than those of the EtherNet/IP module, write auto refresh parameters of the EtherNet/IP module by Utility Package.

The auto refresh parameters set to the EtherNet/IP module will be cleared if the intelligent function module parameters other than those of the EtherNet/IP module are written to a QCPU without above operation.

(b) For multiple CPU systems, write parameters only to the control CPU of the EtherNet/IP module.

(c) Set the total size of the character string information parameters (Nic Name, Node Name, Tag name, Data Type name, define name) as below.
• 32K words or less for one module (Own Nic)
• 128K words or less for one project
Data cannot be written into the module if the total exceeds the sizes above.

For details on the calculation for the total size of the character string information parameters, refer to the following.

☞ Appendix 4 Calculation for the Total Size of Character String Information Parameters

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

7.10.3 Reading out parameters of the EtherNet/IP module

Reads out the parameters of the EtherNet/IP module.

(1) Displaying the "Upload Parameter" window
Click [Online]→[Upload Parameter].

"Transfer Setup" window will be displayed if the above operation is performed without setting the connected EtherNet/IP module.
Refer to the following and complete the setting.
☞ Section 7.10.1 Configuring the EtherNet/IP module
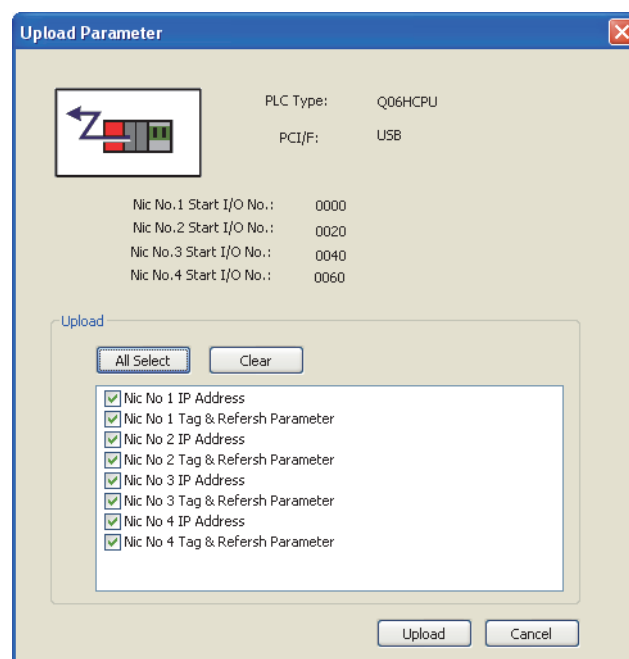
(2) "Upload Parameter" window and setting description

Figure 7.34 "Upload Parameter" window

Table 7.28 Description of the "Upload Parameter" window

Item	Description	Reference section
PLC Type	Displays the QCPU set on the "Transfer Setup" window.	Section 7.10.1 (2)
PC I/F	Displays the connection interface set on the "PC side I/F Setting" window.	Section 7.10.1 (2)
Nic No.1 to 4 Start I/O No.	Displays the start I/O No. of the EtherNet/IP module at connection destination.	Section 7.9.1 (1)

Table 7.28 Description of the "Upload Parameter" window (Continued)

Item	Description	Reference section
Upload	Reads out the parameters of the EtherNet/IP module. 	-

| Item	Description
All Select button	All checkboxes are selected.
Clear button	All checkboxes are cleared.
Refresh Parameter	When they are selected, the settings made in the "Refresh Parameter" window are read from the CPU module.
Nic No.1 to 4 IP Address	The IP address data that have been set in the "Add Own Nic" window are read from the EtherNet/IP modules with the selected Nic Nos.
Nic No.1 to 4 Tag Parameter	The settings made on the "Setting" tab are read from the EtherNet/IP modules with the selected Nic Nos.
Upload button	The selected parameters are read from their respective EtherNet/IP modules.
Cancel button	Deletes the settings of "Upload Parameter".

(3) Precautions

Note the following points when reading the parameters in the EtherNet/IP module into Utility Package.

- Among Data Type registered in the "User Define" window, those not being used by parameters are not written into the EtherNet/IP module.
  Therefore, unused Data Types are deleted when parameters written in the EtherNet/IP module are read into Utility Package.
  To save the Data Types that are not used by parameters, save the project file (*.eip).
- Note that parameters that have been set in the "Refresh Parameter" window may be read as parameters that have been set by each tag. (When the number of auto refresh settings is four or less and the refresh size is the same as the total size of the Tags)
  To save the settings made in the "Refresh Parameter" window, save the project file (*.eip).

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

7.11 "Monitoring" tab (Network Diagnostics)

The following table shows functions of Network diagnostics.

Table 7.29 "Monitoring" tab items

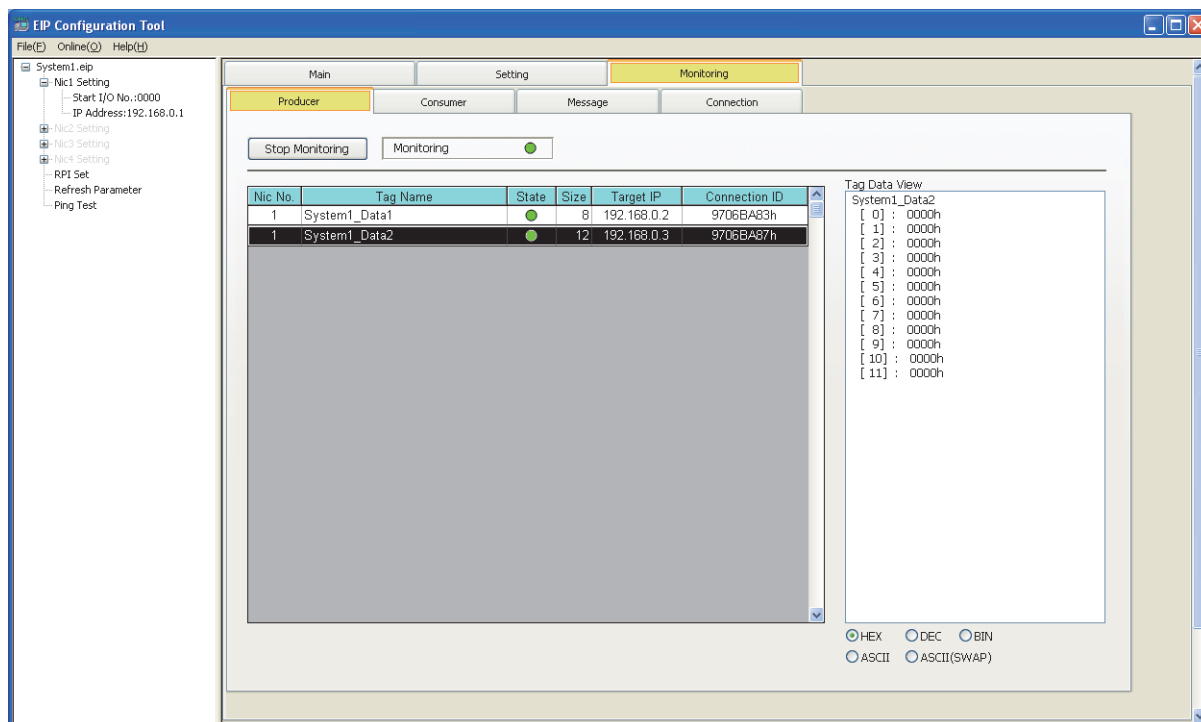| Function	Reference points
The Producer Tag status can be monitored.	☞ Section 7.11 (1) "Producer" window
	☞ Section 3.3.14 Communication status (Class1)
The Consumer Tag status can be monitored.	☞ Section 7.11 (2) "Consumer" window
	☞ Section 3.3.14 Communication status (Class1)
The Message Tag status can be monitored.	☞ Section 7.11 (3) "Message" window
	☞ Section 3.3.15 Communication status (Class3/UCMM)
The connection status can be monitored	☞ Section 7.11 (4) "Connection" window

(1) "Producer" window

Figure 7.35 "Producer" window

Table 7.30 "Producer" window items

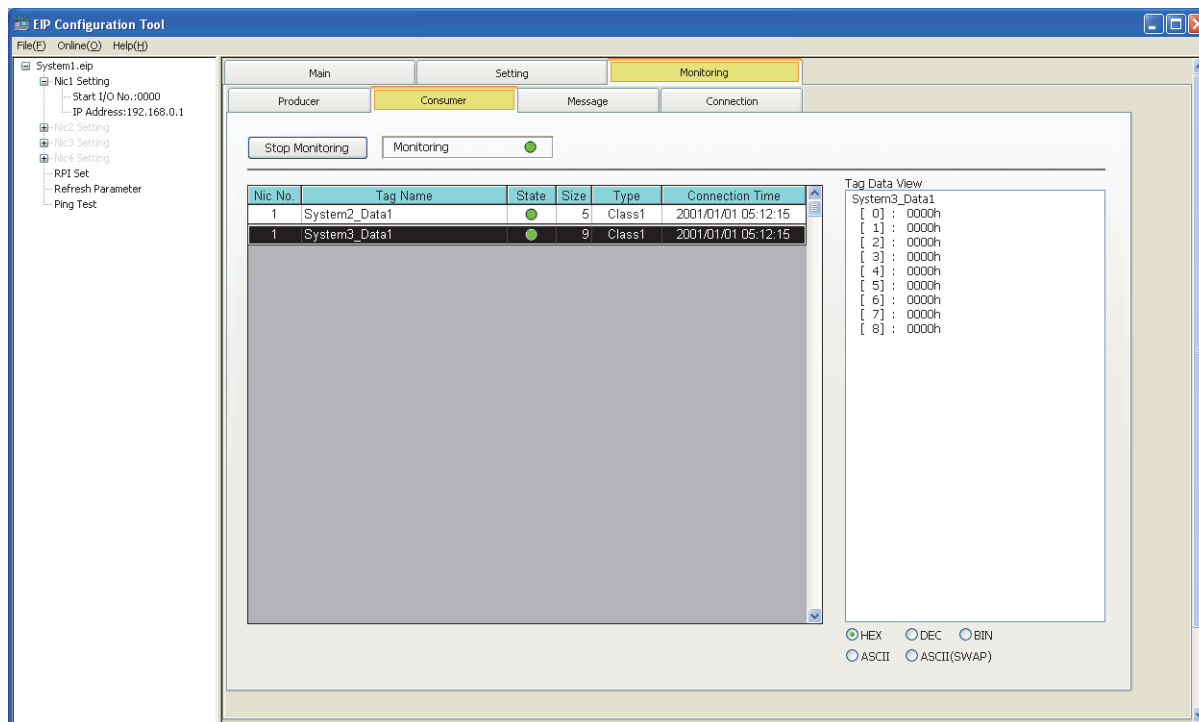| Item	Description
Start Monitoring / Stop Monitoring button	Monitoring is started or stopped in the "Producer" window.
Monitoring/Stop	The monitoring status is displayed. •"Monitoring ● (green)": Monitoring •"Stop ● (red)": Monitoring stopped
Tag status monitor	The status of the Producer Tag that has been registered in the EtherNet/IP module is displayed.
Nic No.	Nic No. is displayed.
Tag Name	The Tag name that has been configured in the EtherNet/IP module is displayed.
State	The status of the Tag is displayed. •● (green): Normal communications •● (red): Abnormal communications
Size	The size of the Tag is displayed.
Target IP	The IP address on the Consumer side is displayed.
Connection ID	The connection ID for the connected device with the requested Tag is displayed. •Blank when Tag communication start process completion (X00) is not on. •"00000000h" is displayed when there has not been a single normal communication since Tag communication start process completion (X00) was turned on.
Tag Data View	The data of the selected Producer are displayed in the format selected below.
HEX/DEC/BIN/ASCII/ ASCII(SWAP)	Select the display format of "Tag Data View". •When ASCII is selected, data except 20_H to $7F_H$ are displayed as ".". When the selected Tag is of the Data Type that has been registered in the "User Define" window, data are displayed as the configured Data Type. (☞ Section 7.9.5 (1) Display and settings of the "User Define" window) When "Unit" of Define is "BIT", data are displayed as shown below. •When "HEX", "DEC", or "BIN" is selected, data are displayed as "ON" or "OFF". •When "ASCII" or "ASCII (SWAP)" is selected, data are displayed as ".".

(2) "Consumer" window

Figure 7.36 "Consumer" window

Table 7.31 "Consumer" window items

Item	Description
Start Monitoring / Stop Monitoring button	Monitoring is started or stopped in the "Consumer" window.
Monitoring/Stop	The monitoring status is displayed. •"Monitoring ● (green)": Monitoring •"Stop ● (red)": Monitoring stopped
Tag status monitor	The status of the Consumer Tag that has been registered in the EtherNet/IP module is displayed.
Nic No.	Nic No. is displayed.
Tag Name	The Tag name that has been configured in the EtherNet/IP module is displayed.
State	The status of the Tag is displayed. •● (green): Normal communications •● (red): Abnormal communications
Size	The size of the Tag is displayed.
Type	The type of the Tag is displayed.
Connection Time	The communication start time and communication end time (year, month, day, hour, minute, and second) are displayed. •During normal communications: Communication start time •During abnormal communications: Communication end time The times are not displayed in the following cases. •Blank when Tag communication start process completion (X00) is not on. •"0000/00/00 00:00:00" is displayed when there has not been a single normal communication since Tag communication start process completion (X00) was turned on.
Tag Data View	The data of the selected Consumer are displayed in the format selected below.

Table 7.31 "Consumer" window items (Continued)

Item	Description
HEX/DEC/BIN/ASCII/ ASCII(SWAP)	Select the display format of "Tag Data View". •When ASCII is selected, data except 20_H to $7F_H$ are displayed as ".". When the selected Tag is of the Data Type that has been registered in the "User Define" window, data are displayed as the configured Data Type. (Section 7.9.5 (1) Display and settings of the "User Define" window) When "Unit" of Define is "BIT", data are displayed as shown below. •When "HEX", "DEC", or "BIN" is selected, data are displayed as "ON" or "OFF". •When "ASCII" or "ASCII (SWAP)" is selected, data are displayed as ".".

1

OVERVIEW

2

SYSTEM
CONFIGURATION

3

SPECIFICATIONS

4

FUNCTION

5

PRE-OPERATION
PROCEDURES

6

PARAMETER

7

UTILITY PACKAGE
(SW1DNC-EIPUTL-E)

8

PROGRAMMING

(3) "Message" window

Figure 7.37 "Message" window

Table 7.32 "Message" window items

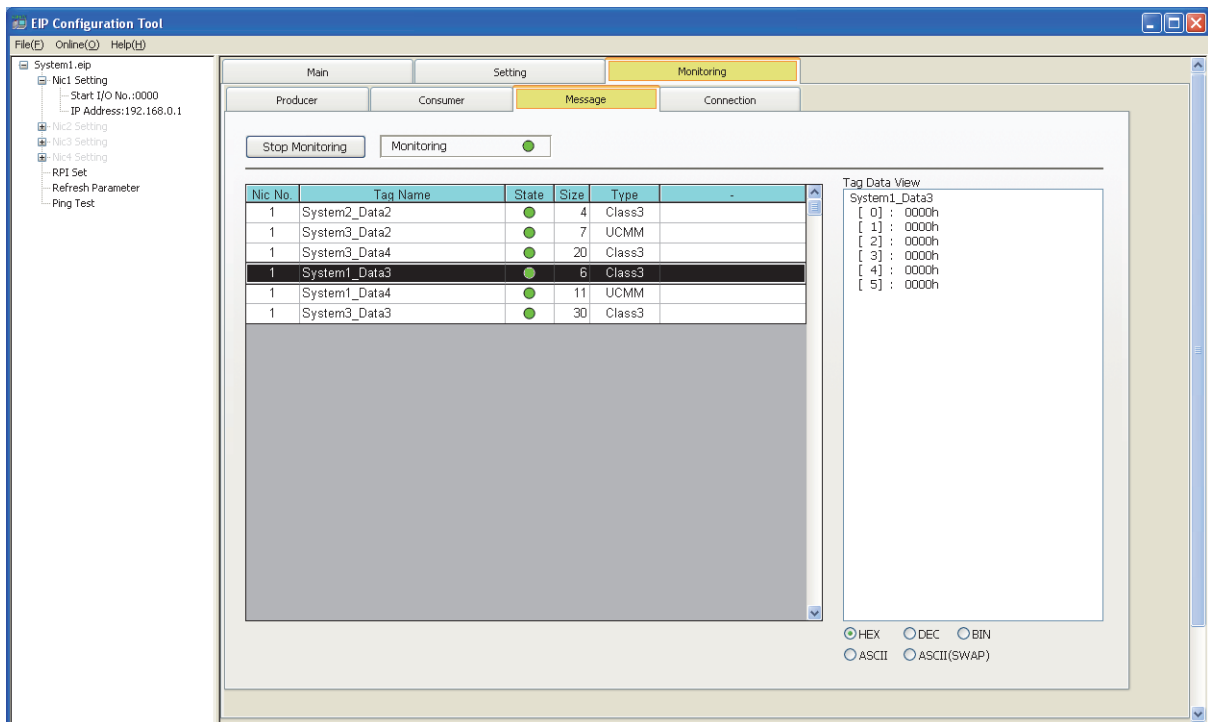| Item		Description
Start Monitoring / Stop Monitoring button		Monitoring is started or stopped in the "Message" window.
Monitoring/Stop		The monitoring status is displayed. •"Monitoring ● (green)": Monitoring •"Stop ● (red)": Monitoring stopped
Tag status monitor		The status of the Message Tag that has been registered in the EtherNet/IP module is displayed.
	Nic No.	Nic No. is displayed.
	Tag Name	The Tag name that has been configured in the EtherNet/IP module is displayed.
	State	The status of the Tag is displayed. •● (green): Normal communications •● (red): Abnormal communications
	Size	The size of the Tag is displayed.
	Type	The type of the Tag (Class3/UCMM) is displayed.
Tag Data View		The data of the selected Message are displayed in the format selected below.
	HEX/DEC/BIN/ASCII/ ASCII(SWAP)	Select the display format of "Tag Data View". •When ASCII is selected, data except 20_H to $7F_H$ are displayed as ".". When the selected Tag is of the Data Type that has been registered in the "User Define" window, data are displayed as the configured Data Type. (☞ Section 7.9.5 (1) Display and settings of the "User Define" window) When "Unit" of Define is "BIT", data are displayed as shown below. •When "HEX", "DEC", or "BIN" is selected, data are displayed as "ON" or "OFF". •When "ASCII" or "ASCII (SWAP)" is selected, data are displayed as ".".

(4) "Connection" window
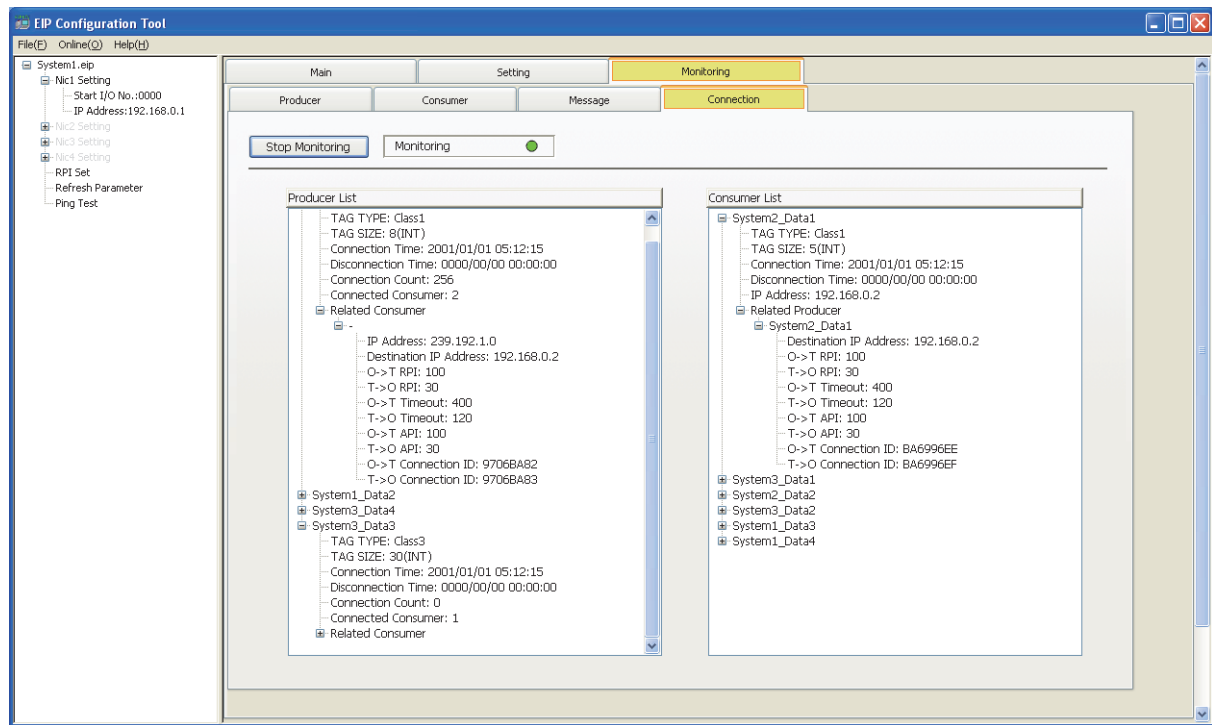
Figure 7.38 "Connection" window

Table 7.33 "Connection" window items

Item	Description
Stop Monitoring / Stop Monitoring button	Monitoring is started or stopped in the "Connection" window.
Monitoring/Stop	The monitoring status is displayed. •"Monitoring ● (green)": Monitoring •"Stop ● (red)": Monitoring stopped

Table 7.33 "Connection" window items

Item	Description
Producer List	The details of the Producer Tag/Message Tag that have been registered in the EtherNet/IP module are displayed.
TAG TYPE	The type of the Tag (Class1/Class3/UCMM) is displayed.
TAG SIZE	The size of the Tag is displayed in INT units.
Connection Time	The communication start time of the Producer Tag/Message Tag is displayed.[1][2]
Disconnection Time	The communication end time of the Producer Tag/Message Tag is displayed.[1][3]
Connection Count	The maximum number of Consumer Tags that can communicate with the Producer Tag/Message Tag is displayed.
Connected Consumer	The number of Consumer/Message Tags that is communicating with the Producer Tag/Message Tag is displayed.[1][4]
Related Consumer	The details of the communication destination Tag (Consumer Tag/Message Tag) are displayed.
Tag name	The communication destination Tag name is displayed.
IP Address	The Multicast Address of the Producer Tag/Message Tag is displayed.[1][5]
Destination IP Address	The IP address of the communication destination Tag is displayed.[1][5]
O→T RPI	The RPI from Originator to Target with the communication target Tag is displayed.[1][4]
T→O RPI	The RPI from Target to Originator with the communication target Tag is displayed.[1][4]
O→T Timeout	The time-out value from Originator to Target with the communication target Tag is displayed.[1][4]
T→O Timeout	The time-out value from Target to Originator with the communication target Tag is displayed.[1][4]
O→T API	The API from Originator to Target with the communication target Tag is displayed.[1][4]
T→O API	The API from Target to Originator with the communication target Tag is displayed.[1][4]
O→T Connection ID	The Connection ID from Originator to Target with the communication target Tag is displayed.[1][6]
T→O Connection ID	The Connection ID from Target to Originator with the communication target Tag is displayed.[1][6]
Consumer List	The details of the Consumer Tag/Message Tag that have been registered in the EtherNet/IP module are displayed.
TAG TYPE	The type of the Tag (Class1/Class3/UCMM) is displayed.
TAG SIZE	The size of the Tag is displayed in INT units.
Connection Time	The communication start time of the requested Tag is displayed.[1][2]
Disconnection Time	The communication end time of the requested Tag is displayed.[1][3]
IP Address	The IP address of the Producer Tag/Message Tag is displayed.[1]
Related Producer	The details of the communication destination Tag (Producer Tag/Message Tag) are displayed.
Tag name	The communication destination Tag name is displayed.[1]
Destination IP Address	The IP address of the communication destination tag is displayed.[1]
O→T RPI	The RPI from Originator to Target with the communication target Tag is displayed.[1][4]
T→O RPI	The RPI from Target to Originator with the communication target Tag is displayed.[1][4]
O→T Timeout	The time-out value from Originator to Target with the communication target Tag is displayed.[1][4]
T→O Timeout	The time-out value from Target to Originator with the communication target Tag is displayed.[1][4]
O→T API	The API from Originator to Target with the communication target Tag is displayed.[1][4]
T→O API	The API from Target to Originator with the communication target Tag is displayed.[1][4]
O→T Connection ID	The Connection ID from Originator to Target with the communication target Tag is displayed.[1][6]
T→O Connection ID	The Connection ID from Target to Originator with the communication target Tag is displayed.[1][6]

* 1 "-" is displayed when Tag communication start process completion (X00) is not on.
* 2 "0000/00/00 00:00:00" is displayed when there has not been a single normal communication since Tag communication start process completion (X00) was turned on.
* 3 "0000/00/00 00:00:00" is displayed when there has not been a single abnormal communication since Tag communication start process completion (X00) was turned on.
* 4 "0" is displayed when there has not been a single normal communication since Tag communication start process completion (X00) was turned on.
* 5 "0.0.0.0" is displayed when there has not been a single normal communication since Tag communication start process completion (X00) was turned on.
* 6 "00000000" is displayed when there has not been a single normal communication since Tag communication start process completion (X00) was turned on.

7.12   Help Menu

The product information of Utility Package is displayed on this window.

(1) Displaying the version information window
Click [About] from [Help] menu.

(2) Version information on the "About" window

Figure 7.39 Version information on the "About" window

1

OVERVIEW

2

SYSTEM
CONFIGURATION

3

SPECIFICATIONS

4

FUNCTION

5

PRE-OPERATION
PROCEDURES

6

PARAMETER

7

UTILITY PACKAGE
(SW1DNC-EIPUTL-E)

8

PROGRAMMING

CHAPTER 8 PROGRAMMING

This chapter describes programming of the EtherNet/IP module.

8.1 System Configuration Example

This section describes the system configuration.
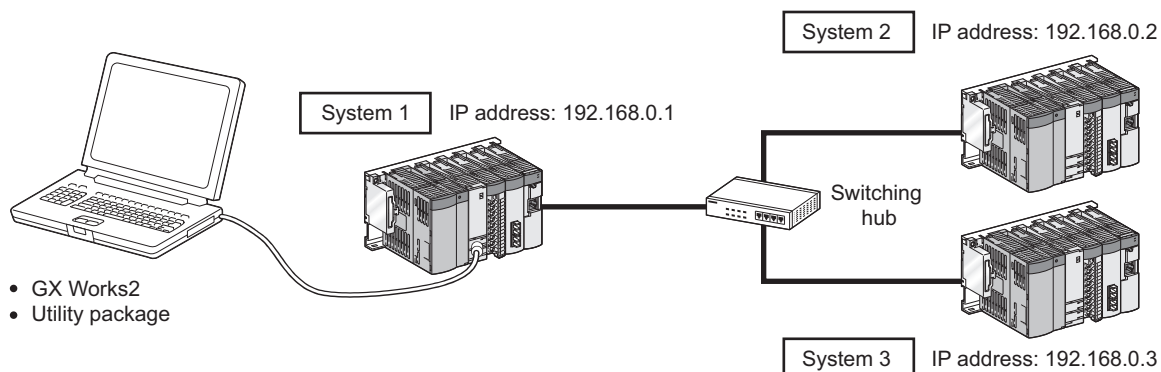In and after Section 8.2, the following system structure is used for explanation.

Figure 8.1 System configuration example

In this example, the EtherNet/IP module is mounted in slot 0 of the main base unit with the start I/O No. set to "0000".

8.2 Setting Description for Communication

The following Tag communication is used as a program example.

(1) Class1 Tag communication
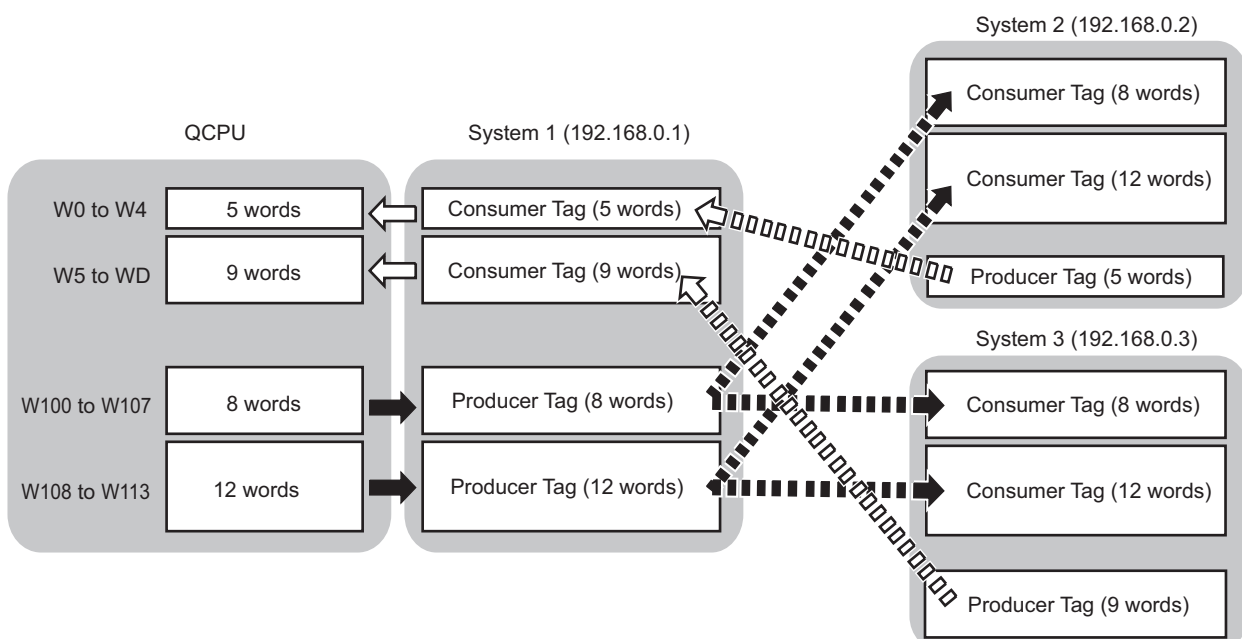
   (a) Setting description for communication

Figure 8.2 Setting description of Class1 Tag communication

(b) Tag name

Consider a tag name for Producer Tag.

The names for Consumer Tag and Producer Tag must be matched.

Table 8.1 Considering tag names for Class1 Tag communication

Producer Tag		Tag name
192.168.0.1	Producer Tag (8 words)	System1_Data1
	Producer Tag (12 words)	System1_Data2
192.168.0.2	Producer Tag (5 words)	System2_Data1
192.168.0.3	Producer Tag (9 words)	System3_Data1

(2) Class3 Tag communication and UCMM Tag communication

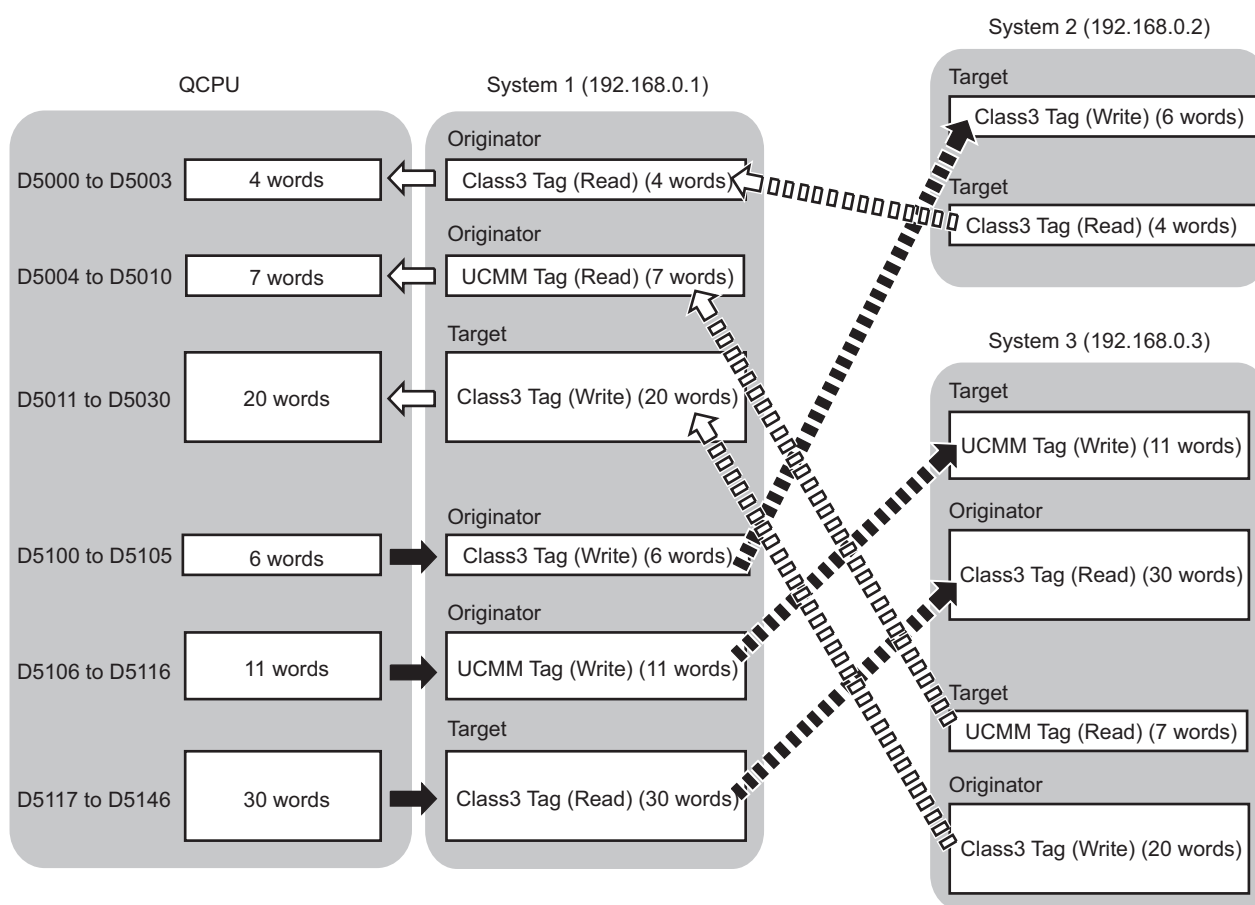(a) Setting description for communication

Figure 8.3 Setting description of Class3 and UCMM Tag communication

(b) Tag name

Consider a tag name for Originator.

The name for Target and Originator must be matched.

Table 8.2 Considering tag names for Class3 and UCMM Tag communications

Originator		Tag name
192.168.0.1	Class3 Tag (Read) (4 words)	System2_Data2
	UCMM Tag (Read) (7 words)	System3_Data2
	Class3 Tag (Write) (6 words)	System1_Data3
	UCMM Tag (Write) (11 words)	System1_Data4
192.168.0.3	Class3 Tag (Read) (30 words)	System3_Data3
	Class3 Tag (Write) (20 words)	System3_Data4

8.3 Parameter Setting

Set parameters in Utility Package referring to Section 8.1 and Section 8.2 and write them to the module.

(1) System 1 (192.168.0.1) setting

    (a) IP address and Common Parameter setting
    Double-click a cell in "Own Nic" in the "Basic" window on the "Setting" tab and make settings in the "Add Own Nic" window as shown below.

Figure 8.4 Setting in the "Add Own Nic" window for System 1

    (b) Connected device setting
    Make settings in "[Remote Nic]" in the "Basic" window as shown below.

Figure 8.5 Setting in the "Basic" window for System 1

(c) Class1 Tag Parameter setting

Make settings in the "Producer" window on the "Setting" tab as shown below.
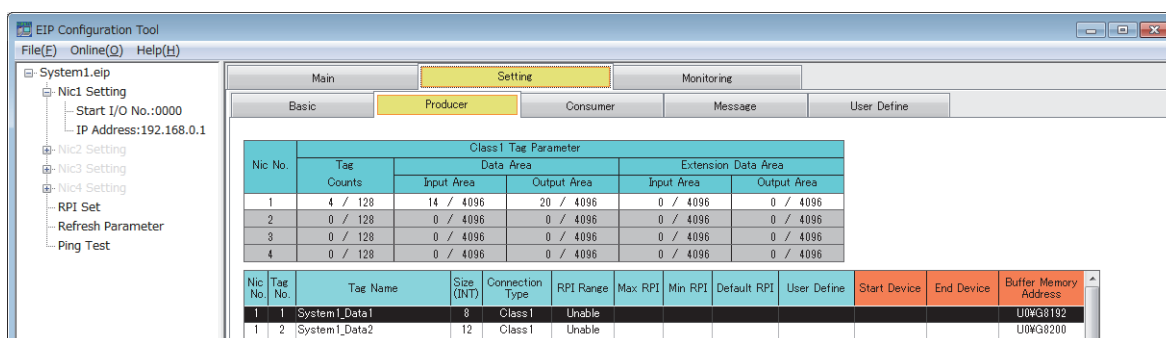
Figure 8.6 Setting in the "Producer" window for System 1

Make settings in the "Consumer" window on the "Setting" tab as shown below.
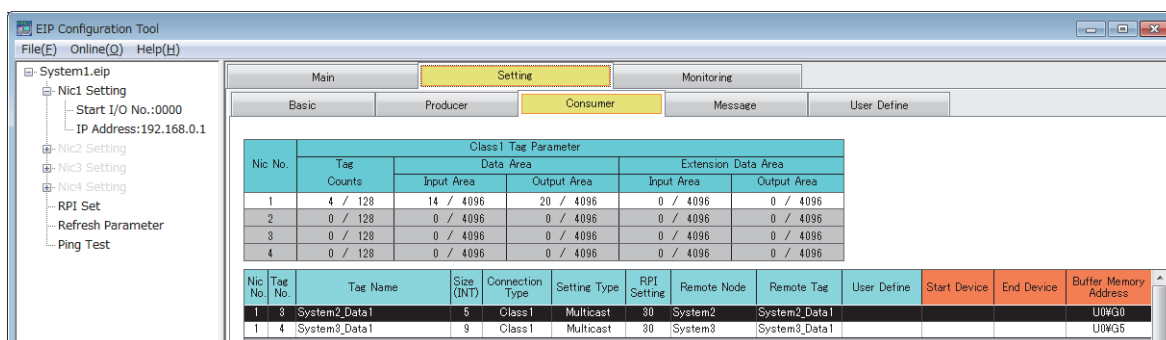
Figure 8.7 Setting in the "Consumer" window for System 1

Set the items not displayed in the above Tag Parameter list as shown below.
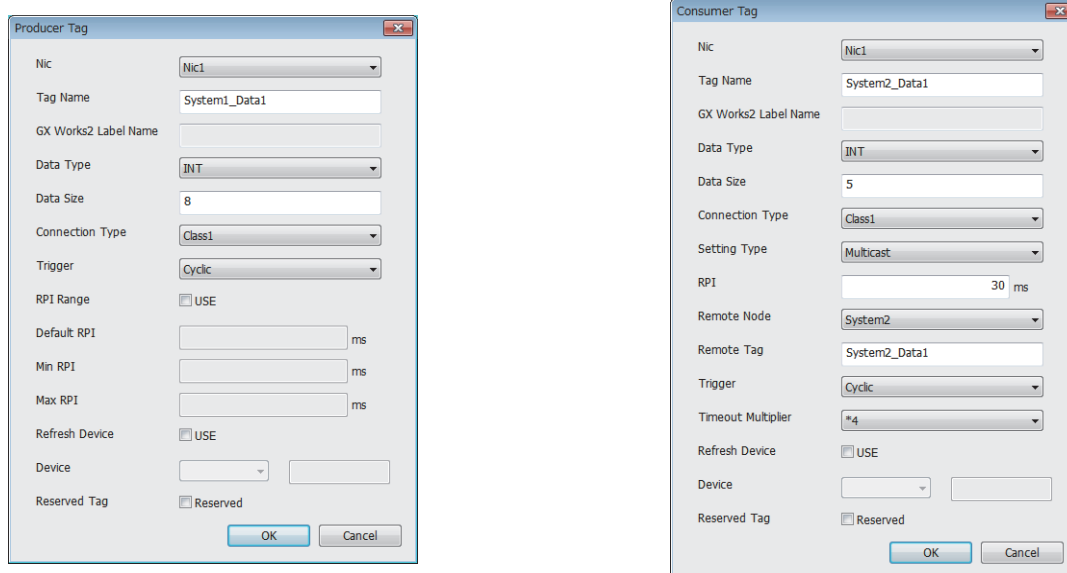
Figure 8.8 Setting in the "Producer Tag" window and "Consumer Tag" window for System 1

(d) Class3/UCMM Tag Parameter setting

Make settings in the "Message" window on the "Setting" tab as shown below.
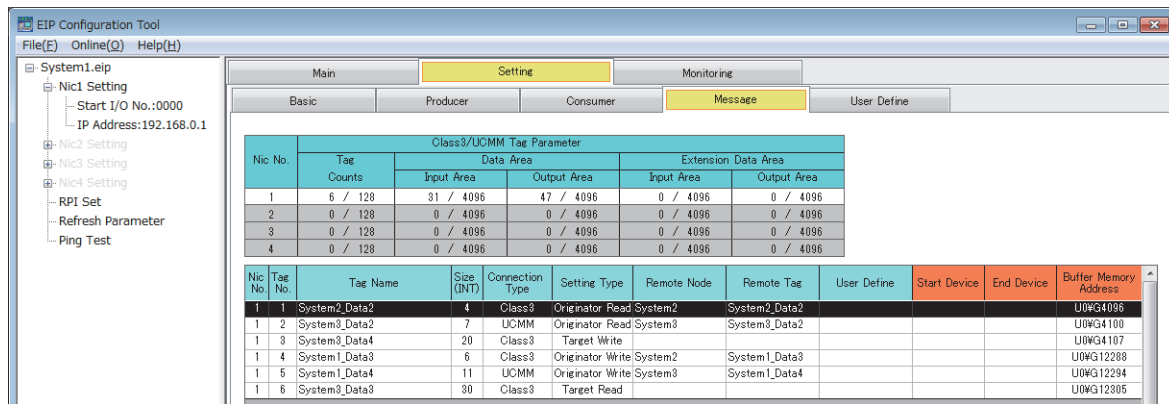
Figure 8.9 Setting in the "Message" window for System 1

Set the items not displayed in the above Tag Parameter list as shown below.
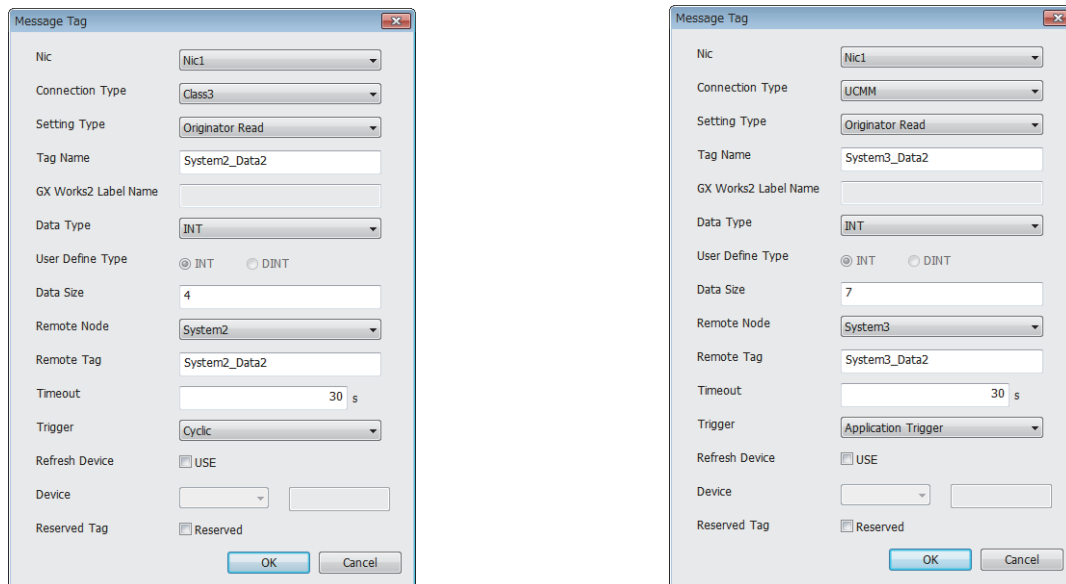
Figure 8.10 Setting in the "Message Tag" window for System 1

(2) System 2 (192.168.0.2) setting
Use the default settings except for the following settings.

(a) IP address and Common Parameter setting
Make settings in the "Add Own Nic" window as shown below.

Figure 8.11 Setting in the "Add Own Nic" window for System 2

(b) Connected device setting
Make settings in "[Remote Nic]" in the "Basic" window as shown below.

Figure 8.12 Setting in the "Basic" window for System 2

(c) Class1 Tag Parameter setting

Figure 8.13 Class1 Tag Parameter setting for System 2

Set the items not displayed in the above Tag Parameter list to the same values as those of System 1 (192.168.0.1). (☞ (1) (c) Class1 Tag Parameter setting in this section)

(d) Class3/UCMM Tag Parameter setting

Figure 8.14 Class3/UCMM Tag Parameter setting for System 2

Set the items not displayed in the above Tag Parameter list to the same values as those of System 1 (192.168.0.1). (☞ (1) (d) Class3/UCMM Tag Parameter setting in this section)

(3) System 3 (192.168.0.3) setting

Use the default settings except for the following settings.

(a) IP address and Common Parameter setting

Make settings in the "Add Own Nic" window as shown below.

Figure 8.15 Setting in the "Add Own Nic" window for System 3

(b) Connected device setting

Make settings in "[Remote Nic]" in the "Basic" window as shown below.

Figure 8.16 Setting in the "Basic" window for System 3

(c) Class1 Tag Parameter setting

Figure 8.17 Class1 Tag Parameter setting for System 3

Set the items not displayed in the above Tag Parameter list to the same values as those of System 1 (192.168.0.1). ((1) (c) Class1 Tag Parameter setting in this section)

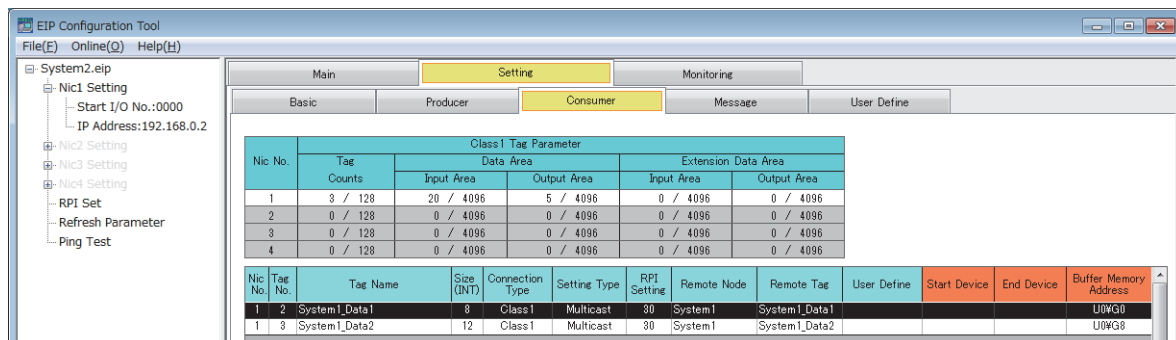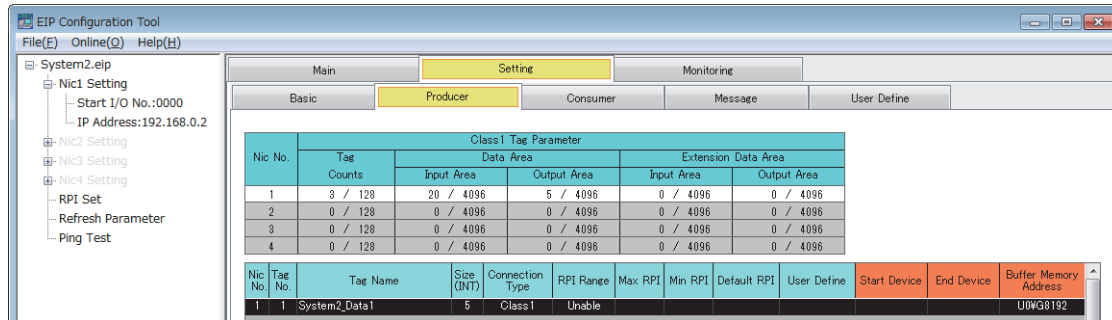(d) Class3/UCMM Tag Parameter setting
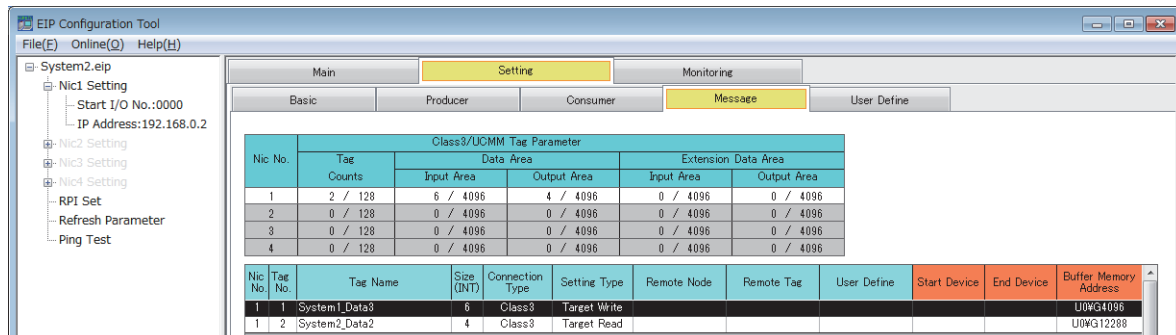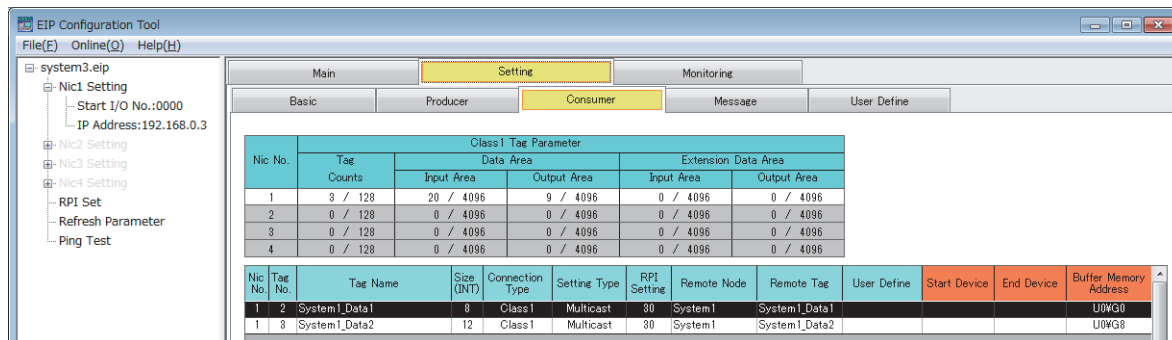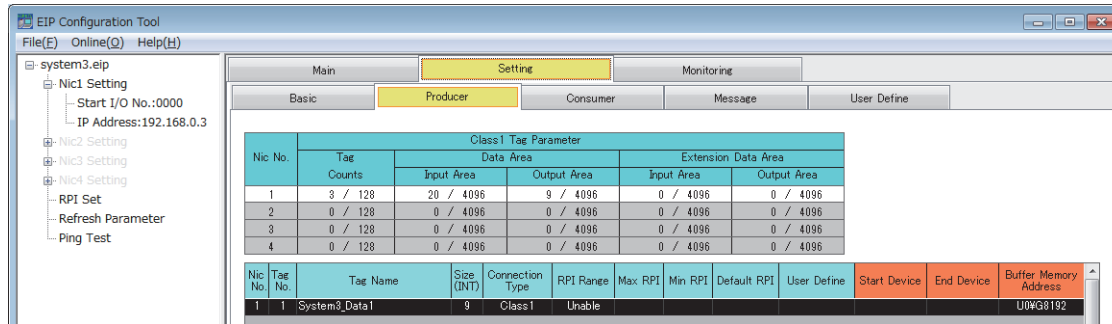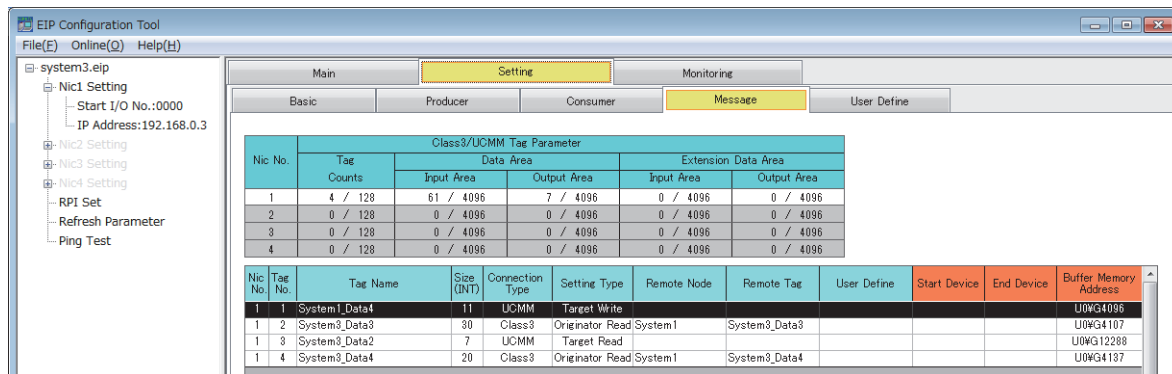

Figure 8.18 Class3/UCMM Tag Parameter setting for 192.168.0.3

Set the items not displayed in the above Tag Parameter list to the same values as those of System 1 (192.168.0.1). ((1) (d) Class3/UCMM Tag Parameter setting in this section)

8.4 Program Example

This section describes program examples.
The list below shows the devices used for program examples in and after Section 8.4.1.

(1) I/O signals of the EtherNet/IP module

Table 8.3 I/O signals of the EtherNet/IP module

Device	Application	Device	Application
X00	Tag communication start process completion	Y00	Tag communication start request
X02	PING test completion	Y02	PING test execution request
X06	Flash ROM access completion	Y06	Flash ROM access request
X08	TCP/UDP/IP parameter change completion	Y08	TCP/UDP/IP parameter change request
X0D	Acquiring IP address	-	-
X0E	Own station error	-	-
X0F	Module READY	-	-

(2) Special relays (SM)

Table 8.4 Special relays (SM)

Device	Application
SM402	Turns on during one scan after RUN is set

(3) Devices used by user

Table 8.5 Devices used by user

Device	Application	Device	Application
M0	Flag for Tag communication start	D100 to D104	Refresh device for own station error information
M1	Flag for Application Trigger of Class3/UCMM Tag No.1	D4000 to D4255	Refresh device for Class1 Diagnostics Information
M2	Flag for Application Trigger of Class3/UCMM Tag No.2	D4400 to D4655	Refresh device for Class3/UCMM Diagnostics Information
M3	Flag for Application Trigger of Class1 Tag No.3	W0 to W4	Refresh device for Class1 Tag No.1
M4	Flag for Application Trigger of Class1 Tag No.4	W5 to WD	Refresh device for Class1 Tag No.2
M5	Flag for Application Trigger of Class3/UCMM Tag No.4	D5000 to D5003	Refresh device for Class3/UCMM Tag No.1
M6	Flag for Application Trigger of Class3/UCMM Tag No.5	D5004 to D5010	Refresh device for Class3/UCMM Tag No.2
M7	Flag for data transmission permission of Class3/UCMM Tag No.6	D5011 to D5030	Refresh device for Class3/UCMM Tag No.3
M1000 to M1255	Refresh device for Application Trigger (Class1)	W100 to W107	Refresh device for Class1 Tag No.3
M2000 to M2255	Refresh device for Application Trigger (Class3/UCMM)	W108 to W113	Refresh device for Class1 Tag No.4
M4000 to M4255	Refresh device for communication status (Class1)	D5100 to D5105	Refresh device for Class3/UCMM Tag No.4
M4400 to M4655	Refresh device for communication status (Class3/UCMM)	D5106 to D5116	Refresh device for Class3/UCMM Tag No.5
-		D5117 to D5146	Refresh device for Class3/UCMM Tag No.6

1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SPECIFICATIONS

4 FUNCTION

5 PRE-OPERATION PROCEDURES

6 PARAMETER

7 UTILITY PACKAGE (SW1DNC-EIPUTL-E)

8 PROGRAMMING

Table 8.5 Devices used by user (Continued)

Device	Application	Device	Application
Z0	Indirectly specified device for Application Trigger acceptance	Z9	Indirectly specified device for the refresh target of receive data
Z1	Indirectly specified device for Application Trigger completion	Z10	Indirectly specified device for the number of tags
Z3	Indirectly specified device for communication error completion	Z11	Indirectly specified device for Tag No.
Z4	Indirectly specified device for the number of tags	Z12	Indirectly specified device for Class1 send data start address
Z5	Indirectly specified device for Tag No.	Z13	Indirectly specified device for data size
Z6	Indirectly specified device for Class1 receive data start address	Z14	Indirect specification device for data size (Un\G16654 or later)
Z7	Indirectly specified device for data size	Z15	Indirectly specified device for the refresh target of receive data
Z8	Indirect specification device for data size (Un\G16654 or later)	F0 to F11	Annunciator for error indication

8.4.1 Program example of Tag communication

This section shows examples of Tag communication programs in System 1 (192.168.0.1).

(1) Setting auto refresh
When using auto refresh, complete the following settings in Utility Package.

(a) Class1 Tag parameter setting
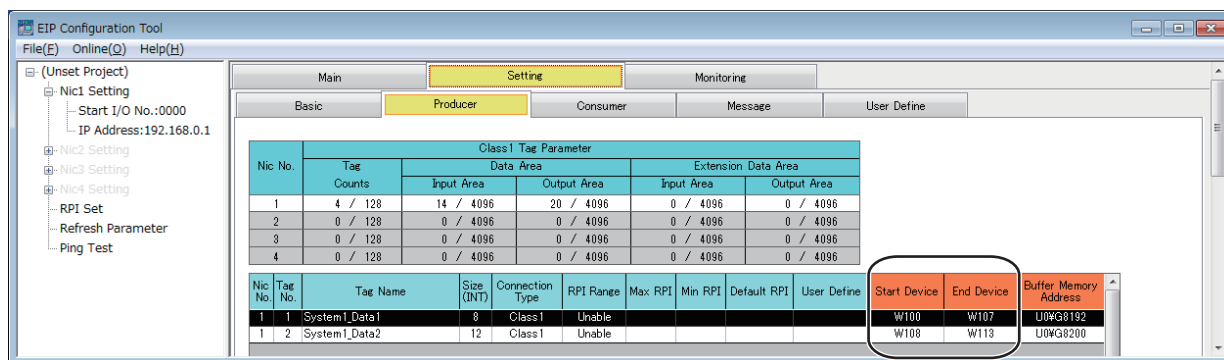
Set the auto refresh target device
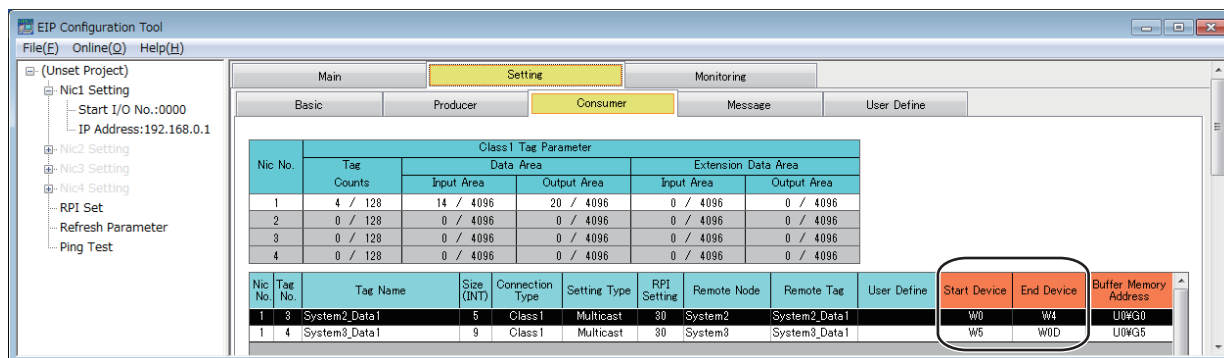
Set the auto refresh target device

Figure 8.19 Class1 Tag Parameter setting for System 1

(b) Class3/UCMM Tag parameter setting
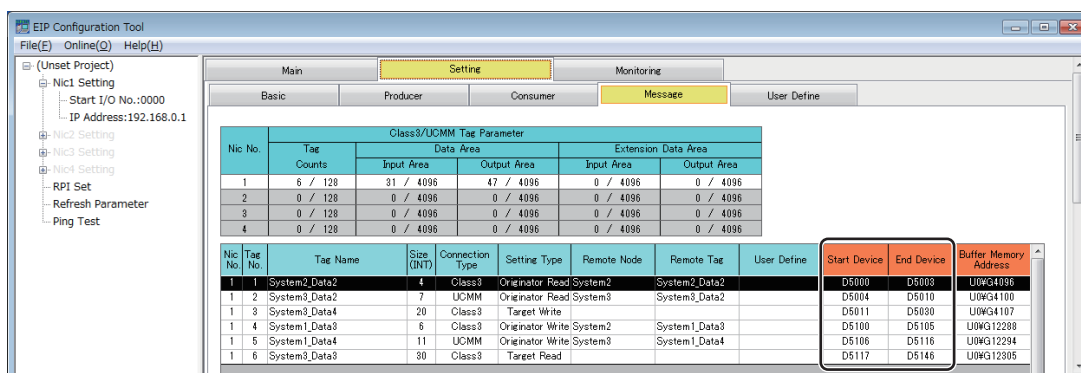
Set the auto refresh target device

Figure 8.20 Class3/UCMM Tag Parameter setting for System 1

(c) Refresh parameter setting

Setting Area	Setting Item	Transfer Direction	Nic1		
			Size	Refresh Device (Start Device)	Refresh Device (End Device)
Data Area	Class1 Input Area	MODULE -> PLC	0		
	Class3/UCMM Input Area	MODULE -> PLC	0		
	Class1 Output Area	MODULE <- PLC	0		
	Class3/UCMM Output Area	MODULE <- PLC	0		
Extension Data Area	Extension Class1 Input Area	MODULE -> PLC	0		
	Extension Class3/UCMM Input Area	MODULE -> PLC	0		
	Extension Class1 Output Area	MODULE <- PLC	0		
	Extension Class3/UCMM Output Area	MODULE <- PLC	0		
Status Area	Module Error Information	MODULE -> PLC	5	D100	D104
	Class1 Communication Status	MODULE -> PLC	16	M4000	M4255
	Class1 Diagnostics Information	MODULE -> PLC	256	D4000	D4255
	Class3/UCMM Communication Status	MODULE -> PLC	16	M4400	M4655
	Class3/UCMM Diagnostics Information	MODULE -> PLC	256	D4400	D4655

Figure 8.21 Refresh Parameter setting for System 1

8.4 Program Example
8.4.1 Program example of Tag communication

(2) Program Example

Write the following sequence program to the QCPU set at 192.168.0.1.

A part enclosed with a dotted line is not required when auto refresh is set in Utility Package.

<Refreshing data from the QCPU to the EtherNet/IP module>

X0 X0F	MOV H0 Z4		
	MOV H0 Z5		
	MOV H0 Z6		
	MOV H0 Z7	Index register initialization	
	MOV H0 Z8		
	MOV H0 Z9		
	MOV U0\G16636 Z4	Class1 Tag Counts acquisition	
	FOR Z4	Refresh data set for all Tags. (FOR to NEXT)	
X0 X0F <> U0\G25856Z5 H0FFFF	MOV U0\G25856Z5 Z6	Class1 receive data start address acquisition	
	MOV U0\G16654Z7 Z8	Data size acquisition	
	BMOV U0\G0Z6 W0Z9 Z8	Store receive data in devices.	
	INC Z5	Tag No. increment	
	+ H23 Z7	Increase indirectly specified Data Size address by number of data assigned to one tag.	
	+ Z8 Z9	Increase receive data storage address by number of data assigned to one tag.	
	NEXT		
X0 X0F	BMOV U0\G4096 D5000 K4	Class3/UCMM Tag No.1 refresh	
	BMOV U0\G4100 D5004 K7	Class3/UCMM Tag No.2 refresh	
	BMOV U0\G4107 D5011 K20	Class3/UCMM Tag No.3 refresh	
X0 X0F	BMOV U0\G27008 K4M1000 K48	Application Trigger (Class1) refresh	
	BMOV U0\G27072 K4M2000 K48	Application Trigger (Class3/UCMM) refresh	
	BMOV U0\G27200 K4M3000 K48	Class3 communication error status refresh	
	BMOV U0\G27136 K4M4000 K48	Communicating status (Class1) refresh	
	BMOV U0\G27184 K4M4400 K48	Communicating status (Class3/UCMM) refresh	
X0 X0F	BMOV U0\G27264 D100 K5	Own station error status refresh	
	BMOV U0\G27392 D4000 K256	Class1 Diagnostics Information refresh	
	BMOV U0\G27648 D4400 K256	Class3/UCMM Diagnostics Information refresh	

Figure 8.22 Program example of Tag communication

< Initial setting at startup >

| SM402 | | [MOV H100 Z0] | Indirect specification for Application Trigger acceptance |

| | | [MOV H200 Z1] | Indirect specification for Application Trigger completion |

< Tag communication start >

| M0 X0F Y2 Y6 Y8 X0D | (Y0) | Set Tag communication start request (Y00) to ON. |
| X2 X6 X8 | | |

< Error handling >

| X0 X0E | Processing for own station error | For own station error |
| | [SET F0] | |

| X0 X0F [<> D4000 H0] | Processing for Class1 Tag No.1 error | For Class1 Tag No.1 error |
| | [SET F1] | |

| X0 X0F [<> D4001 H0] | Processing for Class1 Tag No.2 error | For Class1 Tag No.2 error |
| | [SET F2] | |

| X0 X0F [<> D4002 H0] | Processing for Class1 Tag No.3 error | For Class1 Tag No.3 error |
| | [SET F3] | |

| X0 X0F [<> D4003 H0] | Processing for Class1 Tag No.4 error | For Class1 Tag No.4 error |
| | [SET F4] | |

| X0 X0F [<> D4400 H0] | Processing for Class3/UCMM Tag No.1 error | For Class3/UCMM Tag No.1 error |
| M3000 | [SET F6] | |

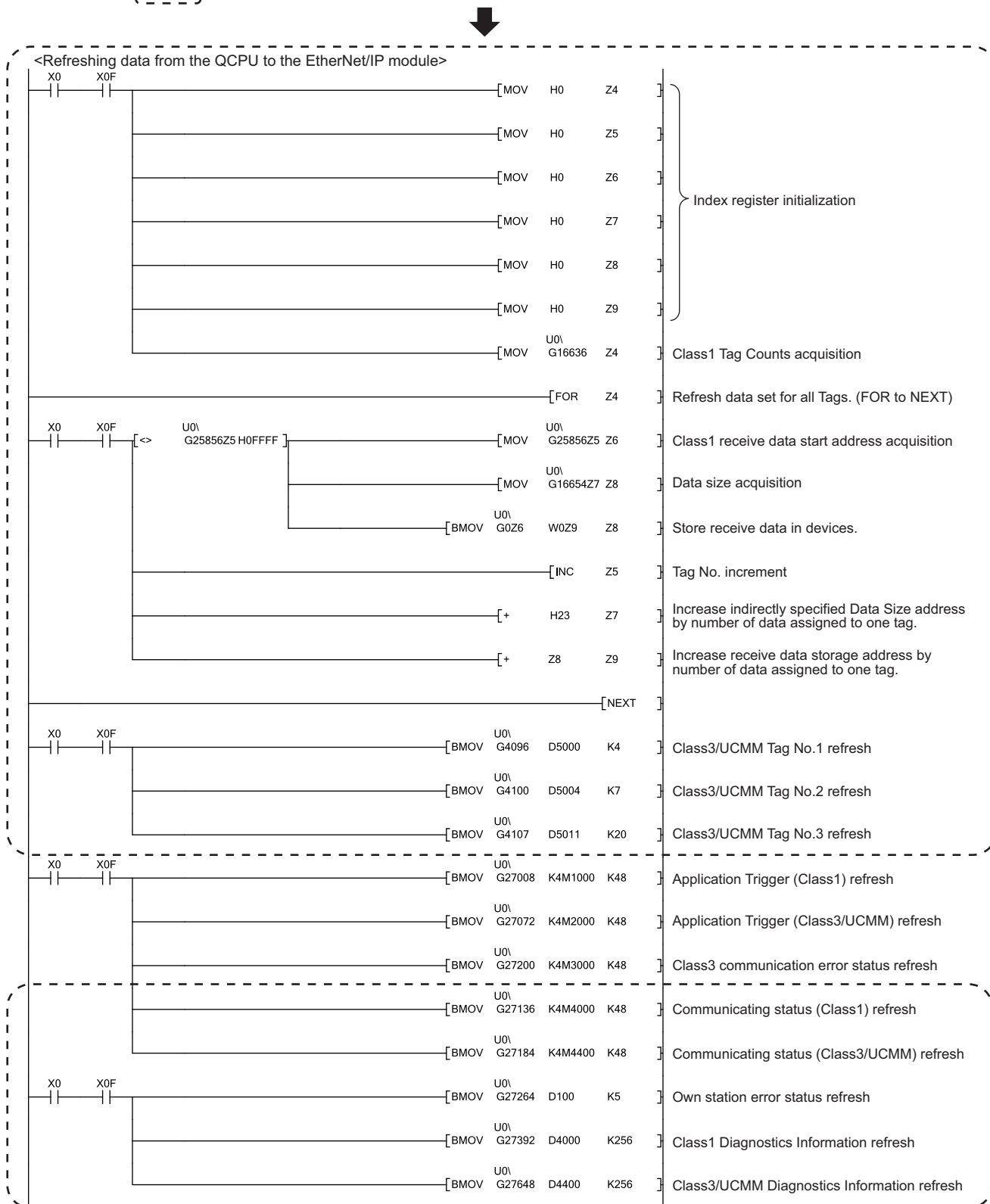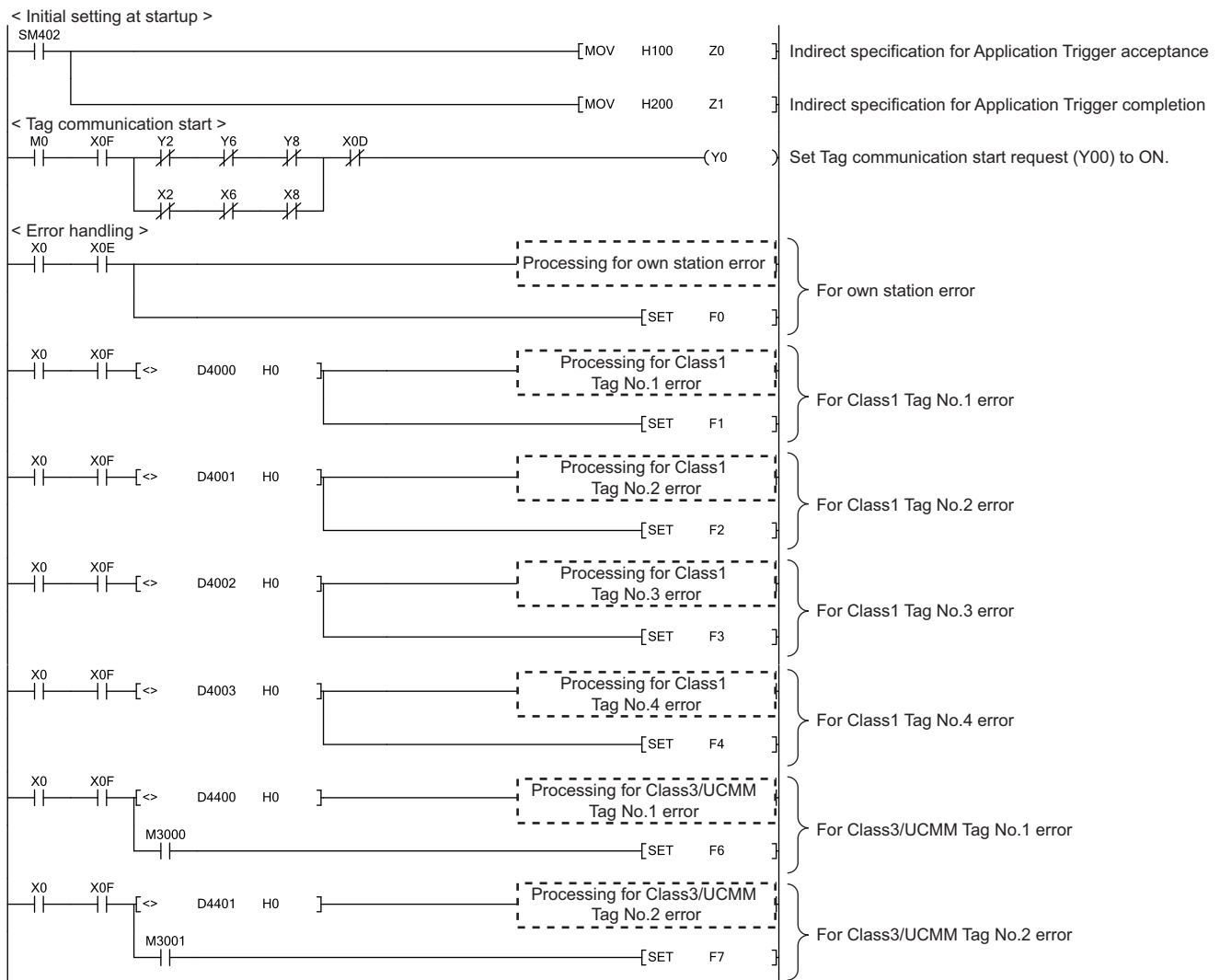| X0 X0F [<> D4401 H0] | Processing for Class3/UCMM Tag No.2 error | For Class3/UCMM Tag No.2 error |
| M3001 | [SET F7] | |

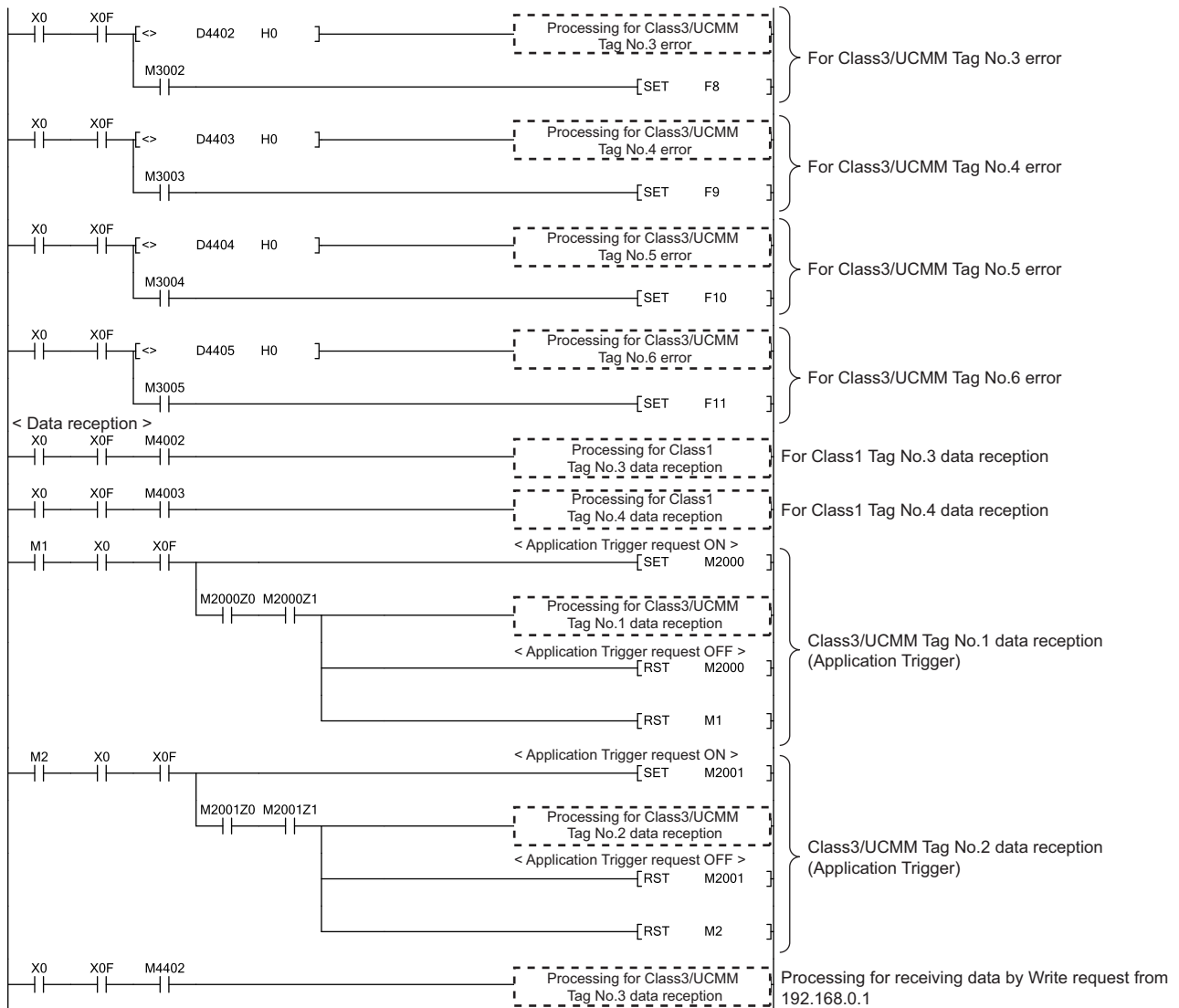**Figure 8.22 Program example of Tag communication (continued)**

Figure 8.22 Program example of Tag communication (continued)

< Data transmission >

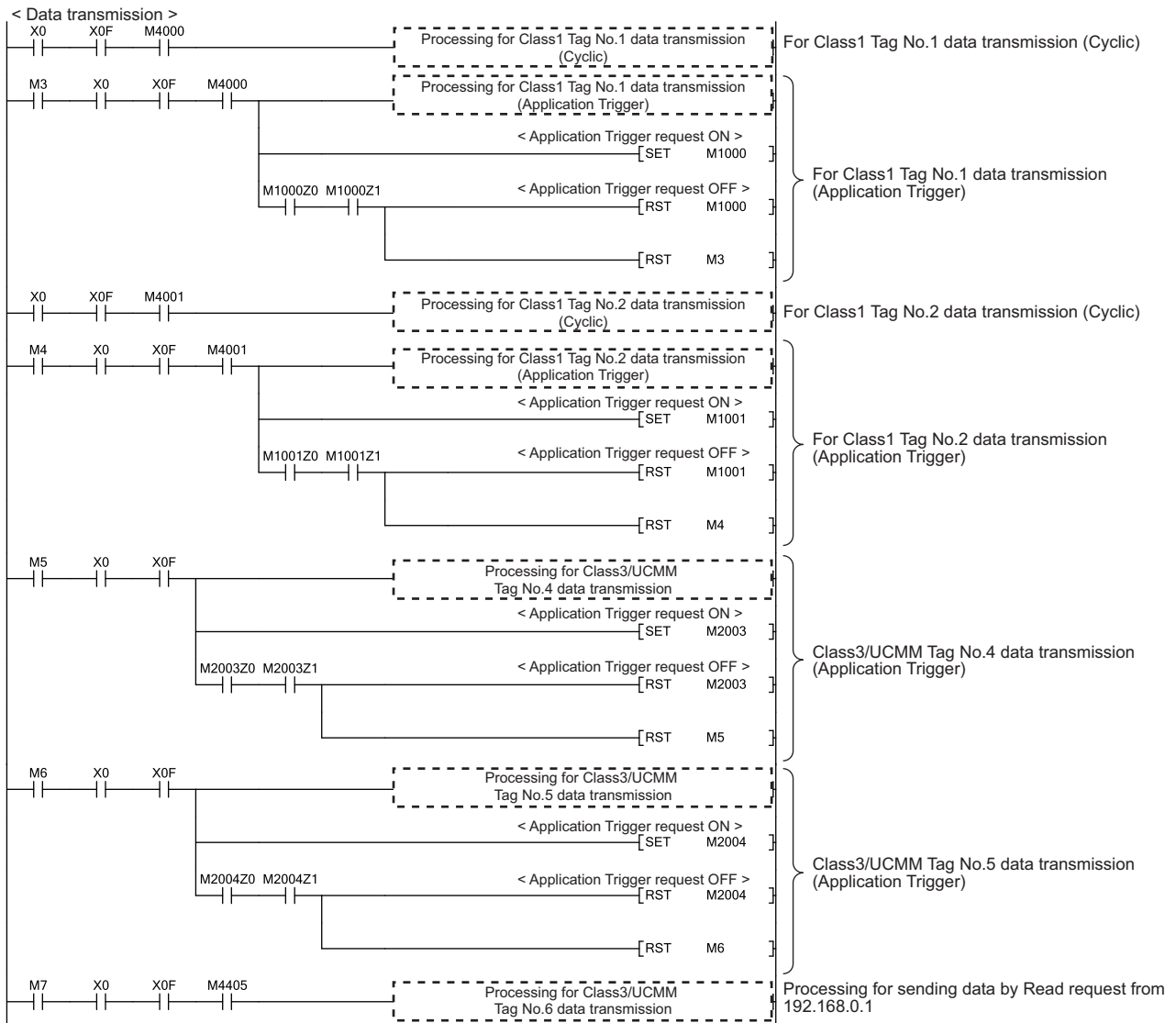**Figure 8.22 Program example of Tag communication (continued)**

8.4 Program Example
8.4.1 Program example of Tag communication

A part enclosed with a dotted line is not required when auto refresh is set in Utility package.

<Refreshing data from the QCPU to the EtherNet/IP module>

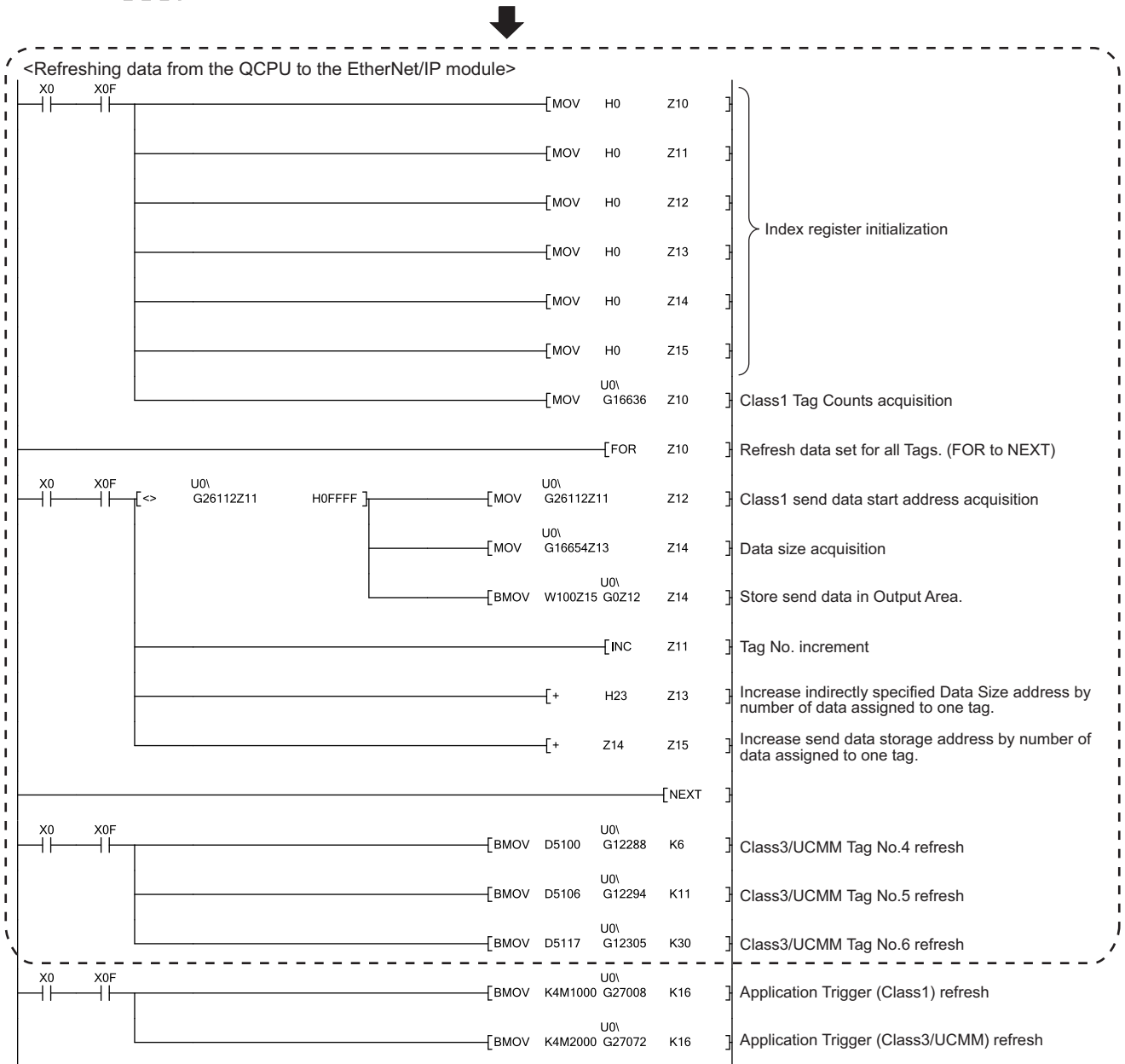|		Instruction			Comment
X0 X0F		MOV	H0	Z10	Index register initialization
		MOV	H0	Z11	
		MOV	H0	Z12	
		MOV	H0	Z13	
		MOV	H0	Z14	
		MOV	H0	Z15	
		MOV	U0\G16636	Z10	Class1 Tag Counts acquisition
		FOR		Z10	Refresh data set for all Tags. (FOR to NEXT)
X0 X0F <> U0\G26112Z11 H0FFFF		MOV	U0\G26112Z11	Z12	Class1 send data start address acquisition
		MOV	U0\G16654Z13	Z14	Data size acquisition
		BMOV	W100Z15 G0Z12	Z14	Store send data in Output Area.
		INC		Z11	Tag No. increment
		+	H23	Z13	Increase indirectly specified Data Size address by number of data assigned to one tag.
		+	Z14	Z15	Increase send data storage address by number of data assigned to one tag.
		NEXT			
X0 X0F		BMOV	D5100 U0\G12288	K6	Class3/UCMM Tag No.4 refresh
		BMOV	D5106 U0\G12294	K11	Class3/UCMM Tag No.5 refresh
		BMOV	D5117 U0\G12305	K30	Class3/UCMM Tag No.6 refresh
X0 X0F		BMOV	K4M1000 U0\G27008	K16	Application Trigger (Class1) refresh
		BMOV	K4M2000 U0\G27072	K16	Application Trigger (Class3/UCMM) refresh

Figure 8.22 Program example of Tag communication (continued)

CHAPTER 9   TROUBLESHOOTING

This chapter describes how to troubleshoot the EtherNet/IP module and error codes.

9.1   Troubleshooting Procedure

This section describes troubleshooting procedure.
The following shows troubleshooting procedure in a flowchart.

(1) Before troubleshooting
    Confirm that there is no error in the CPU module.
    If any error is identified in the CPU module, check the detail and take corrective
    actions. (☞ Manual for the CPU module used)

(2) Troubleshooting Procedure
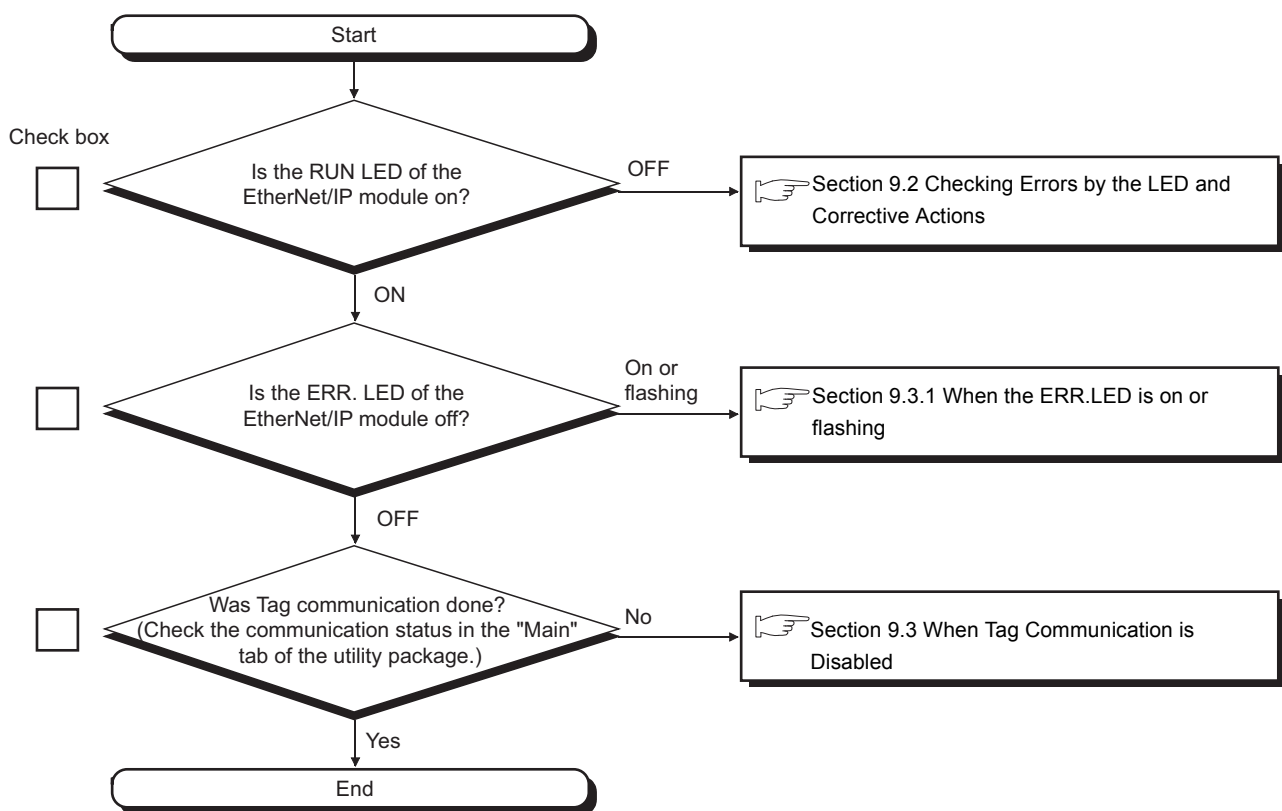
Figure 9.1 Troubleshooting procedure

9.2   Checking Errors by the LED and Corrective Actions

This chapter describes how to check errors on the LED.

(1) Causes and actions
The following table shows possible causes indicated by the LED status of the
EtherNet/IP module and corrective actions.

Table 9.1 Checking errors by the LED and corrective actions

LED	LED status	Cause	Corrective action
RUN	Off	EtherNet/IP module mounting error	Turn off the power and mount the EtherNet/IP module correctly.
		Insufficient power supply	Check the power capacity of the programmable controller system. If the power supply is insufficient, change the combination of the modules or replace the power supply module.
		Watchdog timer error	Perform the following operations •Power off and then on the programmable controller. •Reset the CPU module. If the RUN LED does not turn off even after above operations, please consult your local Mitsubishi representative.
		CPU module failure	Refer to the manual for the CPU module and take corrective actions.
ERR.	On	Module stop error (Hardware error, invalid IP address etc.)	☞ Section 9.3.1 When the ERR.LED is off or flashing
	Rapid flashing	Module continuation error (Parameter error)	
	Slow flashing	Module continuation error (communication error)	

9.3 When Tag Communication is Disabled

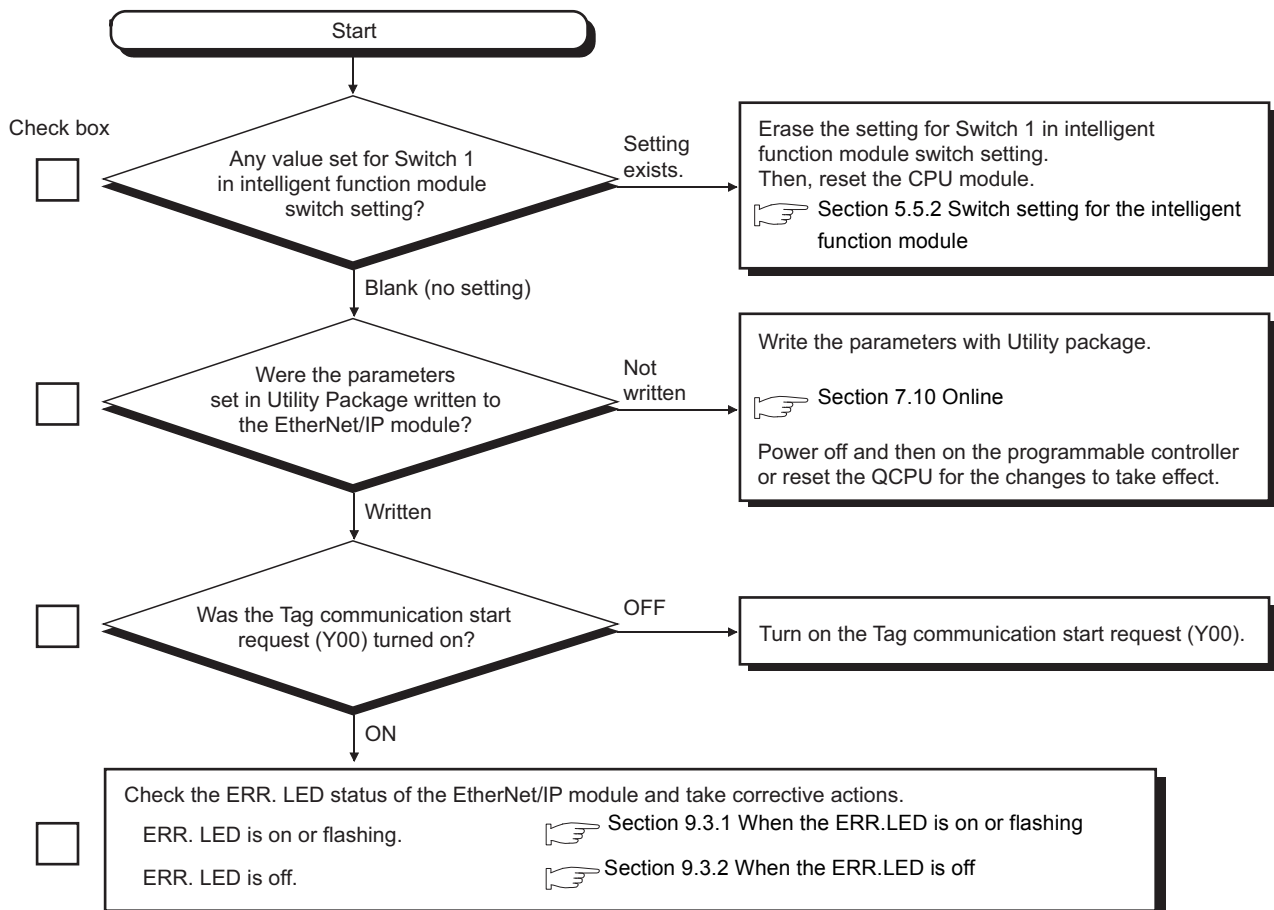The following flowchart shows the troubleshooting when the Tag communication is disabled.

Figure 9.2 When Tag communication is Disabled

9.3.1 When the ERR.LED is on or flashing

Check the error code and take corrective actions. (☞ Section 9.4 Error Code)

9.3.2 When the ERR.LED is off

Any of the following is the possible cause.
- Tag communication is not started
- Tag communication is on but never communicated
- An error message was returned in Class3 or UCMM Tag communication

Figure 9.3 When the ERR.LED is off

(1) For Class1 Tag communication

Check box

Start

Check if the Tag is communicating normally.
☞ Section 7.11 "Monitoring" tab (Network Diagnostics)

Is the Tag communicating normally? — No →

Turn off the Tag communication start request (Y00) and execute a PING test.

☞ Section 5.8 PING Test

If the PING test failed, check that the IP addresses of the EtherNet/IP module and other devices are correct.

Yes

Is the Input/Output Area refresh target device setting correct? — Incorrect →

If the PING test failed, check that the IP addresses of the EtherNet/IP module and other devices are correct.
<Checking buffer memory addresses>
☞ Section 3.3.7 Class1 send/receive data start address
<Checking auto refresh target devices>
☞ Section 7.9.2 (2) Display and settings of the "Producer Tag" window
Section 7.9.3 (2) Display and settings of the "Consumer Tag" window

Correct

End

Figure 9.4 For Class1 Tag communication

(2) For Class3 Tag communication

Check box

Start

☐ Check if the Tag is communicating normally.
☞ Section 7.11 "Monitoring" tab (Network Diagnostics)

☐ Is the Tag communicating normally? — No → Turn off the Tag communication start request (Y00) and then execute a PING test.
☞ Section 5.8 PING Test

If the PING test failed, check that the IP addresses of the EtherNet/IP module and other devices are correct.

Yes

☐ When Application Trigger is set for Trigger, is the Application Trigger request (Class3/UCMM) (Un\G27072 to Un\G27087) turned to on? — No → Turning on the Tag's Application Trigger request (Class3/UCMM) (Un\G27072 to Un\G27087) sends the request.
☞ Section 3.3.12 Application Trigger (Class3/UCMM)

Yes

☐ Is Target set for Tag type? — Originator → Check the Communication Error (Class3/UCMM) (Un\G27200 to Un\G27215) for a response error.
☞ Section 3.3.15 Communication status (Class3/UCMM)

If a response error is identified, check the error code and take corrective actions.
☞ Section 9.4 Error Code

Target

☐ Did the other device receive a normal response from the EtherNet/IP module? — Error response → Check the error detail on the device and take corrective actions.

Normal response

☐ Is the Input/Output Area refresh target device setting correct? — Incorrect → Check if the refresh target devices are set correctly.

<Checking buffer memory addresses>
☞ Section 3.3.8 Class3/UCMM send/receive data start address

<Checking auto refresh target devices>
☞ Section 7.9.4 (2) Display and settings of the "Message Tag" window

Correct

End

Figure 9.5 For Class3 Tag communication

(3) For UCMM Tag communication

Figure 9.6 For UCMM Tag communication

9.4 Error Code

This section describes error codes of the EtherNet/IP module and how to retrieve them.

9.4.1 How to check error codes

The following describes how to check error codes.

(1) Checking in Utility Package
Error codes can be checked in Utility Package.

(a) Error codes of the EtherNet/IP module
Check error codes displayed in "Module Error Information" on the "Main" tab.
(☞ Section 7.6 "Main" Tab (Module Status Display))

(b) Error codes of each Tag

Click the ⬚Detail View⬚ button on the "Main" tab and check the error codes of each

Tag displayed in the "Detail View" window. (☞ Section 7.6 (1) "Detail View"
window)
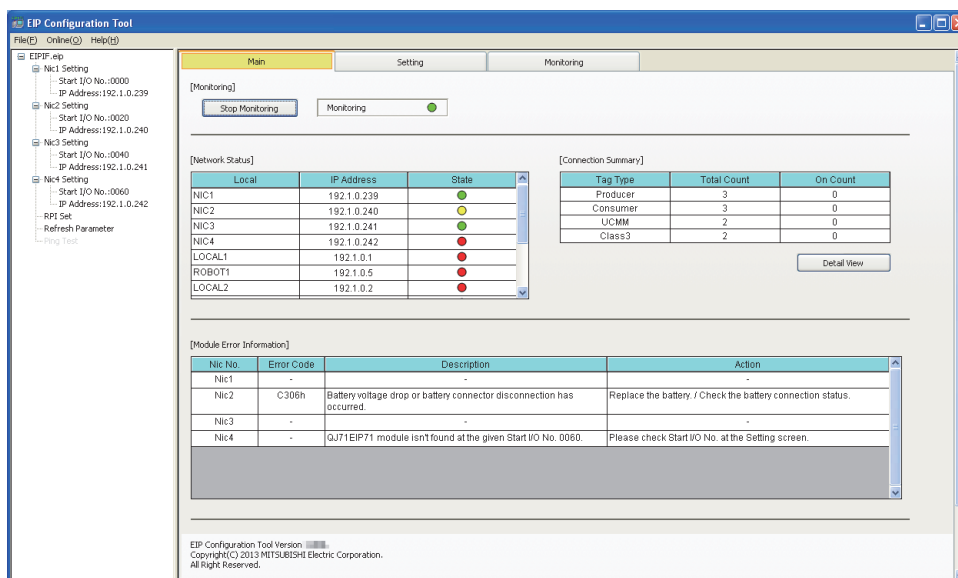
Figure 9.7 "Main" tab

(2) Checking by operating status

Error codes are stored or displayed in the following location.

Table 9.2 Classification and storage location of error codes

Errors occur when;		Stored in /displayed on	Error code (Hex.)	Reference section
Ping test		Execution result (Un\G27908)	0400H	Section 9.4.2 (1)
			C400H	Section 9.4.2 (6)
Self-diagnostics		Self-diagnostics execution result (Un\G27268)	0500H to 054FH	Section 9.4.2 (2)
			C500H to C543H	Section 9.4.2 (7)
Tag communication	Parameter error	Own station error status (Un\G27264)	C000H to C020H	Section 9.4.2 (3)
	Communication error	•Own station error status (Un\G27264) •Class1 Diagnostics Information (Un\G27392 to Un\G27647) •Class3/UCMM Diagnostics Information (Un\G27648 to Un\G27903)	C100H to C1BCH C2 * * H [*1]	Section 9.4.2 (4)
Own station error occurrence		Own station error status (Un\G27264)	C300H to C306H	Section 9.4.2 (5)
			CF10H to CF52H	Section 9.4.2 (8)

* 1 General CIP error code.
A general CIP error code is stored in the place where ** is shown.

9.4.2 Error code list

The following table shows error codes of the EtherNet/IP module.

(1) PING test status (Normal)

Table 9.3 PING test status (Normal)

Error code (Hex.)	Error	Error detail	Action
0400H	- (Normal)	The PING test completed normally	-

(2) Self-diagnostics status (Normal)

Table 9.4 Self-diagnostics status (Normal)

Error code (Hex.)	Error	Error detail	Action
0500H	- (Normal)	Two-port RAM test in process	Terminate the hardware test.
0501H	- (Normal)	Sum check test in process	
0502H to 050EH	System error	System error	Please consult your local Mitsubishi representative.
050FH	- (Normal)	Hardware test completed normally.	-
0510H to 051FH	System error	System error	Please consult your local Mitsubishi representative.
0520H	- (Normal)	Self-loopback test in process	Terminate the self-loopback test.
0521H to 052EH	System error	System error	Please consult your local Mitsubishi representative.
052FH	- (Normal)	Self-loop back test completed normally	-
0530H to 054FH	System error	System error	Please consult your local Mitsubishi representative.

(3) Parameter error of the EtherNet/IP module (Error)

Table 9.5 Parameter error of the EtherNet/IP module (Error)

Error code (Hex.)	Error	Error detail	Action
C000H	Switch 1 error	Switch 1 setting is invalid in the intelligent function module switch setting.	Correct the switch 1 setting in the intelligent function module switch setting.
C001H to C002H	System error	System error	Please consult your local Mitsubishi representative.
C003H to C004H	CPU module failure	A CPU module error was detected.	Confirm that there is no error in the CPU module. If an error has occurred, check the error details and take corrective actions.
C005H to C00FH	System error	System error	Please consult your local Mitsubishi representative.
C010H	TCP/UDP/IP parameter error	Any of TCP/UDP/IP parameters is invalid.	Refer to the TCP/UDP/IP parameter error information (Un\G27265 to Un\G27267) and correct the parameter. (⫣ Section 3.3.16 Own station error information)

Table 9.5 Parameter error of the EtherNet/IP module (Error) (Continued)

Error code (Hex.)	Error	Error detail	Action
C011H	Tag Parameter error	Tag Parameter data is invalid	Check the error details by any of the following and correct the Tag Parameter. •"Detail View" window on the "Main" tab in Utility Package •Class1 Diagnostics Information (Un\G27392 to Un\G27647) •Class3/UCMM Diagnostics Information (Un\G27648 to Un\G27903)
C012H	TCP/UDP/IP and Tag Parameter error	Both any of TCP/UDP/IP parameters and Tag Parameter data are invalid.	Same actions as for error codes C010H and C011H.
C013H	System error	System error	Please consult your local Mitsubishi representative.
C014H to C019H	Tag Parameter error	Tag Parameter may be corrupt.	Write the parameters in Utility Package again.
C01AH	Flash ROM initialization error	Writing to the Flash ROM or initialization of the Flash ROM has failed.	Write data into the Flash ROM or initialize the Flash ROM again. If the same error code appears again, please consult your local Mitsubishi representative.
C01BH	Tag Parameter error	Tag Parameter may be corrupt.	Write the parameters in Utility Package again.
C01CH	Extension Common Parameter error (Extension Input/Output Area Size setting error)	The total size set in the following areas is over 4,000H (16384). •Class1 Extension Input Area Size(Un\G16630) •Class3/UCMM Extension Input Area Size(Un\G16631) •Class1 Extension Output Area Size(Un\G16632)	•Correct the total size set in the following areas to 4,000H (16384) or less. •Class1 Extension Input Area Size(Un\G16630) •Class3/UCMM Extension Input Area Size(Un\G16631) •Class1 Extension Output Area Size(Un\G16632)
C020H	Flash ROM writing error	Failed to write parameters to the flash ROM.	•Write the parameters in Utility Package again. •If the same error code appears again, please consult your local Mitsubishi representative.
C021H	Tag Parameter error	Tag Parameter may be corrupt.	Write the parameters in Utility Package again.

(4) Communication error of the EtherNet/IP module

Table 9.6 Communication error of the EtherNet/IP module

Error code (Hex.)	Error	Error detail	Action
C100H	TX FIFO underflow error	A TX FIFO underflow error occurred.	•Increase the RPI value in Consumer Tag and restart the Tag communication.
C101H	TX descriptor depletion error	The TX descriptor has depleted.	•Check if the line status is normal (check for influence of noise and the hub status)
C102H	Send abort error	A send abort was detected.	•Increase the RPI value in Consumer Tag and restart the Tag communication.
C103H	Send timeout error	A send timeout occurred.	
C104H	Collision error	Packet collision occurred when sending.	•Check if the target device is operating normally. •Check if the line status is normal (check for influence of noise and the hub status)
C105H	Carrier lost	Carrier was not set or was lost during transmission.	•Check if the target device is operating normally. •Check if the line status is normal (check for influence of noise and the hub status)
C106H	No carrier	Unable to detect the carrier.	Check if the line status is normal (check for influence of noise and the hub status)
C107H	Too-short send frame error	The sent message frame was less than 4 bytes in length.	•On the target device, check if the response message is correct. •Check if the line status is normal (check for influence of noise and the hub status)
C108H	Transmission blocking error	Transmission was blocked.	•Check if the target device is operating normally. •Check if the line status is normal (check for influence of noise and the hub status)
C109H	Receive FIFO overflow error	A receive FIFO overflow error occurred.	•Increase the RPI value in Consumer Tag and restart the Tag communication.
C10AH	Receive descriptor depletion error	The receive descriptor has depleted.	•Check if the target device is operating normally. •Check if the line status is normal (check for influence of noise and the hub status)
C10BH	Receive frame overflow error	Receive frame overflow occurred.	•Increase the RPI value in Consumer Tag and restart the Tag communication. •On the target device, check if the response message is correct. •Check if the line status is normal (check for influence of noise and the hub status)
C10CH	Receive abort error	A receive abort was detected	•Check if the target device is operating normally. •Check if the line status is normal (check for influence of noise and the hub status)
C10DH	CRC error	A CRC error occurred	•Check if the target device is operating normally. •Check if the line status is normal
C10EH	MII error	MII's RX_ER (receive error) turned on.	
C10FH	Too-short receive frame error	The received message is less than 64bytes in length.	On the target device, check if the response message is correct.
C110H	Too-long receive frame error	The received message frame is 1519 bytes or more in length.	
C111H	Fraction bit error	Fraction bit error occurred.	•Check if the target device is operating normally. •Check if the line status is normal
C112H to C11FH	System error	System error	Please consult your local Mitsubishi representative.

Table 9.6 Communication error of the EtherNet/IP module (Continued)

Error code (Hex.)	Error	Error detail	Action
C120H	Connection failure	Connection establishment failed. The target device is offline.	•Check if the target device is operating normally. •Check if the line status is normal •The line may be congested. Retry after a while.
C121H	Connection failure	Connection establishment failed. The target device is online, but not respond to a connection request.	
C122H	Connection failure	Connection establishment failed. The target device is online, but returned a connection error.	
C123H	Connection timeout	The connection with the target device timed out.	•Check if the target device is operating normally. •Check if the line status is normal •The line may be congested. Retry after a while. •When "Trigger" is set to "Application Trigger" in Class3 Tag communication, make the request within the Timeout time. Or, change the Timeout time. •Increase the RPI value since data sending and receiving may not have been available at specified RPI due to high communication load.
C124H	Duplicate Forward_Open error	•Since Forward_Open was received from the target device during use of the connection, the connection status returns to the waiting-for-Open status. •The Originator is attempting to establish a connection to the Target, where a connection has already been established.	•Check the conditions for the device to reopen (Forward Open), and take corrective actions. •Increase the value for the Target-to-Originator Time Out Multiplier.
C125H to C129H	System error	System error	Please consult your local Mitsubishi representative.
C12AH	Request error	Unable to connect to the specified device.	•Check if the target device is operating normally. •Retry after a while. •Restart the EtherNet/IP module.
C12BH	Request timeout	The request timed out since no response is returned.	•Check if the target device is operating normally. •Check if the line status is normal •The line may be congested. Retry after a while.
C12CH to C12DH	System error	System error	Please consult your local Mitsubishi representative.
C12EH	Out-of-memory-space error	The module runs out of available memory.	Restart the EtherNet/IP module.
C12FH	System error	System error	Please consult your local Mitsubishi representative.
C130H	Thread creation error	Failed to create a thread.	Restart the EtherNet/IP module.
C131H	Socket function error	An error occurred in the socket function.	•Retry after a while. •Restart the EtherNet/IP module.
C132H	Non-blocking error	An error occurred when the socket is set to non-blocking mode.	Restart the EtherNet/IP module.
C133H	System error	System error	Please consult your local Mitsubishi representative.
C134H	No. of sessions exceeded	Number of sessions exceeded the maximum.	•Retry after a while. •Restart the EtherNet/IP module.
C135H	No. of connections exceeded	Number of connections exceeded the maximum.	
C136H	No. of requests exceeded	Number of requests exceeded the maximum.	

Table 9.6 Communication error of the EtherNet/IP module (Continued)

Error code (Hex.)	Error	Error detail	Action
C137H to C138H	System error	System error	Please consult your local Mitsubishi representative.
C139H	Connection information acquisition error	There is no connection information available for the specified instance.	•Retry after a while. •Restart the EtherNet/IP module.
C13BH	TCP/IP interface object attribute acquisition failure	Failed to acquire a TCP/IP interface object attribute.	•Retry after a while. •Restart the EtherNet/IP module.
C13CH	Assembly instance creation failure	Failed to create an assembly instance.	Restart the EtherNet/IP module.
C13DH	System error	System error	Please consult your local Mitsubishi representative.
C142H to C146H	System error	System error	Please consult your local Mitsubishi representative.
C147H	Duplicate IP address	The IP address is duplicated.	Change the IP address of the EtherNet/IP module or the other device in the same network.
C148H	Invalid IP address	The IP address of the EtherNet/IP module is invalid.	Correct the IP address of the EtherNet/IP module.
C149H to C15FH	System error	System error	Please consult your local Mitsubishi representative.
C160H	Invalid IP address	Own station's or invalid IP address is set for "IP Address" of Tag Parameter.	Correct the "IP Address" setting in Tag Parameter.
C161H	Invalid connection type	An option other than "Multicast" and "Point to Point" is specified for "Connection Type" of Tag Parameter.	Correct the "Data Type" setting in Tag Parameter.
C162H	Invalid trigger	An option other than "Cyclic" and "Application Trigger" is specified for "Trigger" of Tag Parameter.	Correct the "Trigger" setting in Tag Parameter.
C163H	Duplicate setting	The same tag is being created.	Change the tag name in Tag Parameter.
C166H	Invalid receive data size	The specified receive data size is 251 words (501 bytes) or more.	Correct the "Data Size" value in Tag Parameter.
C167H	Invalid send data size	The specified send data size is 251 words (501 bytes) or more.	Correct the "Data Size" value in Tag Parameter.
C16AH	Invalid Time Out	The specified Time Out Multiplier is out of range.	Correct the "Time Out MultiPlier" value in Tag Parameter.
C16BH	Invalid tag type	The specified tag type is invalid	Correct the tag type in Tag Parameter.
C16CH	Invalid tag name	No tag name is set.	Set a tag name in Tag Parameter.
C16DH	Invalid data size	The data size is invalid.	Correct the tag type or "Data Size" setting in Tag Parameter.
C16EH	Invalid data type	An option other than "INT" and "DINT" is specified for "Data Type".	Correct the "Data Type" setting in Tag Parameter.
C16FH	Invalid Min_RPI	The specified RPI(Min) value is outside the range of 5 to 9999.	Correct the "Min RPI" value in Producer Tag.
C170H	Invalid Default_RPI	The RPI(Default) value is invalid. •The specified value is outside the range of 5 to 10000. •A value smaller than Min_RPI is set. •A value larger than Max_RPI is set.	Correct the "Default RPI" value in Producer Tag.
C171H	Max_RPI ≤ Min_RPI	The specified RPI(Max) value is smaller than RPI(Min).	Check and correct the "Max RPI" and "Min RPI" values in Producer Tag.
C173H	Invalid RPI	The specified RPI value is outside the range of 5 to 10000.	Correct the "Data Size" value in Tag Parameter.
C174H	Invalid Time Out	The specified Time Out value is outside the range of 30 to 10000.	Correct the "Time Out MultiPlier" value in Tag Parameter.

Table 9.6 Communication error of the EtherNet/IP module (Continued)

Error code (Hex.)	Error	Error detail	Action
C175H	Invalid Max_RPI	The specified RPI (Max) value is outside the range of 6 to 10000.	Correct the "Max RPI" value in Producer Tag.
C176H to C18FH	System error	System error	Please consult your local Mitsubishi representative.
C190H	Extended error	The Originator set in the target device is trying to establish a connection with the Target, with which the Originator has already established a connection.	Find the conditions for the target device to notify this error and take measures. (☞ the manual for the target device)
C191H		The specified combination is not supported. The Target does not support the combination of the specified Transport Class and Trigger.	
C192H		Ownership conflict. The connection cannot be established since another connection has exclusively allocated some of the resources required for this connection.	
C193H		The connection to be closed is not found on the target device.	Check the following and restart the Tag communication. •The target device is operating normally. •The line status is normal.

Table 9.6 Communication error of the EtherNet/IP module (Continued)

Error code (Hex.)	Error	Error detail	Action
C194H	Extended error	Tag communication is attempted to the target specified by invalid Tag Parameter data. The target device does not support the specified connection type, connection priority, redundancy owner, or size fixed/variable connection.	Find the conditions for the target device to notify this error and take measures. (☞ the manual for the target device)
C195H		The connection size is invalid. •The Target or router does not support the specified connection size. •The specified size does not match the size for a fixed size connection. •The requested size is too large for the specified network.	
C196H		The other end of the connection is not set.	
C197H		The target device does not support the specified RPI value.	
C198H		Number of connections is exceeded.	
C199H		The product code or vendor ID specified in the electronic key logical segment does not match the one of the target device.	
C19AH		Device type mismatch. The device type specified in the electronic key logic segment does not match that of the target device.	
C19BH		Revision mismatch. The major and minor revisions specified in the electronic key logical segment do not match valid revisions of the target device.	
C19CH		Invalid produced or consumed application path. The produced or consumed application path specified in Connection Path does not correspond to a valid one in the target application.	
C19DH		The configuration application path is invalid or inconsistent. The application path specified for the set data does not correspond to a configuration application. Or, it is inconsistent with the consumed or produced application path.	
C19EH		The connection request failed since there are no non-listen only connection types currently open.	
C19FH		The maximum number of connections of the target object has been exceeded.	
C1A0H		•RPI is smaller than Production Inhibit Time. •The Target → Originator RPI is smaller then the Target → Originator Production Inhibit Time.	

Table 9.6 Communication error of the EtherNet/IP module (Continued)

Error code (Hex.)	Error	Error detail	Action
C1A1H	Extended error	Connection timed out. A client attempted to send a connection-oriented message (Class1 or Class3 Tag communication) over a connection that has been timed out.	Find the conditions for the target device to notify this error and take measures. (☞ the manual for the target device)
C1A2H		Tag communication timed out before receiving a reply.	•Check if the target device is operating normally. •Check if the line status is normal •The line may be congested. Retry after a while. •Find the conditions for the target device to notify this error and take measures. (☞ the manual for the target device)
C1A3H		Parameter error in Tag communication. In the following services, there is a Connection Tick Time and Connection time-out combination that is not supported by an intermediate node. •Unconnected_Send service •Forward_Open service •Forward_Close service	Find the conditions for the target device to notify this error and take measures. (☞ the manual for the target device)
C1A4H		The message for Unconnected _Send service is too large.	
C1A5H		Unconnected ACK without reply. The message was sent via UCMM Tag communication and ACK was received, a data response message was not received.	
C1A6H		Insufficient connection buffer memory is available in the target and router devices.	
C1A7H		Network bandwidth is not available for data. A producer device in the connection path cannot allocate sufficient bandwidth for the connection on its link.	
C1A8H		No consumed connection ID filter is available.	
C1A9H		The target device is not configured to send scheduled priority data. If required to make a connection that specifies scheduled priority, the device is unable to send packets during the scheduled portion of the network update time interval.	
C1AAH		Schedule signature mismatch. The connection scheduling information of the Originator device is not consistent with that of the Target network.	
C1ABH		Schedule signature validation is not possible. The connection scheduling information in the Originator device cannot be validated on the Target network.	

Table 9.6 Communication error of the EtherNet/IP module (Continued)

Error code (Hex.)	Error	Error detail	Action
C1AC_H	Extended error	No port is available. The port specified in the port segment is not available or does not exist.	Find the conditions for the target device to notify this error and take measures. (☞ the manual for the target device)
C1AD_H		Link address is invalid. The link address specified in the port segment is invalid.	
C1AE_H		Invalid segment in Connection Path. The segment type or segment value in Connection Path is invalid.	Check if the tag name or data size matches the tag of the target device.
C1AF_H		Error in Forward_Close service Connection Path. The path in Forward_Close service does not match the connection being closed.	Find the conditions for the target device to notify this error and take measures. (☞ the manual for the target device)
C1B0_H		Scheduling is not specified. Either the schedule network segment was not present or the encoded value in the schedule network segment is invalid (0).	
C1B1_H		The link address to the own station is invalid. The link address in the port segment, which points to the same device (loopback to the own station) is invalid.	
C1B2_H		Secondary resources are unavailable. In a dual chassis redundant system, a connection request that is made to the primary system shall be duplicated on the secondary system. The secondary system is unable to duplicate the connection request.	
C1B3_H		Rack connection is already established. A request for a module connection has been refused because the corresponding data is already included in a rack connection.	
C1B4_H		Module connection is already established. A request for a rack connection has been refused because the corresponding data is already included in a module connection.	
C1B5_H		A connection-related error occurred. This extended status is returned when no other extended status code applies for a connection-related error.	

Table 9.6 Communication error of the EtherNet/IP module (Continued)

Error code (Hex.)	Error	Error detail	Action
C1B6H	Extended error	Redundant connection mismatch. The following fields do not match when attempting to establish a redundant owner connection to the same target path. •O → T_RPI •O → T_connection_parameters •T → O_RPI •T → O_connection_parameters •xport_type_and_trigger	Find the conditions for the target device to notify this error and take measures. (☞ the manual for the target device)
C1B7H		No user configurable link consumer resources are available in the producing device. The configured consuming node No. is already in use for a producing application.	
C1B8H		No user configurable link consumer resources are available in the producing device. No link resource is available on the consuming node, which is set in the producing application.	
C1B9H		The network link in a path to the device is offline.	
C1BAH		No Target application data is available. The Target application does not have valid data to produce for the requested connection.	
C1BBH		No Originator application data is available. The Originator application does not have valid data to produce for the requested connection.	
C1BCH		Vender-specific error.	
C2**H	General error	General CIP error code. A general CIP error code is stored in the place where ** is shown.	

9.4 Error Code
9.4.2 Error code list

(5) Own station error of the EtherNet/IP module

Table 9.7 Own station error of the EtherNet/IP module

Error code (Hex.)	Error	Error detail	Action
C300H	Tag communication start request (Y00) execution condition error	An error was detected in the execution conditions for turning on the Tag communication start request (Y00).	Turn off the following signals before turning on the Tag communication start request (Y00). •PING test execution request (Y02) •Flash ROM access request (Y06) •TCP/UDP/IP parameter change request (Y08) •Acquiring IP address (X0D)
C301H	PING test execution error	An error was detected in the execution conditions for the PING test execution.	Turn off the following signals before the PING test execution. •Tag communication start request (Y00) •Flash ROM access request (Y06) •TCP/UDP/IP parameter change request (Y08) •Acquiring IP address (X0D)
C303H	Connection Monitoring execution condition error	An error was detected in the execution conditions for displaying the "Connection" window on the "Monitoring" tab in Utility Package.	Turn off the following signals before displaying the "Connection" window in Utility Package. •PING test execution request (Y02) •Flash ROM access request (Y06) •TCP/UDP/IP parameter change request (Y08)
C304H	Flash ROM access request (Y06) execution condition error	An error was detected in the execution conditions for turning on the Flash ROM access request (Y06).	Turn off the following signals before turning on the Flash ROM access request (Y06). •Tag communication start request (Y00) •PING test execution request (Y02) •TCP/UDP/IP parameter change request (Y08)
C305H	TCP/UDP/IP parameter change request (Y08) execution condition error	An error was detected in the execution conditions for turning on the TCP/UDP/IP parameter change request (Y08).	Turn off the following signals before turning on the TCP/UDP/IP parameter change request (Y08). •Tag communication start request (Y00) •PING test execution request (Y02) •Flash ROM access request (Y06)
C306H	Battery error	Battery voltage drop or battery connector disconnection has occurred.	•Replace the battery. •Check the battery connection status.
C307H to C308H	System error	System error	Please consult your local Mitsubishi representative.

(6) Errors of PING test (Error)

Table 9.8 PING test error (Error)

Error code (Hex.)	Error	Error detail	Action
C400H	IP Address setting error	•IP address is invalid. •The IP address of the own station was specified for the PING test.	Correct the IP address setting.

(7) Errors of self-diagnostics (Error)

Table 9.9 Errors of self-diagnostics (Error)

Error code (Hex.)	Error	Error detail	Action
C500H	2-port RAM test error	An error was detected in the 2-port RAM test of the hardware test.	•Check the installation status of the EtherNet/IP module and re-execute the test. •If the error repeats, please consult your local Mitsubishi representative.
C501H	Sam check test error	An error was detected on the sum check test of the hardware test.	
C502H to C51FH	System error	System error	
C520H	Message transmission test error	An error was detected in the message transmission test of the self-loopback test.	
C521H to C543H	System error	System error	

(8) Module error of the EtherNet/IP module

Table 9.10 Module error of the EtherNet/IP module

Error code (Hex.)	Error	Error detail	Action
CF10H to CF52H	System error	System error	Please consult your local Mitsubishi representative.

APPENDICES

Appendix 1   Transportation Precautions

When transporting lithium batteries, treat them based on the transportation regulations.

Appendix 1.1   Controlled model

The lithium battery for the EtherNet/IP module is classified as follows.

Table APPX.1 Lithium battery

Product Name	Model Name	Product supply status	Classification for transportation
Battery for Q Series	Q6BAT	Lithium battery	Non-hazardous material

Appendix 1.2   Handling for transportation

We ship products packed in accordance with transportation regulations. When transporting products after repacking or unpacking them, make them comply with the IATA Dangerous Goods Regulations, IMDG Code, and national transportation regulations. For details, consult with the carrier.

Appendix 2 Handling of Batteries and Devices with Built-in Batteries in EU Member States

This section describes the precautions for disposing of waste batteries in EU member states and exporting batteries and/or devices with built-in batteries to EU member states.

Appendix 2.1 Disposal precautions

In EU member states, there is a separate collection system for waste batteries. Dispose of batteries properly at the local community waste collection/recycling center.

The symbol shown in Figure APPX.1 is printed on the batteries and packaging of batteries and devices with built-in batteries used for Mitsubishi programmable controllers.

Figure APPX.1 Symbol

Note: This symbol is for EU member states only.
The symbol is specified in the new EU Battery Directive (2006/66/EC) Article 20 "Information for end-users" and Annex ll.

The symbol indicates that batteries need to be disposed of separately from other wastes.

Appendix 2.2   Exportation precautions

The new EU Battery Directive (2006/66/EC) requires the following when marketing or exporting batteries and/or devices with built-in batteries to EU member states.
- To print the symbol on batteries, devices, or their packaging.
- To explain the symbol in the manuals of the products

(1) Labeling
To market or export batteries and/or devices with built-in batteries, which have no symbol, to EU member states on September 26, 2008 or later, print the symbol shown in the Figure APPX.1 on the batteries, devices, or their packaging.

(2) Explaining the symbol in the manuals
To export devices incorporating Mitsubishi programmable controller to EU member states on September 26,2008 or later, provide the latest manuals that include the explanation of the symbol.
If no Mitsubishi manuals or any old manuals without the explanation of the symbol are provided, separately attach an explanatory note regarding the symbol to each manual of the devices.

⊠**POINT**

The requirements apply to batteries and/or devices with built-in batteries manufactured before the enforcement date of the new EU Battery Directive (2006/66/EC).

Appendix 3   When Using GX Developer

This section describes the operating procedure when using GX Developer.

(1) Applicable software version
For the applicable software version, refer to the following.
☞ Section 2.1 (3) Applicable software packages

Appendix 3.1   Operation of GX Developer

Configure the following settings when using GX Developer.

(1) Intelligent function module detailed setting
Double-click "PLC parameter" in the project window and click the "I/O assignment" tab.
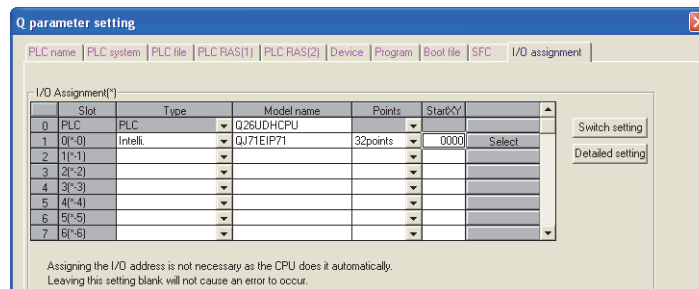
Figure APPX.2 "I/O assignment"

Table APPX.2 Setting items on the "I/O assignment" tab

Item	Description
Type	Select "Intelli.".
Model name	Enter the model name of the module.
Points	Select "32points".
Start XY	Enter the start I/O number of the EtherNet/IP module.

Clicking ⟨Detailed setting⟩ displays the "Intelligent function module detailed setting" window.
Refer to the following and complete the setting.
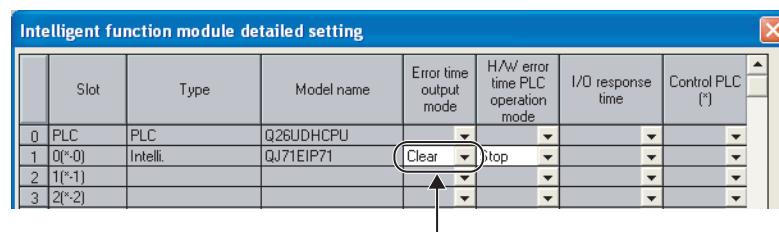
Setting for a CPU stop error

Figure APPX.3 "Intelligent function module detailed setting"

Table APPX.3 Setting description in "Intelligent function module detailed setting"

Item	Description
Error time output mode	Clear: Stops Tag communication when a CPU stop error occurred. (default)
	Hold: Continues Tag communication when a CPU stop error occurred.

(2) Switch setting for the intelligent function module

Double-click "PLC parameter" in the project window and click the "I/O assignment" tab.
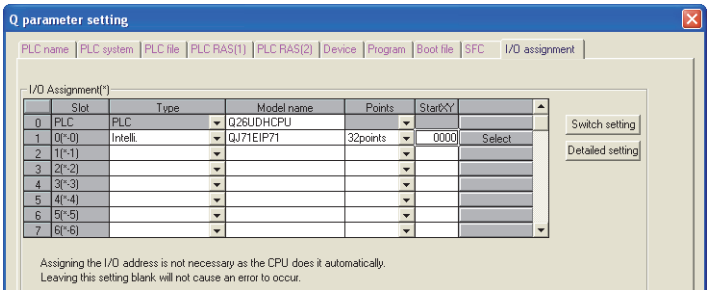
Figure APPX.4 "I/O assignment"

Clicking Switch setting displays the "Switch setting for I/O and intelligent function module" window.

Refer to the following and complete the setting.

Select "HEX".
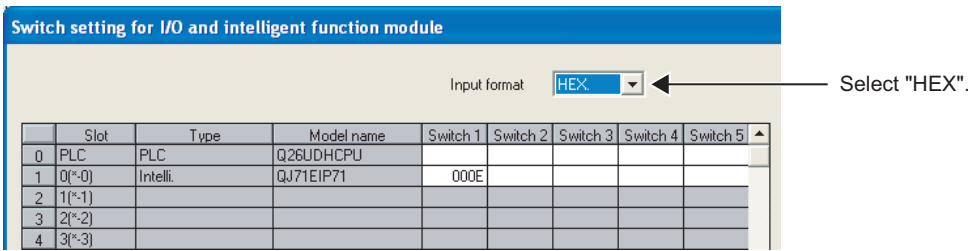
Figure APPX.5 "Switch setting for I/O and intelligent function module"

Table APPX.4 Setting items in "Switch setting for I/O and intelligent function module"

Item	Description
Switch 1	Set the hardware test or self-loopback test. No settings (blank): Online mode (default) $000D_H$: Hardware test $000E_H$: Self-loopback test
Switch 2	No settings (blank) When any item is set, delete the settings and leave the field blank.
Switch 3	
Switch 4	
Switch 5	

Appendix 4   Calculation for the Total Size of Character String Information Parameters

Set the total size of the character string information parameters (Nic Name, Node Name, Tag name, Data Type name, and Define name) as follows.
- 32K words or less for one module (Own Nic)
- 128K words or less for one project

Data cannot be written into the module if the total exceeds the sizes above.

Appendix 4.1   Calculating formula for the total size of character string information parameters

The total size of character string information parameters for each module (Own Nic) is calculated as follows.

Total size of character string information parameters = Header + Nic Name + Node Name + Tag name + Data Type name, Define name + Footer.

For the size of each character string information parameter, refer to the following.

Table APPX.5 Calculating formula

Name	Calculating formula for size (words)[2]
Header	9 (fixed)
Nic Name	$\dfrac{NicName+1}{2}+1$
Node Name[1]	$\displaystyle\sum_{i=1}^{n}\left(\dfrac{REMCONi+1}{2}+1\right)+\sum_{j=1}^{m}\left(\dfrac{REMORGj+1}{2}+1\right)+512$ n: Number of Consumer Tags set m: Number of Message Tags (Originator) set REMCONi: Number of characters of Node Name of the ith Consumer Tag REMORGj: Number of characters of Node Name of the jth Message Tag (Originator)
Tag name[1]	$\displaystyle\sum_{i=1}^{n}\left(\dfrac{TAGCONi+1}{2}+1\right)+\sum_{j=1}^{m}\left(\dfrac{TAGORGj+1}{2}+1\right)+512$ n: Number of Consumer Tags set m: Number of Message Tags (Originator) set TAGCONi: Number of characters of Node Name of the ith Consumer Tag TAGORGj: Number of characters of Node Name of the jth Message Tag (Originator)
Data Type name[1], Define name[1]	$\displaystyle\sum_{i=1}^{n}\left(\dfrac{UDi+1}{2}+2+TOTALDLi\right)+512$ $TOTALDLi=\displaystyle\sum_{j=1}^{mi}\left(\dfrac{DEFINEj+1}{2}+3\right)$ n: Number of Tags using Data Type registered in the "User Define" window mi: Number of registered Defines in Data Type used in the ith Tag UDi: Number of characters of Data Type name used in the ith Tag TOTALDLi: Parameter size of Data Type used in the ith Tag DEFINEj: Number of characters of jth Define name registered in Data Type used in the ith Tag
Footer	1 (fixed)

* 1   When the same character string information parameter is used in multiple Tag Parameters in one module (Own Nic), use only one character string information parameter for the calculation. (Appendix 7.3 Calculation example of character string information parameters)

* 2   Round each number down to the nearest integer.

Appendix 4.2　　Example of the character string information parameter setting

This section describes examples of the character string information parameter setting. Examples of calculation for character string information parameters are described in Appendix 4.3.

(1) Setting in the "Basic" window

Table APPX.6 Setting in "[Own Nic]" in the "Basic" window

Nic No.	Start I/O No.	Nic Name	IP address
1	0000	MY_NIC_NAME_01	192.168.0.1
2	0020	MY_NIC_NAME_02	192.168.0.2
3	0040	MY_NIC_NAME_03	192.168.0.3
4	0060	MY_NIC_NAME_04	192.168.0.4

Table APPX.7 Setting in "[Remote Nic]" in the "Basic" window

Node Name	Nic No.	IP address
NODE_NIC1_001	1	192.168.0.100
NODE_NIC1_002	1	192.168.0.101
NODE_NIC2_001	2	192.168.0.110
NODE_NIC2_002	2	192.168.0.111
NODE_NIC3_001	3	192.168.0.120
NODE_NIC3_002	3	192.168.0.121
NODE_NIC4_001	4	192.168.0.130
NODE_NIC4_002	4	192.168.0.131

(2) Setting in the "Producer" window (only data related to character string information parameters)
The Tag name of Producer Tag does not affect the size of character string information parameters.

Table APPX.8 Setting in the "Producer" window (abstract)

Nic No.	Tag No.	Tag name	Data Type name
1	1	PD_01_001	UD_001

(3) Setting in the "Consumer" window (only data related to character string information parameters)

Table APPX.9 Setting in the "Consumer" window (abstract)

Nic No.	Tag No.	Tag name	Node Name	Remote Tag name	Data Type name
1	2	CS_01_001	NODE_NIC1_001	PD_01_001	
2	1	CS_02_001	NODE_NIC2_001	PD_02_001	
2	2	CS_02_002	NODE_NIC2_001	PD_02_002	
2	3	CS_02_003	NODE_NIC2_002	PD_02_003	
2	4	CS_02_004	NODE_NIC2_002	PD_02_004	
3	1	CS_03_001	NODE_NIC3_001	PD_03_001	UD_100
3	2	CS_03_002	NODE_NIC3_002	PD_03_002	UD_200
4	1	CS_04_001	NODE_NIC4_001	PD_04_001	UD_100
4	2	CS_04_002	NODE_NIC4_002	PD_04_002	UD_200

Appendix 4 Calculation for the Total Size of Character String Information Parameters
Appendix 4.2 Example of the character string information parameter setting

APPX - 7

(4) Setting in the "Message" window (only data related to character string information parameters)
When "Setting Type" is "Target Read" or "Target Write", the Tag name does not affect the size of character string information parameters.

Table APPX.10 Setting in the "Message" window (abstract)

Nic No.	Tag No.	Tag name	Setting Type	Node Name	Remote Tag name	Data Type name
1	1	UAW_01_001	Originator Write	NODE_NIC2_002	UPW_01_001	
1	2	UPR_01_001	Target Read			
2	1	MAR_02_001	Originator Read	NODE_NIC2_001	MPR_02_001	
2	2	MAW_02_001	Originator Write	NODE_NIC2_001	MPW_02_001	
2	3	UAR_02_001	Originator Read	NODE_NIC2_002	UPR_02_001	
2	4	UAW_02_001	Originator Write	NODE_NIC2_002	UPW_02_001	
3	1	MAR_03_001	Originator Read	NODE_NIC3_001	MPR_03_001	UD_100
3	2	UAW_03_001	Originator Write	NODE_NIC3_002	UPW_03_001	UD_200
4	1	MAW_04_001	Originator Write	NODE_NIC4_001	MPW_04_001	UD_100
4	2	UAR_04_001	Originator Read	NODE_NIC4_002	UPR_04_001	UD_200

(5) Setting in the "User Define" window

Table APPX.11 Data Type name: UD_100

No.	Offset	Define name	Unit	Size
1	0/100	DEFINE_001	INT	20
2	20/100	DEFINE_002	DINT	20
3	60/100	DEFINE_003	BYTE	40
4	80/100	DEFINE_004	BIT	320

Table APPX.12 Data Type name: UD_200

No.	Offset	Define name	Unit	Size
1	0/200	DEFINE_001	INT	20
2	20/200	DEFINE_002	DINT	20
3	60/200	DEFINE_003	BYTE	40
4	80/200	DEFINE_004	BIT	320
5	100/200	DEFINE_005	INT	20
6	120/200	DEFINE_006	DINT	20
7	160/200	DEFINE_007	BYTE	40
8	180/200	DEFINE_008	BIT	320

Appendix 4.3 Examples of calculation for character string information parameters

This section describes examples of calculation for the total size of character string information parameters using the setting examples described in Appendix 4.2.

(1) Total size of character string information parameters used in Nic No. 1

(a) Nic Name
Nic Name = 14 characters ("MY_NIC_NAME_01")

$$\frac{NicName+1}{2}+1=8$$

(b) Node Name
n = 1, m = 1
$REMCON_1$ = 13 characters ("NODE_NIC1_001")
$REMORG_1$ = 13 characters ("NODE_NIC1_002")

$$\sum_{i=1}^{n}\left(\frac{REMCONi+1}{2}+1\right) + \sum_{j=1}^{m}\left(\frac{REMORGj+1}{2}+1\right) +512$$

$$= \left(\frac{13+1}{2}+1\right) + \left(\frac{13+1}{2}+1\right) +512=528$$

(c) Tag name
n = 1, m = 1
$TAGCON_1$ = 9 characters ("CS_01_001")
$TAGORG_1$ = 10 characters ("UAW_ 01_ 001")

$$\sum_{i=1}^{n}\left(\frac{TAGCONi+1}{2}+1\right) + \sum_{j=1}^{m}\left(\frac{TAGORGj+1}{2}+1\right) +512$$

$$= \left\{\left(\frac{9+1}{2}+1\right)\right\} + \left\{\left(\frac{10+1}{2}+1\right)\right\} +512=524$$

(d) Data Type name, Define name
n = 1
UD_1 = Data Type name used in "PD_01_001" = 6 characters ("UD_100)
m_1 = 4 (number of registered Defines in UD_1)
Define $name_1$ = 10 characters ("DEFINE_001")
Define $name_2$ = 10 characters ("DEFINE_002")
Define $name_3$ = 10 characters ("DEFINE_003")
Define $name_4$ = 10 characters ("DEFINE_004")

$$TOTALDL_1=\left\{\left(\frac{10+1}{2}+3\right) + \left(\frac{10+1}{2}+3\right) + \left(\frac{10+1}{2}+3\right) + \left(\frac{10+1}{2}+3\right)\right\}=32$$

$$\sum_{i=1}^{n}\left(\frac{UDi+1}{2}+2+TOTALDLi\right) +512= \left(\frac{6+1}{2}+2+32\right) +512=549$$

According to (a) to (d), the total size of character string information parameters used in Nic No. 1 is obtained by: Header + Nic Name + Node Name + Tag name + Data Type name, Define name + Footer = 9+8+528+524+549+1 =1619 words.

(2) Total size of character string information parameters used in Nic No. 2

(a) Nic Name
Nic Name = 14 characters ("MY_NIC_NAME_02")

$$\frac{NicName+1}{2}+1=8$$

(b) Node Name
n = 4, m = 4
$REMCON_1$ = 13 characters ("NODE_NIC2_001")
$REMCON_2$ = Excluded from calculation because Node Name is the same as that of $REMCON_1$.
$REMCON_3$ = 13 characters ("NODE_NIC2_002")
$REMCON_4$ = Excluded from calculation because Node Name is the same as that of $REMCON_3$.
$REMORG_1$ = Excluded from calculation because Node Name is the same as that of $REMCON_1$.
$REMORG_2$ = Excluded from calculation because Node Name is the same as that of $REMCON_1$.
$REMORG_3$ = Excluded from calculation because Node Name is the same as that of $REMCON_3$.
$REMORG_4$ = Excluded from calculation because Node Name is the same as that of $REMCON_3$.

$$\sum_{i=1}^{n}\left(\frac{REMCONi+1}{2}+1\right) + \sum_{j=1}^{m}\left(\frac{REMORGj+1}{2}+1\right)+512$$

$$=\left(\frac{13+1}{2}+1\right)+\left(\frac{13+1}{2}+1\right)+512=528$$

(c) Tag name
n = 4, m = 4
$TAGCON_1$ = 9 characters ("CS_02_001")
$TAGCON_2$ = 9 characters ("CS_02_002")
$TAGCON_3$ = 9 characters ("CS_02_003")
$TAGCON_4$ = 9 characters ("CS_02_004")
$TAGORG_1$ = 10 characters ("MAR_ 02_ 001")
$TAGORG_2$ = 10 characters ("MAW_ 02_ 001")
$TAGORG_3$ = 10 characters ("UAR_ 02_ 001")
$TAGORG_4$ = 10 characters ("UAW_ 02_ 001")

$$\sum_{i=1}^{n}\left(\frac{TAGCONi+1}{2}+1\right) + \sum_{j=1}^{m}\left(\frac{TAGORGj+1}{2}+1\right)+512$$

$$\left\{\left(\frac{9+1}{2}+1\right)+\left(\frac{9+1}{2}+1\right)+\left(\frac{9+1}{2}+1\right)+\left(\frac{9+1}{2}+1\right)\right\}+$$

$$\left\{\left(\frac{10+1}{2}+1\right)+\left(\frac{10+1}{2}+1\right)+\left(\frac{10+1}{2}+1\right)+\left(\frac{10+1}{2}+1\right)\right\}+512=560$$

(d) Data Type name, Define name

n = 0

$$\sum_{i=1}^{n} \left(\frac{UDi+1}{2} +2 \right) +TOTALDLi+512=0+0+512=512$$

According to (a) to (d), the total size of character string information parameters used in Nic No. 2 is obtained by: Header + Nic Name + Node Name + Tag name + Data Type name, Define name + Footer = 9+8+528+560+512+1 =1618 words.

(3) Total size of character string information parameters used in Nic No. 3

(a) Nic Name
Nic Name = 14 characters ("MY_NIC_NAME_03")

$$\frac{NicName+1}{2} +1=8$$

(b) Node Name
n = 2, m = 2
$REMCON_1$ = 13 characters ("NODE_NIC3_001")
$REMCON_2$ = 13 characters ("NODE_NIC3_002")
$REMORG_1$ = Excluded from calculation because Node Name is the same as that of $REMCON_1$.
$REMORG_2$ = Excluded from calculation because Node Name is the same as that of $REMCON_1$.

$$\sum_{i=1}^{n} \left(\frac{REMCONi+1}{2} +1 \right) + \sum_{j=1}^{m} \left(\frac{REMORGj+1}{2} +1 \right) +512$$

$$= \left(\frac{13+1}{2} +1 \right) + \left(\frac{13+1}{2} +1 \right) +512=528$$

(c) Tag name
n = 2, m = 2
$TAGCON_1$ = 9 characters ("CS_03_001")
$TAGCON_2$ = 9 characters ("CS_03_002")
$TAGORG_1$ = 10 characters ("MAR_ 03_ 001")
$TAGORG_2$ = 10 characters ("MAW_ 03_ 001")

$$\sum_{i=1}^{n} \left(\frac{TAGCONi+1}{2} +1 \right) + \sum_{j=1}^{m} \left(\frac{TAGORGj+1}{2} +1 \right) +512$$

$$= \left\{ \left(\frac{9+1}{2} +1 \right) + \left(\frac{9+1}{2} +1 \right) \right\} + \left\{ \left(\frac{10+1}{2} +1 \right) + \left(\frac{10+1}{2} +1 \right) \right\} +512=536$$

(d) Data Type name, Define name

$n = 4$

UD_1 = Data Type name used in "CS_03_001" = 6 characters ("UD_100)

UD_2 = Data Type name used in "CS_03_002" = 6 characters ("UD_200)

UD_3 = Data Type name used in MAR_03_001 = Excluded from calculation because the Data Type name is the same as that of UD_1.

UD_4 = Data Type name used in UAW_03_001 = Excluded from calculation because the Data Type name is the same as that of UD_2.

$m_1 = 4$ (number of registered Defines in UD_1)

Define name$_1$ = 10 characters ("DEFINE_001")

Define name$_2$ = 10 characters ("DEFINE_002")

Define name$_3$ = 10 characters ("DEFINE_003")

Define name$_4$ = 10 characters ("DEFINE_004")

$$TOTALDL_1 = \left\{ \left(\frac{10+1}{2} +3 \right) + \left(\frac{10+1}{2} +3 \right) + \left(\frac{10+1}{2} +3 \right) + \left(\frac{10+1}{2} +3 \right) \right\} = 32$$

$m_2 = 8$ (number of registered Defines in UD_2)

Define name$_1$ = 10 characters ("DEFINE_001")

Define name$_2$ = 10 characters ("DEFINE_002")

Define name$_3$ = 10 characters ("DEFINE_003")

Define name$_4$ = 10 characters ("DEFINE_004")

Define name$_5$ = 10 characters ("DEFINE_005")

Define name$_6$ = 10 characters ("DEFINE_006")

Define name$_7$ = 10 characters ("DEFINE_007")

Define name$_8$ = 10 characters ("DEFINE_008")

$$TOTALDL_2 = \left\{ \begin{array}{l} \left(\frac{10+1}{2} +3 \right) + \left(\frac{10+1}{2} +3 \right) + \left(\frac{10+1}{2} +3 \right) + \left(\frac{10+1}{2} +3 \right) \\ \left(\frac{10+1}{2} +3 \right) + \left(\frac{10+1}{2} +3 \right) + \left(\frac{10+1}{2} +3 \right) + \left(\frac{10+1}{2} +3 \right) \end{array} \right\} = 64$$

$TOTALDL_3$ and $TOTALDL_4$ are excluded from calculation because UD_3 and UD_4 are excluded from calculation.

$$\sum_{i=1}^{n} \left(\frac{UDi+1}{2} +2+TOTALDLi \right) +512$$

$$= \left[\left\{ \left(\frac{6+1}{2} +2 \right) + \left(\frac{6+1}{2} +2 \right) \right\} +(34+64) \right] +512 = 618$$

According to (a) to (d), the total size of character string information parameters used in Nic No. 3 is obtained by: Header + Nic Name + Node Name + Tag name + Data Type name, Define name + Footer = 9+8+528+536+618+1 =1700 words.

(4) Total size of character string information parameters used in Nic No. 4

Its total size of character string information parameters is also 1700 words because the number of characters used in Nic No. 4 is the same as that of Nic No. 3.

(5) Grand total
In the case of the setting examples described in Appendix 7.2, the grand total size of character string information parameters is obtained by summing up the sizes used in Nic Nos. 1 to 4: 1619+1618+1700+1700 = 6637 words.

Appendix 5   Added and enhanced Functions

The following table lists the added and enhanced functions in the EtherNet/IP module.

Table APPX.13 Function added and supported Utility Package version

Added and enhanced functions	Serial No. (first 5 digits)	Utility package version
Setting of a tag name with 41 or more characters (☞ Section 7.9.1 "Basic" window)	"17012" or later	1.01B or later

Appendix 6   External Dimensions
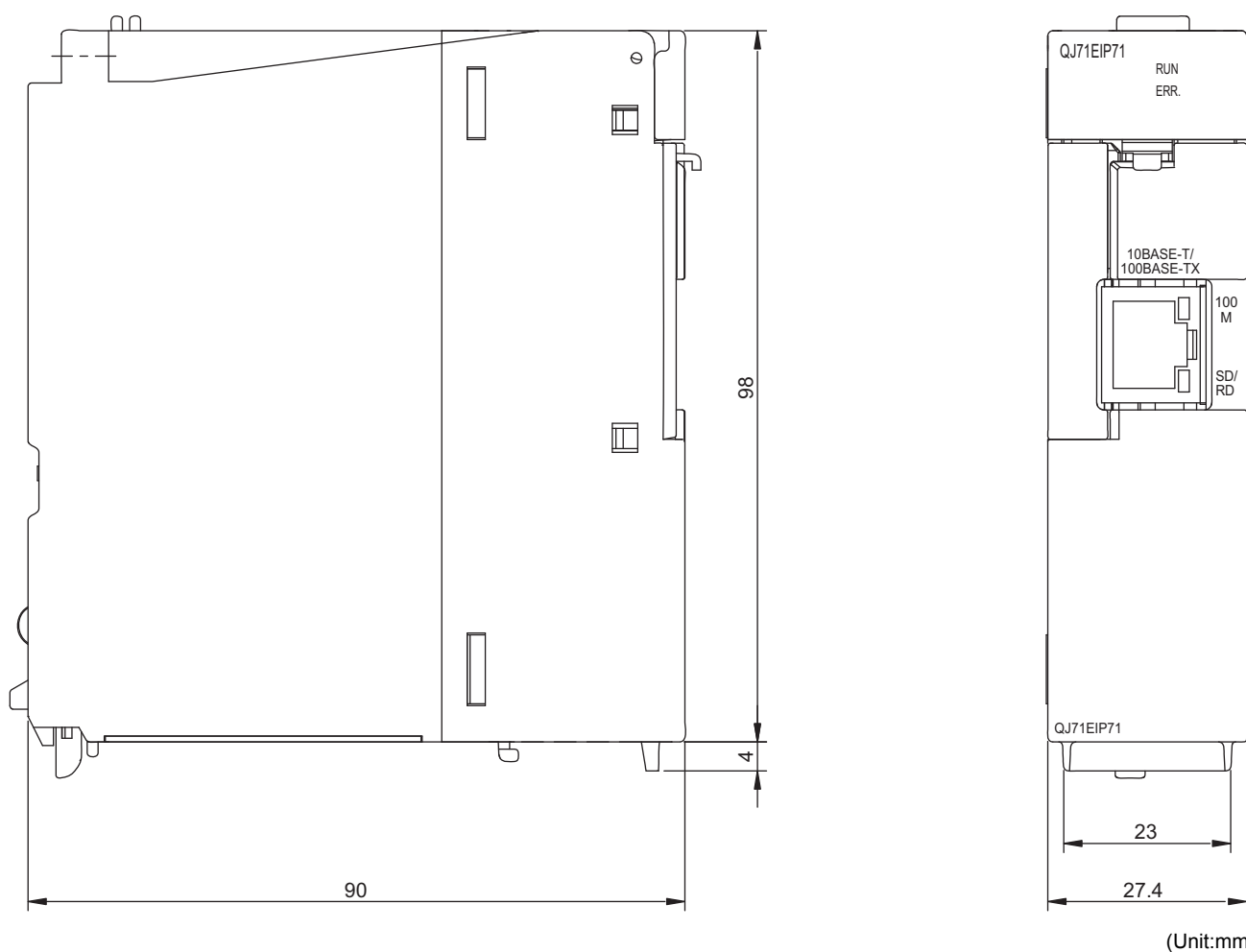
(Unit:mm)

Figure APPX.6 External dimensions

Memo

INDEX

WARRANTY

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

1. Gratis Warranty Term and Gratis Warranty Range

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

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

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.

Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

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

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

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.
Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

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

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

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

SH(NA)-081157ENG-B(1502)MEE

MODEL: QJ71EIP71-U-E

MODEL CODE: 13JZ85

MITSUBISHI ELECTRIC CORPORATION

When exported from Japan, this manual does not require application to the
Ministry of Economy, Trade and Industry for service transaction permission.

Specifications subject to change without notice.