MITSUBISHI ELECTRIC

TECHNICAL BULLETIN

FA-A-0401-B

Replacement From MELSEC iQ-R EtherNet/IP Network Interface Modules To MELSEC iQ-R CC-Link IE TSN Plus Master/Local Modules

■Date of Issue
April 2023 (Ver. B: July 2025)

■Relevant Models
RJ71EIP91, RJ71GN11-EIP

Thank you for your continued support of Mitsubishi Electric programmable controllers.
We have just released the CC-Link IE TSN Plus master/local module that supports two networks, CC-Link IE TSN and EtherNet/IP.
This technical bulletin describes how to replace the EtherNet/IP network interface modules with the CC-Link IE TSN Plus master/local modules.

1 ALTERNATIVE MODELS

Modules

Before replacement		After replacement	
Product	**Model**	**Product**	**Model**
EtherNet/IP Network interface module	RJ71EIP91	CC-Link IE TSN Plus master/local module	RJ71GN11-EIP

Before using those models, read the manuals to confirm the functions, specifications, setting method, and how to use. (☞ Page 30 RELEVANT MANUALS)

Software

Item	Before replacement	After replacement
	RJ71EIP91	**RJ71GN11-EIP**
Supported version of GX Works3	1.065T or later	1.082L or later*1
EtherNet/IP setting	EtherNet/IP Configuration Tool for RJ71EIP91	EtherNet/IP configuration tool*2

*1 Available versions differ depending on the firmware version of the module used. For the latest combination of the module firmware version and the EtherNet/IP configuration tool version, refer to the following.
📖 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual (SH-082472ENG)

*2 The EtherNet/IP configuration tool is included in GX Works3 version 1.090U or later and is automatically installed. When the version of GX Works3 used is earlier than 1.090U, the EtherNet/IP configuration tool should be installed. For how to install the EtherNet/IP configuration tool, refer to the following.
📖 EtherNet/IP Configuration Tool Installation Instructions (BCN-P5999-1530)

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2 COMPARISON OF SPECIFICATIONS

2.1 Current Consumption

The following shows the difference in current consumption between the RJ71EIP91 and the RJ71GN11-EIP.

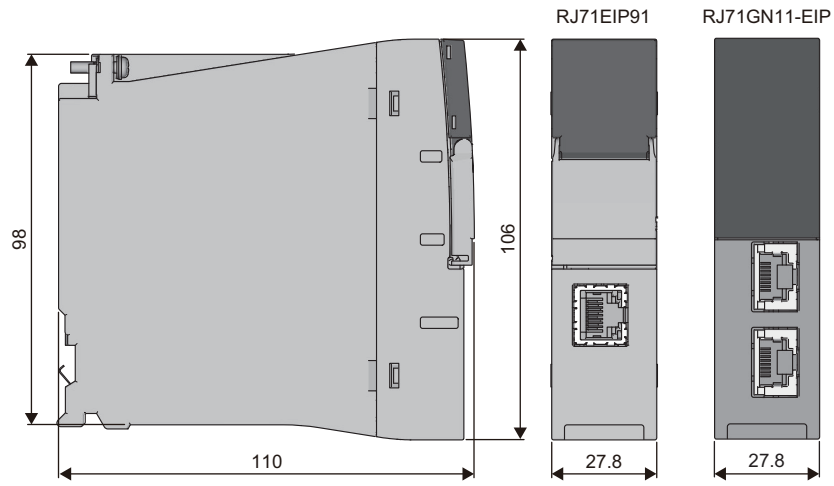
RJ71EIP91	RJ71GN11-EIP
1.09A	1.54A

2.2 External Dimensions

There is no difference in external dimensions between the RJ71EIP91 and the RJ71GN11-EIP.

RJ71EIP91			RJ71GN11-EIP		
Depth	Width	Height*1	Depth	Width	Height*1
110mm	27.8mm	106 (98)mm	110mm	27.8mm	106 (98)mm

*1 The value in parentheses indicates the height of the base unit mounting side.



Unit (mm)

2.3 Weight

The following shows the difference in weight between the RJ71EIP91 and the RJ71GN11-EIP.

RJ71EIP91	RJ71GN11-EIP
0.24kg	0.26kg

2.4 Part Names

The following lists differences between the RJ71EIP91 and the RJ71GN11-EIP.

For the RJ71GN11-EIP, check the following items on the Ethernet port P2 side.

No.	RJ71EIP91		RJ71GN11-EIP	
	LED name	Description	LED name	Description
1.	RUNLED	Operation status is indicated. • Lighting: Normal operation in progress • Flashing: Initial processing in progress • Off: Error	RUNLED	Operation status is indicated. • Lighting: Normal operation in progress • Off: Error
2.	ERRLED	Module error status is indicated. • Lighting or flashing: Error • Off: Normal operation in progress	ERRLED	Module error status is indicated. • Flashing in 200ms interval: Error • Off: Normal operation in progress
3.	MS LED	EtherNet/IP device error status is indicated. • Lighting in green: Communications are available. • Lighting in red: Moderate error or major error • Flashing in red: Minor error	P2 STATUS LED	EtherNet/IP device operating status is indicated. • Lighting in green: In communication • Lighting in red: Moderate error or major error • Flashing in green: No connection established • Flashing in red: Minor error • Off: No error
4.	NS LED	EtherNet/IP network status is indicated. • Lighting in green: In communication • Flashing in green: No connection established		
5.	SPEED LED	EtherNet/IP link status is indicated. • Lighting in orange: Link-up (1Gbps) • Lighting in green: Link-up (100Mbps) • Off: Link-down	P2 LINK LED	Link status is indicated. • Lighting: Link-up • Flashing: Data being sent or received • Off: Link-down
6.	SD/RD LED	Data communication status on EtherNet/IP is indicated. • Lighting: Data being sent or received • Off: No data sent or received		
7.	Ethernet port	For the EtherNet/IP connection. Ethernet cables should be used.	Ethernet port P2	For the network connection. Ethernet cables should be used.
8.	Production information marking	Module production information (16 digits) is indicated.	Production information marking	Module production information (16 digits) is indicated.

2.5 Communication Specifications

This section describes the differences in communication specifications between the RJ71EIP91 and the RJ71GN11-EIP.

○: Supported, ×: Not supported

Network	Item	Description	RJ71EIP91	RJ71GN11-EIP
EtherNet/IP	Class1 communications (Cyclic transmission)	Instance communications	○*1	○
		Tag communications	○	○
		Data size of all connections	64K bytes	361K bytes
		RPI (communication cycle)	0.5ms to 60000ms	0.5ms to 60000ms
		PPS (communication processing performance)*2	12000PPS	12000PPS
	Class3 communications (Message communications)	Instance communications (only for the server)	○	○
		Tag communications	×	○
	UCMM communications (Message communications)	Instance communications	○	○
		Tag communications	×	○

*1 Only the originator is supported.

*2 Use the model so that the total number of transmitting packets and receiving packets is 12000PPS or less.

For other communication specifications, refer to the manuals of each module. (☞ Page 30 RELEVANT MANUALS)

When the RJ71EIP91 is an originator

The following table lists the application types that can be used when the RJ71EIP91 is an originator.

○: Requests from the EtherNet/IP device can be accepted, ×: Requests from the EtherNet/IP device cannot be accepted

Communication method	Connection settings							
	Application type	Trigger type			Input type (T → O)		Output type (O → T)	
		Cyclic	Application Trigger	Change of State	Fixed	Variable	Fixed	Variable
Class1 communications (instance communications)	Exclusive Owner	○	○	○	○	○	○	○
	Input Only	○	○	○	○	○	○	○
	Listen Only	○	○	○	○	○	○	○
	Redundant Owner	×	×	×	×	×	×	×
Class1 communications (Tag communications)	Input Only	○	○	○	○	○	○	○

When the RJ71GN11-EIP is an originator

The following table lists the application types that can be used when the RJ71GN11-EIP is an originator.

○: Requests from the EtherNet/IP device can be accepted, ×: Requests from the EtherNet/IP device cannot be accepted, —: No combination

Communication method	Connection settings							
	Application type	Trigger type			Input type (T → O)		Output type (O → T)	
		Cyclic	Application Trigger	Change of State	Fixed	Variable	Fixed	Variable
Class1 communications (instance communications)	Exclusive Owner	○	×	○	○	○	○	○
	Input Only	○	×	○	○	○	○	—*1
	Listen Only	○	×	○	○	○	○	—*1
	Redundant Owner	×	×	×	×	×	×	×
Class1 communications (Tag communications)	Input Only	○	×	○	○	○	○	—*1

*1 Heartbeat (packet for checking the communication status) that is used for the output type (O → T) of Input Only and Listen Only is 0 bytes, so Fixed must be selected.

Point

Application Trigger is not supported by the RJ71GN11-EIP, however, Change of State can be used as an alternative.

Auto refresh is recommended when Change of State is used. This prevents inconsistent output data. If auto refresh is not used, data sending triggered by output data update may occur in sequence or some data may be lost.

For the connection via Class1 communication with auto refresh, do not use FBs of M+Model_Class1GetInputData and M+Model_Class1SetOutputData in the program. Doing so may result in inconsistency between output data set by refresh and output data set in module FB.

When the RJ71EIP91 is a target

The following table lists the application types that can be used when the RJ71EIP91 is a target.

○: Requests from the EtherNet/IP device can be accepted, ×: Requests from the EtherNet/IP device cannot be accepted

Communication method	Connection settings							
	Application type	Trigger type			Input type (T → O)		Output type (O → T)	
		Cyclic	Application Trigger	Change of State	Fixed	Variable	Fixed	Variable
Class1 communications (instance communications)	Exclusive Owner	×	×	×	×	×	×	×
	Input Only	×	×	×	×	×	×	×
	Listen Only	×	×	×	×	×	×	×
	Redundant Owner	×	×	×	×	×	×	×
Class1 communications (Tag communications)	Input Only	○	○	○	○	×	○	×

When the RJ71GN11-EIP is a target

The following table lists the application types that can be used when the RJ71GN11-EIP is a target.

○: Requests from the EtherNet/IP device can be accepted, ×: Requests from the EtherNet/IP device cannot be accepted, —: No combination

Communication method	Connection settings							
	Application type	Trigger type			Input type (T → O)		Output type (O → T)	
		Cyclic	Application Trigger	Change of State	Fixed	Variable	Fixed	Variable
Class1 communications (instance communications)	Exclusive Owner	○*3	×	○*3	○*3	×	○*3	×
	Input Only	○	×	○*1	○	×	○	—*2
	Listen Only	×	×	×	×	×	×	—*2
	Redundant Owner	×	×	×	×	×	×	×
Class1 communications (Tag communications)	Input Only	○	×	○*1	○	×	○	—*2

*1 When the RJ71GN11-EIP is a target and Change of State is used, the EDS file Ver.1.2 should be used. The EDS file Ver.1.2 is included in the EtherNet/IP Configuration Tool (1.03D).

*2 Heartbeat (packet for checking the communication status) that is used for the output type (O → T) of Input Only and Listen Only is 0 bytes, so Fixed must be selected.

*3 This setting is available when the firmware version of the RJ71GN11-EIP is 05 or later, the version of the EtherNet/IP configuration tool is 1.04E or later, and the version of GX Works3 is 1.095Z.

Point

Application Trigger is not supported by the RJ71GN11-EIP, however, Change of State can be used as an alternative.

Auto refresh is recommended when Change of State is used. This prevents inconsistent output data. If auto refresh is not used, data sending triggered by output data update may occur in sequence or some data may be lost.

For the connection via Class1 communication with auto refresh, do not use FBs of M+Model_Class1GetInputData and M+Model_Class1SetOutputData in the program. Doing so may result in inconsistency between output data set by refresh and output data set in module FB.

2.6 Processing Time

The following table lists the difference of processing time between the RJ71EIP91 and the RJ71GN11-EIP.
For more details, refer to the manuals of each module. (☞ Page 30 RELEVANT MANUALS)

Model	Calculation value	Calculation formula (unit: ms)
RJ71EIP91	Normal value	0.573 + (Sequence scan ÷ 2) + Module processing time*1 + (RPI ÷ 2)
	Maximum value	0.725 + Sequence scan time + Module processing time*1 + RPI
RJ71GN11-EIP	Normal value	0.573 + (Sequence scan ÷ 2) + Module processing time*1 + (RPI ÷ 2)
	Maximum value	0.725 + Sequence scan time + Module processing time*1 + RPI

*1 The module processing time of the RJ71EIP91 and the RJ71GN11-EIP is calculated as follows.
Module processing time [ms] = 0.0001 × Total data size [byte] + 0.007 × Number of connections

Point

When the RJ71GN11-EIP with the firmware version "02" or earlier is used, the performance value and module processing time are calculated as follows.

- Normal value: 0.573 + (Sequence scan ÷ 2) + Module processing time + RPI
- Maximum value: 0.725 + Sequence scan time + Module processing time + (RPI × 1.5)

Module processing time [ms] = 0.0006 × Total data size [byte] + 0.007 × Number of connections

2.7 Available FBs

The following table lists the differences in FBs between the RJ71EIP91 and the RJ71GN11-EIP.
For more details, refer to the manuals of each module. (☞ Page 30 RELEVANT MANUALS)
○: Supported, ×: Not supported

FB name	Overview	RJ71EIP91		RJ71GN11-EIP	
M+Model_Class1GetInputData	Acquires the input data of the specified connection number by using Class1 communications.	○	251 steps	○*1*2	344 steps
M+Model_Class1SetOutputData	Sets the output data of the specified connection number by using Class1 communications.	○	251 steps	○*1*2	344 steps
M+Model_UCMMOriginator_ReadTagData	Acquires data from the tag of the specified external device by using UCMM tag communications.	×	—	○	724 steps
M+Model_UCMMOriginator_WriteTagData	Sets data to the tag of the specified external device by using UCMM tag communications.	×	—	○	712 steps
M+Model_Class3Originator_ReadTagData	Acquires data from the tag of the specified external device by using Class3 tag communications.	×	—	○	587 steps
M+Model_Class3Originator_WriteTagData	Sets data to the tag of the specified external device by using Class3 tag communications.	×	—	○	567 steps
M+Model_UCMMOriginator_MessageSend	Sends a message to the specified external device by using UCMM message communications.	×	—	○	799 steps
M+Model_Class3Originator_MessageSend	Sends a message to the specified external device by using Class3 message communications.	×	—	○	678 steps

*1 There is no functional difference in the processing executed in each FB. In FBs of the RJ71GN11-EIP, however, output data related to connection communication errors tends to increase.
*2 For the connection via Class1 communication with auto refresh, which is specified in the RJ71GN11-EIP parameter setting, do not use M+Model_Class1GetInputData and M+Model_Class1SetOutputData in the program. Doing so may result in inconsistency between output data set by refresh and output data set in module FB. For details, refer to manuals of used module.

2.8 I/O Signals

This section describes the I/O signal assignment when the start I/O number is 0.

The I/O signals should be set manually.

Differences in input signals (when the start I/O number is 0)

Device No.	RJ71EIP91		RJ71GN11-EIP		
	Signal name	Label name	Signal name	Label name	Usage
X00	Module Ready	bSts_ModuleReady	Module failure	bIn_ModuleFailure	Common for modules
X01	Use prohibited	(Reserved)	Own Data Link	bIn_DataLink	For the CC-Link IE TSN
X02	Use prohibited	(Reserved)	Use prohibited	(Reserved)	—
X03	Use prohibited	(Reserved)	Other Data Link (use prohibited in a local station)	bIn_NotDataLink_Other	For the CC-Link IE TSN
X04 to X0D	Use prohibited	(Reserved)	Use prohibited	(Reserved)	—
X0E	Use prohibited	(Reserved)	Module Error	bIn_ModuleError	Common for modules
X0F	Module Error	bSts_ModuleError	Module Ready	bIn_ModuleReady	Common for modules
X10	EtherNet/IP communication in process	bSts_CommunicationDuringSetup	EtherNet/IP communication in process	bSts_CommunicationDuringStartup	For the EtherNet/IP
X11	Use prohibited	(Reserved)	Use prohibited	(Reserved)	—
X12	PING test completion	bSts_PingTestComplete	PING test completion	bSts_PingTestComplete	For the EtherNet/IP
X13	Use prohibited	(Reserved)	Use prohibited	(Reserved)	—
X14	Connection information read completion	bSts_ConnectionInfoReadComplete	Use prohibited	(Reserved)	—
X15	Connection information read error	bSts_ConnectionInfoReadError	Use prohibited	(Reserved)	—
X16 to X1E	Use prohibited	(Reserved)	Use prohibited	(Reserved)	—
X1F	Communication Ready	bSts_CommunicationReady	Communication Ready	bSts_CommunicationReady	For the EtherNet/IP

Differences in output signals (when the start I/O number is 0)

Device No.	RJ71EIP91		RJ71GN11-EIP		
	Signal name	Label name	Signal name	Label name	Usage
Y00 to Y0D	Use prohibited	(Reserved)	Use prohibited	(Reserved)	—
Y0E	Use prohibited	(Reserved)	Module error clear request	bOut_ModuleErrorClearRequest	Common for modules
Y0F	Module error clear request	bSet_ModuleErrorClearRequest	Use prohibited	(Reserved)	—
Y10	EtherNet/IP communication start request	bSet_CommunicationStartupRequest	Use prohibited	(Reserved)	—
Y11	Use prohibited	(Reserved)	Use prohibited	(Reserved)	—
Y12	PING test execution request	bSet_PingTestRequest	PING test execution request	bSet_PingTestRequest	For the EtherNet/IP
Y13	Use prohibited	(Reserved)	Use prohibited	(Reserved)	—

Device No.	RJ71EIP91		RJ71GN11-EIP		
	Signal name	Label name	Signal name	Label name	Usage
Y14	Connection information read request	bSet_ConnectionInfoRequest	Use prohibited	(Reserved)	—
Y15 to Y1F	Use prohibited	(Reserved)	Use prohibited	(Reserved)	—

2.9 Buffer Memory

The following table lists the differences in buffer memory areas between the RJ71EIP91 and the RJ71GN11-EIP.

Name	RJ71EIP91 buffer memory		RJ71GN11-EIP buffer memory	
	Address (decimal)	Address (hexadecimal)	Address (decimal)	Address (hexadecimal)
RJ71EIP91: Block assurance specification per connection RJ71GN11-EIP: Intelligent auto refresh status	16629	40F5H	— (set in GX Works3)*1	— (set in GX Works3)*1
RJ71EIP91: Block assurance state per connection RJ71GN11-EIP: Intelligent auto refresh status	16630	40F6H	7340033	700001H
PING test request area	27904 to 27907	6D00H to 6D03H	7340048 to 7340051	700010H to 700013H
PING test response area	27908 to 27911	6D04H to 6D07H	7340052 to 7340064	700014H to 700020H
MAC address	25733 to 25735	6485H to 6487H	7340085 to 7340088	700035H to 700037H
EtherNet/IP communication start request	— (Y10)	— (Y10)	7340096	700040H
EtherNet/IP communication in-process status	— (X10)	— (X10)	7340097 (equivalent to X10)	700041H (equivalent to X10)
EtherNet/IP data link continuation specification request	16634	40FAH	7340104	700048H
EtherNet/IP data link continuation specification state	16635	40FBH	7340105	700049H
Class1 Input Area	65536 to 98303	10000H to 17FFFH	7348224 to 7533055	702000H to 72F1FFH
Class1 Output Area	196608 to 229375	30000H to 37FFFH	7536640 to 7721471	730000H to 75D1FFH
Class1 Input data length	16640 to 16895	4100H to 41FFH	7729152 to 7729407	75F000H to 75F0FFH
Class1 Output data length	16896 to 17151	4200H to 42FFH	7729408 to 7729663	75F100H to 75F1FFH
Class1 Start offset address to the input data	25856 to 26111 (1 WORD per connection)	6500H to 65FFH (1 WORD per connection)	7729664 to 7730175 (1 DWORD per connection)	75F200H to 75F3FFH (1 DWORD per connection)
Class1 Start offset address to the output data	26112 to 26367 (1 WORD per connection)	6600H to 66FFH (1 WORD per connection)	7730176 to 7730687 (1 DWORD per connection)	75F400H to 75F5FFH (1 DWORD per connection)
Data link status (Class1)	27136 to 27151	6A00H to 6A0FH	7734272 to 7734287	760400H to 76040FH
Error status (Class1)	27152 to 27167	6A10H to 6A1FH	7734288 to 7734303	760410H to 76041FH
Reserved station (Class1)	27168 to 27183	6A20H to 6A2FH	7734304 to 7734319	760420H to 76042FH
Class1 Connection Behavior Error status (input)	27392 to 27647 (1 WORD per connection for input and output)	6B00H to 6BFFH (1 WORD per connection for input and output)	7734528 to 7735039	760500H to 7606FFH
Class1 Connection Behavior Error status (output)			7735040 to 7735551	760700H to 7608FFH
Class1 cyclic pause specification	—	—	7735808 to 7735823	760A00H to 760A0FH
Class1 cyclic pause status	—	—	7735824 to 7735839	760A10H to 760A1FH
Class1 Block assurance specification per connection (connection input data update state)	32768 to 33023	8000H to 80FFH	—*1	—*1
Class1 Block assurance specification per connection (connection output data update state)	33024 to 33279	8100H to 81FFH	—*1	—*1
Connection information (Status)	28291 to 28294	6E83H to 6E86H	—	—
Connection information (Counter)	28295 to 28305	6E87H to 6E91H	—	—
Connection information (Diagnostic)	28306 to 28325	6E92H to 6EA5H	7737344 to 7742463 (20 WORD per connection)	761000H to 7623FFH (20 WORD per connection)
Connection information (Send Socket Diagnostic)	28326 to 28333	6EA6H to 6EADH	—	—
Connection information (Receive Socket Diagnostic)	28334 to 28341	6EAEH to 6EB5H	—	—

*1 The RJ71GN11-EIP does not support the block assurance per connection which is performed by using buffer memory.

3 FUNCTIONAL COMPARISON

For more details, refer to the manuals of each module. (☞ Page 30 RELEVANT MANUALS)
For the differences in communication specifications between the RJ71EIP91 and the RJ71GN11-EIP, refer to Page 3 Communication Specifications.

3.1 Between the RJ71EIP91 and the RJ71GN11-EIP(P1)

○: Supported, ×: Not supported

Item	Functions	Description	RJ71EIP91	RJ71GN11-EIP (P1: CC-Link IE TSN)
Ethernet connection	Connection with MELSOFT products	Programming and monitoring the programmable controller are performed from the engineering tool via Ethernet. Monitoring and testing the programmable controller are performed from the GOT via Ethernet.	×	○
	Connection with SLMP-compatible devices	Connects SLMP-compatible devices (such as a personal computer or a vision sensor) to the CC-Link IE TSN Plus module.	×	○
	Socket communications	Using dedicated instructions, arbitrary data can be exchanged with an external device connected by Ethernet over TCP/IP or UDP/IP.	×	○
Security	IP filter	Identifies the IP address of the access source, and prevents unauthorized access.	×	○
	Remote password	Permits or prohibits access from the external device to the CPU module via the CC-Link IE TSN Plus module.	×	○

3.2 Between the RJ71EIP91 and the RJ71GN11-EIP(P2)

○: Supported, ×: Not supported

Item	Functions	Description	RJ71EIP91	RJ71GN11-EIP (P2: EtherNet/IP)
EtherNet/IP communications	Cyclic transmission stop and restart	Stop or restart of cyclic transmission is enabled individually for each connection by using buffer memory areas.	×	○
	Communication status setting function at the occurrence of a CPU stop error	Sets whether to stop or continue EtherNet/IP communications when RUN state is changed to STOP state or a stop error occurs on a CPU module on which the CC-Link IE TSN Plus module is mounted.	○	○
	EtherNet/IP communication automatic start function	With this function, EtherNet/IP communications can be started without any program when the programmable controller is powered off and on.	×	○
	Auto refresh	Data is automatically transferred to the device of the CPU module without programs.	×	○
Ethernet connection	Connection with SLMP-compatible devices	Connects SLMP-compatible devices (such as a personal computer or a vision sensor) to the CC-Link IE TSN Plus module.	×	○
	Socket communications	Using dedicated instructions, arbitrary data can be exchanged with an external device connected by Ethernet over TCP/IP or UDP/IP.	×	○
Security	IP filter	Identifies the IP address of the access source, and prevents unauthorized access.	×	○
	Remote password	Permits or prohibits access from the external device to the CPU module via the CC-Link IE TSN Plus module.	×	○
RAS	IP address duplication detection	If one network has stations with the same IP address, duplication is detected.	×	○

3.3 Differences in EtherNet/IP functions of the engineering tool

The following table lists the differences in EtherNet/IP functions of the engineering tool.

○: Supported, ×: Not supported

Item	Functions	Description	RJ71EIP91	RJ71GN11-EIP
Module setting	Module setting using GX Works3	By using GX Works3, settings including the station number and IP address of the module are configured.	○	○
	EtherNet/IP communication setting	By using GX Works3, settings related to EtherNet/IP communications are configured.	○*1	○
Network detection	Network detection	EtherNet/IP devices on the network are detected and EtherNet/IP communication settings are configured online.	○*1	○*2
Parameter write	Writing to the CPU module	The parameters set in GX Works3 are written to the CPU module.	○	○
	Writing to a network module	The EtherNet/IP communication settings are written to the network module.	○*1	○*3
Troubleshooting	Diagnostics using buffer memory	By using GX Works3, the EtherNet/IP network status is checked on buffer memory areas.	○	○
	Network diagnostics	By using the EtherNet/IP configuration tool, the connection status of EtherNet/IP devices can be checked.	○*1	○*4

*1 To configure settings, start the EtherNet/IP Configuration Tool by using GX Works3.
*2 To use the function, the RJ71GN11-EIP with the firmware version "04" or later and the EtherNet/IP configuration tool version 1.03D or later should be required.
*3 These settings are written to the network module all at once when they are written to the CPU module.
*4 It is checked by using the intelligent function module monitor of GX Works3 version 1.090U or later.

4 REPLACEMENT PROCEDURES

This chapter describes how to replace the MELSEC iQ-R EtherNet/IP network interface module (RJ71EIP91) with the MELSEC iQ-R CC-Link IE TSN plus master/local modules (RJ71GN11-EIP).
For details, refer to the following.
📖 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual (SH-082472ENG)

4.1 Overview

The replacement procedure is shown below.

1. Module installation (☞ Page 12 Module Installation)
2. Cable check and connection (☞ Page 12 Cable Check and Connection)
3. Module parameter setting (☞ Page 13 Module Parameter Setting)
4. EtherNet/IP communication parameter setting (☞ Page 15 EtherNet/IP Communication Parameter Setting)
5. Program modification (☞ Page 27 Program Modification)
6. System operation check (☞ Page 29 System Operation Check)

4.2 Module Installation

Install the RJ71GN11-EIP to a base unit to structure the system.
For details, refer to the following.
📖 MELSEC iQ-R Module Configuration Manual (SH-081262ENG)

4.3 Cable Check and Connection

When using EtherNet/IP, connect a Ethernet cable to the P2.
For details, refer to the following.
📖 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual (SH-082472ENG)

4.4 Module Parameter Setting

Add the CC-Link IE TSN Plus module to the engineering tool.

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

The basic setting and application setting are included in the parameter settings. Select one of the settings shown in the window below.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ RJ71GN11-EIP(T+E) ⇨ [Port2 Module Parameter (EtherNet/IP)]

After setting the parameters, click the [Apply] button.

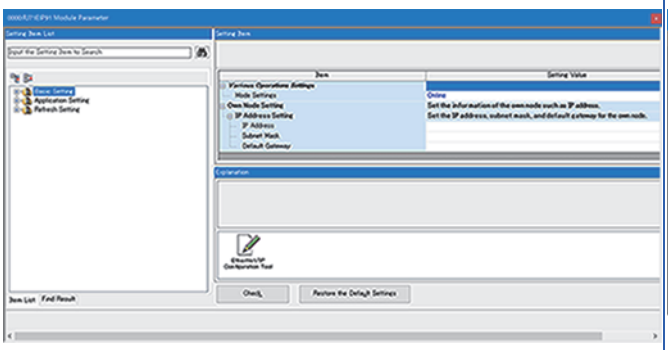
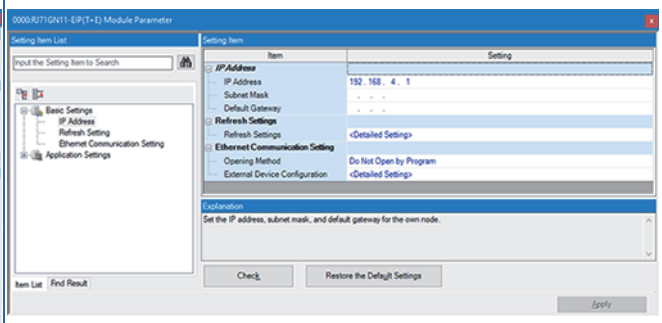
For details, refer to the following.

MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual (SH-082472ENG)

Basic setting

Set the IP address and subnet mask for the CC-Link IE TSN Plus module as follows.

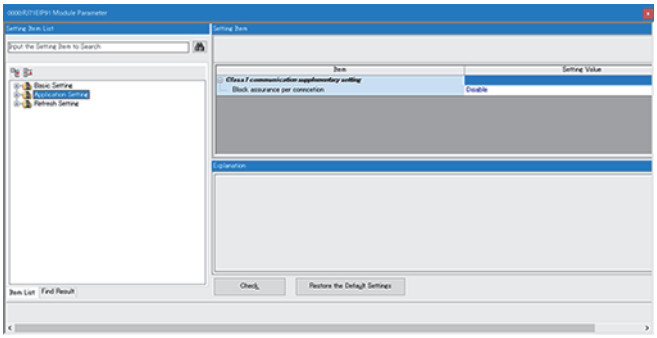
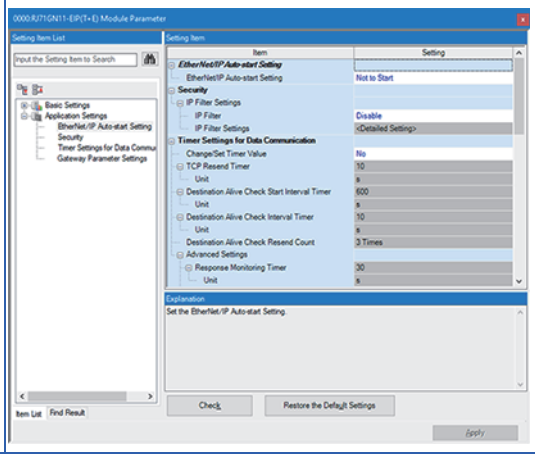
[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ RJ71GN11-EIP(T+E) ⇨ [Port2 Module Parameter (EtherNet/IP)] ⇨ [Basic Setting] ⇨ [IP Address Setting]

RJ71EIP91	RJ71GN11-EIP
	

Item	Default	Setting value	Remarks
IP address, 1st octet	192	0 to 223	Always set the value that matches the actual system.
IP address, 2nd octet	168	0 to 255	
IP address, 3rd octet	4	0 to 255	
IP address, 4th octet	1	1 to 254	
Subnet mask, 1st octet	Blank	128 to 255	
Subnet mask, 2nd octet	Blank	0 to 255	
Subnet mask, 3rd octet	Blank	0 to 255	
Subnet mask, 4th octet	Blank	0 to 252	

Application setting

The RJ71GN11-EIP does not support the block assurance per connection which is performed.
When the block assurance per connection is enabled for the RJ71EIP91, enabling the refresh setting in the RJ71GN11-EIP basic setting prevents data inconsistency. For details, refer to manuals of used module.

RJ71EIP91	RJ71GN11-EIP
	

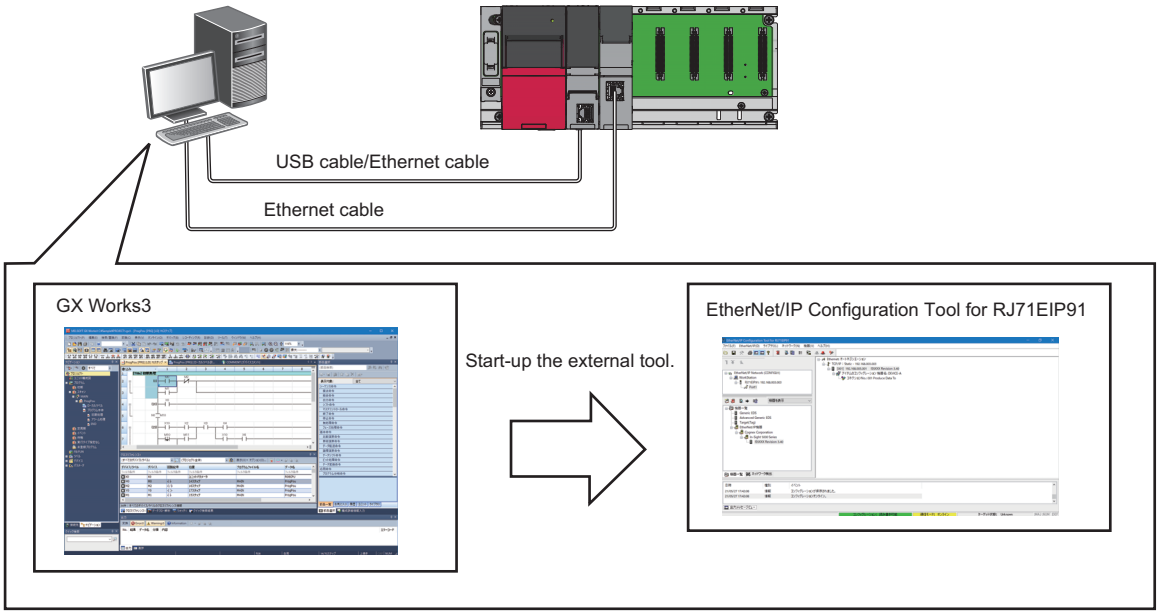
4.5 EtherNet/IP Communication Parameter Setting

The parameter setting method differs between the RJ71EIP91 and the RJ71GN11-EIP.

Set module	Module parameters	Parameters for the EIP communications
RJ71EIP91	• Use GX Works3. • The parameters are written directly to the CPU module.*1	• Use the EtherNet/IP Configuration Tool for RJ71EIP91. • The parameters are written to the RJ71EIP91 via network.
RJ71GN11-EIP	• Use GX Works3. • The parameters are written directly to the CPU module.*1	• Use the EtherNet/IP configuration tool. • The parameters are written directly to the CPU module.*1

*1 The parameters are written by connecting an Ethernet cable or USB cable to the CPU module.

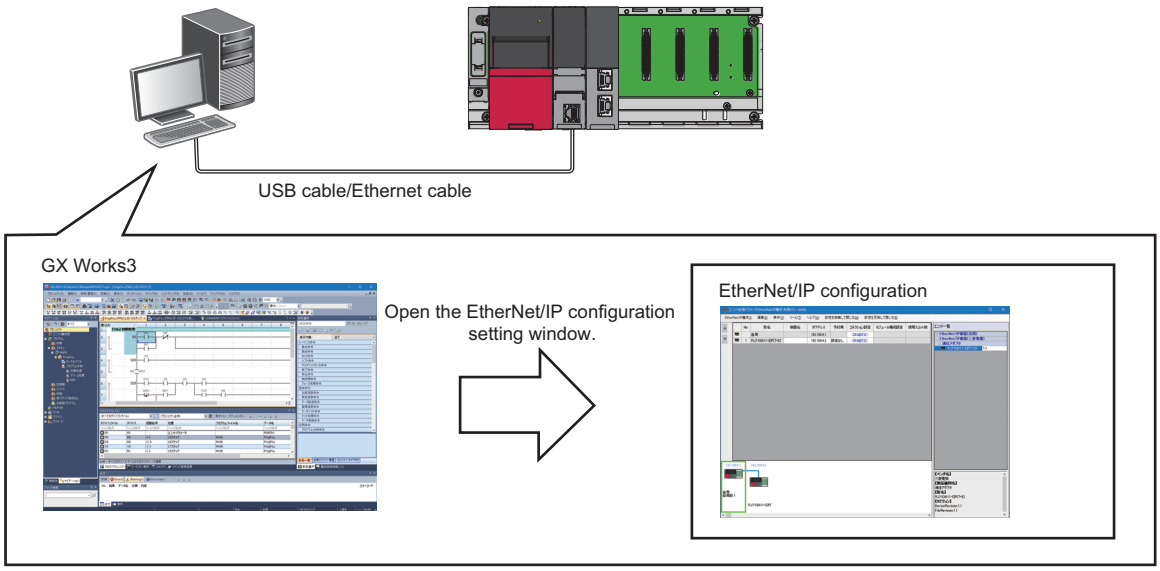
Parameter setting method for the RJ71EIP91



Parameters that are written directly to the CPU module by using GX Works3
- IP address setting
- Refresh setting (ladder diagram setting)
- EtherNet/IP communication start request

Parameters that are written to the RJ71EIP91 by using the EtherNet/IP Configuration Tool for RJ71EIP91 via network
- Originator setting
- Target setting

Parameter setting method for the RJ71GN11-EIP



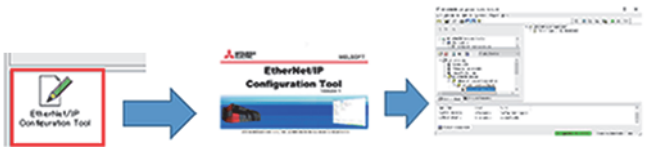
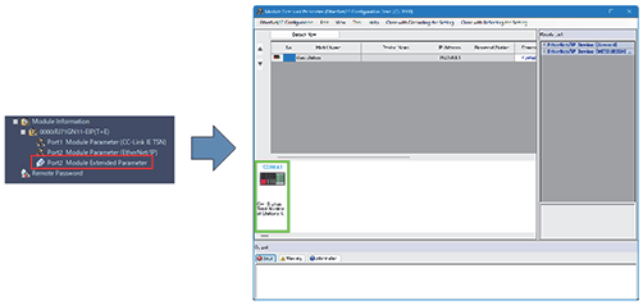
Parameters that are written directly to the CPU module by using GX Works3

- IP address setting
- Refresh setting (ladder diagram setting)
- EtherNet/IP communication start request
- Originator setting*1
- Target setting*1

*1 Setting is performed by using the EtherNet/IP configuration tool.

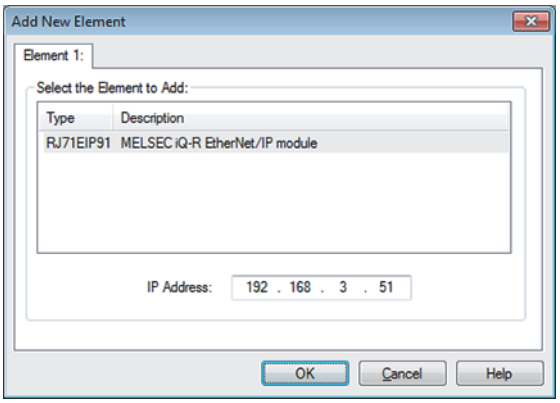
Setting tool startup

Start up the setting tool from the navigation window in the GX Works3.

RJ71EIP91	RJ71GN11-EIP
Start the EtherNet/IP Configuration Tool from the module parameter explanation column.	Double-click "Port2 Module Extended Parameter" in the navigation window in the GX Works3.
	

IP address setting

Set the originator IP address.

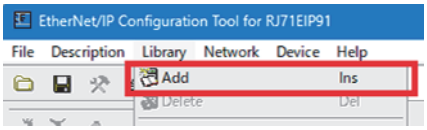
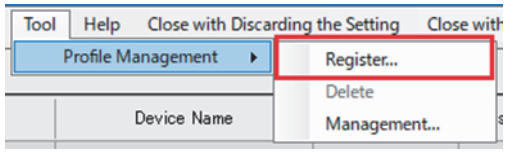
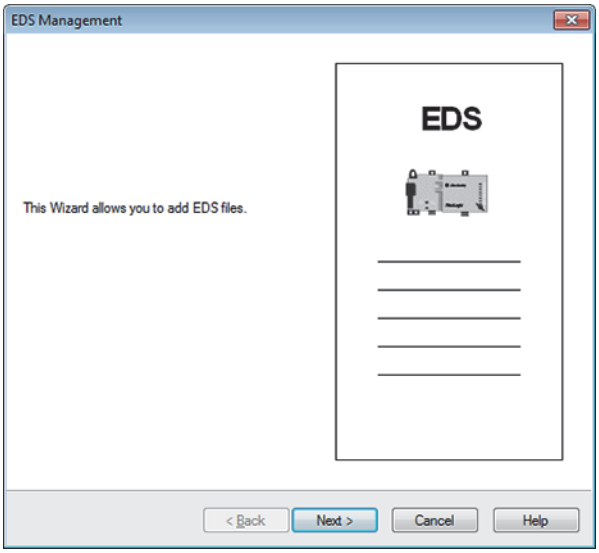
RJ71EIP91	RJ71GN11-EIP
When EtherNet/IP Configuration Tool is activated, the [Add New Element] window appears. Enter the same IP address as set in the module parameters. 	No applicable step. The IP address set in module parameters is used, so no user input required.

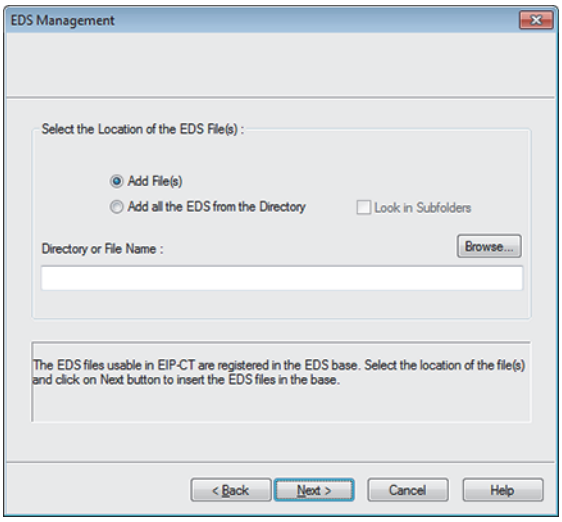
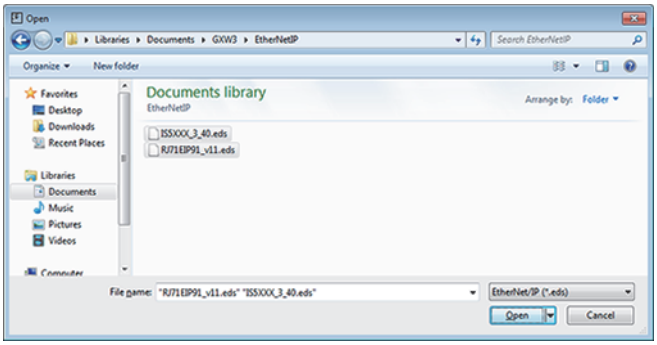
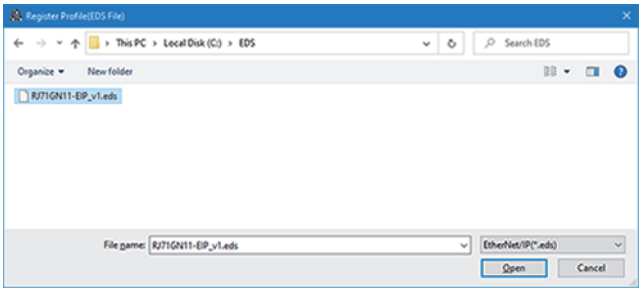
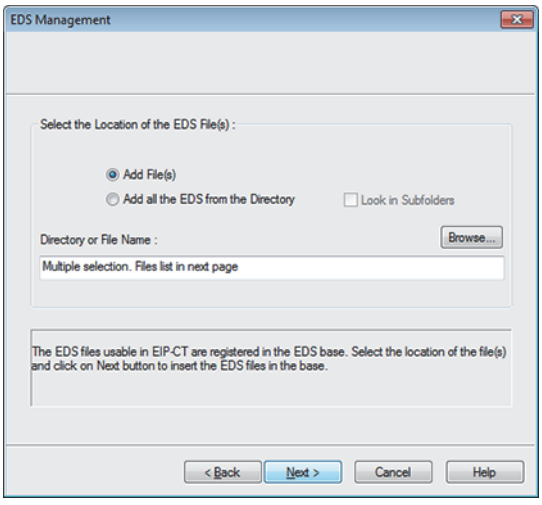
Addition of EDS files

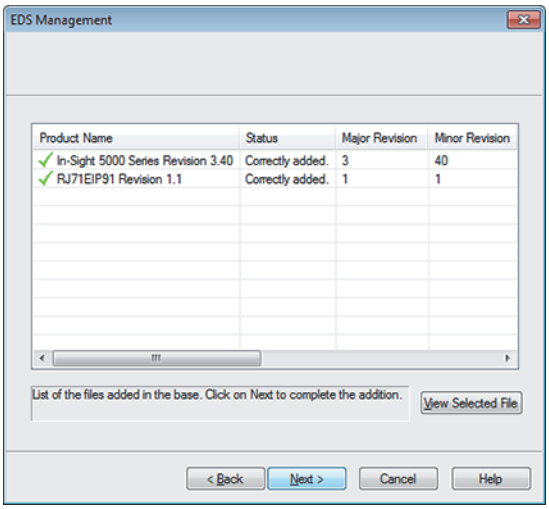
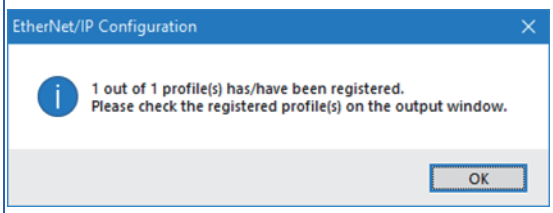
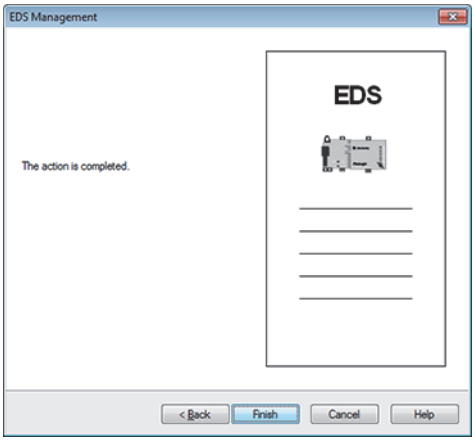
Open the dialog for registering EDS files from the basic menu to set.

The EDS files used in the RJ71EIP91 are saved in the "EDS" folder in the folder where project files are saved. Its configuration path can be checked in the Configuration Manager window.

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

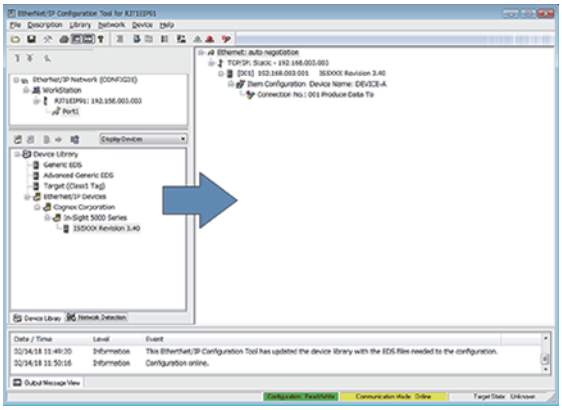
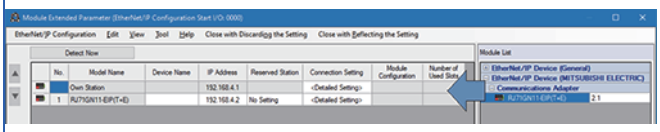
RJ71EIP91	RJ71GN11-EIP
Basic menu ⇨ [Library] ⇨ [Add] 	Basic menu ⇨ [Tool] ⇨ [Profile Management] ⇨ [Register...] 
Click [Next] in the [EDS Management] window. 	No applicable step.

RJ71EIP91	RJ71GN11-EIP
Open the file selection dialog and click the [Browse...] button. 	No applicable step.
Select the EDS file to be registered and click the [Open] button. 	Select the EDS file to be registered and click the [Open] button. 
Click the [Next] button to register. 	No applicable step. Registration is executed once the [Open] button is clicked.

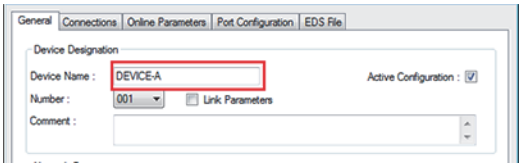
RJ71EIP91	RJ71GN11-EIP
The result of the process is displayed. Confirm that the EDS file is added to [Device Library] and click the [Next] button. 	The result of the process is displayed. Confirm that the EDS file is added to [Module List] and click the [OK] button. 
Close the dialog for registering EDS files. Click the [Finish] button. 	No applicable step. The dialog for registering EDS files is closed once the [OK] button is clicked.
The results of EDS file addition are displayed on the [Output Message View] window.	The results of EDS file addition are displayed on the [Output Window].

Originator setting

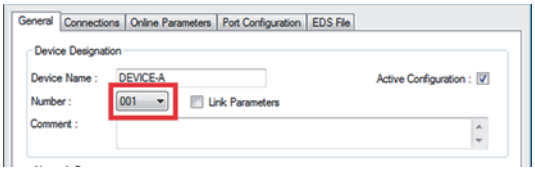
Add the EtherNet/IP device to the network configuration.

RJ71EIP91	RJ71GN11-EIP
Select the EtherNet/IP devices from [Device Library] and follow the steps below to open the EtherNet/IP device setting window. • Basic menu [Library] ⇨ [Insert in Configuration] • Right-click to pull-down menu [Insert in Configuration]. • Drag and drop. 	Select the EtherNet/IP device from [Module List] and follow the steps below. • Right-click to pull-down menu [Add to EtherNet/IP Configuration]. • Drag and drop. 

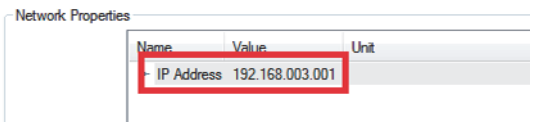
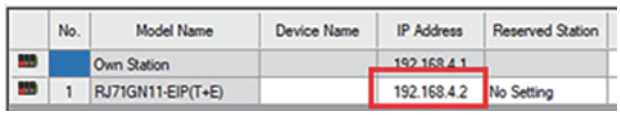
Set the model that matches the RJ71EIP91.

RJ71EIP91	RJ71GN11-EIP
[General] tab 	Set the model that matches the RJ71EIP91. 

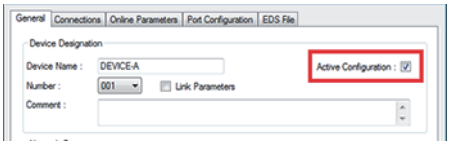
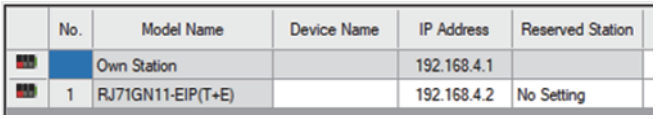
Set the device number. There are no applicable settings for the RJ71EIP91.

RJ71EIP91	RJ71GN11-EIP
[General] tab 	No applicable setting items.

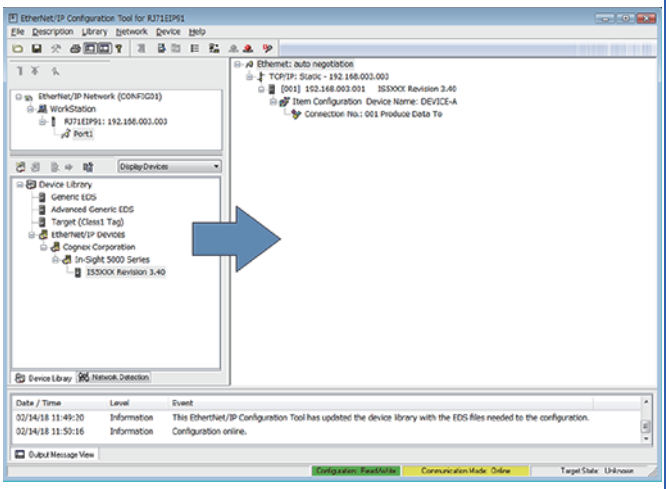
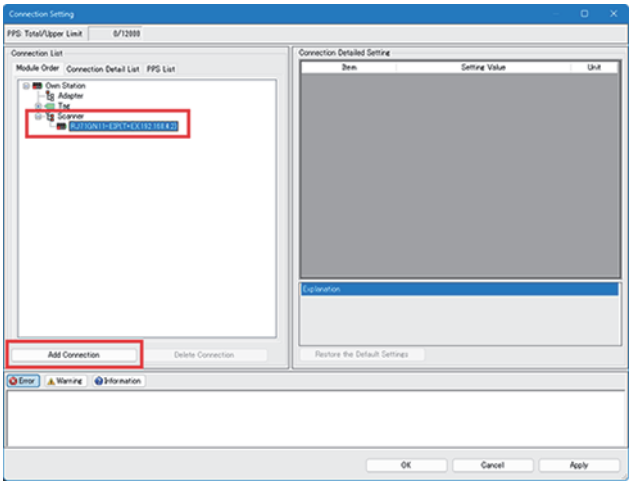
Set the IP address that matches the RJ71EIP91.

RJ71EIP91	RJ71GN11-EIP
[General] tab 	Set the model that matches the RJ71EIP91. 

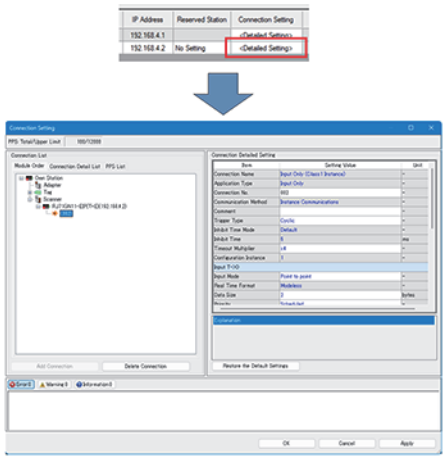
Set the reserved station that matches the RJ71EIP91.

RJ71EIP91	RJ71GN11-EIP
[General] tab 	Set the model that matches the RJ71EIP91. 

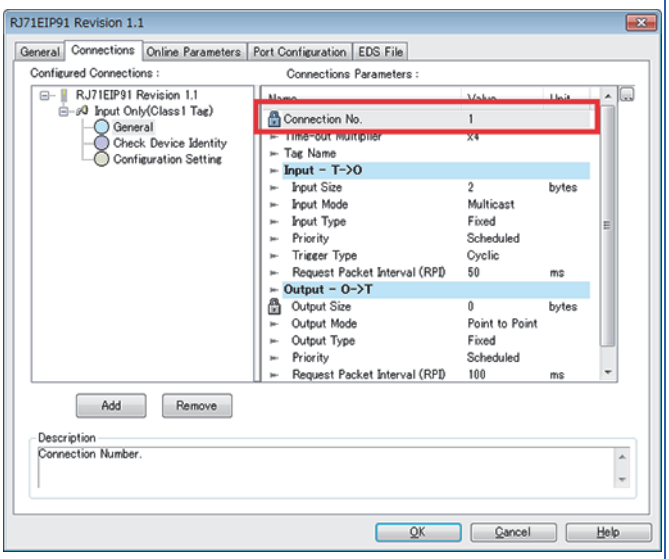
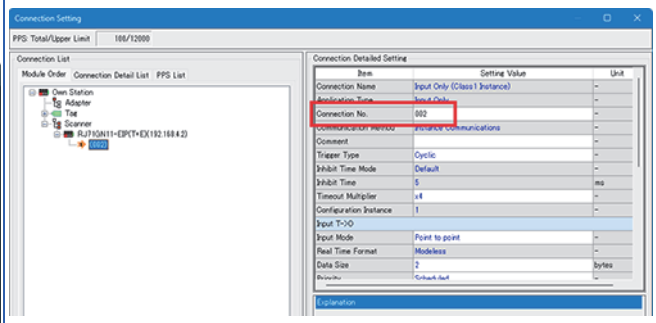
Add the connection that matches the RJ71EIP91 to the network configuration.

RJ71EIP91	RJ71GN11-EIP
Select the EtherNet/IP devices from [Device Library] and follow the steps below to open the EtherNet/IP device setting window. • Basic menu [Library] ⇨ [Insert in Configuration] • Right-click to pull-down menu [Insert in Configuration]. • Drag and drop. 	Select [Tag] under [Module Order] in [Connection List] and then click [Add Connection]. 

Open the connection setting window.

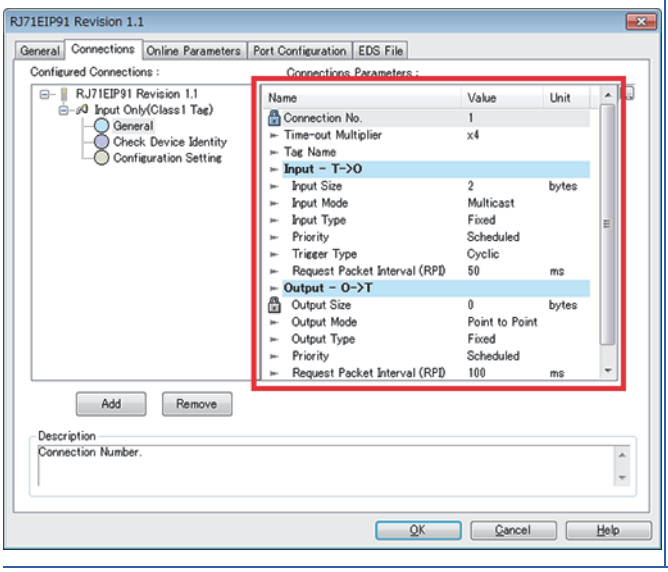
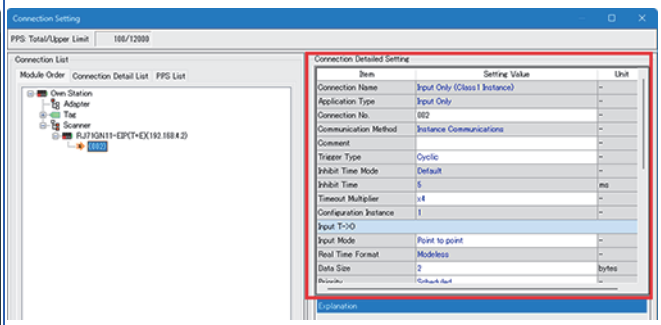
RJ71EIP91	RJ71GN11-EIP
Double-click the added EtherNet/IP device. Switch to the [Connections] tab.	Double-click [<Detailed Settings>] in the [Connection Settings]. 

Set the connection number that matches the RJ71EIP91.

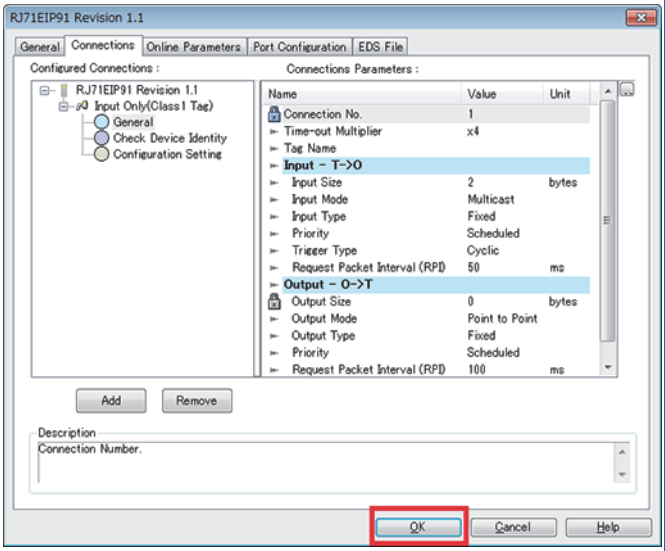
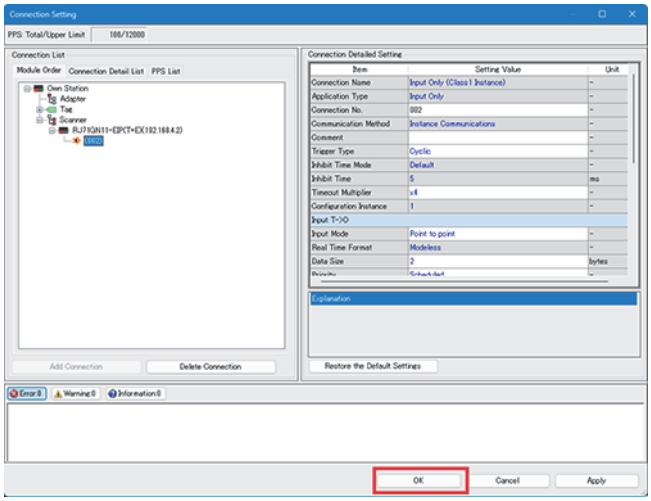
RJ71EIP91	RJ71GN11-EIP
[Connections] tab Connection numbers are assigned in the order in which connections are added. 	Thus, set the connection number that matches the RJ71EIP91.*1 

*1 Otherwise, the connection data used in the program will not be consistent.

Set the connection parameter that matches the RJ71EIP91.

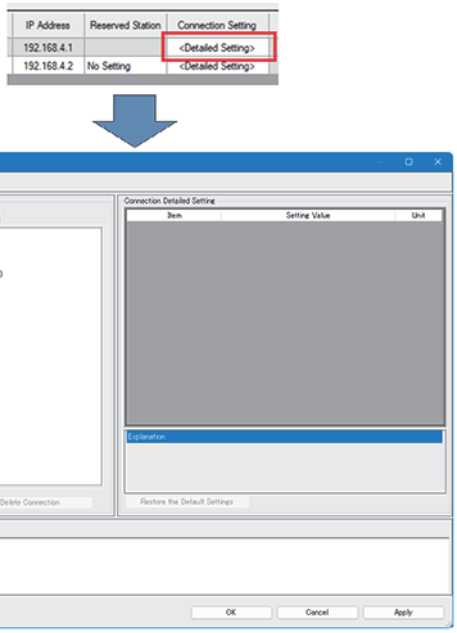
RJ71EIP91	RJ71GN11-EIP
[Connections] tab 	Set the model that matches the RJ71EIP91. 

Click the [OK] button to complete the setting.

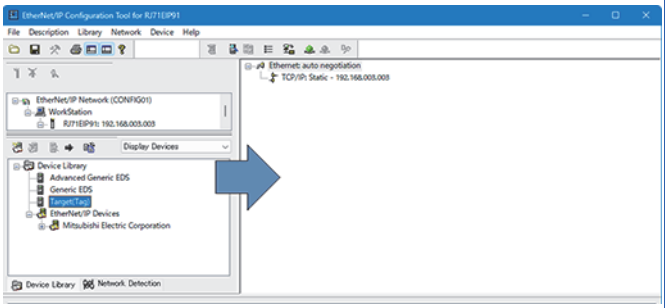
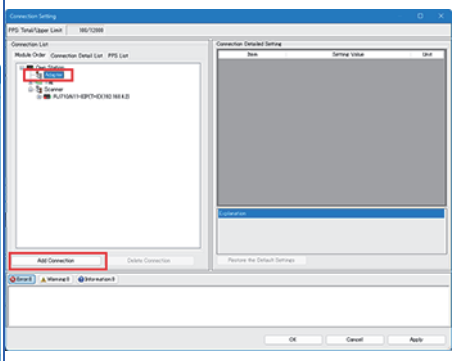
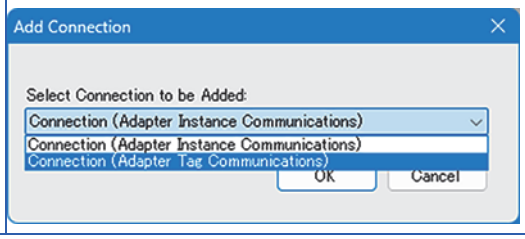
RJ71EIP91	RJ71GN11-EIP
Click the [OK] button.	Click the [OK] button.
	

Target (Tag) setting

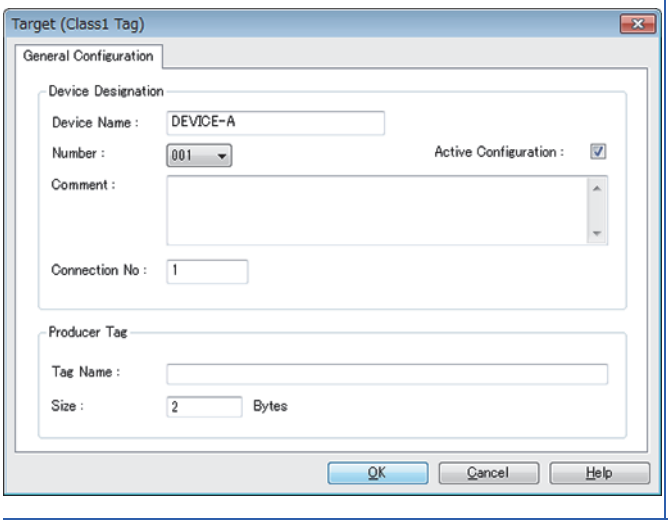
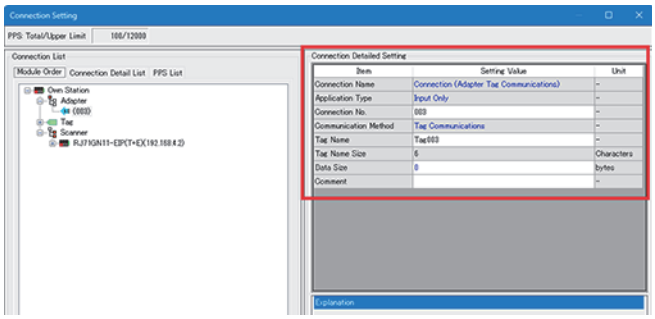
Open the connection setting window.

RJ71EIP91	RJ71GN11-EIP
No applicable step.	Double-click [<Detailed Setting>] in the [Connection Settings] line for the own station. 

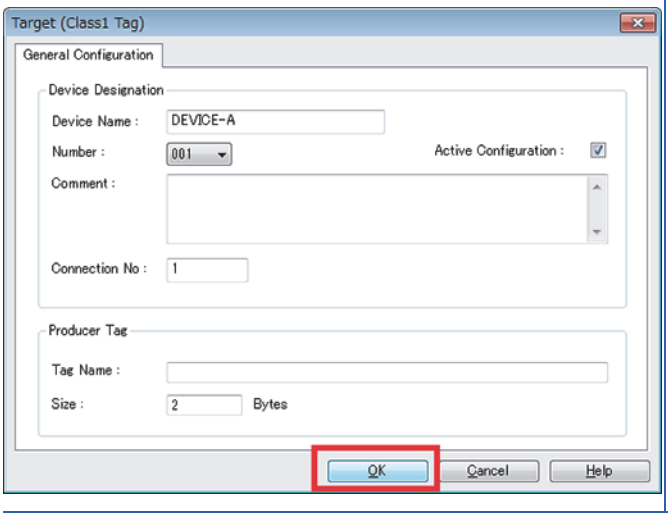
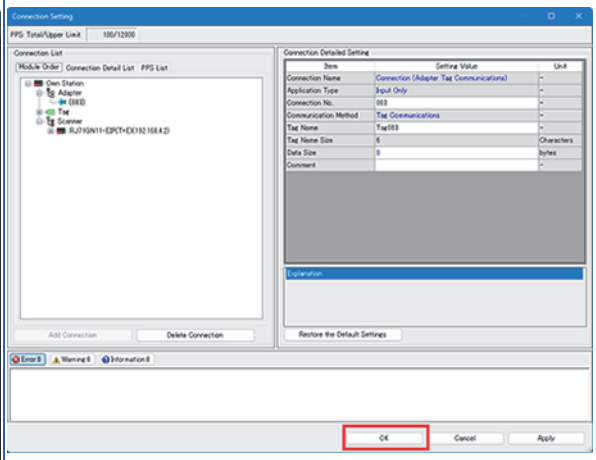
Add the target that matches the RJ71EIP91 to the network configuration.

RJ71EIP91	RJ71GN11-EIP
Select [Target(Tag)] from [Device Library] and follow the steps below to open the EtherNet/IP device setting window. • Basic menu [Library] ⇨ [Insert in Configuration] • Right-click to pull-down menu [Insert in Configuration]. • Drag and drop. 	Select [Adapter] under [Module Order] in [Connection List] and then click [Add Connection]. Select [Connection (Adapter Tag Communications)] in the [Add Connection] window and click the [OK] button.  

Set the connection parameter that matches the RJ71EIP91.

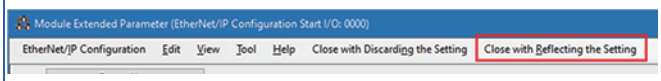
RJ71EIP91	RJ71GN11-EIP
Set parameters. 	Select the added connection and set the connection parameter. 

Click the [OK] button to complete the setting.

RJ71EIP91	RJ71GN11-EIP
Click the [OK] button. 	Click the [OK] button. 

Writing to the module

Close the configuration tool.

RJ71EIP91	RJ71GN11-EIP
No applicable step. Data is written directly to the module from EtherNet/IP Configuration Tool.	Click [Close with Reflecting the Setting] in the Basic menu to exit the setting tool. (Operation window is returned to the GX Works3.) 

Put the device online. There are no applicable steps for the RJ71EIP91.

RJ71EIP91	RJ71GN11-EIP
Basic menu [File] ⇨ [Online mode]	No applicable step.

Open the window for writing data to the module.

RJ71EIP91	RJ71GN11-EIP
Basic menu [File] ⇨ [Download]	In the basic menu of GX Works3, click [Online] ⇨ [Write to PLC].

Execute writing data to the module.

RJ71EIP91	RJ71GN11-EIP
Click the [Download] button.	Select the write target and click the [Execute] button.

4.6 Program Modification

Device change

When changing from the RJ71EIP91 to the RJ71GN11-EIP, change the devices in the RJ71EIP91 program as follows.

Input signals

Item	RJ71EIP91	RJ71GN11-EIP
Device	**Before replacement**	**After replacement**
Module Ready	X0	XF
Own Error	XF	XE
Connection information read completion	X14	Not supported*1
Connection information read error	X15	Not supported*1

*1 Connection information read request is not required because information on 256 connections is saved in the RJ71GN11-EIP buffer memory area.

Output signals

Item	RJ71EIP91	RJ71GN11-EIP
Device	**Before replacement**	**After replacement**
Module error clear request	YF	XE
EtherNet/IP communication start request	Y10	Un\G7340096
Connection information read request	Y14	Not supported*1

*1 Connection information read request is not required because information on 256 connections is saved in the RJ71GN11-EIP buffer memory area.

Buffer Memory

Item	RJ71EIP91	RJ71GN11-EIP
Device	**Before replacement (Address (Decimal))**	**After replacement (Address (Decimal))**
Block assurance specification per connection	16629	— (Not supported)*1
Block assurance state per connection	16630	— (Not supported)*1
Application Trigger operation specification request (Class1)	16631	— (Not supported)*2
Application Trigger operation specification status (Class1)	16632	— (Not supported)*2
EtherNet/IP data link continuation specification request	16634	7340104
EtherNet/IP data link continuation specification state	16635	7340105
Class1 Input data size	16640 to 16895 (1 WORD per connection)	7729152 to 7729407 (1 WORD per connection)
Class1 Output data size	16896 to 17151 (1 WORD per connection)	7729408 to 7729663 (1 WORD per connection)
MAC address	25733 to 25735	7340085 to 7340087
Class1 Input data size	16640 to 16895	7729152 to 7729407
Class1 Output data size	16896 to 17151	7729408 to 7729663
Class1 Start offset address to the input data	25856 to 26111 (1 WORD per connection)	7729664 to 7730175 (2 WORD per connection)
Class1 Start offset address to the output data	26112 to 26367 (1 WORD per connection)	7730176 to 7730687 (2 WORD per connection)
Application Trigger (Class1)	27008 to 27055	— (Not supported)*2
Data link status (Class1)	27136 to 27151	7734272 to 7734287
Error status (Class1)	27152 to 27167	7734288 to 7734303
Reserved station (Class1)	27168 to 27183	7734304 to 7734319
Class1 Connection Behavior Error status (input)	27392 to 27647 (1 WORD per connection for input and output)	7734528 to 7735039 (2 WORD per connection)
Class1 Connection Behavior Error status (output)		7735040 to 7735551 (2 WORD per connection)

Item		RJ71EIP91	RJ71GN11-EIP
Device		**Before replacement (Address (Decimal))**	**After replacement (Address (Decimal))**
PING test request area		27904 to 27907	7340048 to 7340051
PING test response area		27908 to 27911	7340052 to 7340064
PING test request area	Communication time check	27904	7340048
	Transmission count	27905	7340049
	IP Address	27906 to 27907	7340050 to 7340051
PING test response area	Result	27908	—*3
	Total number of packet transmissions	27909	7340052
	Number of success	27910	7340053
	Number of failure	27911	7340054
	Error code	—*3	7340055 to 7340056
Node information area		28160 to 28170	— (Not supported)
Connection information read request area, Connection number destination		28288	— (Not supported)*4
Connection information read response area, Read result		28290	— (Not supported)*4
Connection information		28291 to 28341	7737344 to 7742463*4 (20 WORD per connection)
Class1 Block assurance specification per connection (connection input data update state)		32768 to 33023	— (Not supported)
Class1 Block assurance specification per connection (connection output data update state)		33024 to 33279	— (Not supported)
Class1 Input Area		65536 to 98303	7348224 to 7533055
Class1 Output Area		196608 to 229375	7536640 to 7721471
UCMM communications execution command		393216 to 393249	7749632 to 7749679
UCMM data link request command UCMM data link receive command		393280 to 442431	7751680 to 7753727
EtherNet/IP communication start request		— (Y10)	7340096
EtherNet/IP communication in-process status		— (X10)	7340097 (equivalent to X10)

*1 The RJ71GN11-EIP does not have buffer memory area for the block assurance per connection. Enabling the refresh setting in the RJ71GN11-EIP basic setting prevents data inconsistency.

*2 The RJ71GN11-EIP does not support "Application Trigger", but "Change of State" can be used as an alternative.

*3 The RJ71EIP91 saves the error code in this area when completed with an error, but the RJ71GN11-EIP saves the error code in the error code storage area.

*4 Connection information read request is not required because information on 256 connections is saved in the RJ71GN11-EIP buffer memory area.

Class1 Communications Communication

Ex.
Class1 Communications Communication Example
Change programs in reference with Class1 Communications Communication Example in the following manual.
📖 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual (SH-082472ENG)
If FBs cannot be changed due to insufficient CPU memory caused by an increase in the number of steps, use the auto refresh function and change the program so that it does not include FBs.
For details, refer to programs for the target 2 in the manual.

Replacement of Application Trigger

the RJ71GN11-EIP does not support "Application Trigger", but "Change of State" can be used as an alternative.
For details, refer to manuals of used module.

■"Application Trigger" operation in the RJ71EIP91

Set the trigger type to "Application" in the connection settings to transmit data at a given timing.
Use this function in situations such as when it is temporarily necessary to communicate at an interval that is shorter than the communication cycle in a system that has a long RPI (Requested Packet Interval).
Data transmission is performed according to the following procedure.
Set "Application Trigger operating specification request (Class1)". "Application Trigger request (Class1)" is turned on and "Application Trigger Acceptance (Class1)" is turned on. Then, data stored in "Class1 Output Area" is transmitted.

■"Change of State" operation in the RJ71GN11-EIP

When an output data update is detected, a new frame is sent on the line.
If the RPI (communication cycle) time has elapsed since the last transmission without an output data update, a frame with the same send data as the previous one is automatically sent on the line to maintain the connection.
A new frame cannot be sent on the line before the time (inhibit time) specified for "Inhibit Time" has elapsed since the last transmission. Set the "Inhibit Time" value to match the actual system in the connection detailed settings.

Connection detailed setting	
Inhibit time mode	**Inhibit time (ms)**
Default	A quarter of RPI is used as the inhibit time.
Un-Activated	0ms
Custom	Setting range of 1 to 255

UCMM Message communications communication

Ex.
UCMM Message Communications Communication Example
Change programs in reference with UCMM Message Communications Communication Example in the following manual.
📖 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual (SH-082472ENG)

PING test

Ex.
Program Example of PING Test
Change programs in reference with the Program Example of PING Test in the following manual.
📖 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual (SH-082472ENG)

4.7 System Operation Check

Always read SAFETY PRECAUTIONS in the manual before using the RJ71GN11-EIP. And then, verify the system thoroughly before running it.
For troubleshooting, refer to the following.
📖 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual (SH-082472ENG)

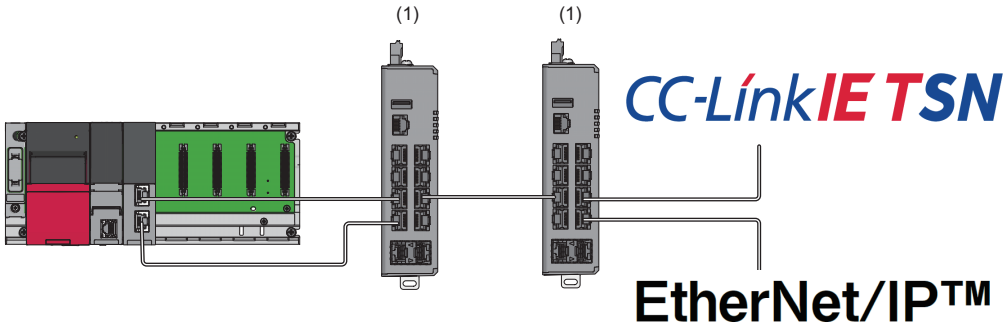
5 PRECAUTIONS

5.1 When Using Two Networks In Combination

To use the CC-Link IE TSN and EtherNet/IP in combination by connecting them to the same switch for the RJ71GN11-EIP, check the precautions on the CC-Link IE TSN system configuration described in the manual and perform the sufficient pre-operation check.

When the Port 1 and Port 2 are configured in a loop through a switch for the RJ71GN11-EIP, packets sent from one port of the module by broadcast together may be received on the other port of the module itself. Please configure the system carefully.

Example of system configuration described above



(1) Industrial switch (compatible with the CC-Link IE TSN Class A or CC-Link IE TSN Class B)

In the above example, attention must be paid to broadcast packet communication due to the loop configuration.

6 RELEVANT MANUALS

📖 MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Startup) (SH-081913ENG)

📖 MELSEC iQ-R EtherNet/IP Network Interface Module User's Manual (Application) (SH-081915ENG)

📖 MELSEC iQ-R CC-Link IE TSN Plus Master/Local Module User's Manual (SH-082472ENG)

REVISIONS

Version	Date of Issue	Revision
A	April 2023	First edition
B	July 2025	Addition of description on replacement from the RJ71EIP91 to RJ71GN11-EIP.

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