

MITSUBISHI Electric Corporation

MELSEC iQ-R Series

Ethernet Driver

Supported version

TOP Design Studio

V1.0 or higher



CONTENTS

We would like to thank our customers for using M2I's "Touch Operation Panel (M2I TOP) Series". Read this manual and familiarize yourself with the connection method and procedures of the "TOP and external device".

1. System configuration [Page 2](#)

Describes the devices required for connection, the setting of each device, cables, and configurable systems.

2. External device selection [Page 3](#)

Select a TOP model and an external device.

3. TOP communication setting [Page 4](#)

Describes how to set the TOP communication.

4. External device setting [Page 9](#)

Describes how to set up communication for external devices.

5. Supported addresses [Page 11](#)

Refer to this section to check the addresses which can communicate with an external device.

1. System configuration

The system configuration of TOP and "MITSUBISHI Electric Corporation - MELSEC iQ-R Ethernet" is as follows:

Series	CPU	Link I/F	Communication method	Communication setting	Cable
MELSEC iQ-R	R04 R04EN R08 R08EN R120 R120EN R16 R16EN R32 R32EN	CPU Built-in Ethernet	Ethernet (TCP/UDP)	3. TOP communication setting 4. External device setting	Twisted pair cable ^{*Note 1)}

*Note 1) Twisted pair cable

- Refer to STP (Shielded Twisted Pair Cable) or UTP (Unshielded Twisted Pair Cable) Category 3, 4, 5.
- Depending on the network configuration, you can connect to components such as the hub and transceiver, and in this case, use a direct cable.

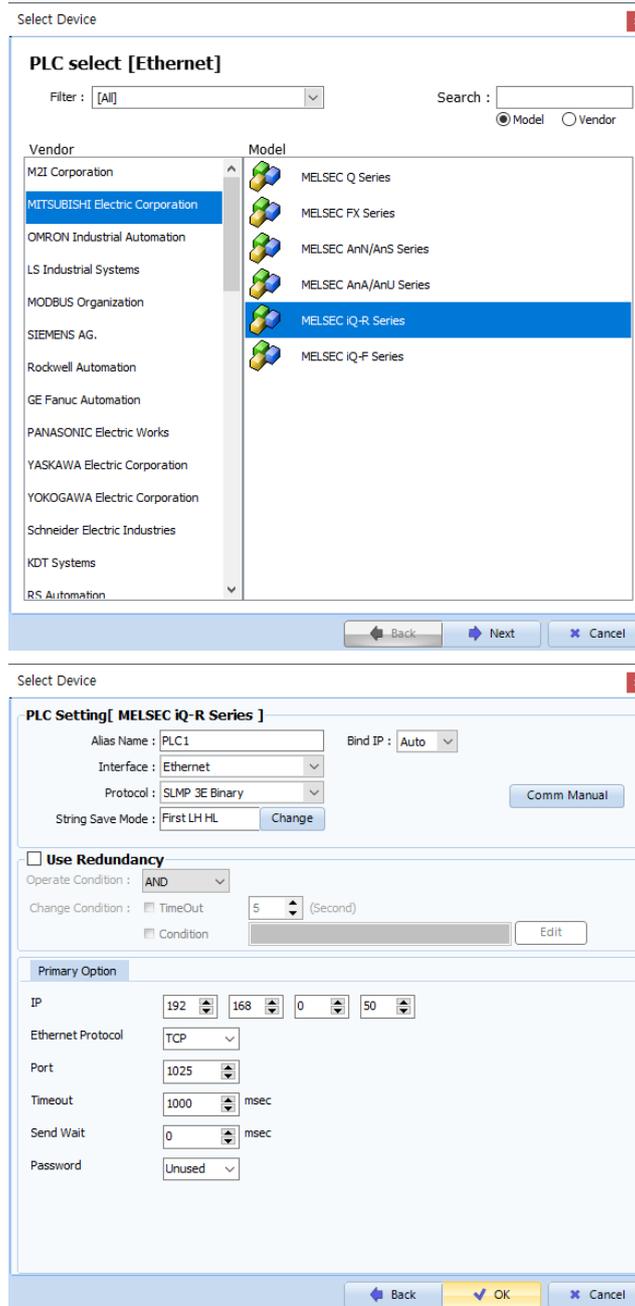
■ Connectable configuration

- 1:1 (one TOP and one external device) connection



2. External device selection

- Select a TOP model and a port, and then select an external device.



Settings		Contents											
TOP	Model	Check the TOP display and process to select the touch model.											
External device	Vendor	Select the vendor of the external device to be connected to TOP. Please select "MITSUBISHI Electric Corporation".											
	PLC	Select the external device to be connected to the TOP. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: black; color: white;">Model</th> <th style="background-color: black; color: white;">Interface</th> <th style="background-color: black; color: white;">Protocol</th> </tr> </thead> <tbody> <tr> <td>MELSEC iQ-R Series</td> <td>CPU Ethernet</td> <td>iQ-R Ethernet (Binary)</td> </tr> <tr> <td colspan="3" style="background-color: #e1eef6;">Supported Protocol</td> </tr> <tr> <td>iQ-R Ethernet</td> <td>(BINARY)</td> <td></td> </tr> </tbody> </table> <p>Please check the system configuration in Chapter 1 to see if the external device you want to connect is a model whose system can be configured.</p>	Model	Interface	Protocol	MELSEC iQ-R Series	CPU Ethernet	iQ-R Ethernet (Binary)	Supported Protocol			iQ-R Ethernet	(BINARY)
Model	Interface	Protocol											
MELSEC iQ-R Series	CPU Ethernet	iQ-R Ethernet (Binary)											
Supported Protocol													
iQ-R Ethernet	(BINARY)												

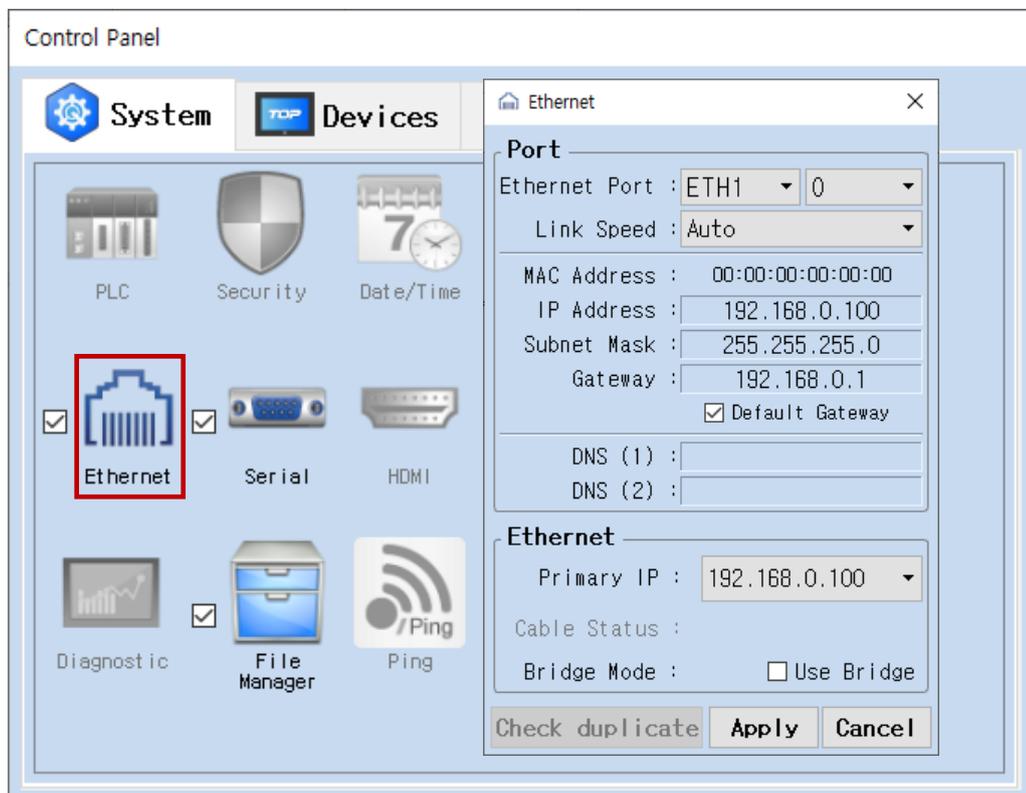
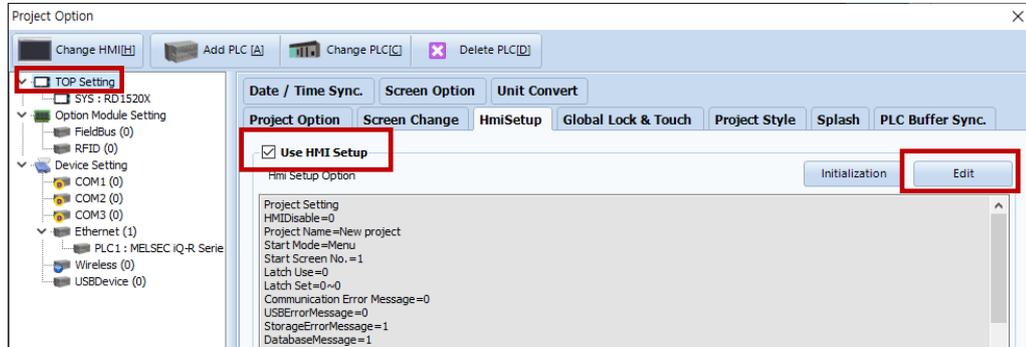
3. TOP communication setting

The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

- [Project > Project Property > TOP Setting] → [Project Options > "Use HMI Setup" Check > Edit > Ethernet]
- Set the TOP communication interface in TOP Design Studio.



Items	TOP	External device	Remarks
IP Address* Note 1 Note 2)	192.168.0.100	192.168.0.51	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

*[Note 1](#)) The network addresses of the TOP and the external device (the first three digits of the IP, 192 . 168 . 0 . 0) should match.

*[Note 2](#)) Do not use duplicate IP addresses over the same network.

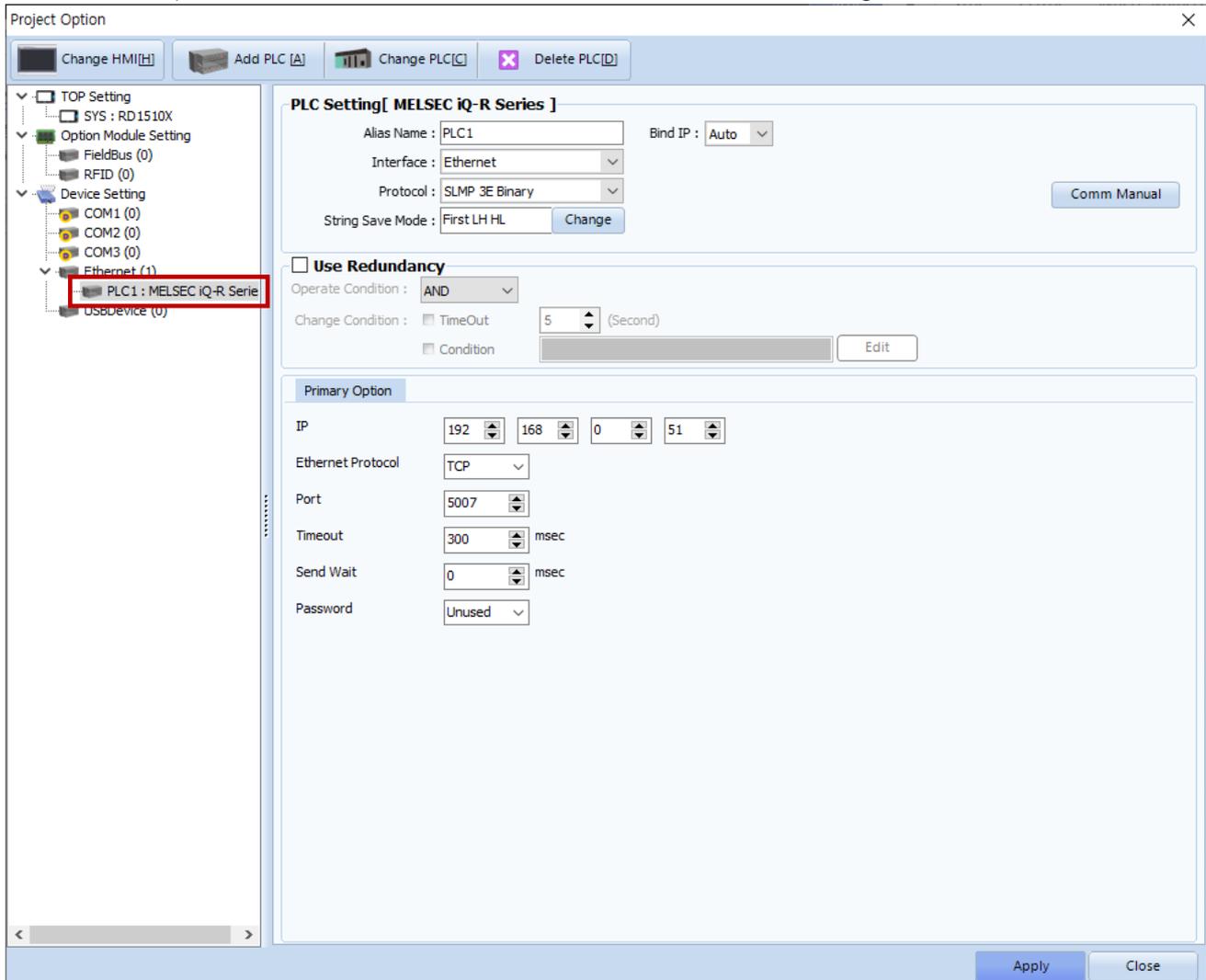
* The above settings are examples recommended by the company.

Items	Description
IP Address	Set an IP address to be used by the TOP to use over the network.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.

(2) Communication option setting

■ [Project > Project Property > PLC Settings > ETHERNET > "PLC1 : MELSEC-iQR Series"]

– Set the options of the MELSEC iQR Series Ethernet communication driver in TOP Design Studio.



Items	Settings	Remarks
Interface	Select "CPU Ethernet".	Refer to "2. External device selection".
Protocol	Select the communication protocol between the TOP and an external device.	
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	
Port	Enter the Ethernet communication port number of an external device.	Reference the table below
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	
HMI TCP PORT	For TCP N:1, set the HMI TCP PORT differently for each HMI.	

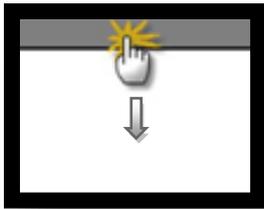
MELFSEC iQ-R Series CPU Communication port no.

Protocol	Port number	Remarks
TCP	5007 _{DEC}	Fixed
UDP	5006 _{DEC}	Fixed

3.2. Communication setting in TOP

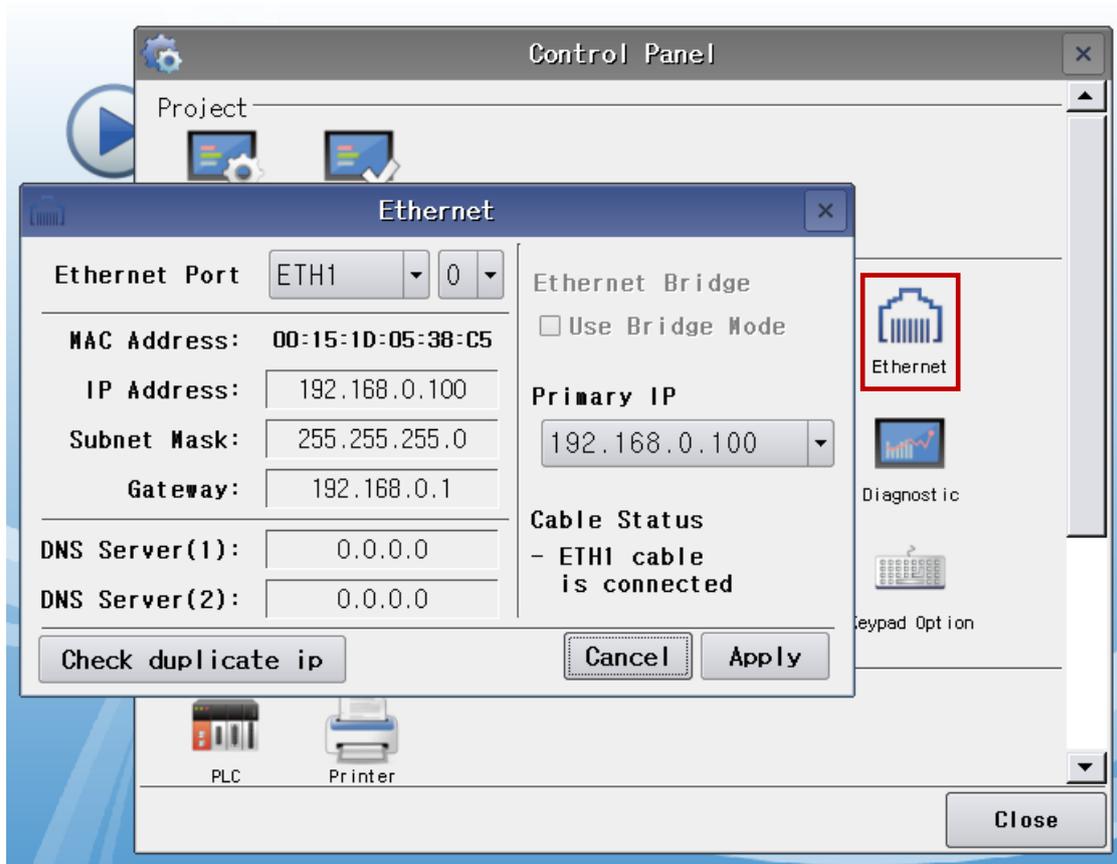
* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.



(1) Communication interface setting

- [Main Screen > Control Panel > Ethernet]



Items	TOP	External device	Remarks
IP Address* Note 1 Note 2)	192.168.0.100	192.168.0.51	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

*[Note 1](#)) The network addresses of the TOP and the external device (the first three digits of the IP, 192 . 168 . 0 . 0) should match.

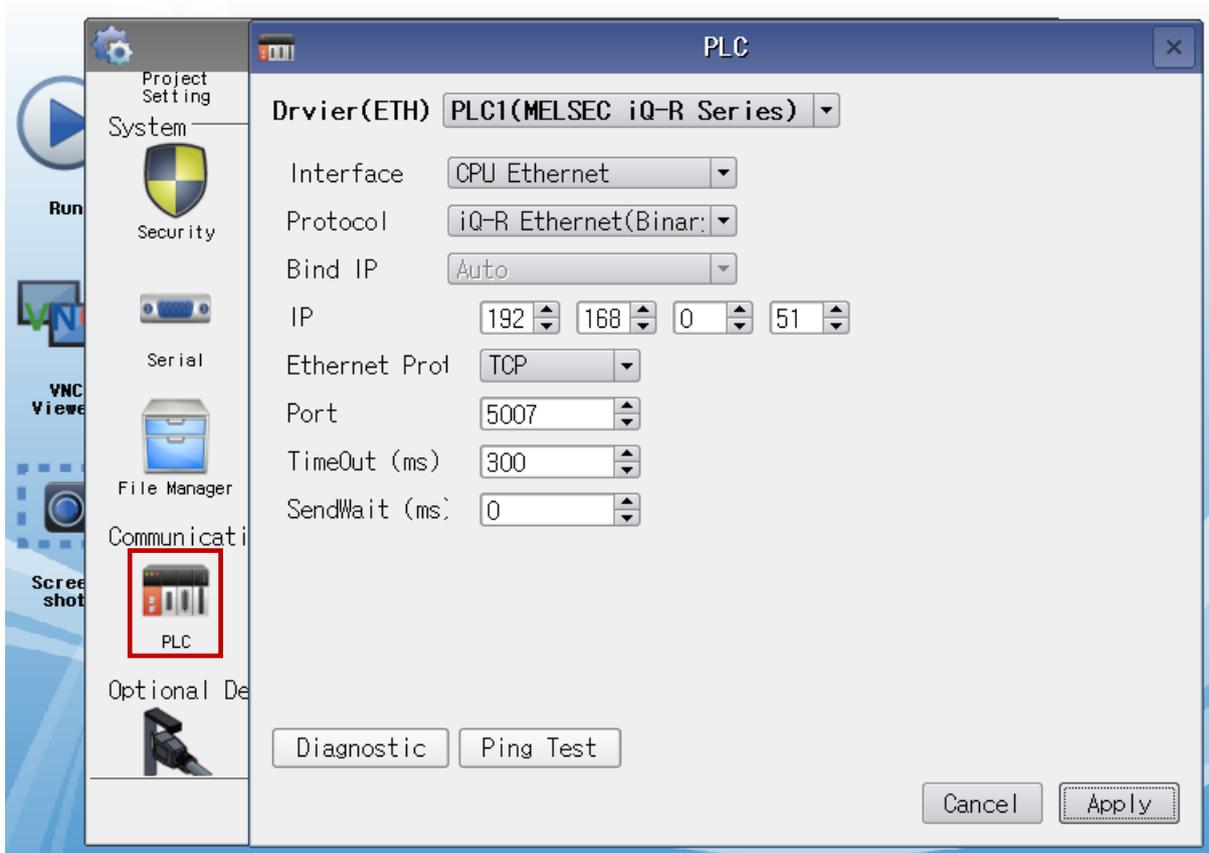
*[Note 2](#)) Do not use duplicate IP addresses over the same network.

* The above settings are examples recommended by the company.

Items	Description
IP Address	Set an IP address to be used by the TOP to use over the network.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.

(2) Communication option setting

■ [Main Screen > Control Panel > PLC]



Items	Settings	Remarks
Interface	Select "CPU Ethernet".	Refer to "2. External device selection" .
Protocol	Select the communication protocol between the TOP and an external device.	Refer to "2. External device selection" .
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	
Port	Enter the Ethernet communication port number of an external device.	Reference the table below
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	
HMI TCP PORT	For TCP N:1, set the HMI TCP PORT differently for each HMI.	

MELFSEC iQ-R Series CPU Communication port no.

Protocol	Port number	Remarks
TCP	5007 _{DEC}	Fixed
UDP	5006 _{DEC}	Fixed

3.3 Communication diagnostics

- Check the interface setting status between the TOP and an external device.
 - Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.
 - Check if the port (ETH1/ETH2) settings you want to use in [Control Panel > Ethernet] are the same as those of the external device.

- Diagnosis of whether the port communication is normal or not
 - Touch "Communication diagnostics" in [Control Panel > PLC].
 - The Diagnostics dialog box pops up on the screen and determines the diagnostic status.

OK	Communication setting normal
Time Out Error	Communication setting abnormal - Check the cable, TOP, and external device setting status. (Reference: Communication diagnostics sheet)

- Communication diagnostics sheet
 - If there is a problem with the communication connection with an external terminal, please check the settings in the sheet below.

Items	Contents	Check		Remarks	
System configuration	How to connect the system	OK	NG	1. System configuration	
	Connection cable name	OK	NG		
TOP	Version information	OK	NG	2. External device selection 3. Communication setting	
	Port in use	OK	NG		
	Driver name	OK	NG		
	Other detailed settings	OK	NG		
	Relative prefix	Project setting	OK		NG
		Communication diagnostics	OK		NG
	Ethernet port setting	IP Address	OK		NG
Subnet Mask		OK	NG		
Gateway		OK	NG		
External device	CPU name	OK	NG	4. External device setting	
	Communication port name (module name)	OK	NG		
	Protocol (mode)	OK	NG		
	Setup Prefix	OK	NG		
	Other detailed settings	OK	NG		
	Ethernet port setting	IP Address	OK		NG
		Subnet Mask	OK		NG
Gateway		OK	NG		
Check address range	OK	NG	5. Supported addresses (For details, please refer to the PLC vendor's manual.)		

4. External device setting

4.1 GX Works3 Connection Settings

Set as below using MELSEC Series Ladder Software "GX Works3". For more detailed setting method than that described in this example, refer to the PLC user manual.



- The network addresses of the TOP and the external device (the first three digits of the IP, 192 . 168 . 0 . 0) should match.
- Do not use duplicate IP addresses over the same network.

Step 1. In [GX Works3] software project window [Parameter] – [relevant CPU model name] double-click and bring up [Module parameter] pop-up window

Step 2. In [Module parameter], select [Basic Settings] tab and set as follows:

Item	Value
Own Node Settings	
Parameter Setting Method	Parameter Editor
IP Address	
IP Address	192 . 168 . 0 . 1
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	192 . 168 . 0 . 1
Enable/Disable Online Change	Disable All (SLMP)
Communication Data Code	Binary
Opening Method	Do Not Open by Program
External Device Configuration	
External Device Configuration	<Detailed Setting>

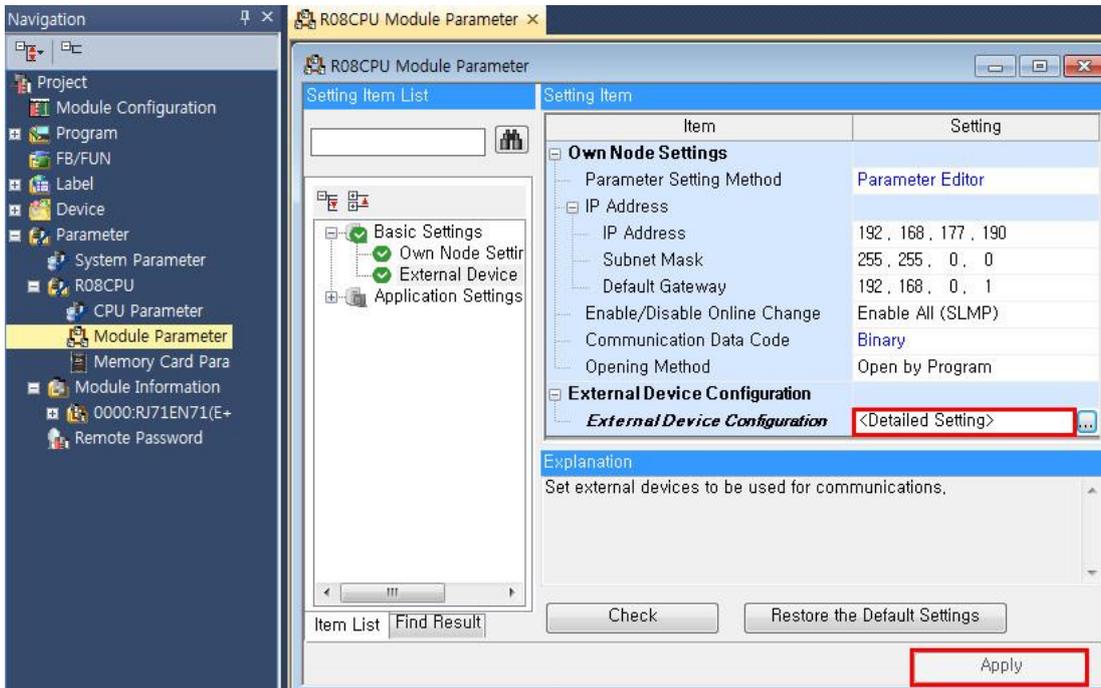
Items	Settings
IP address	MELSEC-iQ-R CPU Ethernet Port Assignment IP
Subnet mask pattern	Set when using subnet mask
Default router IP	Set when using router
Communication data code	Binary code (fixed)
Enable online change	Not used

Step 3. [Online] > Transmit the parameter set to [Write to PLC] and reset the PLC.

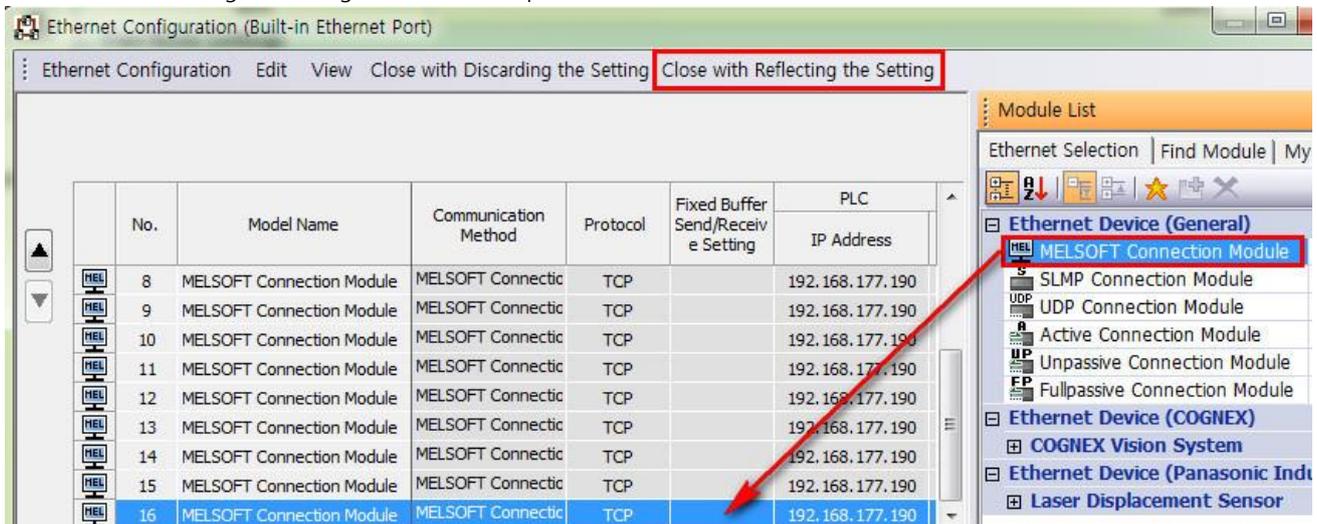
4.2 GX Works3 N:1 setting (*Relevant only for TCP)

Step 1. In [GX Works3] software project window [Parameter] – [relevant CPU model name] double-click and bring up [Module parameter] pop-up window

Step 2. In [Module parameter], select [Detailed Setting on right side of External Device Configuration] tab and set as follows:



Step 3. [Ethernet Configuration] > Drag [MELSOFT Connection Module] from the [Module List] to the left, set it up, and select Close With Reflecting the Setting, as shown in the picture below.



Step 4. In [Module Parameter] window, press Apply.

Step 5. [Online] > Transmit the parameter set to [Write to PLC] and reset the PLC.

5. Supported addresses

The devices available in TOP are as follows:

The device range (address) may differ depending on the CPU module series/type. The TOP series supports the maximum address range used by the external device series. Please refer to each CPU module user manual and be take caution to not deviate from the address range supported by the device you want to use.

Device	Bit Address	Word Address	Word Address NOTE	32 BIT
Input Relay	X0000 ~ X3FFF _(HEX)	X0000 ~ X3FF0 _(HEX)	X***0 *Note 1)	L/H *Note 3)
Output Relay	Y0000 ~ Y3FFF _(HEX)	Y0000 ~ Y3FF0 _(HEX)	Y***0 *Note 1)	
Internal Relay	M0 ~ M161882111	M0 ~ M161882096	M0000 + 16*n *Note 2)	
Special Relay	SM0 ~ SM4095	SM0 ~ SM4080	SM0000 + 16*n *Note 2)	
Latch Relay	L0000 ~ L32767	L0000 ~ L32752	L0000 + 16*n *Note 2)	
Annunciator	F0 ~ F131071	F0 ~ F131056	F0000 + 16*n *Note 2)	
Link Relay	B0 ~ B9A61FFF _(HEX)	B0 ~ B9A61FF0 _(HEX)	B***0 *Note 1)	
Special Link Relay	SB0 ~ SB9A61FFF _(HEX)	SB0 ~ SB9A61FF0 _(HEX)	SB***0 *Note 1)	
Timer (contact)	TS0 ~ TS8993439	-		
Timer (coil)	TC0 ~ TC8993439	-		
Aggregate Timer (contact)	SS0 ~ SS8993439	-		
Aggregate Timer (coil)	SC0 ~ SC8993439	-		
Counter (contact)	CS0 ~ CS8993439	-		
Counter (coil)	CC0 ~ CC8993439	-		
Timer (current value)	TN0.00 ~ TN8993439.15	TN0 ~ TN8993439		
Aggregate Timer (current value)	SN0.00 ~ SN8993439.15	SN0 ~ SN8993439		
Counter (current value)	CN0.00 ~ CN8993439.15	CN0 ~ CN8993439		
Data Register	D0.00 ~ D10117631.15	D0 ~ D10117631		
Special Data Register	SD0.00 ~ SD4095.15	SD0 ~ SD4095		
File Register	R0.00 ~ R32767.15	R0 ~ R32767		
Link special register	SW0.00 ~ SW9A61FF.15 _(HEX)	SW0 ~ SW9A61FF _(HEX)		
Extension file register	ZR0.00 ~ ZR10027007.15	ZR0 ~ ZR10027007		
Index register	Z0.00 ~ Z23.15	Z0 ~ Z23		
Buffer memory	G0.00 ~ G268435455.15	G0 ~ G268435455		
Index register (32bits)	LZ0.00 ~ LZ11.31	LZ0 ~ LZ11		
Link register	W0.00 ~ W9A61FF.15 _(HEX)	W0 ~ W9A61FF _(HEX)		
Long timer contact	LTS0 ~ LTS2529407	-		
Long timer coil	LTC0 ~ LTC2529407	-		
Long timer current value(32bits)	LTN0.00 ~ LTN2529407.31	LTN0 ~ LTN2529407		
Long retentive timer contact	LSS0 ~ LSS2529407	-		
Long retentive timer coil	LSC0 ~ LSC2529407	-		
Long retentive timer current value(32bits)	LSN0.00 ~ LSN2529407.31	LSN0 ~ LSN2529407		

***Note 1)** For bit addresses with hexadecimal "0~F" notations, use the initial 0 bit as the word address

***Note 2)** When using a bit address that uses decimals, use a word address in units of "16"

***Note 3)** The lower 16 BIT data of 32 BIT data is saved in the address whose screen has been registered, and the upper 16 BIT data is saved in the address next to the address whose screen has been registered.

Ex. When saving 32BIT data hexadecimal data 12345678 in address D00100, it is saved to 16BIT device address as follows:

Items	32BIT	16BIT	
	Address	D00100	D00101
Input data (hexadecimal)	12345678	5678	1234