# MITSUBISHI Electric Corporation MELSEC iQ-R Series

# **Ethernet Driver**

Supported version TOP Design Studio V1.0 or higher



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

2. External device selection

#### Page 2

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

#### 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 IQR Ethernet" is as follows:

Series	СРИ	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)	<u>3. TOP</u> <u>communication</u> <u>setting</u> <u>4. External device</u> <u>setting</u>	Twisted pair cable* <sup>Note 1)</sup>

\*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.

elect Device							
PLC select [Et	hernet]						
Filter : [All]			$\sim$	Se	arch :		
			-		0	Model	○ Vendor
Vendor		Model					
M2I Corporation		â 🌮 .	MELSEC Q Serie	s			
MITSUBISHI Electric Cor	poration	8	MELSEC FX Serie	es			
OMRON Industrial Auton	nation	8	MELSEC AnN/An	S Series			
LS Industrial Systems			MELSEC AnA/An	11 Series			
MODBUS Organization							
SIEMENS AG.			MELSEC iQ-R Se				
Rockwell Automation			MELSEC iQ-F Se	ries			
GE Fanuc Automation							
PANASONIC Electric Wo	rks						
YASKAWA Electric Corpo	ration						
YOKOGAWA Electric Cor	poration						
Schneider Electric Indust	ries						
KDT Systems							
RS Automation		~					
				Back	🔹 Nex		× Cancel
PLC Setting[ MELS Alias Name :		eries ]	Bind IP	: Auto ~			
Interface :			~	, Hato -			
Protocol :	SLMP 3E Bir	hary	$\sim$			Comm	Manual
String Save Mode :	First LH HL	Cha	nge				
Use Redundanc	v						
Operate Condition : AI	•		_				
Change Condition : 🔲		5	(Second)				
	Condition					Edit	J
Primary Option							
	192 🚔	168	0 膏 50	•		(	
Primary Option		168	0 🔹 50				
Primary Option IP	ТСР		0 🚺 50				
Primary Option IP Ethernet Protocol	TCP	~	0 🚺 50	V			
Primary Option IP Ethernet Protocol Port	TCP 1025 [ 1000 [	<ul> <li>✓</li> <li>✓</li> </ul>	0 💽 50				
Primary Option IP Ethernet Protocol Port Timeout	TCP           1025         [           1000         [           0         [	✓ ✓ ✓ ✓ Msec	0				
Primary Option IP Ethernet Protocol Port Timeout Send Wait	TCP           1025         [           1000         [           0         [	✓ msec msec	0 💽 50	A y			
Primary Option IP Ethernet Protocol Port Timeout Send Wait	TCP           1025           1000           0	✓ msec msec	0	•			
Primary Option IP Ethernet Protocol Port Timeout Send Wait	TCP           1025           1000           0	✓ msec msec	0	•			

Sett	tings	Contents			
ТОР	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			
		Model	Interface	Protocol	
		MELSEC IQR Series	CPU Ethernet	iQ-R Ethernet (Binary)	
		Supported Protocol			
		iQ-R Ethernet	(BINARY)		
		Please check the system config connect is a model whose syste		the external device you want to	



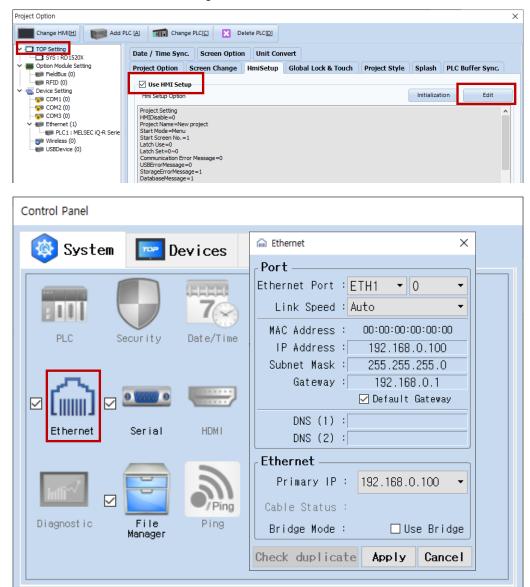
# 3. TOP communication setting

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	ТОР	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.

Project Option	×
Change HMI[H] Mdd PLC [A] The Change PLC C C Delete PLC D	
PLC Setting MELSEC k2-R Series ] Alss Name : PLC1 Bind IP : Auto v Period Setting PCC Setting MELSEC k2-R Series ] Alss Name : PLC1 Bind IP : Auto v Protocol : [LMP ZE Binary v COM2 (0) COM2 (0)	Comm Manual
	Apply Close

Items	Settings	Remarks
Interface	Select "CPU Ethernet".	Refer to "2. External
Protocol	Select the communication protocol between the TOP and an external device.	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.

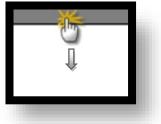
Protocol	Port number	Remarks
TCP	5007 <sub>DEC</sub>	Fixed
UDP	5006 dec	Fixed



#### 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 ]

<b>(</b> \$		Control Panel	×
Project			<b>_</b>
	Ethernet	×	
Lunnj	Ethernet	<b>_</b>	
Ethernet Port	ETH1 • 0 •	Ethernet Bridge	
MAC Address:	00:15:1D:05:38:C5	🗌 Use Bridge Mode	[        ] Ethernet
IP Address:	192.168.0.100	Primary IP	
Subnet Mask:	255.255.255.0	192.168.0.100 💌	Interve
Gateway:	192.168.0.1		Diagnostic
DNS Server(1):	0.0.0.0	Cable Status - ETH1 cable	
DNS Server(2):	0.0.0.0	is connected	
			eypad Option
Check duplicat	te ip	Cancel Apply	
PLC	Printer		· •
			Close

Items	ТОР	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, <u>192</u>. <u>168</u>. <u>0</u>. 0) should match.

\*Note 2) Do not use duplicate IP addresses over the same network.

\* The above settings are <u>examples</u> 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 ]

	<b>6</b>	PLC ×
	Project Setting System	Drvier(ETH) PLC1(MELSEC iQ-R Series) 💌
		Interface CPU Ethernet 💌
Run	Security	Protocol iQ-R Ethernet(Binar: -
		Bind IP Auto -
	0	IP 192 - 168 - 0 - 51 -
	Serial	Ethernet Prod TCP -
VNC Viewe		Port 5007
		TimeOut (ms) 300 🖨
: 🔘	File Manager	SendWait (ms) 0 🚔
	Communicati	
Scree shot		
	PLC	
	Optional De	
		Diagnostic Ping Test
		Cancel Apply

ltems	Settings	Remarks
Interface	Select "CPU Ethernet".	Refer to "2. External
Protocol	Select the communication protocol between the TOP and an external device.	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
ТСР	5007 <sub>DEC</sub>	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.

ОК	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.

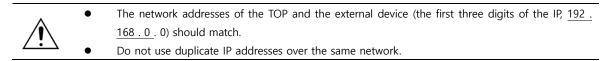
Items	Contents		Check		Remarks	
System	How to connect the system Connection cable name		OK	NG	1 Custom configuration	
configuration			OK	NG	1. System configuration	
ТОР	Version information		OK	NG		
	Port in use		OK	NG		
	Driver name	Driver name				
	Other detailed settings		OK	NG		
	Relative prefix	Project setting	OK	NG	2. External device selection	
		Communication diagnostics	OK	NG	3. Communication setting	
	Ethernet port setting	IP Address	OK	NG		
		Subnet Mask	OK	NG		
		Gateway	OK	NG		
External device	CPU name		OK	NG		
	Communication port name (module name)		OK	NG		
	Protocol (mode)		OK	NG		
	Setup Prefix		OK	NG	4. Enternal device patting	
	Other detailed settings		OK	NG	4. External device setting	
	Ethernet port setting	IP Address	OK	NG		
		Subnet Mask	OK	NG		
		Gateway	OK	NG		
	Check address range	Check address range			5. Supported addresses	
			OK	NG	(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.



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

Setting Item List	Setting Item	
Input the Setting Item to Search	Item	
	📮 O wn Node Settings	
	Parameter Setting Method	Parameter Editor
	IP Address	
🖃 🙋 Basic Settings	IP Address	192,168, 0, 1
Own Node Settings	Subnet Mask	255, 255, 255, 0
External Device Configuration	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=""></detailed>

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

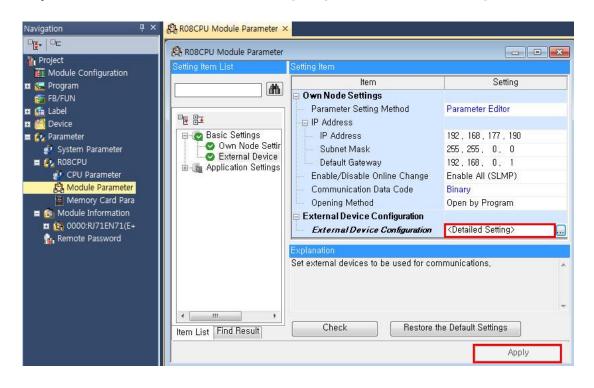
Step 3. [Online] > Transmit the parameter set to [Write to PLC] and reset the PLC.



#### 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.

Eth	hernet	Config	uration Edit View Clos	e with Discarding th	ne Setting	Close with Re	flecting the Setting	9	
									Module List
									Ethernet Selection   Find Module   M
						Fixed Buffer	PLC		開設に開始
		No.	Model Name	Communication Method	Protocol	Send/Receiv e Setting	IP Address		Ethernet Device (General)     MELSOFT Connection Module
	HEL	8	MELSOFT Connection Module	MELSOFT Connectic	TCP		192.168.177.190		SLMP Connection Module
•	HEL	9	MELSOFT Connection Module	MELSOFT Connectic	TCP		192.168.177.190		UDP Connection Module
	HEL	10	MELSOFT Connection Module	MELSOFT Connectic	TCP		192.168.177.190		Active Connection Module
	HEL	11	MELSOFT Connection Module	MELSOFT Connectic	TCP		192.168.177.190		Unpassive Connection Module
	HEL	12	MELSOFT Connection Module	MELSOFT Connectic	TCP		192.163.177.190	1	Fulpassive Connection Module
	HEL	13	MELSOFT Connection Module	MELSOFT Connectic	TCP		192,168,177,190	Ε	Ethernet Device (COGNEX)
	HEL	14	MELSOFT Connection Module	MELSOFT Connectic	TCP		192.168.177.190		COGNEX Vision System
	HEL	15		MELSOFT Connectic	TCP	1	192.168.177.190		Ethernet Device (Panasonic Ind
	HEL	16	MELSOFT Connection Module	MELSOFT Connectic	TCP		192, 168, 177, 190	-	Laser Displacement Sensor

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 <sub>(HEX)</sub>	X0000 ~ X3FF0 <sub>(HEX)</sub>	X***0 *Note 1)	
Output Relay	Y0000 ~ Y3FFF <sub>(HEX)</sub>	Y0000 ~ Y3FF0 <sub>(HEX)</sub>	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 <sub>(HEX)</sub>	B0 ~ B9A61FF0 <sub>(HEX)</sub>	B***0 *Note 1)	
Special Link Relay	SB0 ~ SB9A61FFF <sub>(HEX)</sub>	SB0 ~ SB9A61FF0 <sub>(HEX)</sub>	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		L/H *Note 3
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 <sub>(HEX)</sub>		
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 <sub>(HEX)</sub>	W0 ~ W9A61FF <sub>(HEX)</sub>		
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	D00100	D00101
Input data (hexadecimal)	12345678	5678	1234