MITSUBISHI Electric Corporation MELSEC A 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".

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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.

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Describes how to set the TOP communication.

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Describes how to set up communication for external devices.

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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 A Series Ethernet" is as follows.

Series	СРИ	Link I/F	Communication method	Communication setting	Cable
	A1N AJ71E71 A2N AJ71E71-S3 A0J2H A1S				
MELSEC-A	A1S-C24 A1SJ A2S A2S-S1	A1SJ71E71-B2 A1SJ71E71-B5	Ethernet (TCP/UDP)	<u>3. TOP</u> communication setting	Twisted pair cable ^{*Note 1)}
	A1S A1SH A1SJ A2S A2SH A2SJH	A1SJ71E71-B2-S3 A1SJ71E71-B5-S3		<u>4. External device</u> <u>setting</u>	

*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 connection (one TOP and one external device) connection



• 1:N connection (one TOP and multiple external devices) connection





2. External device selection

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

PLC select [Et	hernet]				
Filter : [All]			\sim	Search :	
				۱	Model 🔿 Vendor
Vendor		Model			
M2I Corporation			MELSEC Q Series		
MITSUBISHI Electric Corp	poration	8	MELSEC FX Series		
OMRON Industrial Autom	nation	80	MELSEC AnN/AnS Series	;	
LS Industrial Systems		8	MELSEC AnA/AnU Series	:	
MODBUS Organization					
SIEMENS AG.			MELSEC IQ-R Series		
Rockwell Automation			MELSEC iQ-F Series		
GE Fanuc Automation					
PANASONIC Electric Wor	ks				
YASKAWA Electric Corpo	ration				
OKOGAWA Electric Corr	poration				
Schneider Floctric Ted	rise				
	nes				
(DT Systems					
RS Automation					
elect Device		C Corioc	1		
Aliae Name -	EC ANN/ AN	s series		~	
AUGN DATE:	IPI C1		Bind IP : Auto		
Interface :	Ethernet		Bind IP : Auto	·	
Interface : Protocol :	Ethernet MC Protocol 1	LE Binary	Bind IP : Auto		Comm Manual
Interface : Protocol : String Save Mode :	Ethernet MC Protocol 1 First LH HL	LE Binary Cha	Bind IP : Auto		Comm Manual
Auras Hariffe : Interface : Protocol : String Save Mode :	PLC1 Ethernet MC Protocol 1 First LH HL	LE Binary Cha	Bind IP : Auto		Comm Manual
Interface : Protocol : String Save Mode : Use Redundanc Operate Condition :	PLC1 Ethernet MC Protocol 3 First LH HL Y	LE Binary Cha	Bind IP : Auto	(Comm Manual
Interface : Protocol : String Save Mode : Use Redundanc Operate Condition :	PLC1 Ethernet MC Protocol 3 First LH HL V MD ~ TimeOut	LE Binary Cha	Bind IP : Auto		Comm Manual
String Save Mode : String Save Mode : String Condition : Derate Condition : Change Condition :	PLC1 Ethernet MC Protocol : First LH HL V ID TimeOut Condition	LE Binary Cha	jind iP : Auto		Comm Manual
Autor Hauffe : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : A Change Condition : Primary Option	PLC1 Ethernet MC Protocol 3 First LH HL 4D TimeOut Condition	E Binary Cha	sind JP : Auto		Comm Manual
Auss Natife : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition : Primary Option IP	PLC1 Ethernet MC Protocol : First LH HL V V TimeOut Condition 192	LE Binary Cha	jind JP : Auto v		Comm Manual
Protocol Protocol Protocol Protocol Protocol Primary Option IP Ethernet Protocol	PLC1 Ethernet MC Protocol 3 First LH HL Y ND TimeOut Condition 192 [UDP	LE Binary Cha	bind JP : Auto		Comm Manual
Protocol Primary Option Primary Option Primary Option Primary Option Primary Option Primary Protocol Port	PLC1 Ethernet MC Protocol : First LH HL AD TimeOut Condition	E Binary Cha) Second)		Comm Manual
Protocol Interface Protocol String Save Mode Use Redundance Primary Option Primary Option P Ethernet Protocol Port Timeout	PLC1 Ethernet MC Protocol : First LH HL V ID V TimeOut Condition	E Binary Cha	jind iP : Auto		Comm Manual
Protocol String Save Mode Use Redundanc Derate Condition Anage Condition Primary Option IP Ethernet Protocol Port Timeout Send Wait	PLC1 Ethernet MC Protocol : First LH HL V UD V TimeOut Condition	LE Binary Cha	jind iP : Auto v v (Second) 0 ♥ 51 ♥		Comm Manual
Protocol : Protocol : String Save Mode : String Save Mode : Use Redundance Operate Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait Debu:	PLC1 Ethermet MC Protocol : First LH HL V D Condition 192 () S001 () S001 () S001 () S001 ()	LE Binary Cha	(Second)		Comm Manual
Protocol : Protocol : String Save Mode : String Save Mode : Use Redundanc Pretace Condition : A Change Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait Retry	PLC1 Ethermet MC Protocol : First LH HL Y JD ✓ TimeOut Condition 192 € [UDP ✓ 5001 € 5 €	E Binary Cha	(Second)		Comm Manual
Protocol : Protocol : String Save Mode : String Save Mode : Use Redundanc Primary Option Primary Option P Ethernet Protocol Port Timeout Send Walt Retry Pc No	PLC1 Ethermet MC Protocol : First LH HL y JD ✓ TimeOut Condition 192 ↓ [UDP ✓ 5001 ↓ 3000 ↓ 5 ↓ 255 ↓	E Binary Cha 5 : 168 • 168 • 1 msec 1 msec 1 msec 1	(Second)		Comm Manual
Protocol : Protocol : String Save Mode : String Save Mode : String Save Mode : Minimum Save Mode : Primary Option IP Ethernet Protocol Port Timeout Send Wait Retry Pc No	PLC1 Ethermet MC Protocol : First LH HL y UD ✓ TimeOut Condition 192 € [UDP ✓ 5001 € 5001 € 5 € 255 €	E Binary Cha	(Second)		Comm Manual Edit

Settings		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 connected to the TOP.		connected to the TOP.	Protocol	
		MELSEC A Series	Ethernet	MC Protocol 1E Binary	
		Supported Protocol			
		MC Protocol 1E (BINARY)			
		Please check the system confic connect is a model whose syste	guration in Chapter 1 to see if m can be configured.	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 properties > TOP settings] → [Project option > Check "Use HMI settings" > Edit > Ethernet]
 - Set the TOP communication interface in TOP Design Studio.



Items	ТОР	External device	Remarks
IP Address*Note 1) Note 2)	192.168.0.50	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 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 properties > PLC setting > ETHERNET > "PLC1 : MELSEC-A Series"]
 - Set the options of the communication driver of MELSEC A Series Ethernet in TOP Design Studio.

Project Option		×
Change HMI[H] Change HMI[H]	[A] The change PLC[C] Delete PLC[D]	
Change HMI(H) Add PLC Change HMI(H) Add PLC SYS : RD1520X Composition Module Setting FieldBus (0) RFID (0) COM2 (0) COM2 (0) Ethermet (1) PLC1 : MELSEC AnN/AnS : Wireless (0) USBDevice (0)	Image PLC[C] Image PLC[D] PLC Setting[MELSEC AnN/ AnS Series] Alias Name : PLC1 Bind IP : Auto Protocol : MC Protocol IE Binary String Save Mode : First LH HL Change Condition : Image Condition : Primary Option IP 192 108 0 Finance String Save Mode : First LH HL Change Condition : TimeOut 5 © (Second) Condition Edit Primary Option IP 192 108 © 0 \$ 100 Port 5001 Solo : meout 300 : mec Retry 5 \$ 255	Comm Manual
	A	pply Close

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External
Protocol	Select "MC Protocol 1E Binary".	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.	
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.	
PC No	Set the prefix of TOP.	



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]

	Ö	💼 Ethernet 🗙 🗙
Run	🔯 System	Port Ethernet Port : ETH1 • 0 •
	PLC Se	MAC Address : 00:15:1D:05:38:C5 IP Address : 192.168.0.50
VNC Viewer		Subnet Mask : 255.255.255.0 Gateway : 192.168.0.1 Default Gateway
Screen shot		DNS (1)
	Diagnostic	Cable Status : ETH1 Connected Bridge Mode : Use Bridge
	[System]	Check duplicate Apply Cancel Close

Items	ТОР	External device	Remarks
IP Address*Note 1) Note 2)	192.168.0.50	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 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]

	ò		PLC	×	
Bus	🔯 Syster	Driver(ETH)	PLC1(MELSEC AnN/AnS Series)	•	
nuli		Interface	Ethernet 🔹		
		Protocol	MC Protocol 1E Bina 🕶		
WNC	PLC	Bind IP	Auto		
VNC		IP	192 🗣 168 🜩 0 🜩 51 🜩		
Viewer	I 🎧 I	Ethernet	UDP 💌		
	Ethernet	Port	5001 🜩		
<u> </u>		Timeout	300 🗭 msec		
Screen	. And	Send Wait	0 🖨 msec		
shot	mil	Retry	5		
	Diagnostic	Pc No	255 🜩		
	[System]	Diagnostic	Ping Test	Apply Cancel	

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External
Protocol	Select "MC Protocol 1E Binary".	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.	
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.	
PC No	Set the prefix of TOP.	



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 whether the port (ETH1/ETH2) settings you want to use are the same as those of the external device in [Control panel > Ethernet].

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.

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

4. External device setting

In order to set up the communication settings of the MELSEC-A Series Ethernet communication module, configure the Ladder Software and DIP Switch inside the device as shown below. For a more detailed setting method than that described in this example, refer to the PLC user manual

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Do not use duplicate IP addresses over the same network.

Step 1. Write the sequence program shown in the example below and download it as PLC.

(The following example depicts the Ethernet reset program for when the Ethernet card is installed in slot 0. If the Ethernet card's slot position changes, the addresses for X and Y shown in the example above must also change. For example, if a card takes up 32 points in slot 0 and an Ethernet card is installed in slot 1, the X1F used in the line 0 of the above example becomes X3F (+32 points). The H0 (buffer memory start address) of TO and FROM commands is converted to H2 (32 points = 2 words).)



Buffer memory settings			Custom device	
Address	Settings	Setting (range)	Address	Settings
0~1	Ethernet card IP address	C0A80033H (192.168.0.51)	M102	COM.ERR OFF command
16	Intended use settings	100H (fixed)	D100	Ethernet card IP address
24	Ethernet card port number	5001	D110	Intended use settings
25~26	Counterpart device (TOP) IP address	FFFFFFFFH (fixed)	D111	Ethernet card port number
27	Counterpart device (TOP) port	FFFFH (fixed)	D112	Counterpart device (TOP) IP Address
	number		~D113	
80	Reset error code	-	D114	Counterpart device (TOP) port number
			D200	Reset error code



Step 2. Configure the Dip Switch settings for the entire module, once sequence program transmission is completed.

(1) Operation Mode Switch

Operation Mode Switch	Contents	Setting Value
BCDCrro BCDCrro BCDCrro	Online	0 (fixed)

(2) Conditional Contact Switch

♦ Configure the AJ71E71 / AJ71E71-S3 as shown in the table below.

Conditional Contact Switch	DIP Switch	Contents	Setting Value
OFF ON	SW1	Line processing for TCP timeout error	OFF
SW1	SWD	Data code settings	OFF
SW2	SVV2 (Bina	(Binary code)	OFF
	SW3		OFF
	SW4	Not used	OFF
	SW5		OFF
SW5	SW6		OFF
	0.4.7	CPU contact timing settings	
	SW7	(Permit WRITE during RUN)	ON
SW8	SW8	Reset time settings	OFF

♦ Configure the A1SJ71E71-B2 / A1SJ71E71-B5 / A1SJ71E71-B2-S3 / A1SJ71E71-B2 –S3 as shown in the table below.

Conditional Contact Switch	DIP Switch	Contents	Setting Value
	SW1	Line processing for TCP timeout error	OFF
ON OFF	SW2	Data code settings	OFF
SW1		(Binary code)	
SW2	S/M/2	CPU contact timing settings	
SW4	5005	(Permit WRITE during RUN)	
	SW4	Reset time settings	OFF

Step 3. Restart the power after configuring the Dip Switch.



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.

Туре	Remarks	Bit-designated address	Word-designated address
Input	Bit	X0000 - X07FF	X0000 - X07F0
Output	Bit	Y0000 - Y07FF	Y0000 - Y07F0
LINK relay	Bit	B0000 - B03FF	
LINK register	Word		W0000 - W03F0
Special relay	Bit	F0000 - F0255	F0000 - F0240
LATCH relay	Bit	L0000 - L2047	L0000 - L2032
Internal relay	Bit	M0000 - M2047	M0000 - M2032
Special relay	Bit	M9000 - M9255	M9000 - M9240
Timer - Coil	Bit	TC000 - TC255	
Timer - Contact	Bit	TS000 - TS255	
Timer-Current value	Word		TN000 - TN255
Counter - Coil	Bit	CC000 - CC255	
Counter - Contact	Bit	CS000 - CS255	
Counter-Current value	Word		CN000 - CN255
Data register	Word	D0000.0 – D1023.15	D0000 - D1023
File register	Word	R0000.0 – R8191.15	R0000 – R8191