

YOKOGAWA Electric Corporation

FA-M3 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 "YOKOGAWA Electric Corporation – FA-M3 Series Ethernet" is as follows:

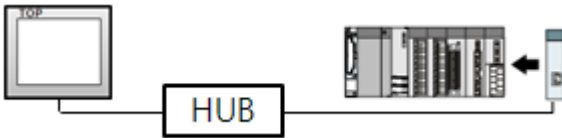
Series	CPU	Link I/F	Communication method	System setting	Cable
FA-M3	F3SP21-0N F3SP25-2N F3SP28-3N F3SP35-5N F3SP38-6N F3SP53-4H F3SP58-6H	F3LE01-5T	Ethernet (UDP) Ethernet (TCP)	3. TOP communication setting 4.1. External device setting 1	Twisted pair cable* Note 1)
	F3SP28-3S F3SP38-6S F3SP53-4S F3SP58-6S F3SP59-7S	F3LE11-0T	Ethernet (UDP) Ethernet (TCP)		
	F3SP66-4S F3SP67-6S	CPU Direct	Ethernet (UDP) Ethernet (TCP)	3. TOP communication setting 4.2. External device setting 2	

*[Note 1](#)) Twisted pair cable

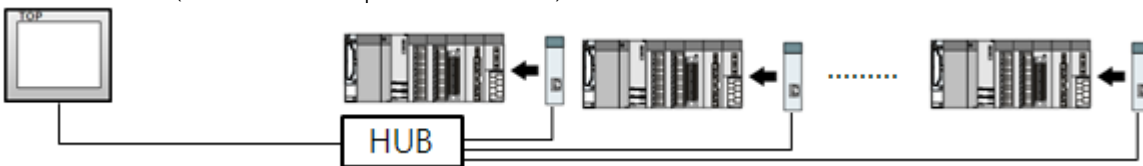
- Refers to STP (Shielded Twisted Pair Cable) or UTP (Unshielded Twisted Pair Cable) Category 3, 4, 5.
- Depending on the network configuration, you can connect to components such as the hub and transceiver, and in this case, use a direct cable.

■ Connectable configuration

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

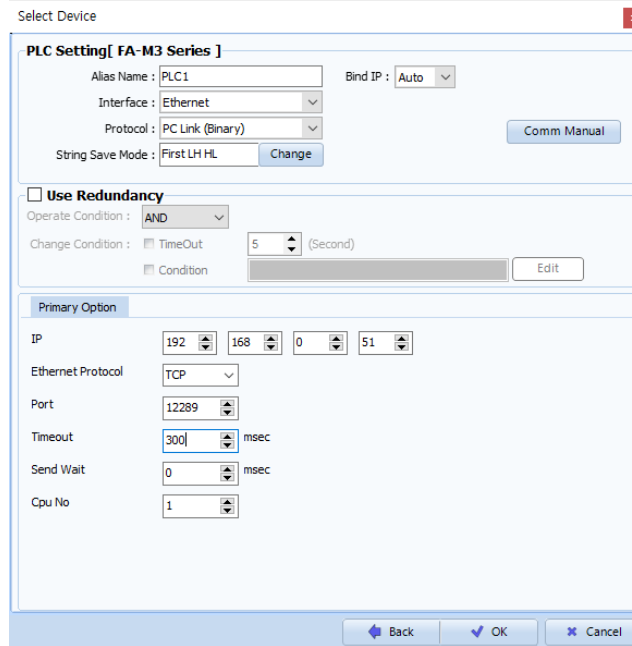
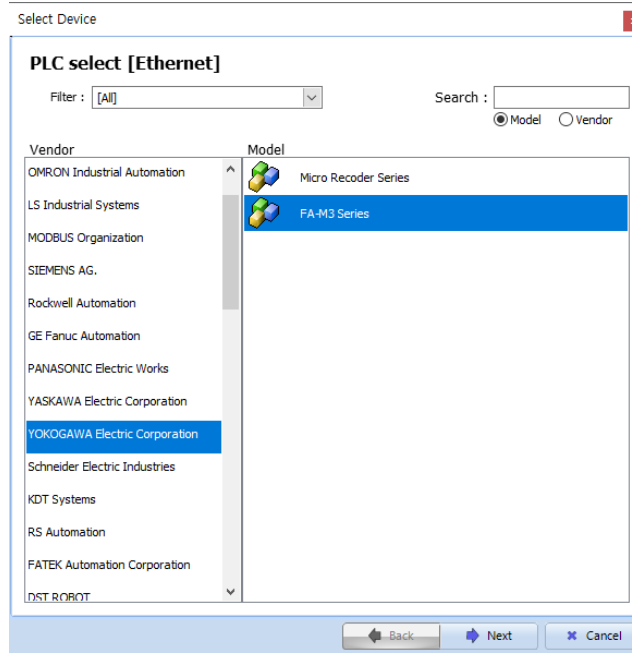


- 1:N connection (one TOP and multiple external devices) connection



2. External device selection

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



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. Select "YOKOGAWA 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>FA-M3 Series</td> <td>Ethernet</td> <td>PC Link</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #e1eef6;">Supported Protocol</th> </tr> </thead> <tbody> <tr> <td>PC Link (ASCII)</td> <td>PC Link (Binary)</td> </tr> </tbody> </table> 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.	Model	Interface	Protocol	FA-M3 Series	Ethernet	PC Link	Supported Protocol		PC Link (ASCII)
Model	Interface	Protocol									
FA-M3 Series	Ethernet	PC Link									
Supported Protocol											
PC Link (ASCII)	PC Link (Binary)										

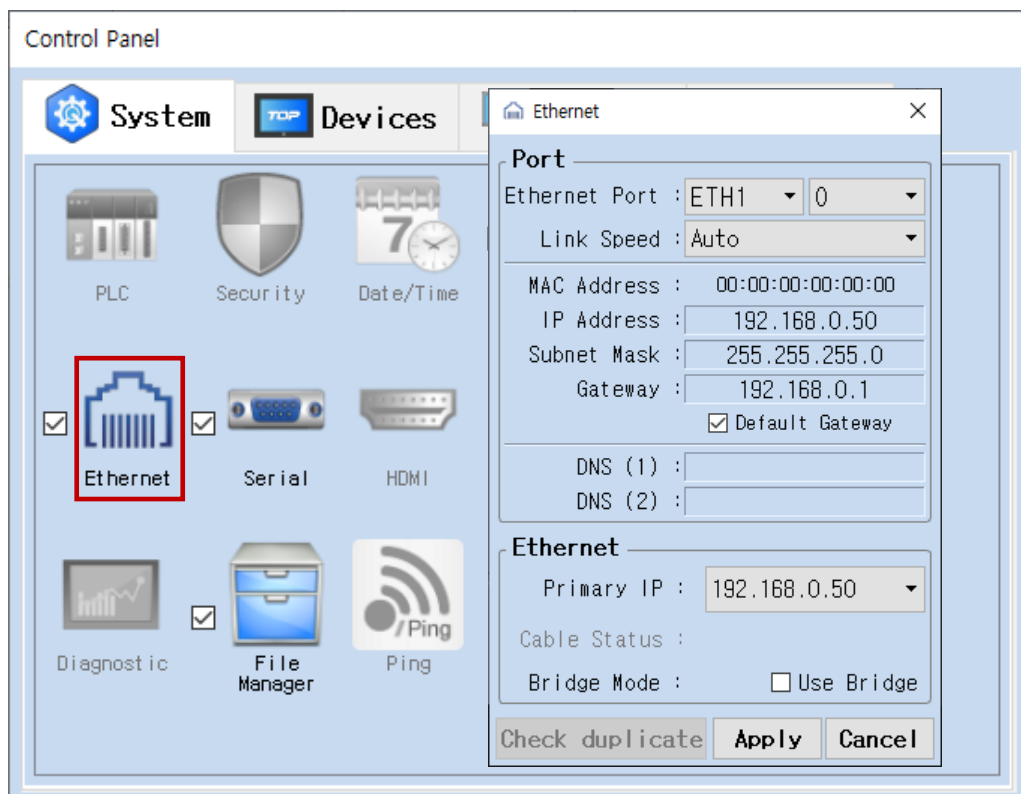
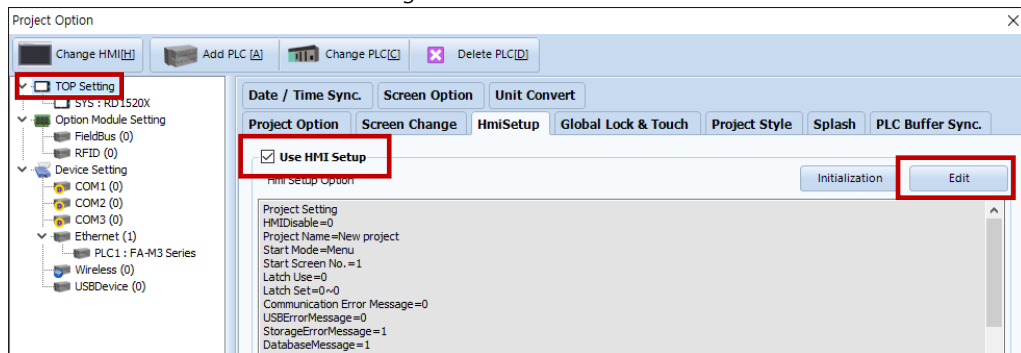
3. TOP communication setting

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 Option > "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)	192.168.0.50	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, 192 . 168 . 0 . 0) should match.

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

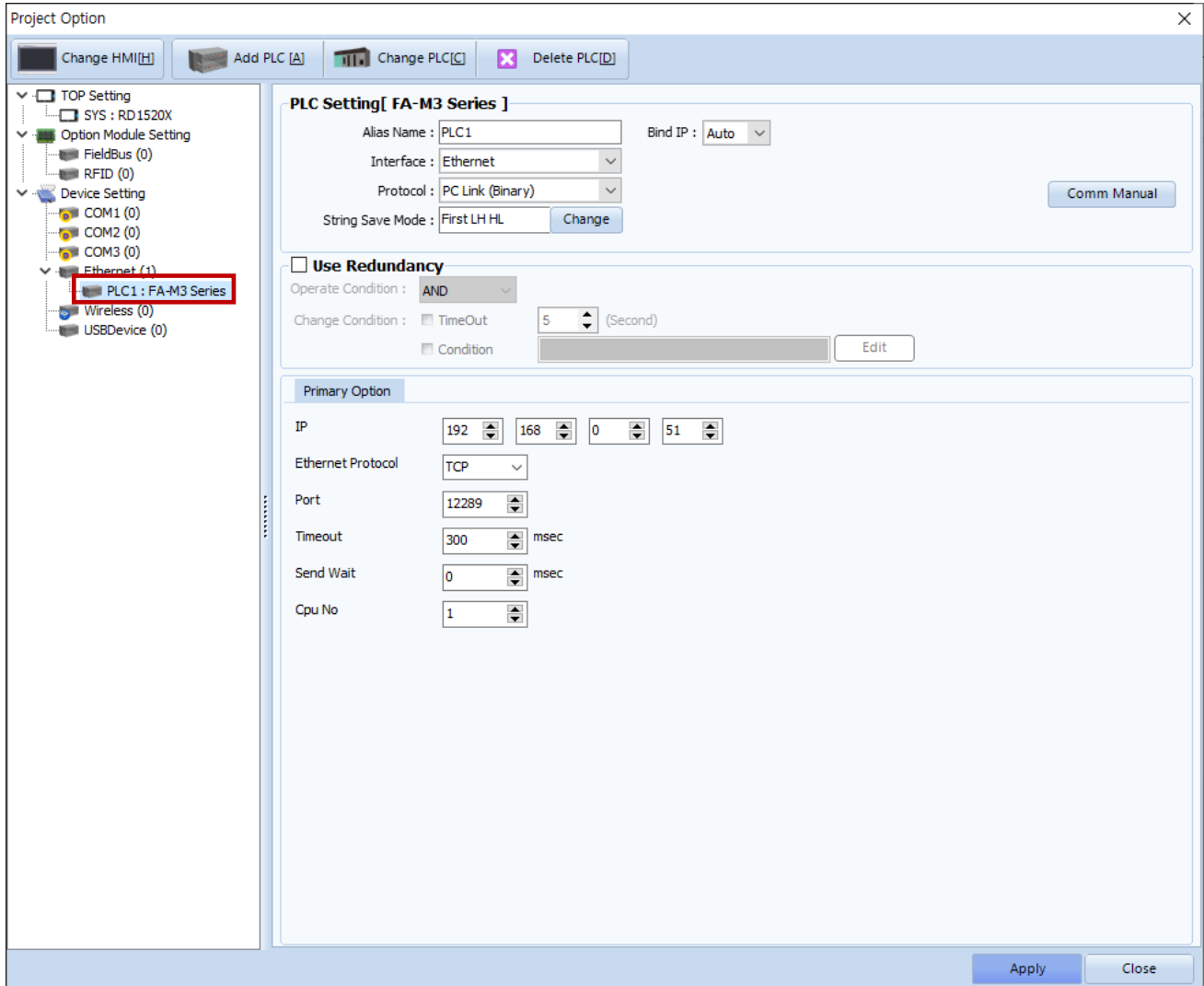
* The above settings are examples recommended by the company.

Items	Description
IP Address	Set an IP address to be used by the TOP 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 Setting > ETHERNET(1) > "PLC1 : FA-M3 Series"]

– Set the options of the FA-M3 Series Ethernet communication driver in TOP Design Studio.



* The above settings are examples recommended by the company.

Items	Settings	Remarks
Interface	Select "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.	
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.	
Cpu No	Enter the CPU no. of the external device.	

3.2. Communication setting in TOP

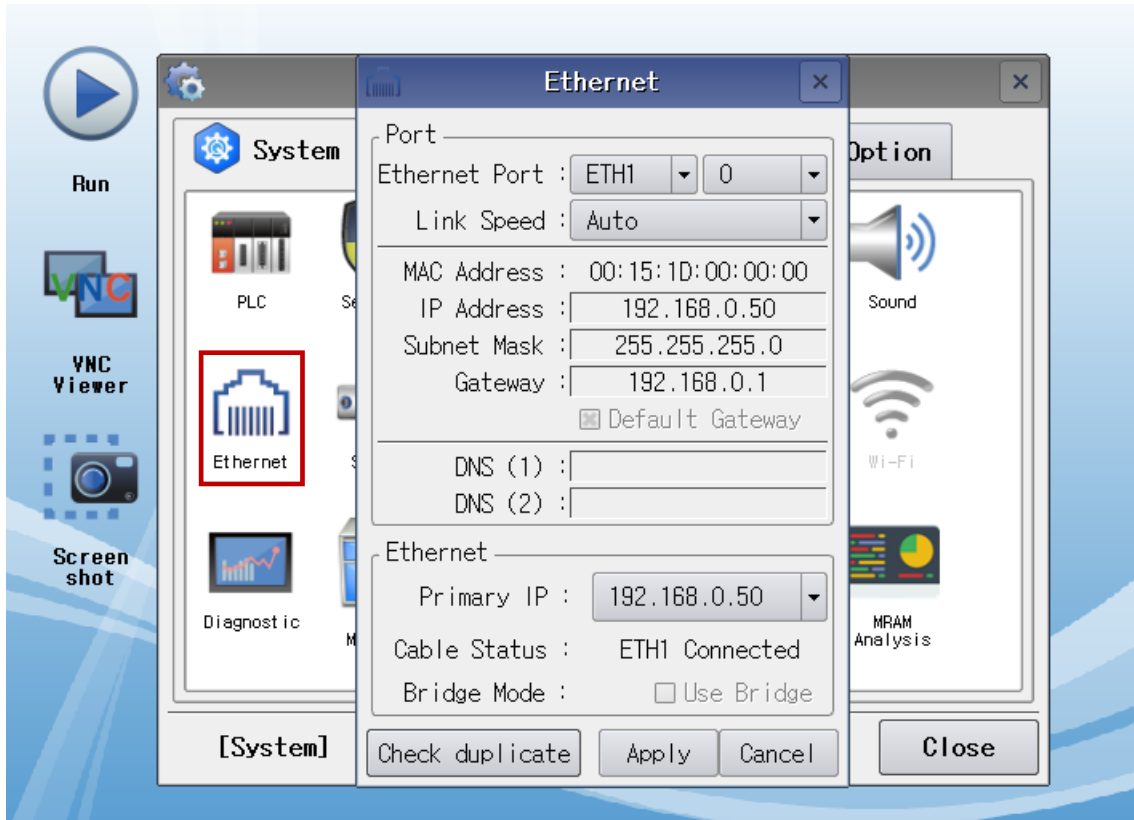
* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- 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)	192.168.0.50	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, 192 . 168 . 0 . 0) should match.

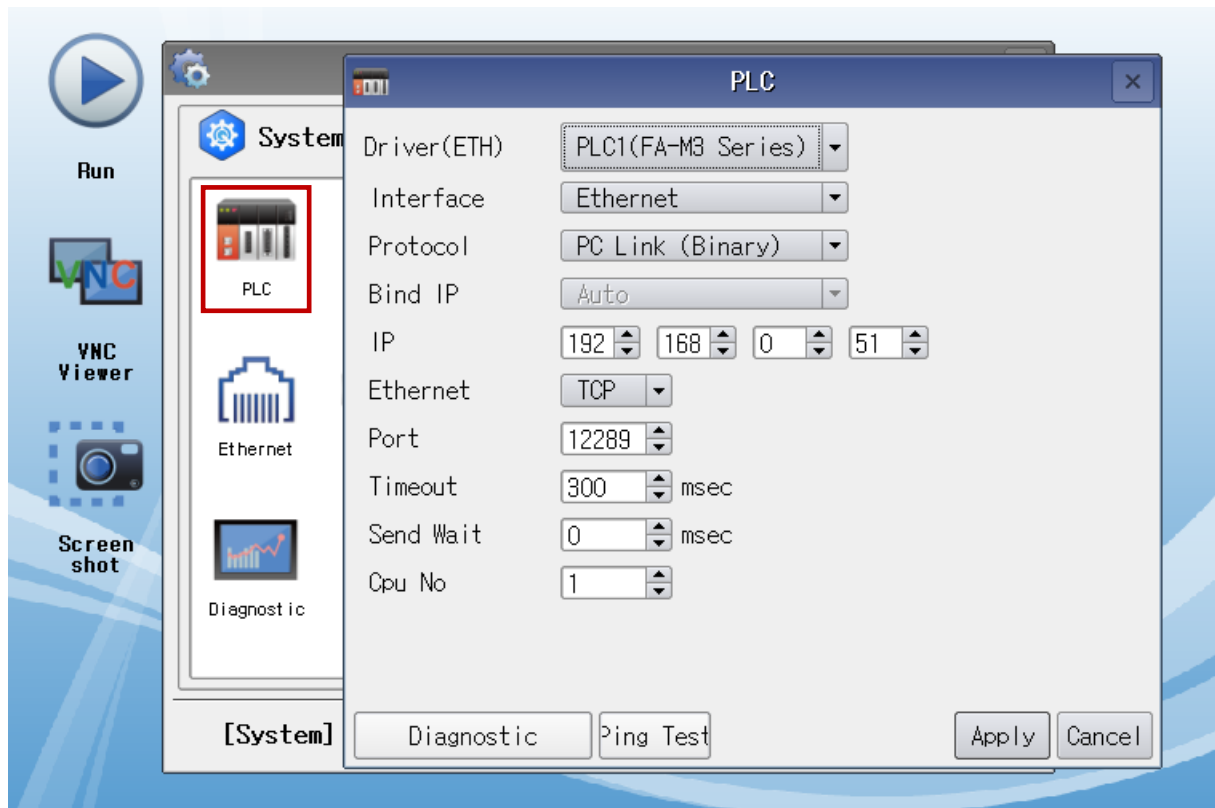
*[Note 2](#)) Do not use duplicate IP addresses over the same network.

* 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]



* The above settings are examples recommended by the company.

Items	Settings	Remarks
Interface	Select "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.	
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.	
Cpu No	Enter the CPU no. of the external device.	

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. External device setting 1 (Ethernet Interface Module)

Set up the Dip Switch located inside the side cover of the communication card to set up the communication.

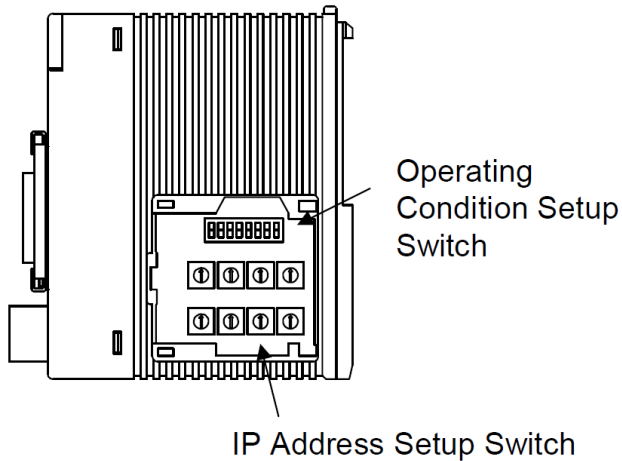
For more detailed setting method than that described in this example, refer to the PLC user manual.



Do not use duplicate IP addresses over the same network.

For detailed instructions on how to set up the "Dip Switch", check the attached documentation inside the side cover.

Right-side View



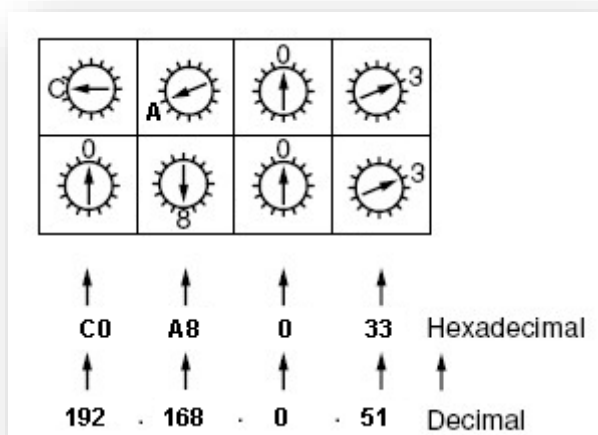
Step 1. Operation Condition Setup Switch Settings

Switch Number	Contents	OFF	ON	Recommended settings	Remarks
SW1	Data format	ASCII	Binary	ON *Note 1)	
SW2	Write protection	Disabled	Enabled	OFF	Fixed
SW3	Always off			OFF	
SW4					
SW5					
SW6					
SW7	Line processing on TCP timeout	Close	Do not close	OFF	
SW8	Loopback test	Normal mode	Test mode	OFF	

*Note 1) Set the same as the TOP communication options. Switch off SW1 when communicating with ASCII.

Step 2. IP Address Setup Switch Settings

Set the IP address of the external device by changing the Rotary Switch to hexadecimal units. Please refer to the information below.



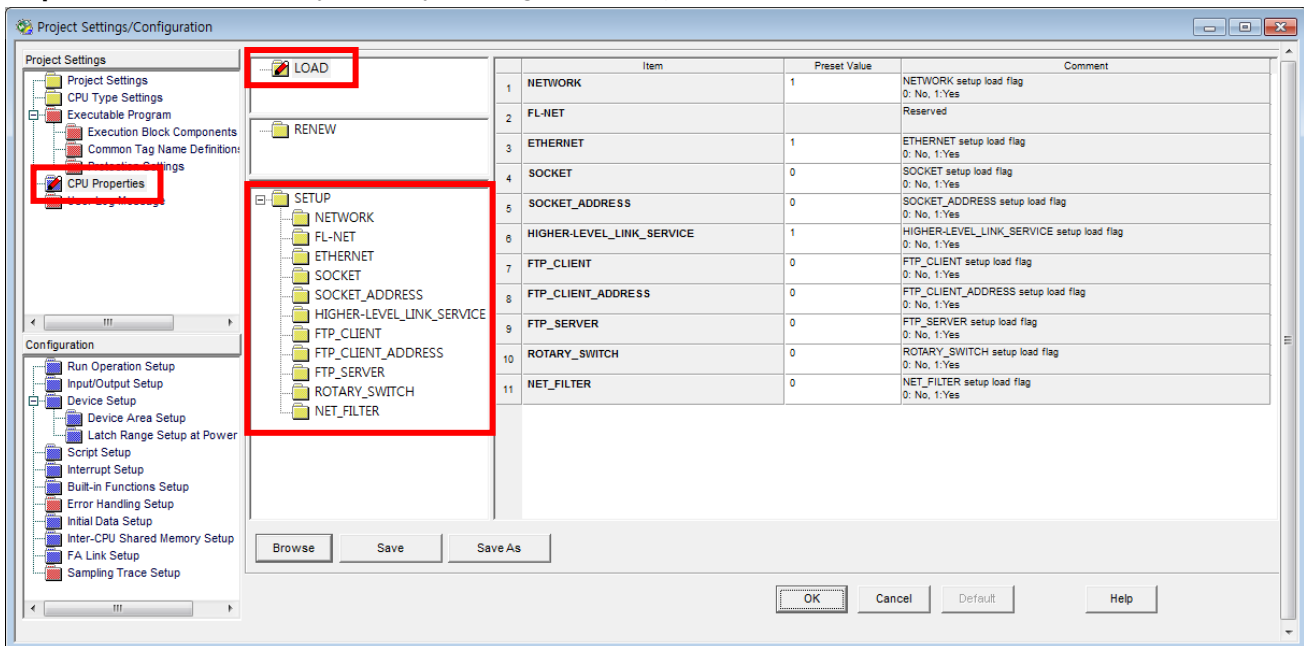
Step 3. Restart the power after configuring.

4.2. External device setting 2 (CPU Direct)

Set as below using "FA-M3 Series" Ladder Software "WideField3".

For more detailed setting method than that described in this example, refer to the PLC user manual.

Step 1. Set as below from [Project] – [Project Settings] – [CPU Properties] – [LOAD] and [SETUP].



• [LOAD]

Items	Settings	Settings	Remarks
NETWORK	1	NETWORK setup load flag On	Fixed
ETHERNET	1	ETHERNET setup load flag On	Fixed
HIGHER-LEVEL_LINK_SERVICE	1	HIGHER-LEVEL_LINK_SERVICE setup flag On	Fixed
Set up items	0		

• [SETUP - NETWORK]

Items	Settings	Remarks
NETWORK_SELECT	1	Fixed

• [SETUP - ETHERNET]

Items	Settings	Remarks
ETHER_MY_IPADDRESS	192.168.0.51	
ETHER_SUBNET_MASK	255.255.255.0	

• [SETUP – HIGHER-LEVEL-LINK-SERVICE]

Items	Settings	Settings	Remarks
HLLINK_PROTOCOL_A	0	TCP/IP	1 = UDP/IP
HLLINK_DATA_FORMAT_A	1	Binary	0 = ASCII

Step 2. Send setting information via CPU.

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.



"TOP Design Studio" represents the CPU's "Device" in accordance with the "FA-M3 Series" Multi-CPU configuration (on Single Unit) as "CPU Number" + "Device Name" (one unit device).

(Example) for Data Register

Multi-CPU	TOP Design Studio Device Name Shown
CPU 1 Data Register	1D
CPU 2 Data Register	2D
CPU 3 Data Register	3D
CPU 4 Data Register	4D

(Note) Multi-CPU configurations can extend to up to four CPUs.

Device	Bit Address	Word Address	32 Bit	Remarks
Input Relay	1X00201 – 4X71664	1X00201 – 4X71649	L/H	*Note 1) Note 2)
Output Relay	1Y00201 – 4Y71664	1Y00201 – 4Y71649		*Note 1)
Internal Relay	1I00001 – 4I65535	1I00001 – 4I65535		
Joint Relay	1E0001 – 4E4096	1E0001 – 4E4081		
Special Relay	1M0001 – 4M9984	1M0001 – 4M9969		
Link Relay	1L00001 – 4L78192	1L00001 – 4L78177		*Note 3)
Timer	Contact	1T0001 – 4T3072		
	Current	———		1TP0001 – 4TP3072
	Setup	———		1TS0001 – 4TS3072
Counter	Contact	1C0001 – 4C3072		
	Current	———		1CP0001 – 4CP3072
	Setup	———		1CS0001 – 4CS3072
Data Register	1D0001.00 – 4D65535.15	1D0001 – 4D65535		
File Register	1B00001.00 – 4B262144.15	1B00001 – 4B262144		
Joint Register	1R0001.00 – 4R4096.15	1R0001 – 4R4096		
Special Register	1Z001.00 – 4Z1024.15	1Z001 – 4Z1024		
Link Register	1W00001.00 – 4W78192.15	1W00001 – 4W78192	*Note 3)	

*Note 1) Instructions for showing Input/Output Relay are as follows..

(Example) X 0[Module Unit No.] 02[Module Slot No.] 01[Terminal No.]		
Items	Setting range	
Module Unit No.	0 – 7	
Module Slot No.	Module unit No is "0"	02 – 16
	Module unit No is "1-7"	01 – 16
Terminal No.	01 – 64	

*Note 2) Read-only Device

*Note 3) Instructions for showing link relay (L), link register (W) are as follows.

(Example) L 7[link Number] 1024[address]		
Items	Setting range	
Link Number	0 – 7	
address	0001 – 71009	