MITSUBISHI Electric Corporation
MELSEC AnA/AnU 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

The system configuration of TOP and "MITSUBISHI Electric Corporation - MELSEC AnA/AnU Series Ethernet" is as follows:

| Series	CPU	Link I/F	Communication method	Communication setting	Cable
MELSEC-A	A2A A2A-S1 A3A A2U A2U-S1 A3U A4U	AJ71E71 AJ71E71-S3	Ethernet (TCP/UDP)	3. TOP communication setting 4. External device setting	Twisted pair cable*Note 1)
	A2US A2US-S1	A1SJ71E71-B2 A1SJ71E71-B5			
	A2US A2US-S1 A2USH-S1	A1SJ71E71-B2-S3 A1SJ71E71-B5-S3			

*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

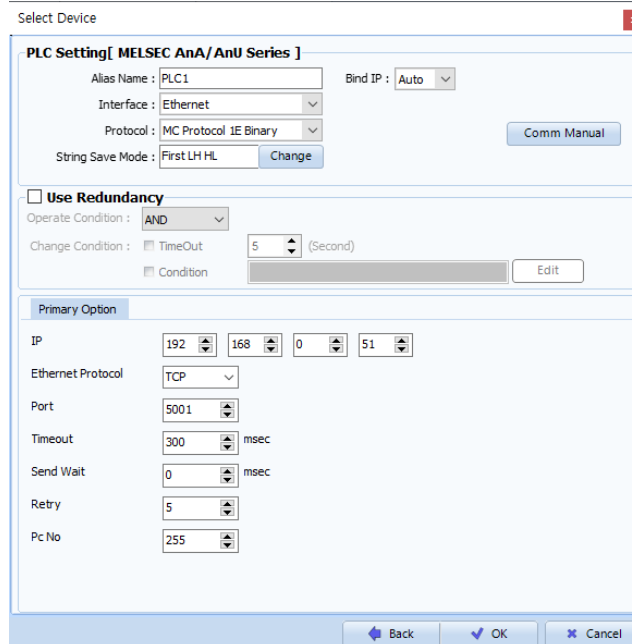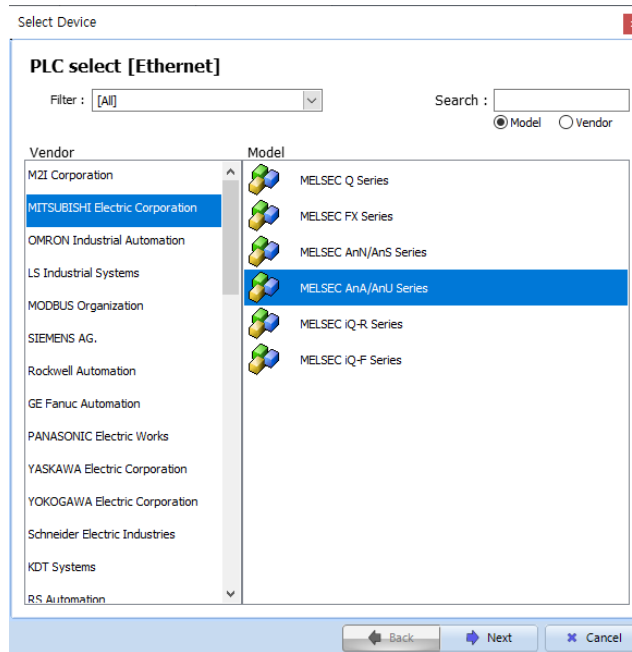・1:1 connection (one TOP and one external device) connection
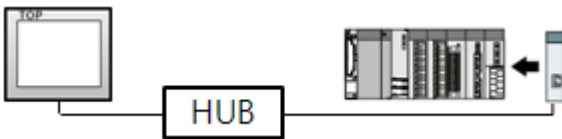
・1:N connection (one TOP and multiple external devices) connection
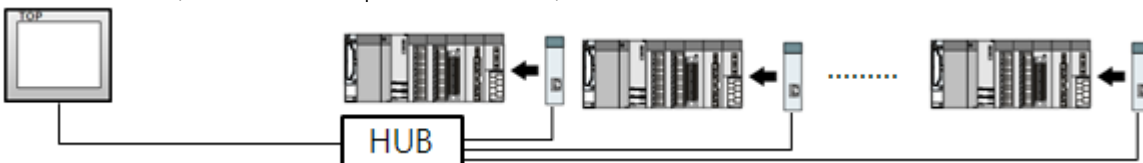
2. External device selection

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

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.

Model	Interface	Protocol
MELSEC AnA/AnU Series	Ethernet	MC Protocol 1E Binary

Supported Protocol
MC Protocol 1E (BINARY)

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.
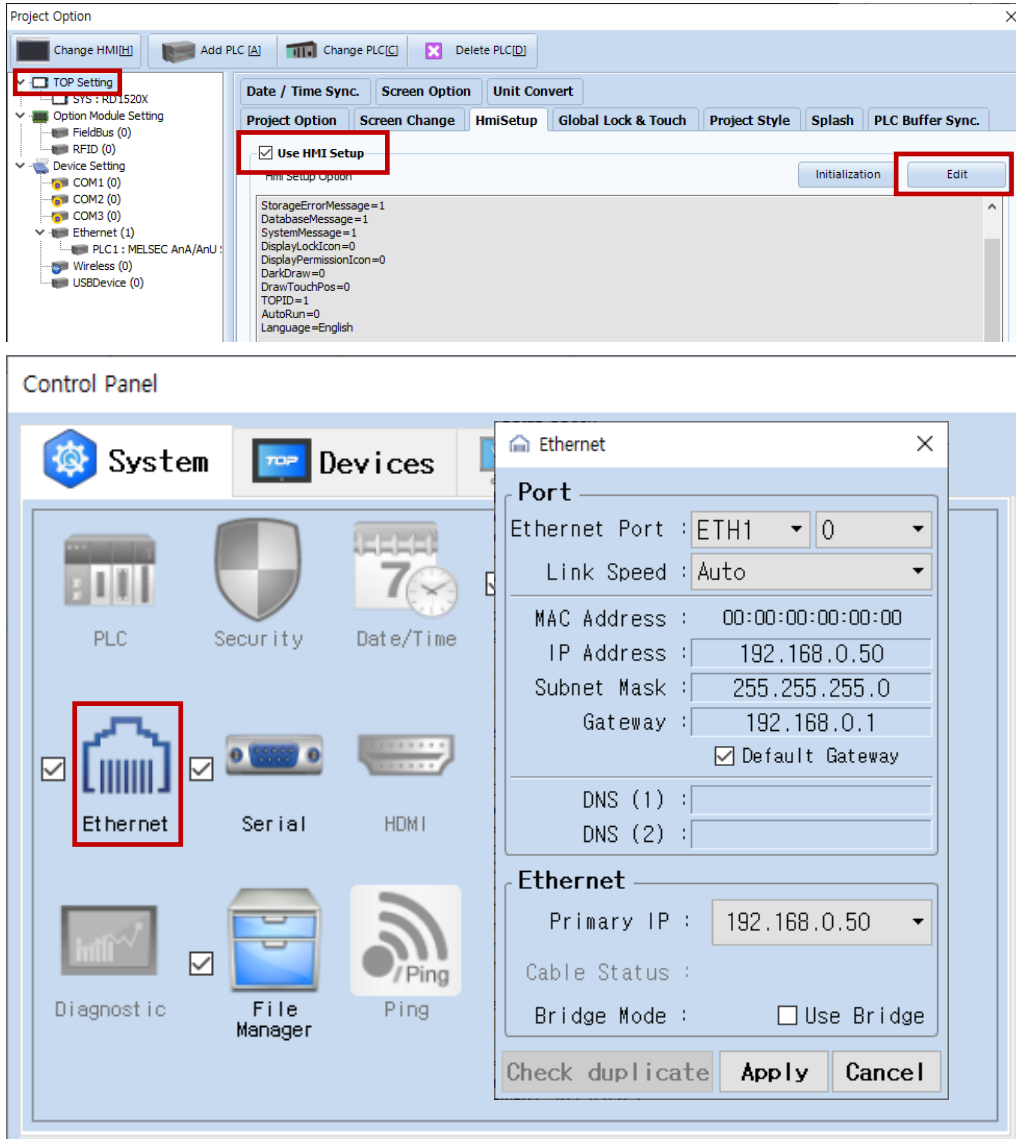
3. TOP communication setting

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.

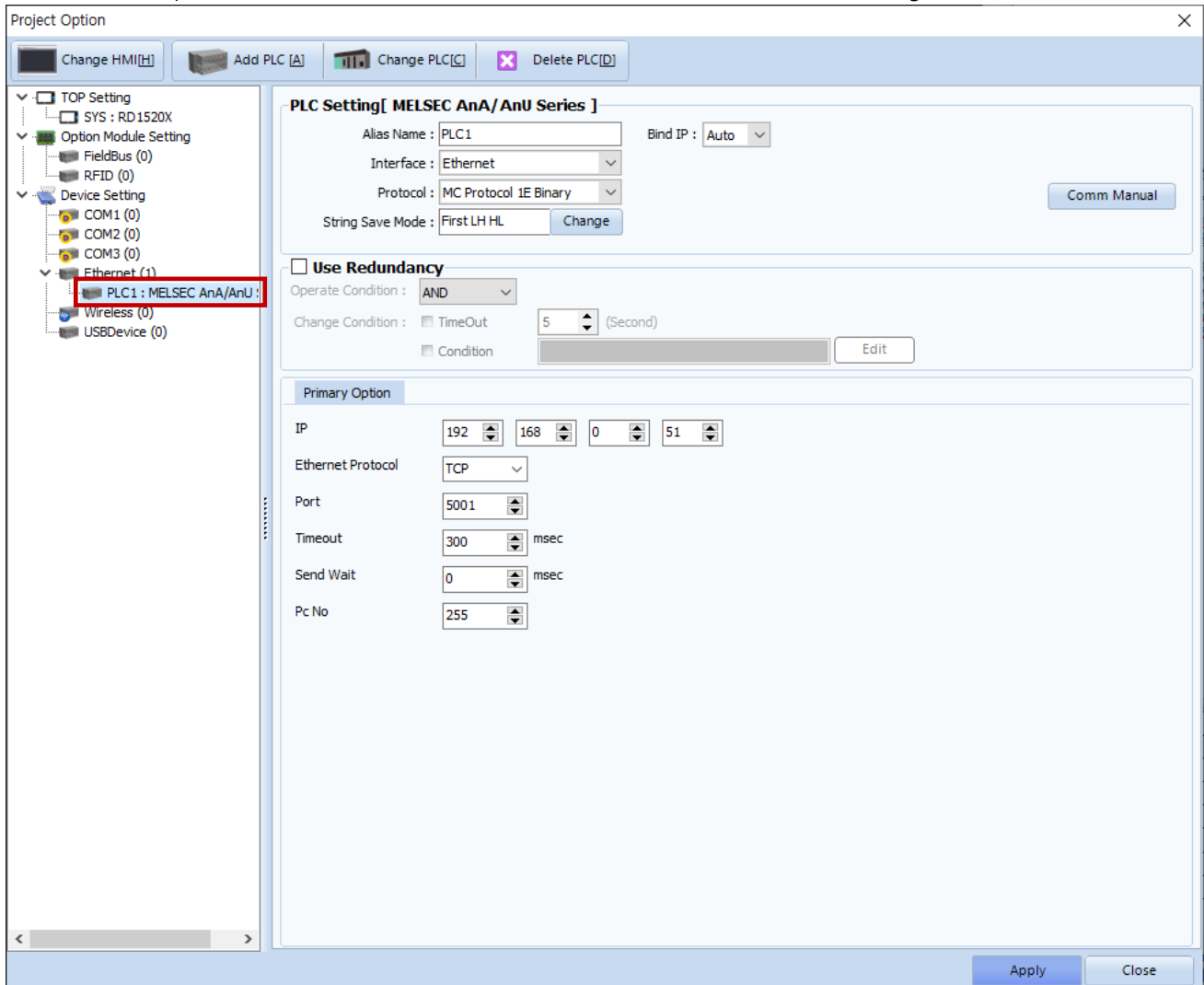*Note 2) Do not use duplicate IP addresses over the same network.

* The above settings are examples recommended by the company.

Items	Description
IP Address	Set an IP address to be used by the TOP 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 > Device Setting > ETHERNET > "PLC1 : MELSEC-AnA/AnU Series"]

    – Set the options of the MELSEC AnA/AnU Series Ethernet communication driver in TOP Design Studio.

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External device selection".
Protocol	Select "MC Protocol 1E Binary".	
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.
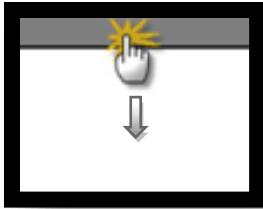
(1) Communication interface setting

■ [Main Screen > Control Panel > Ethernet]

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]


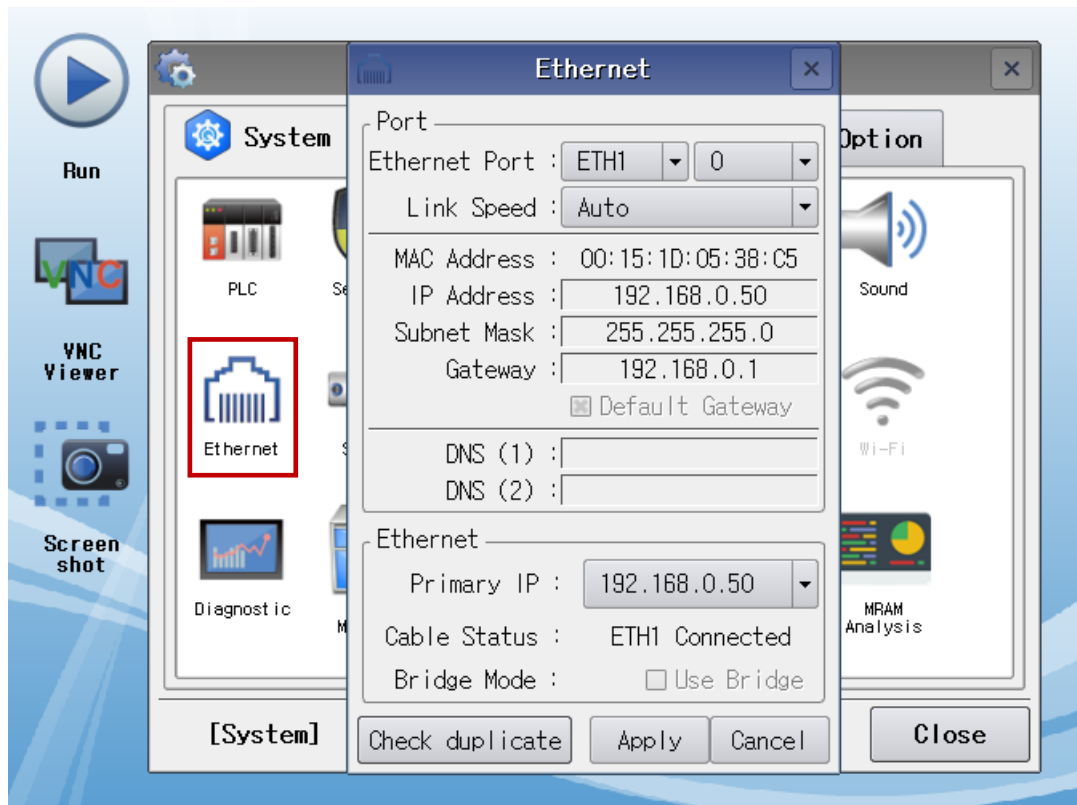| Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External device selection".
Protocol	Select "MC Protocol 1E Binary".	
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	
Port	Enter the Ethernet communication 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 <u>drag </u>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	
	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	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. External device setting
	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

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

⚠ 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).)
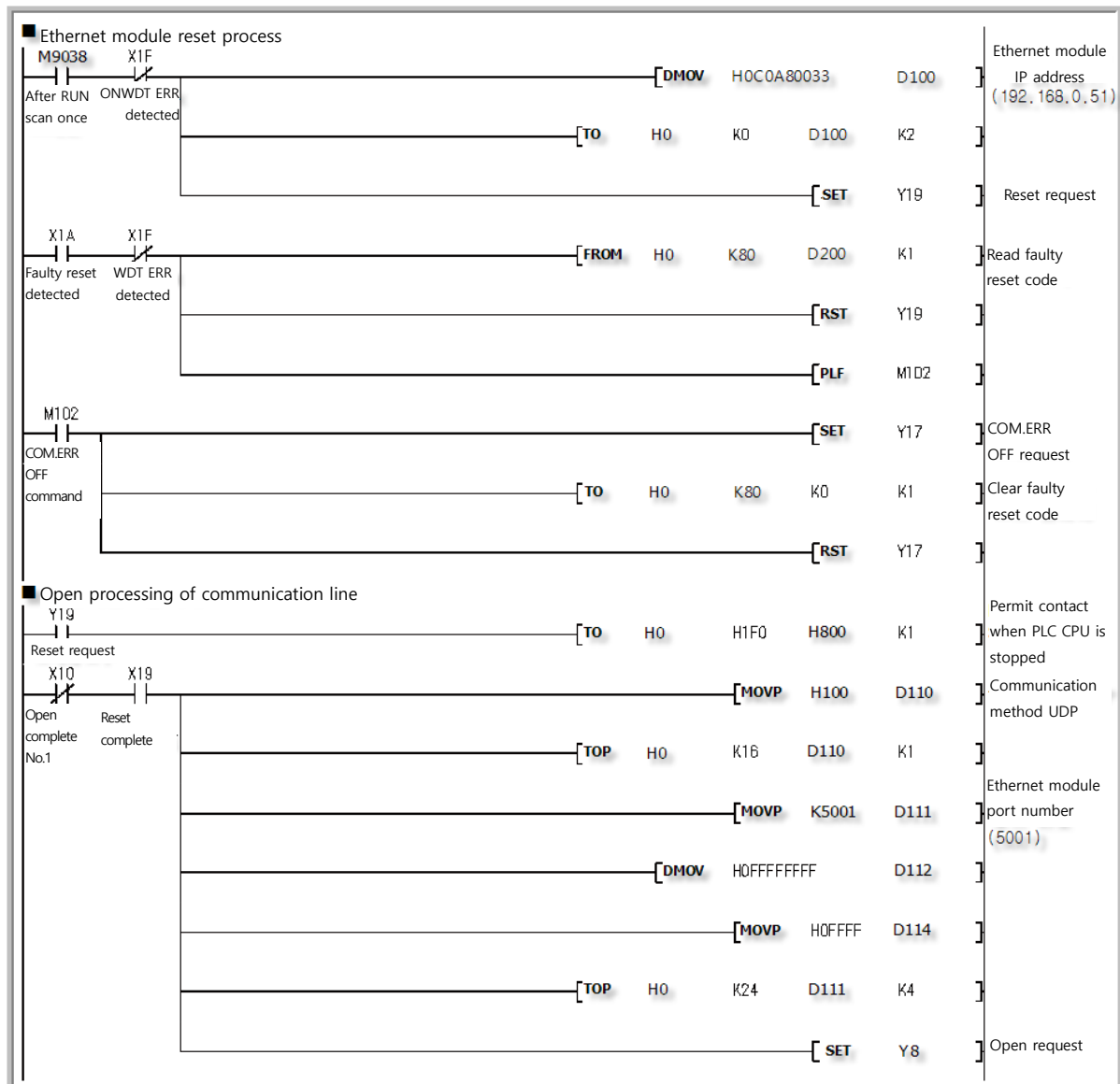
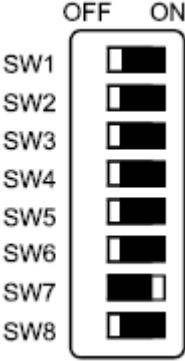| Buffer memory settings			Custom device	
Address	Settings	Setting (range)	Address	Settings
0~1	Ethernet card IP address	C0A80033H (192.168.0.51)	M102	COM.ERR OFF command
16	Intended use settings	100H (fixed)	D100	Ethernet card IP address
24	Ethernet card port number	5001	D110	Intended use settings
25~26	Counterpart device (TOP) IP address	FFFFFFFFH (fixed)	D111	Ethernet card port number
27	Counterpart device (TOP) port number	FFFFH (fixed)	D112~D113	Counterpart device (TOP) IP Address
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
	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
	SW1	Line processing for TCP timeout error	OFF
	SW2	Data code settings (Binary code)	OFF
	SW3	Not used	OFF
	SW4		OFF
	SW5		OFF
	SW6		OFF
	SW7	CPU contact timing settings (Permit WRITE during RUN)	ON
	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
	SW2	Data code settings (Binary code)	OFF
	SW3	CPU contact timing settings (Permit WRITE during RUN)	ON
	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.

Type	Remarks	Bit-designated address	Word-designated address
Input	Bit	X0000 – X1FFF	X0000 – X1FF0
Output	Bit	Y0000 – Y1FFF	Y0000 – Y1FF0
STEP relay	Bit	S0000 - S2047	
Special relay	Bit	F0000 – F2047	F0000 – F2032
LATCH relay	Bit	L0000 – L8191	
Internal relay	Bit	M0000 – M8191	M0000 – M8176
Special relay	Bit	M9000 - M9255	M9000 – M9240
Timer - Coil	Bit	TC000 - TC2047	
Timer - Contact	Bit	TS0000 – TS2047	
Timer-Current value	Word		TN000 – TN2047
Counter - Coil	Bit	CC000 – CC1023	
Counter - Contact	Bit	CS000 – CS1023	
Counter-Current value	Word		CN000 – CN1023
LINK relay	Bit	B0000 – B1FFF	B0000 – B1FFF
LINK register	Word	W0000.0 – W1FFF.F	W0000 – W1FFF
Data register	Word	D0000.0 – D8191.15	D0000 – D8191
Special register	Word	D9000.0 - D9255.15	D9000 - D9255