YOKOGAWA Electric Corporation

µR Series

Ethernet Driver

Supported version TOP Design Studio V1.4.7 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.

3. TOP communication setting Page 4

Describes how to set the TOP communication.

4. External device setting Page 10

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 - μR Series Ethernet" is as follows.

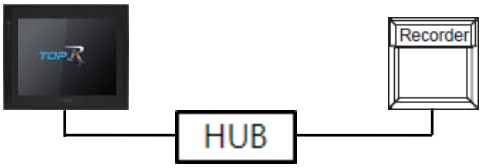
Series	Link I/F	Communication method	Communication setting	Cable
μR10000 μR20000	Ethernet (/C7 Option)	Ethernet (TCP)	3. TOP communication setting 4. External device setting	Twisted pair cable*Note 1)

*Note 1) Twisted pair cable

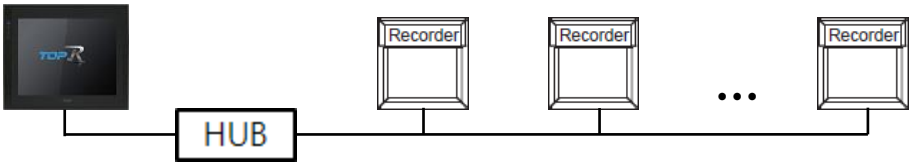
- Refer to STP (Shielded Twisted Pair Cable) or UTP (Unshielded Twisted Pair Cable) Category 3, 4, 5.
- Depending on the network configuration, you can connect to components such as the hub and transceiver, and in this case, use a direct cable.

■ Connectable configuration

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

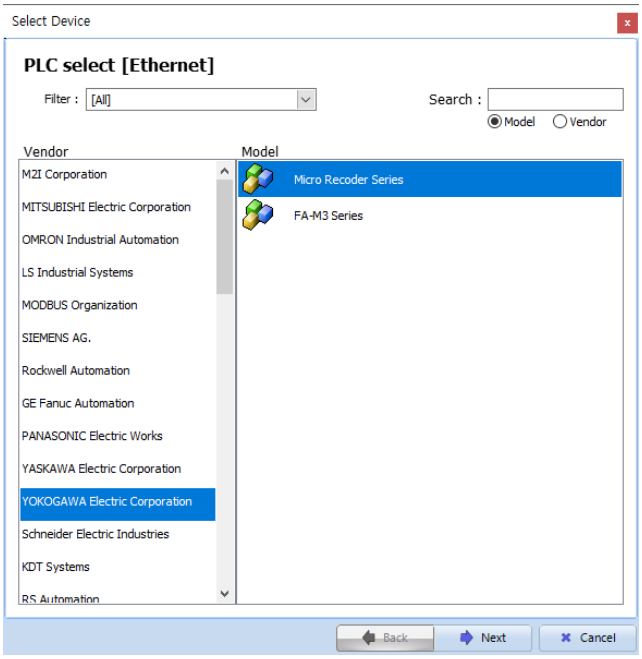


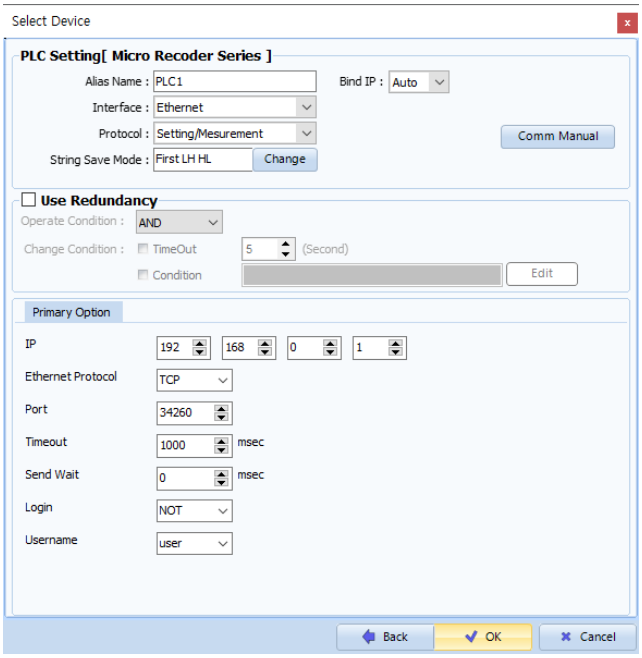
・1:N (one TOP and multiple external devices) connection



2. External device selection

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





Settings		Contents
TOP	Model	Check the display and process of TOP to select the touch model.
External device	Vendor	Select the vendor of the external device. Select "YOKOGAWA Electric Corporation".
	Model	Select external device. **Model** / **Interface** / **Protocol** μR Series / Ethernet / Setting/Measurement 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

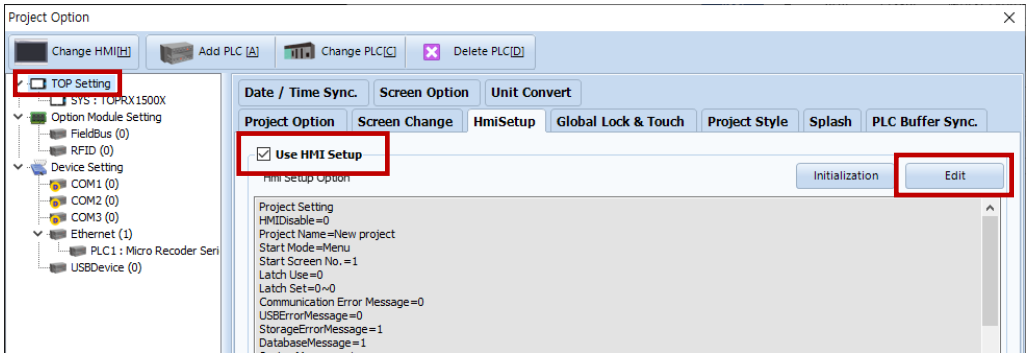
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

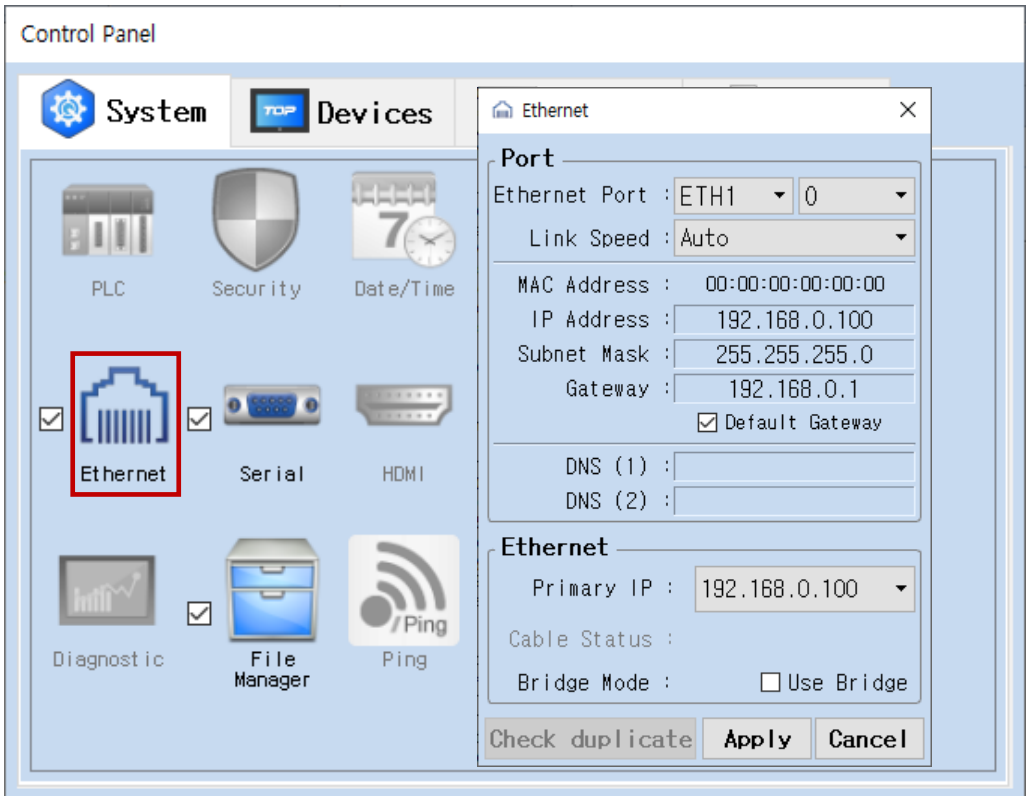
3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

■ [Project] → [Property] → [TOP Setting] → [HMI Setup] → [Use HMI Setup Check] → [Edit] → [Ethernet]

– Set the TOP communication interface in TOP Design Studio.





Items	TOP	External device	Remarks
IP Address	192.168.0.100	192.168.0.50	*Note *Note 2)
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

* The above settings are examples recommended by the company.

*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.

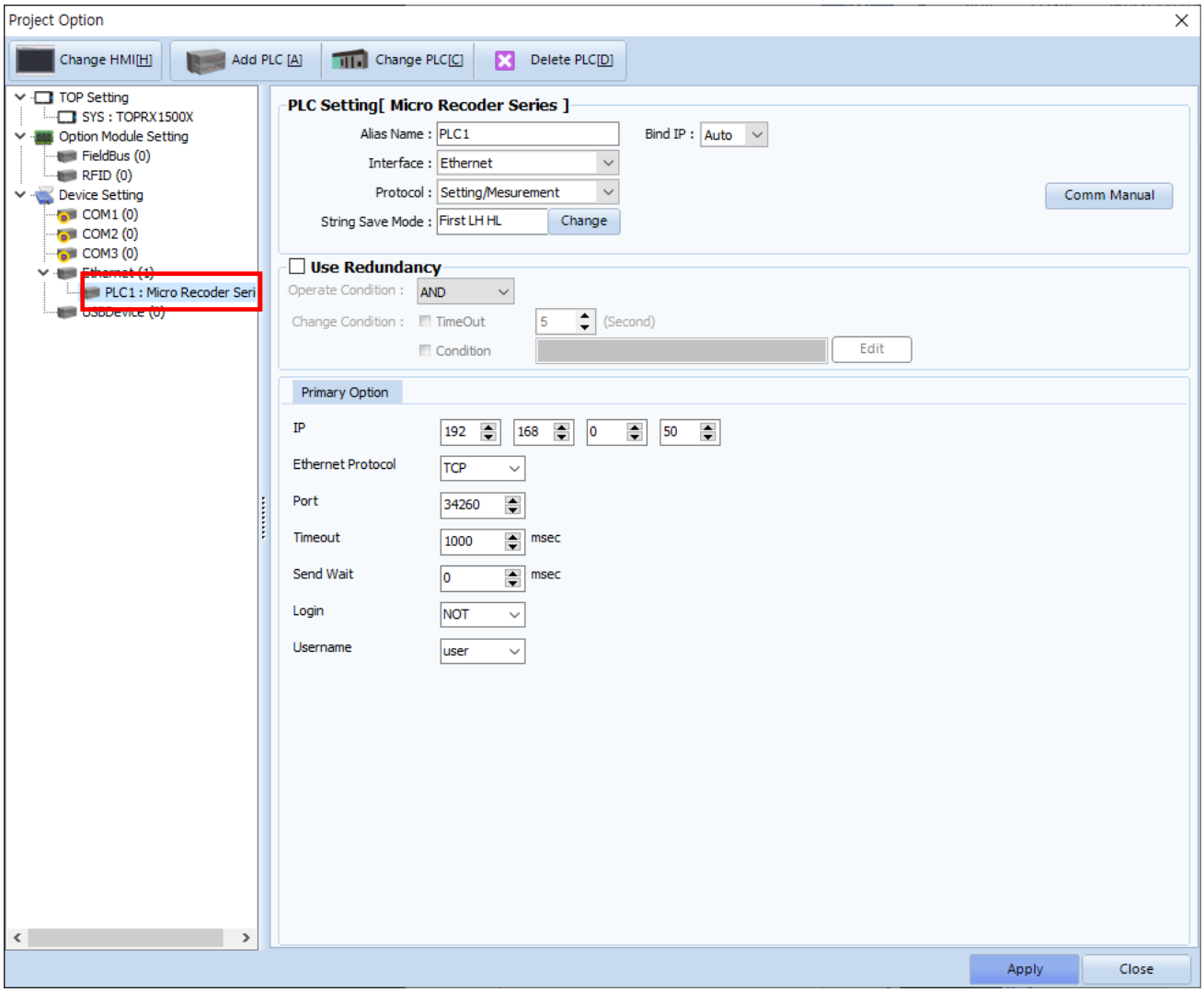
*Note 2) Do not use duplicate IP addresses over the same network.

Items	Description
IP Address	Set the IP address of the TOP.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.

(2) Communication option setting

■ [Project] → [Properties] → [PLC settings > Ethernet > PLC1 : μR Series]

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



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.	*Note 1)
Port	Enter the Ethernet communication port number of an external device.	*Note 2)
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.	
Login	Select whether or not to set up an external device login.	
Username	Enter the user's name.	*Note 3)
Password	Enter the password.	

*Note 1) μR's Setting/Measurement Server Ethernet protocol is TCP.

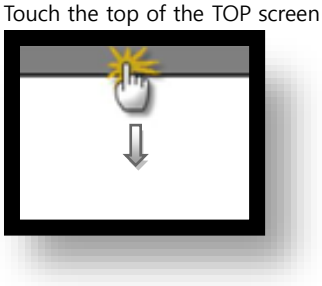
*Note 2) μR's Setting/Measurement Server port no. is 34260.

*Note 3) If login is set to 'not-used', access with the selected item from etither the administrator or the user.

3.2. Communication setting in TOP

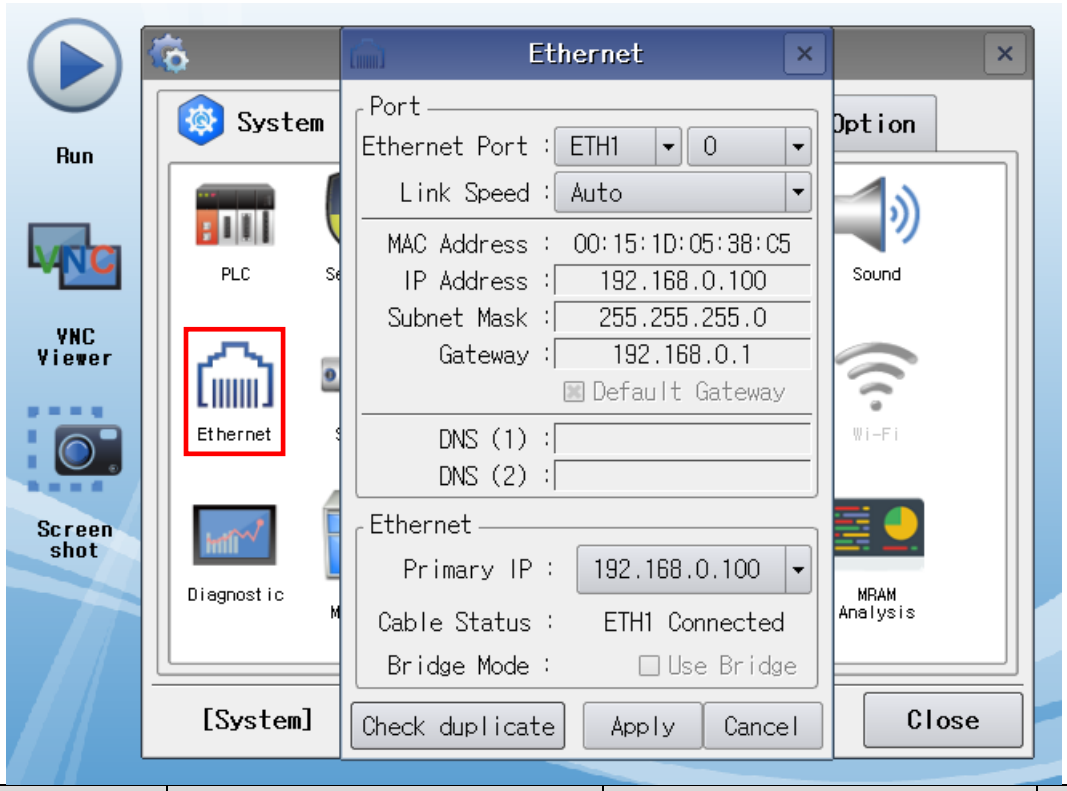
*** This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.**

■ 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	192.168.0.100	192.168.0.50	*Note *Note 2)
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

* The above settings are examples recommended by the company.

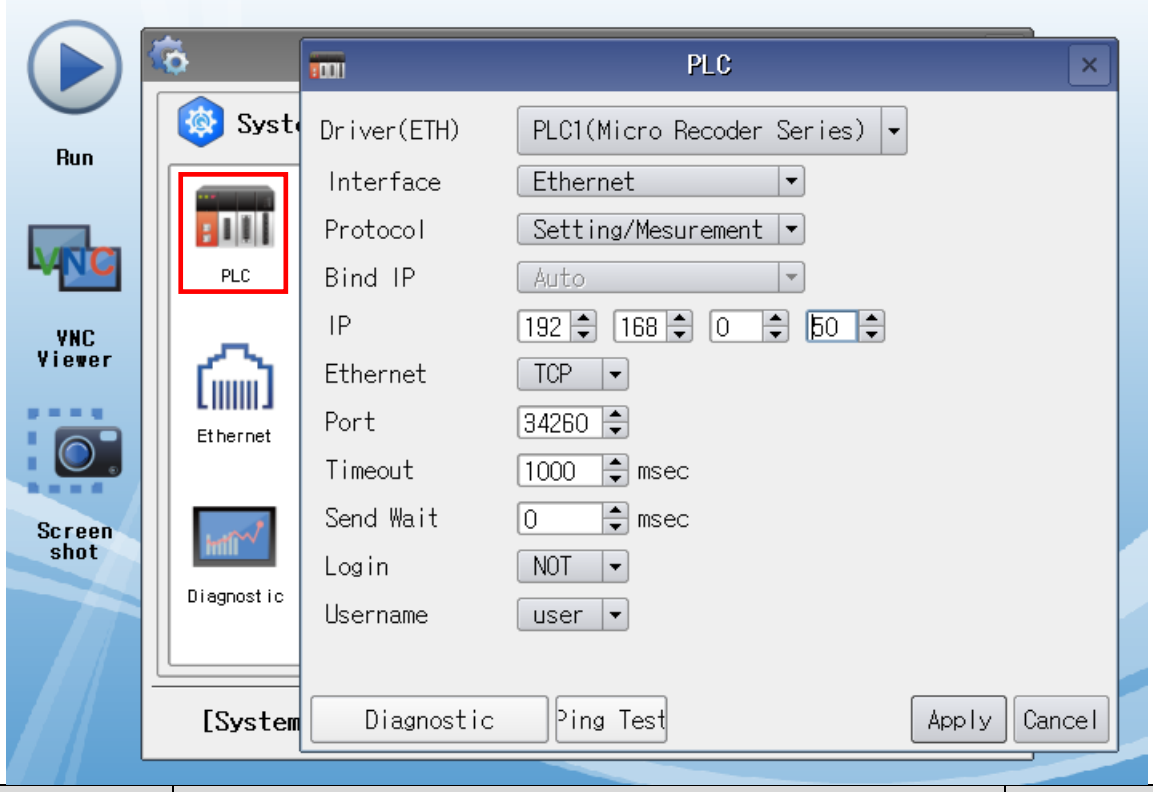
*Note 1) The network addresses of the TOP and the external device (the first three digits of the IP, 192 . 168 . 0 . 0) should match.

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

Items	Description
IP Address	Set the IP address of the TOP.
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 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.	*Note 1)
Port	Enter the Ethernet communication port number of an external device.	*Note 1)
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.	
Login	Select whether or not to set up an external device login.	
Username	Enter the user's name.	*Note 2) *Note 3)
Password	Enter the password.	*Note 3)

*Note 1) μR's Setting/Measurement Server uses TCP, port number 34260.

*Note 2) If login is set to 'not-used', access with the selected item from etither the administrator or the user.

*Note 3) It can be entered in TOP Design Studio.

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.

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

For more detailed setting methods than described in this example, refer to the manufacturer's user manual.

① Press the (MENU) key for 3 seconds to change to the Setting Mode.
② Press the △▽(DISP) key and the ◁▷(FUNC) key together for 3 seconds to change to Basic Setting Mode screen.
③ Select the Basic=Ethernet item with the △▽(DISP) key and press the↵ key to change to the Ethernet setting screen.
④ Press the ↵ key in the Ethernet=Local IP item to change to the IP setting screen.
⑤ Enter the IP, subnet mask and gateway of the recorder using △▽(DISP) key and ◁▷(FUNC) key.
⑥ Select the Ethernet=Login item.
⑦ Set Login=Not (unused) or Login=Use (used).
⑧ When setting Login=Use, select Ethernet=LoginSetting item to set the usernamd and password of an administrator and a user.
⑨ Press ESC/? to return to the Basic Setting screen.
⑩ Select the Basic=End item, and then select the End=Store to save the settings.

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.

(1) Monitoring address (Write disabled)

Address	Channel	Data	Size	Remarks
MEASURED_DATA	01 ~ 24	Recently measured value	16 bits	*Note 1)
COMPUTED_DATA	0A ~ 1P	Recently calculated value	32 bit	*Note 1)
MEASURED_STATUS	01 ~ 24	Recent channel status	16 bits	*Note 2)
COMPUTED_STATUS	0A ~ 1P	Recent channel status	16 bits	*Note 2)
ALARM_LEVEL1	01 ~ 1P	Recent alarm status (level 1)	16 bits	*Note 3)
ALARM_LEVEL2	01 ~ 1P	Recent alarm status (level 2)	16 bits	*Note 3)
ALARM_LEVEL3	01 ~ 1P	Recent alarm status (level 3)	16 bits	*Note 3)
ALARM_LEVEL4	01 ~ 1P	Recent alarm status (level 4)	16 bits	*Note 3)

*Note 1) If the channel status is not (MEASURED/COMPUTED_STATUS) 0, the measured/calculated value of the corresponding channel displays the last read value.

*Note 2) Recorder status according to channel status bits

Bit	Status
0	+Over
1	-Over
2	Burnout (when setting Up)
3	Burnout (when setting Down)
4~15	Reserved

*Note 3) Status according to alarm value

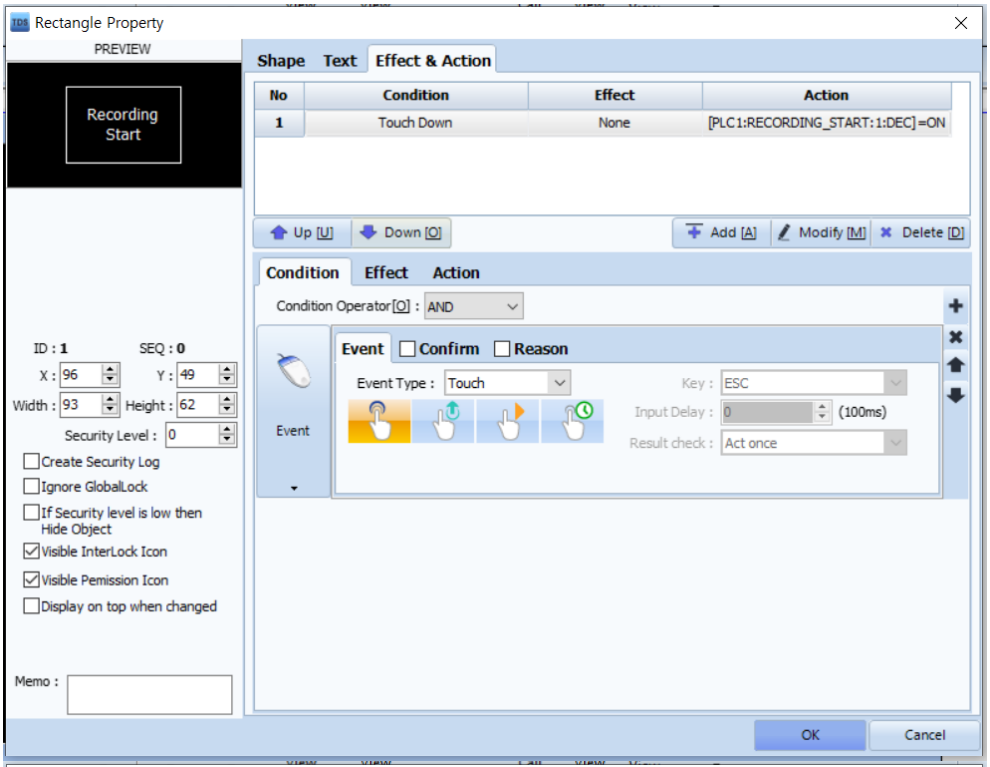
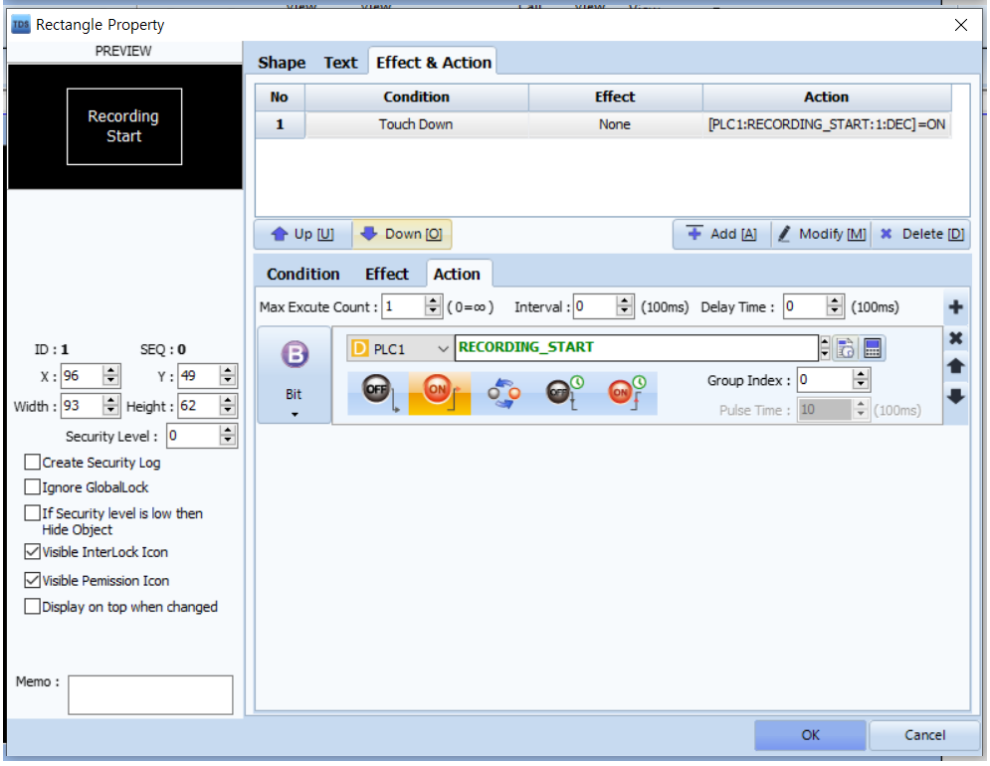
Value	Status
0	None.
1	H (high limit alarm)
2	L (low limit alarm)
3	h (difference high limit alarm)
4	l (difference low limit alarm)
5	R (high limit on rate of change alarm)
6	r (low limit on rate of change alarm)
7	T (delay high limit alarm)
8	t (delay low limit alarm)

(2) Command address

Address	Contents	Remarks
RECORDING_START	Start recording	
RECORDING_STOP	Stop recording	
COMPUTATION_STAR	Start computation	
COMPUTATION_STOP	Stop computation	
COMPUTATION_RESET	Reset computation	

※ How to use the command address

The command address is Write-only, and can be used by registering the operation of an object by turning the bit of the command address On or OFF or entering the temporary value.

Ex) Start recording by pressing a square object.

1. After registering the square object, set "Condition" in "Effects and Actions" to [Event > Touch down].
2. Set the action to [Bit > Enter the recording_start address > ON].
   (Set the maximum number of runs to 1, set the cycle, and set the delay to zero.)
3. Press the square object in TOP and send the RECORDING_START command.