SIEMENS AG.
SIMETIC S7 Series
ETHERNET(OP Communication) Driver

Compatible version	OS	Over 4.0
	XDesignerPlus	Over 4.0.0.0

CONTENTS

Thank you for using M2I's "Touch Operation Panel(M2I TOP) Series". Please read out this manual and make sure to learn connection method and process of TOP – External device"

1. System configuration

TOP와 "SIEMENS AG – SIEMETIC S7 Series CPU ETHERNET(OP Communication)"의 시스템 구성은 아래와 같습니다.

Series	CPU	Link I/F	Method	System settings	Cable
SIMETIC S7-300	CPU312 IFM CPU313 CPU314 CPU314 IFM CPU315 CPU315(F)-2 DP CPU315(F)-2 PN/DP CPU316 CPU316-2 DP CPU317-2 DP CPU317F-2 CPU318-2 CPU317-2 PN/DP CPU319-3 PN/DP CPU614 CPU388	CP 343-1 Lean CP 343-1 IT CP 343-1	Ethernet TCP	3.1 설정 예제 13.1 Setting Example 1 (Page 5)	**Twisted pair cable*Caution1)**
	CPU315-2 PN/DP CPU317-2 PN/DP CPU319-3 PN/DP	CPU Integrated Ethernet Port			
SIMETIC S7-400	CPU412-1 CPU412-2 DP CPU413-1 CPU413-2 DP CPU414-1 CPU414-2 DP CPU414-3 DP CPU416-1 CPU416-2 DP CPU416-3 DP CPU417-4 CPU414-3PN/DP CPU416-3PN/DP CPU417 CPU486	CP 443-1 Lean CP 443-1 IT CP 443-1			
	CPU414-3PN/DP CPU416-3PN/DP	CPU Integrated Ethernet Port			

*Caution1) Twisted pair cable

- This means STP(Shielded Twisted Pair cable) or UTP (Unshielded Twisted Pair cable) category 3,4,5.

- You can connect to configurational device such as hub, transceiver depends on the configuration and in this case, use direct cable.

■ Possible Connecting Configuration

· 1 : 1 connection(1 TOP and 1 External Device)
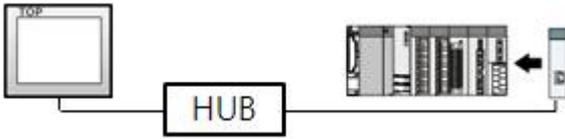
· 1 : N Connection (1 TOP and several external devices) Connection
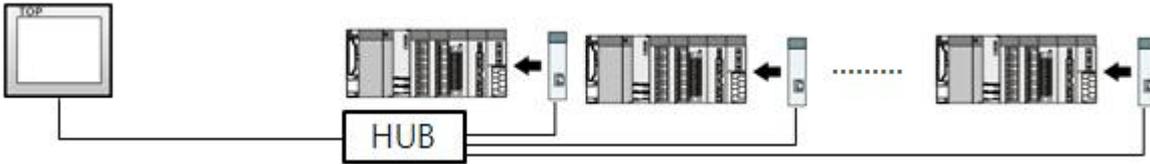
2. Selecting TOP model and external devices

Select the external devices to connect to TOP.
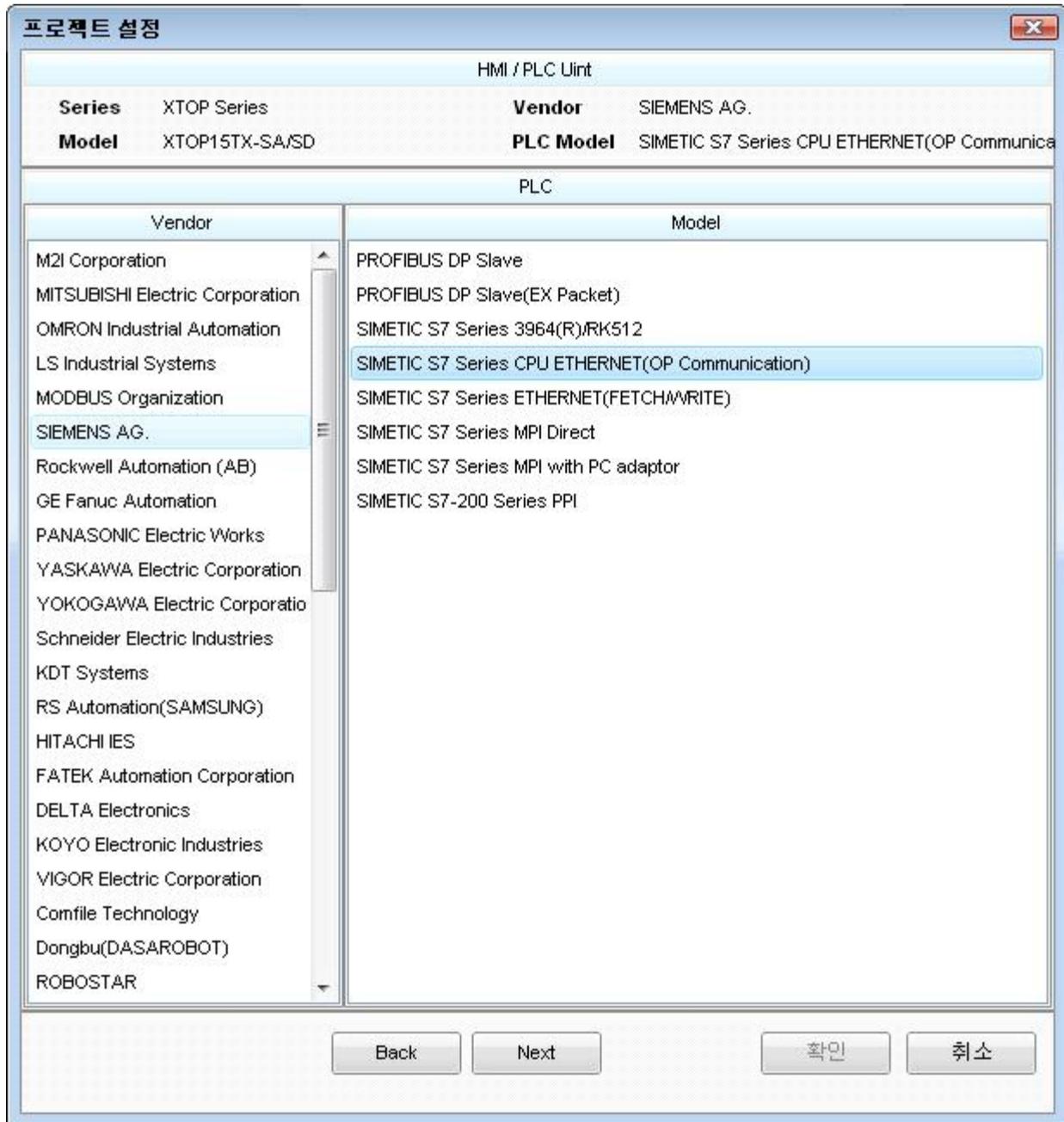
Setting details		Contents
TOP	Series	Select the name of a TOP series that is to be connected to PLC. Before downloading the settings, install the OS version specified in the table below according to TOP series. <table><tr><td>Series</td><td>Version name</td></tr><tr><td>XTOP / HTOP</td><td>V4.0</td></tr></table>
	Name	Select the model name of TOP product.
External device	Manufacturer	Select the manufacturer of external devices to be connected to TOP. Select "SIEMENS AG".
	PLC	Select the model series of external devices to be connected to TOP. Please choose "SIEMETIC S7 Series CPU ETHERNET(OP Communication)". Please check, in the "1. System configuration", if the relevant external device is available to set a

		system configuration.

3. Example of system settings

The setup of communication interface between TOP and SIEMTIC S7 is recommended as below.

3.1 Example of settings 1

Set the system as below.

Details	TOP	SIEMTIC S7 Series		Remark
IP Address*Caution1)Caution2)	192.168.0.50	192.168.0.51		User settings
Subnet Mask	255.255.255.0	255.255.255.0		User settings
Protocol	TCP	TCP		User settings
Port	2000	Read Port	102	User settings
		Write Port	102	

*Caution1) The network address (the 3 front digits of IP, 192.168.000) TOP and external device must be identical.

*Caution2) Please do not use the same IP address in the same network.

(1) XDesignerPlus setup

After setting the below details in [Project > Project Settings], download the detailed settings using TOP tool.
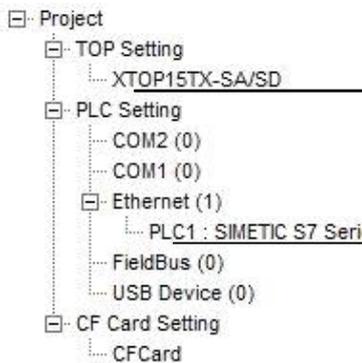
- ■ [Project > Project property > Project > Settings > TOP Name]

Set the communication interface of TOP tool.

- From right window [HMI Setup > check Use HMI Setup > Device Manager]
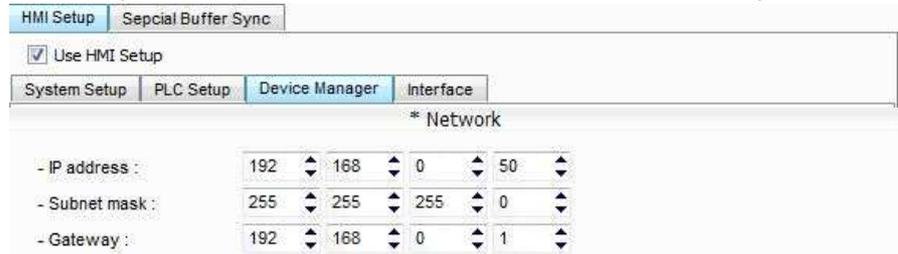
- From right window [HMI Setup > check Use HMI Setup > PLC Setup]
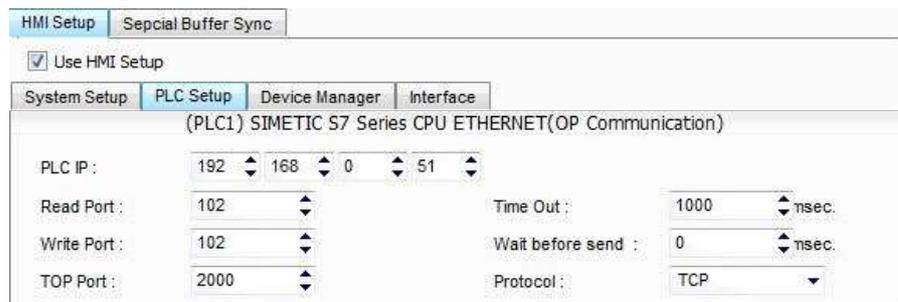
■ External device settings

This sets the option of communication driver for "SIEMETIC S7 Series CPU ETHERNET(OP Communication)".
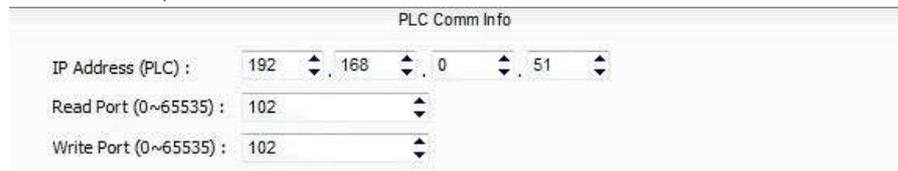
- IP Address (PLC): Type the IP address that the external device was given.

- Reading port / writing port: Choose the port number that will be used for ethernet communication.

(2) External device settings

Setup as below using SIEMTIC S7 Ladder Software STEP 7. Please refer the PLC user manual for more detailed information if you need.

> ⚠️ Please do not use the same IP address in the same network.

1. Create a new project in [New Project] at upper bar of main menu of [SIMETIC Manager].

2. Select menu [Insert] > [Station] > [1 SIMETIC 400 Station] or [2 SIMETIC 300 Station]. → Add CPU

3. Double click added "[SIMETIC 400(1)]" or [SIMETIC 300(1)] CPU > Relevant CPU [Hardware] → New [HW Config] window appears.

4. Open "[SIMATIC 400] > [RACK-400]" or "[SIMATIC 300] > [RACK-300]" at left tree window in [HW Config], select Base unit model, and register it using Drag & Drop to the right bottom.

5. Select [SIMATIC 400] > [PS-400] or [PS-300] and then appropriate power supply unit, and drag & drop it to the current Rack.

6. Select [SIMATIC 400] > [CPU-400] or [CPU-300] and then appropriate CPU unit and drag& drop it to the current Rack.

(If [Properties] – PROFIBUS interface DP] windows appears, press [Cancel] to finish).

◆ When CPU PN/IO setting, right click [PN/IO] which is registered on CPU의 X2 > select [Object Properties…]

(A new [Properties] window will be appeared.)
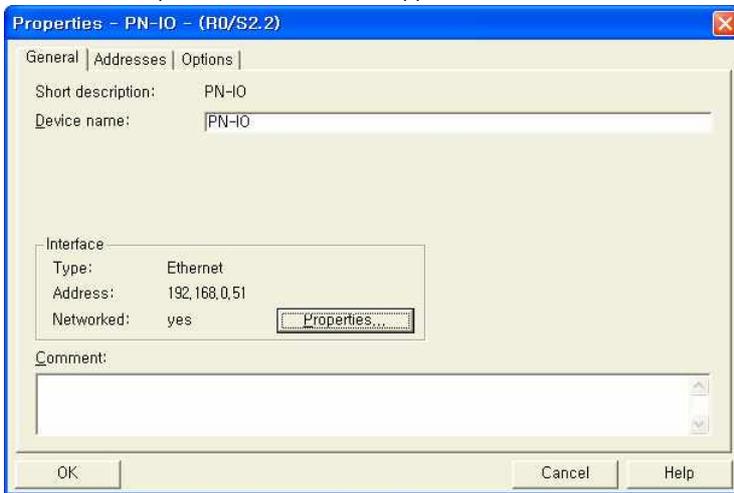
If communication card is used, select additional [SIMATIC 300] > [CP-300] 혹은 [SIMATIC 400] > [CP-400] to choose ethernet communication unit that is being used and drag & drop on current rack.

◆ When setting CP443-1 or CP343-1, right click [Ethernet communication unit name] > Select [Object Properties…]
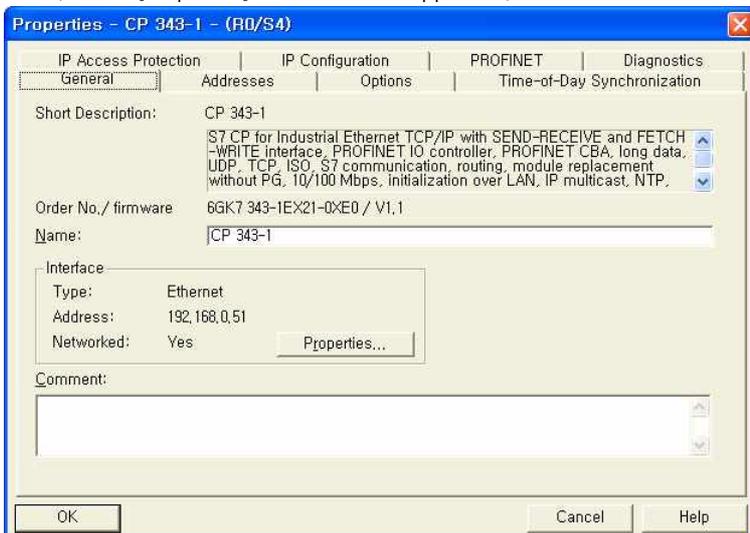
(A new [Properties] window will be appeared.)

7. From [Properties] Tap [General] > Click [Properties...] in the [Interface]. (A new [Properties] window will be appeared.)

8. From [Parameters] Tap in [Properties] window, input [IP address] and [Subnet mask] of Ethernet communication module, and click [New...] key to register the information.

◆ In case of PN/IO ◆ In case of Ethernet Communication Module
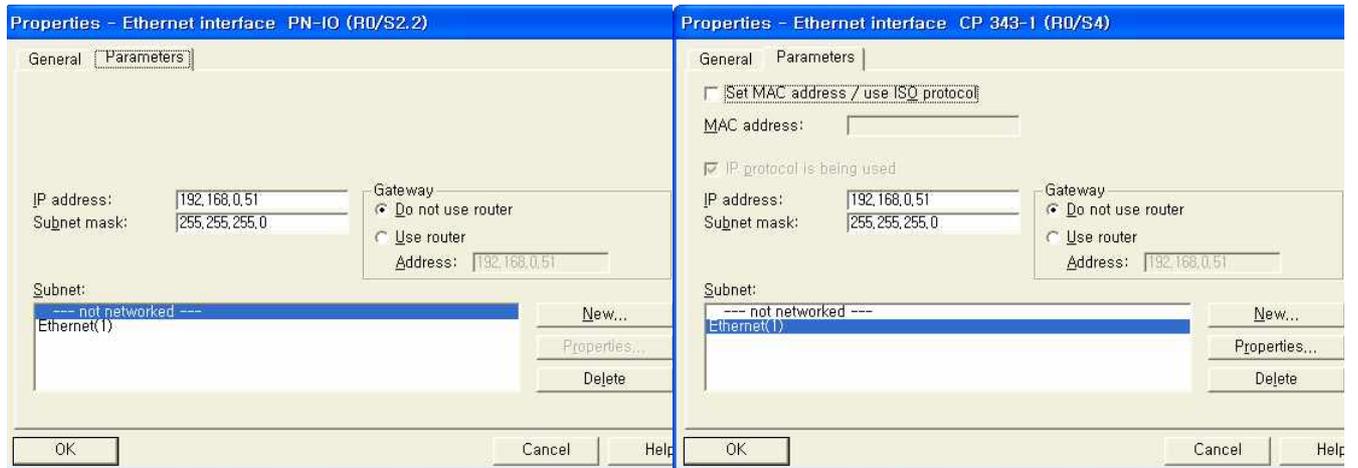
9. Main Menu [Station] > select [Save And Compile] to error checking and save settings, download the saved information to PLC.

10. Reset the power of PLC after downloading.

4. Communication settings details

Communication settings are available at XDesignerPlus or TOP main menu. Communication settings must be identical with the external devices.

4.1 XDesignerPlus settings details

Select [Project > Project property] to show the below window.
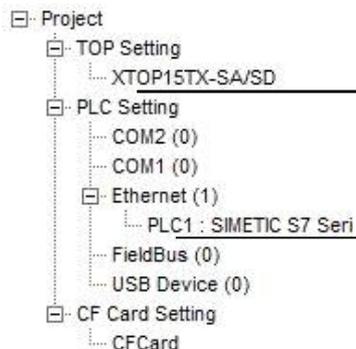
■ [Project > Project property > Project > Settings > TOP Name]
Set the communication interface of TOP tool.
- From right window, [HMI Setup > check Use HMI Setup > Device Manager]
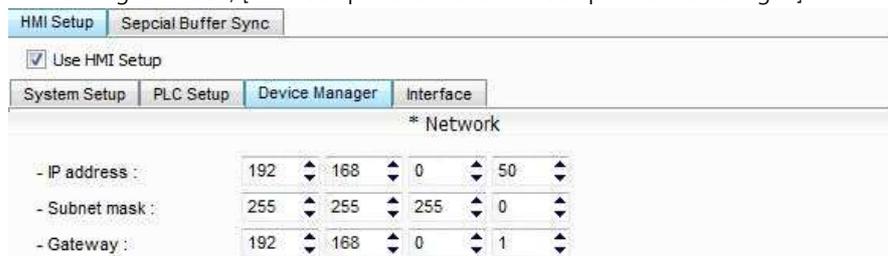
- From right window [HMI Setup > check Use HMI Setup > PLC Setup]
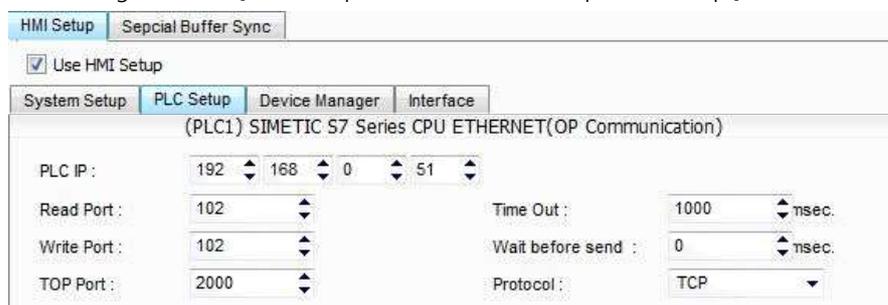
■ External device settings
This sets the option of communication driver for "SIEMETIC S7 Series CPU ETHERNET(OP Communication)".
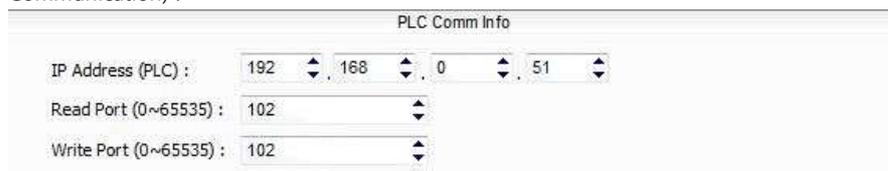
■ Communication Interface Settings

Details	Contents
IP Address	Setup the IP address that TOP receives in the network.
Subnet mask	Input subnet mask of network
Gateway	Input subnet mask of network
PLC IP address	Input IP address that external device gets received.
Read Port / Write Port	Choose port number that will be used for ethernet communication of external device.
TOP port	Port number will be automatically setup if ethernet commucation with external device is in progress.
PLC address [0~65535]	Address of other device. Select between [0 - 65535].
Ethernet time out	Set up TOP's waiting time from external device at [0 - 99] x 100mSec.
Delay time of transmission [x1 mSec]	Set up TOP's waiting time between response receiving – next command request transmission from external device at [0 – 5000] x 1 mSec.

Protocol	Choose the protocol type that are authorized to use following external devices and setup port number.

4.2 TOP main menu setup item

- When a buzzer is on during the power reset, touch 1 spot at the upper LCD to move to "TOP Management Main" display.
- Set up driver interface at TOP according to below **Step1 → Step2**.
  (Press "TOP ethernet setup" in **Step 1** to change setup at **Step 2**.)
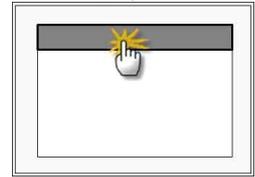
Step 1. [PLC setup] - Setup driver interface.

PLC setup	
PLC IP : 192 . 168 . 0 . 51	Communication Interface
Protocol : TCP	Settings
PLC Read Port : 102	
PLC Write Port : 102	
TOP Port : 2000	
PLC Address : 00	
Timeout : 1000 [mSec]	
Delay time of transmission : 0 [mSec]	
TOP IP : 192 . 168 . 0 . 50	
TOP Ethernet setting communication diagnosis	

Step 1–Reference.

Details	Contents
PLC IP	It is an IP address that external device was given.
Protocol	Choose the protocol type that are authorized to use following external devices and setup port number.
PLC Read Port	It is the port address that will be used for ethernet of external device.
PLC Write Port	It is the port address that will be used for ethernet of external device.
TOP port	Port number will be automatically setup if ethernet commucation with external device is in progress.
PLC address [0~65535]	Address of other device. Select between [0 - 65535].
Timeout [x1 mSec]	Set up TOP's waiting time from external device at [0 - 5000] x 1mSec.
Delay Time before transmitting [x1 mSec]	Set up TOP's waiting time between response receiving – next command request transmission from external device at [0 – 5000] x 1 mSec.
TOP IP	Setup the IP address that TOP receives in the network.

Step 2. [PLC Setup] > [TOP Ethernet Setup] - Setup the serial parameter of correspond port.

Port Settings	
* Ethernet Communication	Ethernet Port
+ Network setting	Communication Interface
- MAC : 00 - 15 - ID - 00 - 30 - 52 (each device has different address)	Settings
- IP Address : 192. 168 . 0 . 50	
- Subnet mask : 255 255 . 255 . 0	
- Gateway : 192 168 . 0 . 1	

Step 2–Reference.

Details	Contents
MAC	Physical official address in the network.
IP Address	Setup the IP address that TOP receives in the network.
Subnet mask	An address that divides the network ID and host ID regarding of IP address.
Gateway	An address that connects a network to another network.

4.3 Communication diagnosis

■ TOP - Confirming interface setting condition between external devices

- Move to Menu by clicking the top side of LCD screen as resetting the power of TOP.

- [Main Menu >Communication setting] Confirm if detail in number 20~24 is identical to the setup information of "■Setup exercise 1".

- PLC Setup > Click the button in "Communication diagnosis" of TOP Ethernet.

- Diagnosis dialog box will pop up on the screen, you can judge by following information that are shown on box no. 3 section.

OK!	Communication setting succeeded
Time Out Error!	Communication setting error - Error in the setting situation of Cable and TOP / External device **(reference : Communication Diagnosis sheet)**

■ Communication Diagnosis Sheet

- Please refer to the information below if you have a problem between external devices and communication connection.

Details	Contents				Confirm	
TOP	Version Information	xDesignerPlus :		O.S :		
	Name of Driver				OK	NG
	External device information (xDesignerPlus Project setting)	IP Address			OK	NG
		Subnet mask			OK	NG
		Gateway			OK	NG
	TOP Information (Main Device Menu Setting)	Protocol	UDP/IP	TCP/IP	OK	NG
		IP Address			OK	NG
		Subnet mask			OK	NG
		Gateway			OK	NG
	Other specified setting info				OK	NG
System configuration	System Connection Method	1:1	1:N	N:1	OK	NG
	Name of cable (Hub usage)	Direct (Use Hub)		Cross (No Hub)	OK	NG
External device	Name of CPU				OK	NG
	Name of communication device				OK	NG
	Protocol(mode)				OK	NG
	Other specified setting info				OK	NG
	IP Address	(Local)		(Destination)	OK	NG
	Port number	(Local)		(Destination)	OK	NG
	Subnet mask				OK	NG
	Gateway				OK	NG
	Address range confirm (other docs)				OK	NG

5. Support address

Devices that are usable with TOP is as below.

There might be difference in the range of device (address) by type / series of CPU module TOP series supports the maximum address range that external device series use Please refer each CPU module user manual carefully for devices that you desired to use to prevent not getting out of range.

	Bit address		Word address		32 bits	Remark
Input Relay * caution1)	I00000.0 – I04095.7	E00000.0 – E04095.7	IW00000 – IW04095	EW00000 – EW04095	**H/L** *caution4caution5)	—
Output Relay * caution2)	Q00000.0 – Q04095.7	A00000.0 – A04095.7	QW00000 – QW04095	AW00000 – AW04095		—
Data Block	DB00001 : DBX00000 – DB65535 : DBX65533.7		DB00001 : DBW00000 – DB65535 : DBW65532			—
Internal Memory	M00000.0 – M08192.7		MW00000 – MW08192			—
Timer*caution3)	—		T00000 – T00255			Unavailable to write
Counter*caution3)	—		C00000 – C00255	Z00000 – Z00255		Unavailable to write

*Caution1) Input Device (I,IW) might not be able to input read on the address of IW0 ~ IW2 because depends on the type of CPU, it becomes subordinate in the integrated I/O. Please refer to the PLC Manual.

*Caution2) Output Device (Q, QW, QD) can write value only in the Run Mode. Output value will be reset if it's STOP Mode.

*Caution3) Device Restricted to Read only

> For displaying the timer, use the calculatation tag, and then devide the timer value to two piece.
>
> At the following example, the inner buffer 1001 means the current timer value and the inner buffer 1002 means the unit.
>
> It means Unit) 0:10ms, 1:100ms, 2:1sec, 3:10sec
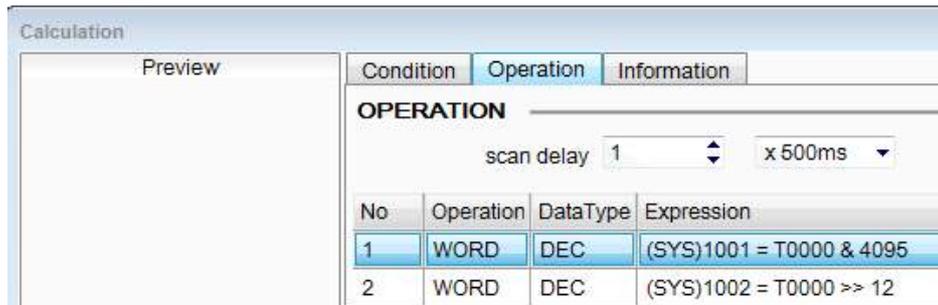
Display the inner buffer 1001, 1002.

*Caution 4) Regarding on Word device, 32 but Data will be saved in the order of from High / Low, 16 bit each.

(Example) VW00000 (32bit data, 0x12345678) ➔ VW00000(16bit, 0x1234) VW00002(16bit, 0x5678)

*Caution5) Checks "Word Swap" function when 32BIT address is used.