CODESYS V3
Ethernet Tag Driver
(Import User Tag)

Supported version TOP Design Studio V1.4.10.33 or higher

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We want to thank our customers who use the Touch Operation Panel.

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Select a TOP model and an external device.

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Describes how to set up communication for external devices.

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Refer to this section to check the data addresses which can communicate with an external device.

1. System configuration

The system configuration of TOP and "CoDeSys Automation Alliance - CODESYS V3 Ethernet Import User Tag" is as follows:

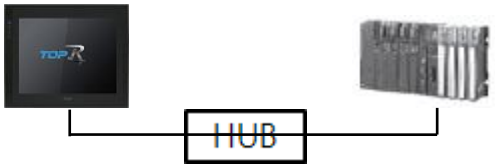
Series	Link I/F	Communication method	System setting	Cable
CODESYS V3 Ethernet (Import User Tag)	-	TCP	3. TOP communication setting 4. External device setting	Twisted pair cable*Note 1)

*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.

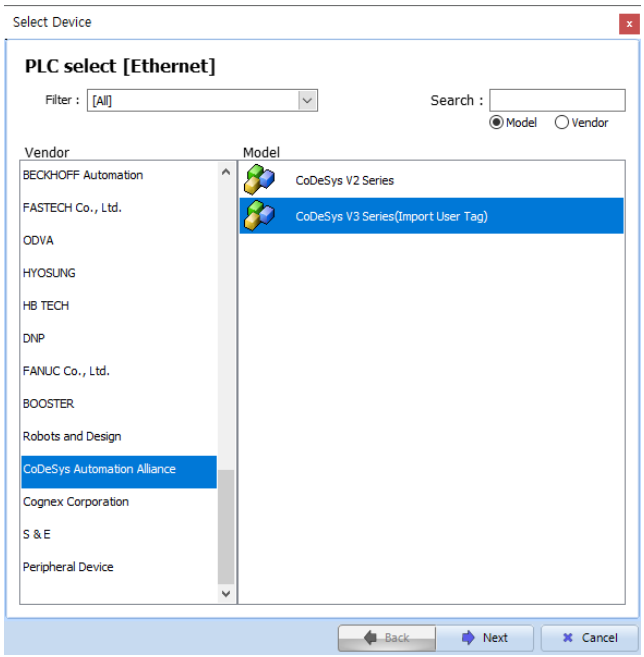
■ Connectable configuration

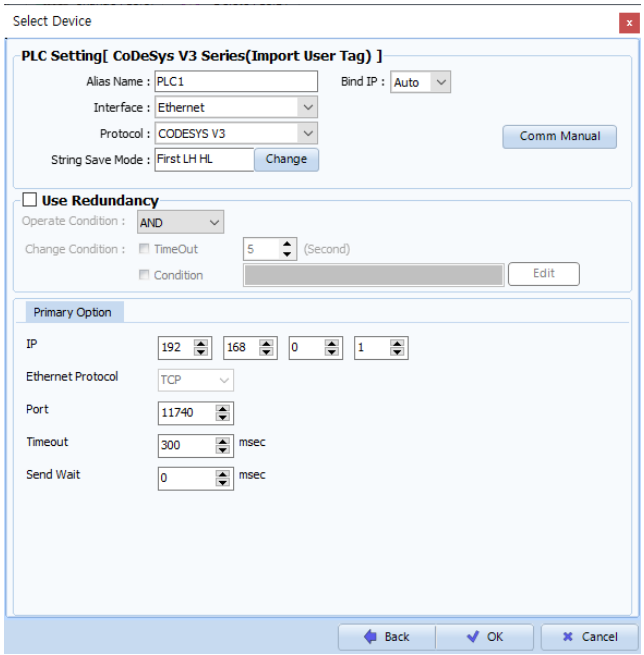
・1:1 connection (one TOP and one external device) connection



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 to be connected to TOP. Select "CoDeSys Automation Alliance".
	PLC	Select the external device to be connected to the TOP.

Model	Interface	Protocol
CoDeSys V3 Series (Import User Tag)	Ethernet	CODESYS V3

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

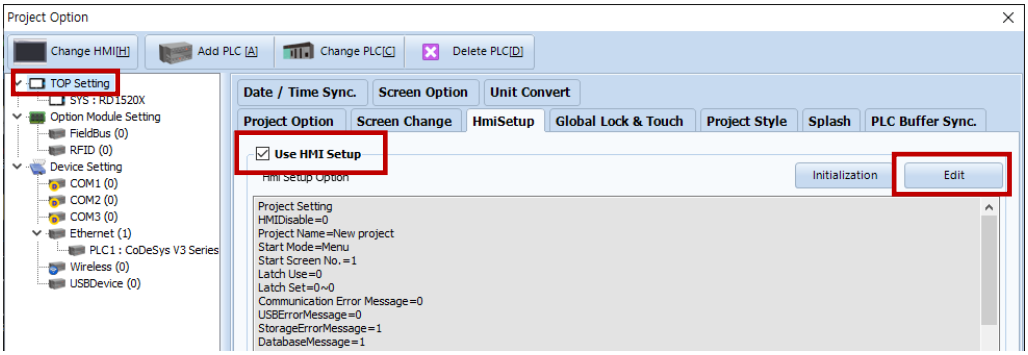
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

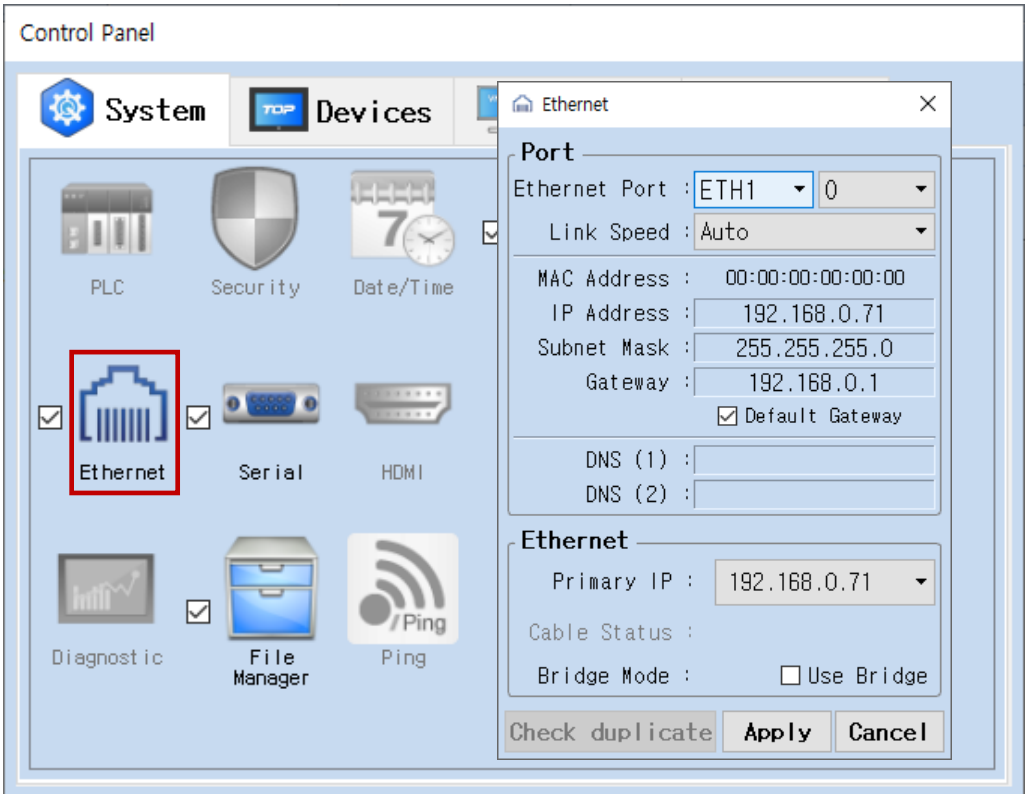
3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

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

– Set the TOP communication interface in TOP Design Studio.





Items	TOP	External device	Remarks
IP Address*Note 1) Note 2)	192.168.1.71	192.168.1.70	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.1.1	192.168.1.1	

*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.

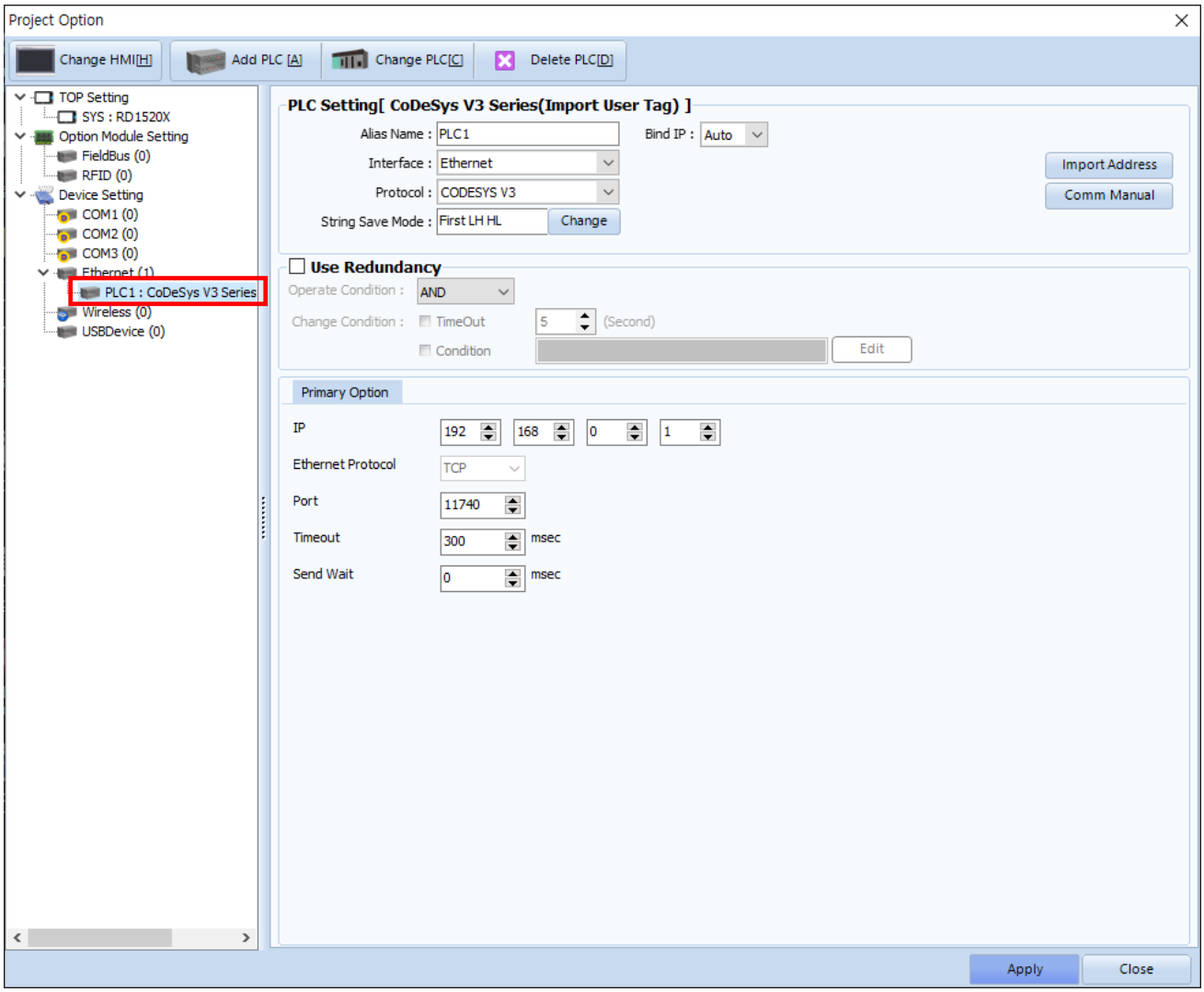
※ The above settings are examples set by the company. It must be set up to suit user environment.

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 > PLC Setting > ETHERNET > "PLC1 : CoDeSys V3 Series"]

– Set the options of the CoDeSys V3 Series communication driver in TOP Design Studio.

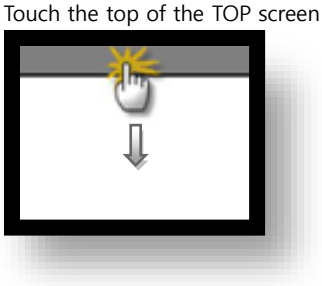


Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External device selection".
Protocol	Choose "CODESYS V3".	
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	
Port	Enter the Ethernet communication port 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.	

3.2. Communication setting in TOP

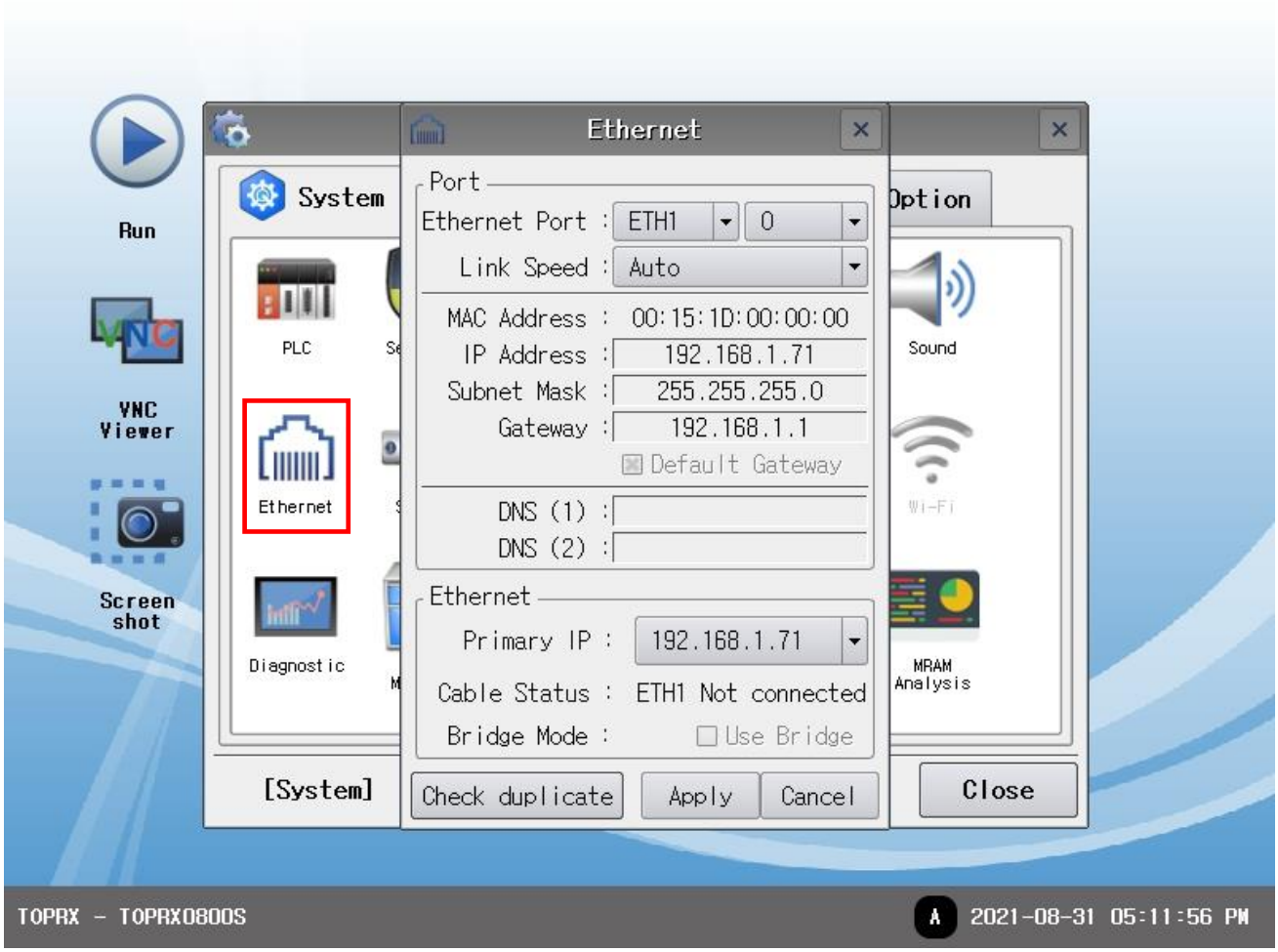
*** This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.**

■ 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)	192.168.1.71	192.168.1.70	
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.

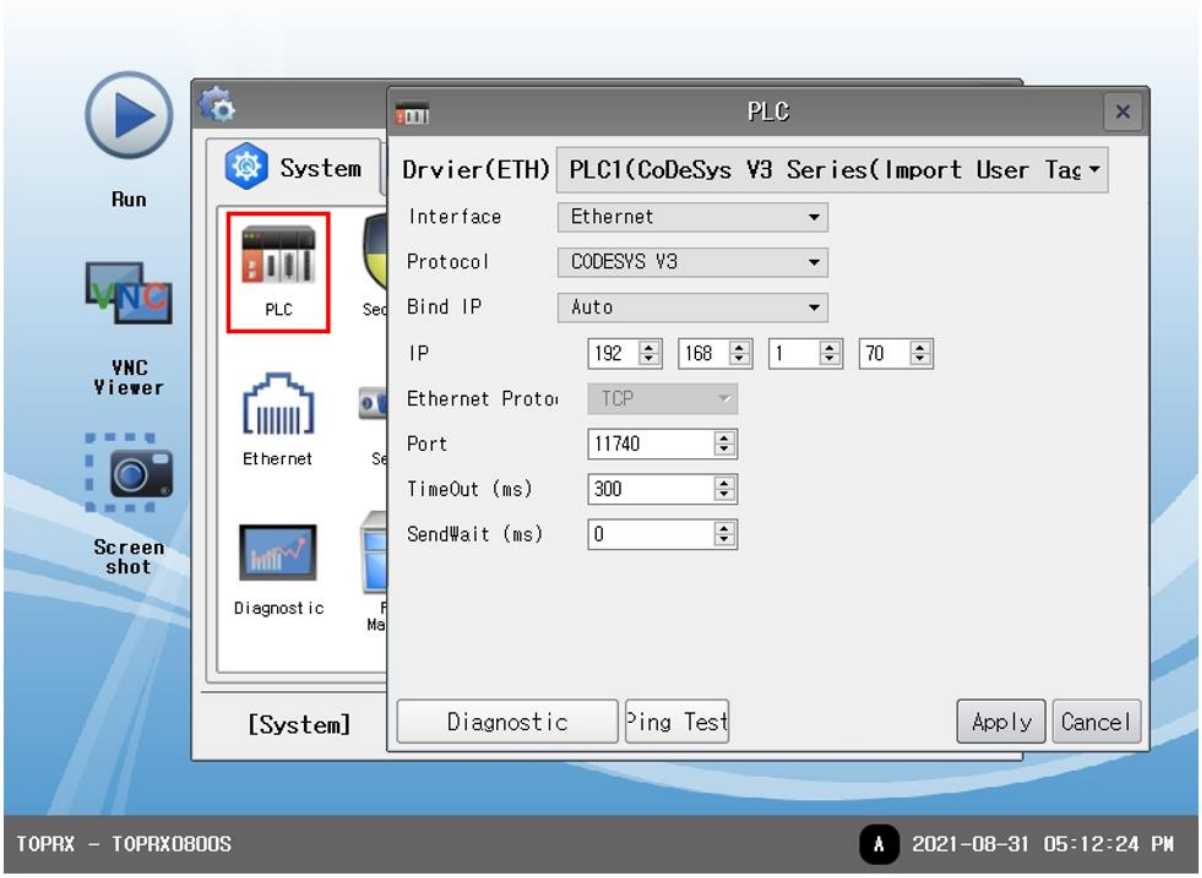
*Note 2) Do not use duplicate IP addresses over the same network.

※ The above settings are examples set by the company. It must be set up to suit user environment.

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	Choose “CODESYS V3”.	
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.	

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 ETH port 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

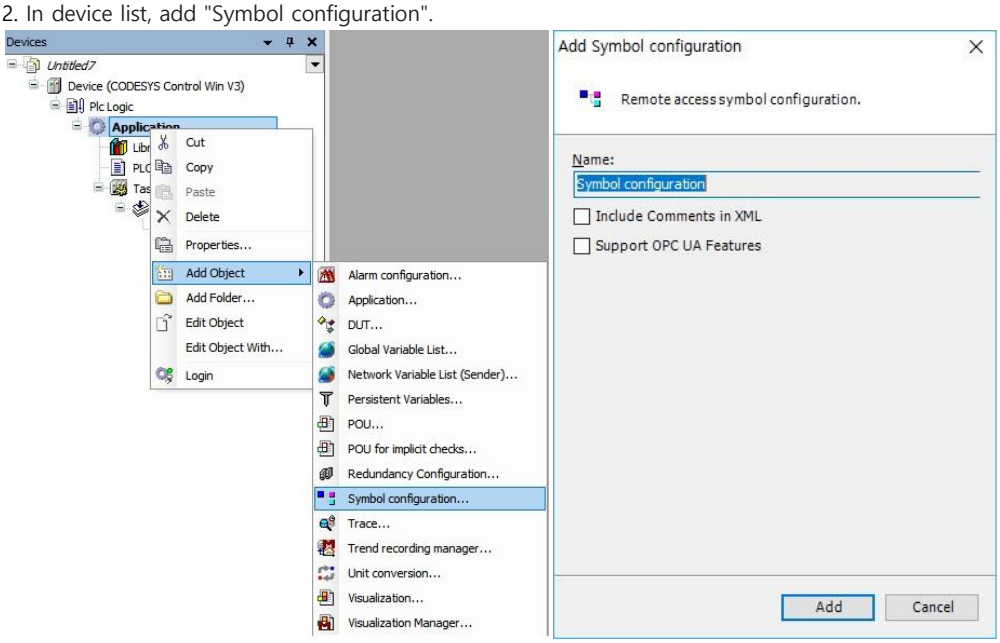
Set as below using “CoDeSys V3.5”. For more detailed setting method than that described in this example, refer to the PLC user manual.

> Do not use duplicate IP addresses over the same network.

■

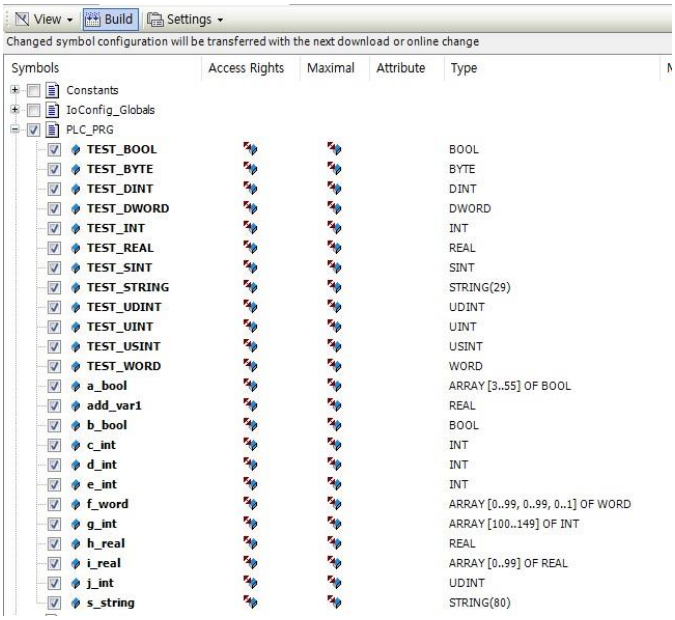
1. Please create a project.

2. In device list, add "Symbol configuration".

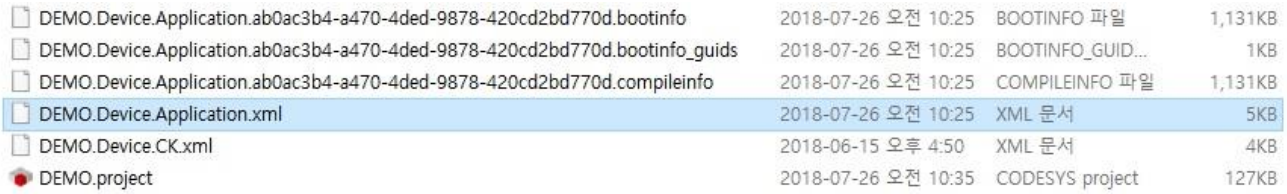


3. Select PLC_RPG and when tag information is shown, build a project..

[build] -> **[Generate Code]**

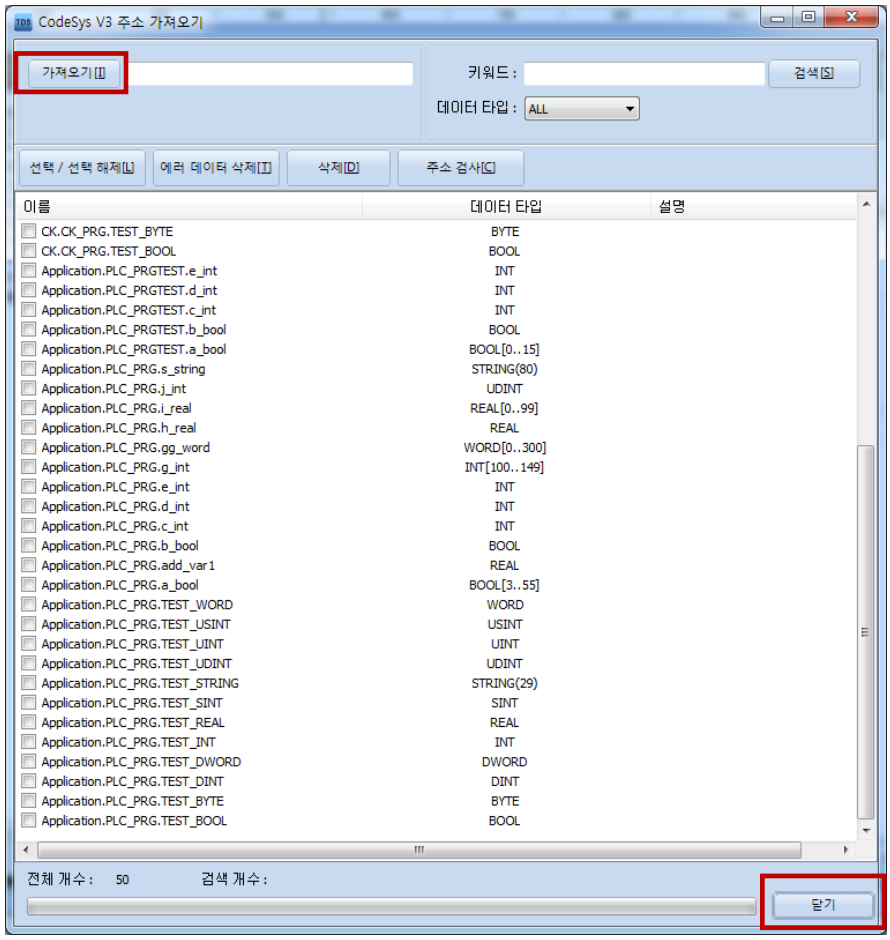


4. Create a *.xml file in the project folder.



3. 'CodeSys V3 Address Import' will be activated by clicking the **"Import Address"** button.

At this point, when you select the file after clicking the "Import" button, the global variable list information created by "CODESYS V3.5" appears.



4. Click the 'Close' button to apply and make it a global variable in TOP Design Studio.

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.

TAG : User Setup Tag Name **Tag Specification**

Device Type		Bit Address	Word Address	32bit	Remarks
BOOL	SINGLE	**TAG.0 – TAG**	–	L/H	*1)*2)
	ARRAY[1]	**TAG[0] – TAG[x-1]**			
BYTE SINT USINT	SINGLE	**TAG.0 – TAG.7**	**TAG**	L/H	*1)*2)*3)
	ARRAY[1]	**TAG[0].0 – TAG[x-1].7**	**TAG[0] – TAG[x-1]**		
	ARRAY[1]	**TAG[0].0 – TAG[x-1].15**	**TAG[0] – TAG[x-1]**		
INT UINT WORD	SINGLE	**TAG.0 – TAG.15**	**TAG**	L/H	*1)*2)
	ARRAY[1]	**TAG[0].0 – TAG[x-1].15**	**TAG[0] – TAG[x-1]**		
DINT UDINT DWORD	SINGLE	**TAG.0 – TAG.31** **TAG[0].0 – TAG[x-1].31**	**TAG**		*1)*2)
	ARRAY[1]		**TAG[0] – TAG[x-1]**		
REAL	SINGLE	-	**TAG**		*1)*2)*4)
	ARRAY[1]		**TAG[0] – TAG[x-1]**		
LREAL	SINGLE	-	**TAG**		*1)*4)
TIME DATE TIME_OF_DAY DATE_AND_TIME	SINGLE	-	**TAG**		*1)
STRING	SINGLE	**TAG.0 – TAG.x-1**	**TAG**		*1)

*1) TAG: Maximum number of characters in tag name is 255, including section characters and property numbers. When ARRAY script is used, the maximum no. of characters is 54.

The number of elements in the ARRAY is included in the controller tag information from an arrangement of 0 to [Element-1] of the array element.

- ARRAY[1] : EX) ARRAY[65535](INT) Element number 65535
- ARRAY[2] : EX) ARRAY[232767](BOOL) Element number 65534
- ARRAY[3] : EX) ARRAY[1116383](DINT) Element number 65532

*3) In PLC, BYTE, SINT, and USINT types are 8-bit units, but the TOP series is based on 16-bit units, so be careful when writing data. E.g.) low byte – Write (O) , High byte – Write (X)

*4) REAL(32Bit) LREAL(64Bit) are real-type data types.

*5) STRING is 81Byte.

LINT, LWORD, ULINT, LTIME, WSTIRN are not supported data types.