ESCO Co., Ltd
IGBT Rectifier
Computer Link Driver

Supported version   TOP Design Studio   V1.0 or higher

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

1. System configuration

Describes the devices required for connection, the setting of each device, cables, and configurable systems.

2. External device selection

Select a TOP model and an external device.

3. TOP communication setting

Describes how to set the TOP communication.

4. External device setting

Describes how to set up communication for external devices.

5. Cable table

Describes the cable specifications required for connection.

6. Supported addresses

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

1. System configuration

The system configuration of TOP and "ESCO Co., Ltd. – ESCO IGBT Rectifier Computer Link" is as follows:

Series	CPU	Link I/F	Communication method	Communication setting	Cable
IGBT Rectifier	IGBT Series	Built-in RS-485 port	RS-485	3. TOP communication setting 4. External device setting	5.1. Cable table 1

■ Connection configuration

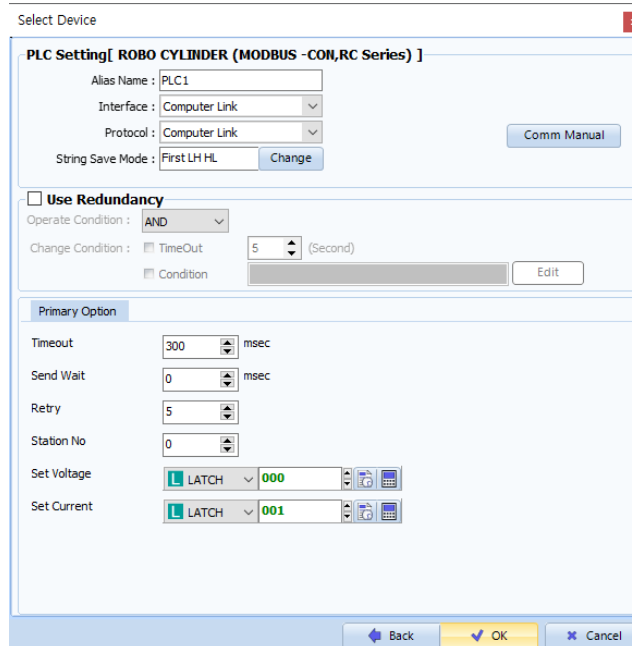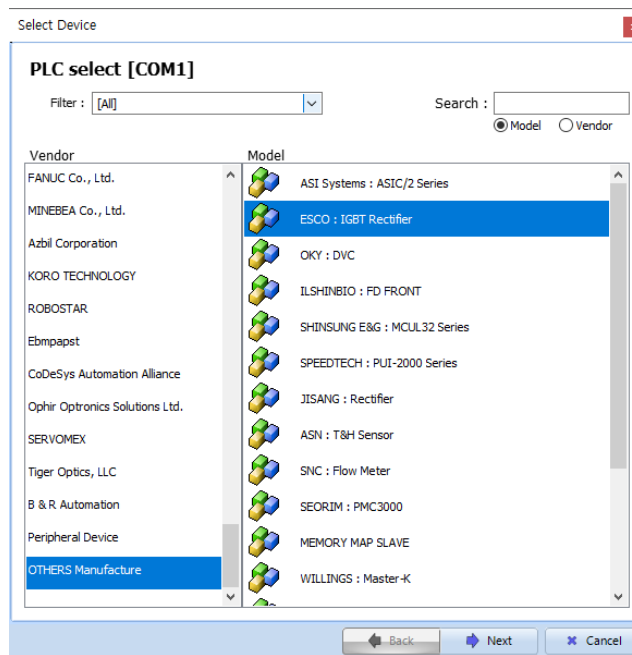・1:1 (one TOP and one external device) connection

・1:N (one TOP and multiple external devices) connection – configuration which is possible in RS-485 communication.
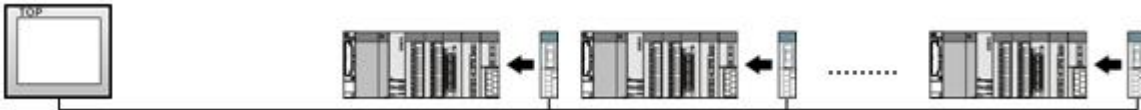
2. External device selection

■ 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 "OTHERS Manufacture".
	PLC	Select an external device to connect to TOP.

Model	Interface	Protocol
Esco IGBT Rectifier	Computer Link	Computer Link

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 > Serial]
  – Set the TOP communication interface in TOP Design Studio.
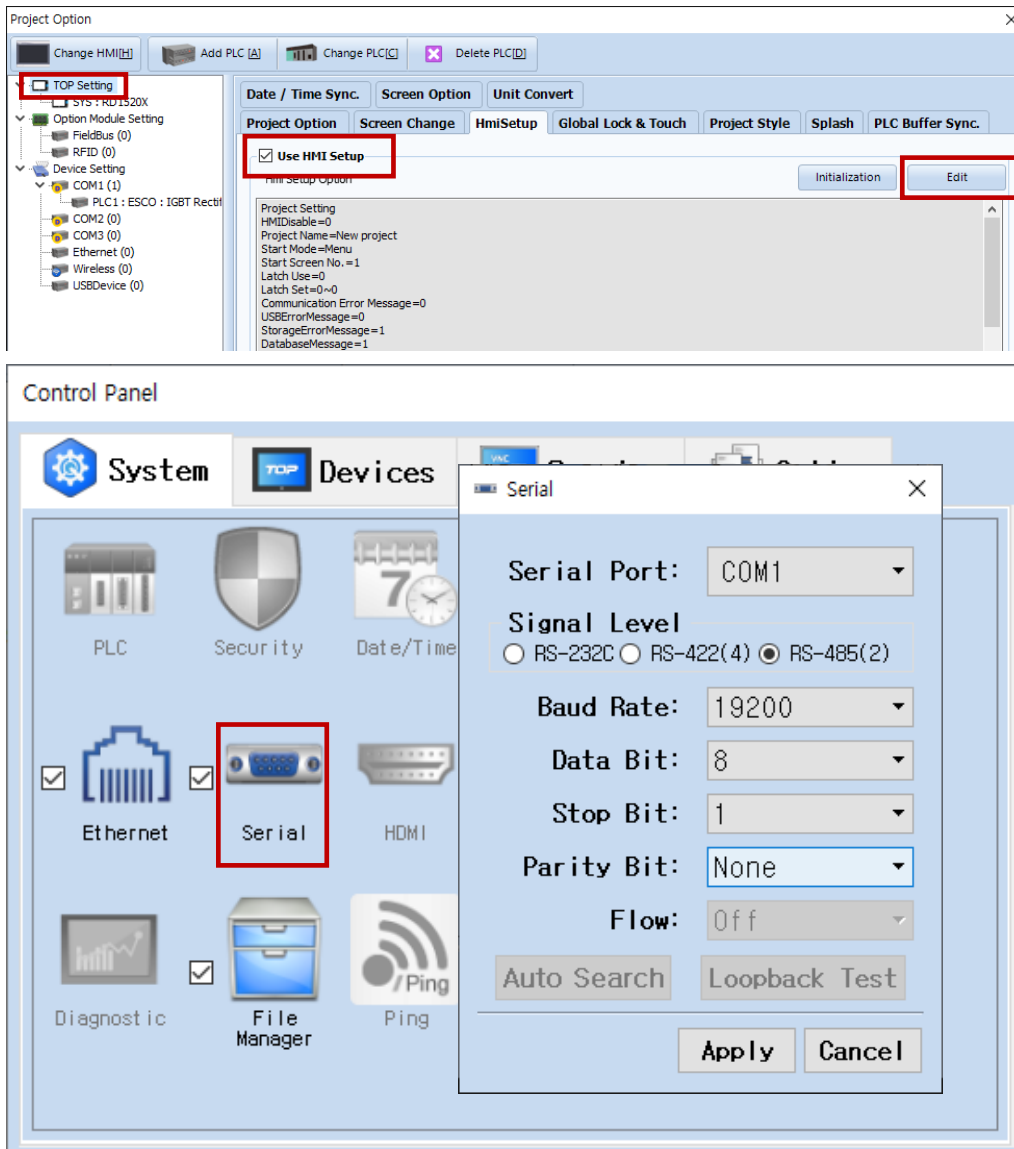
Items	TOP	External device	Remarks
Signal Level (port)	RS-485	RS-485	
Baud Rate	19200		
Data Bit	8		
Stop Bit	1		
Parity Bit	None.		

* The above settings are examples recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.

(2) Communication option setting

■ [Project > Project Property > Device Setting > COM > "ESCO IGBT Rectifier"]
   – Set the options of the ESCO IGBT Rectifier Computer Link communication driver in TOP Design Studio.

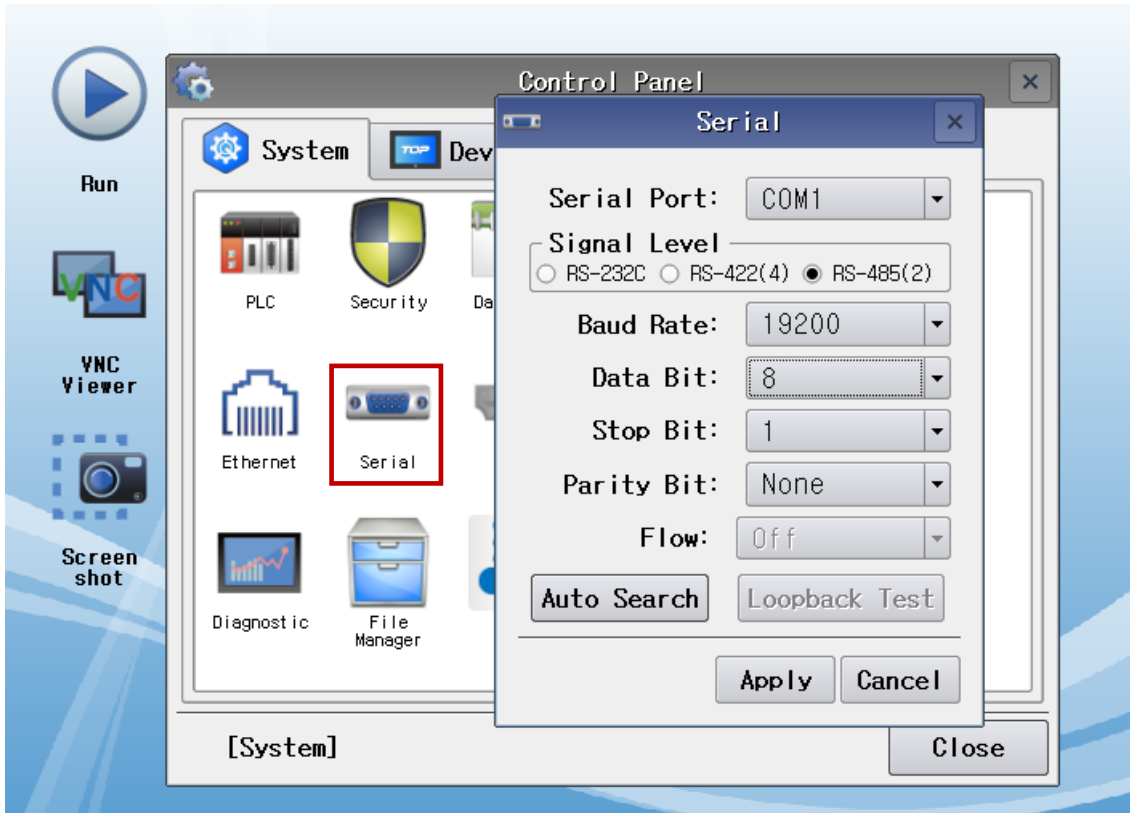| Items	Settings	Remarks
Interface	Configure the communication interface between the TOP and an external device.	Refer to "2. External device selection".
Protocol	Configure the communication protocol between the TOP and an external device.	
TimeOut (ms)	Set the time for the TOP to wait for a response 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.	
Station No	Enter the prefix of an external device.	
Set Voltage	Set the LATCH area where you want to enter the set voltage value.	
Set Current	Set the LATCH area where you want to enter the set voltage value.	

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
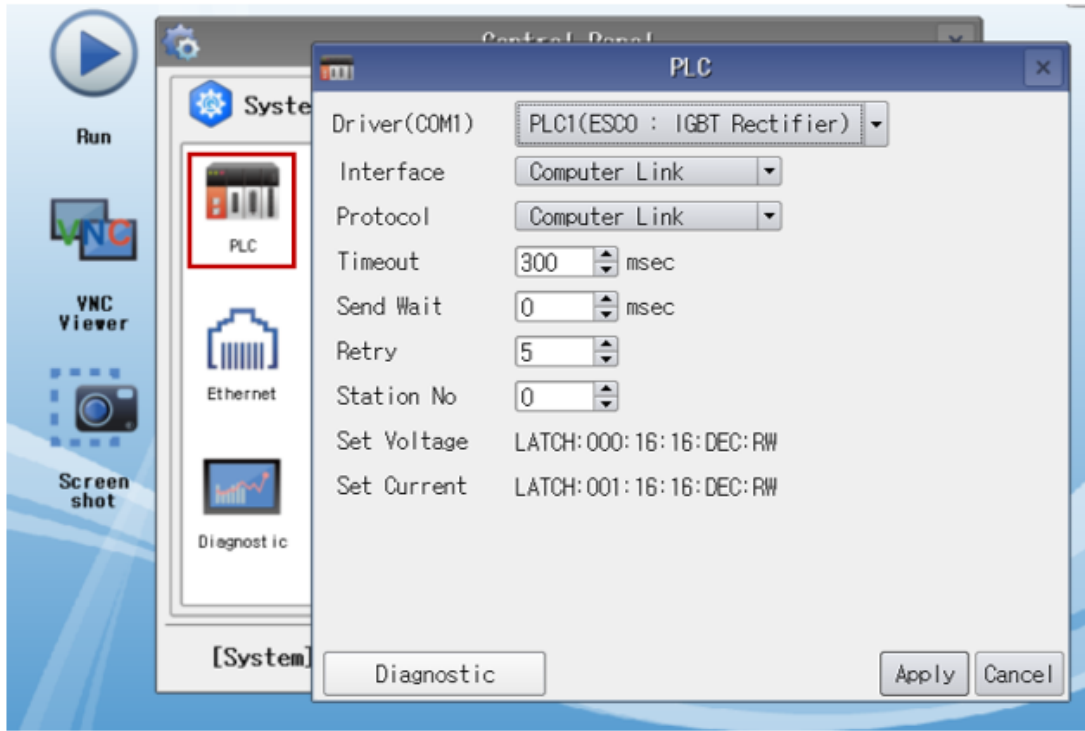
■ [Main Screen > Control Panel > Serial]

Items	TOP	External device	Remarks
Signal Level (port)	RS-485	RS-485	
Baud Rate	19200		
Data Bit	8		
Stop Bit	1		
Parity Bit	None.		

* The above settings are setting examples recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.

(2) Communication option setting

■ [Main Screen > Control Panel > PLC]

Items	Settings	Remarks
Interface	Configure the communication interface between the TOP and an external device.	Refer to "2. External device selection".
Protocol	Configure the communication protocol between the TOP and 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.	
Station No	Enter the prefix of an external device.	
Set Voltage	Set the LATCH area where you want to enter the set voltage value. (The communication can be set only in TOP Design Studio.)	
Set Current	Set the LATCH area where you want to enter the set voltage value. (The communication can be set only 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 if the COM port settings you want to use in [Control Panel > Serial] 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.

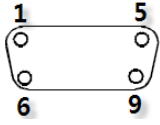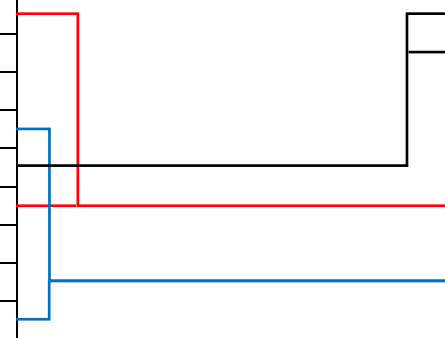| Items	Contents		Check		Remarks
System configuration	How to connect the system		OK	NG	1. System configuration
	Connection cable name		OK	NG	
TOP	Version information		OK	NG	2. External device selection 3. Communication setting
	Port in use		OK	NG	
	Driver name		OK	NG	
	Other detailed settings		OK	NG	
	Relative prefix	Project setting	OK	NG	
		Communication diagnostics	OK	NG	
	Serial Parameter	Transmission Speed	OK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	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	
	Serial Parameter	Transmission Speed	OK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
	Check address range		OK	NG	6. Supported addresses (For details, please refer to the PLC vendor's manual.)

4. External device setting

Set the equivalent communication settings to that of the TOP by referring to the ESCO's IGBT (Intelligent) rectifier manual.

5. Cable table

This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.

(The cable diagram described in this section may differ from the recommendations of "ESCO Co., Ltd.")
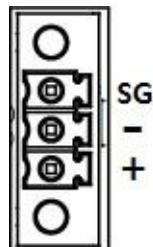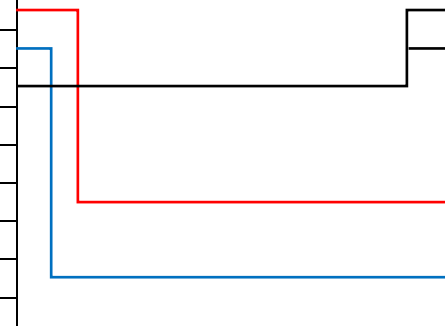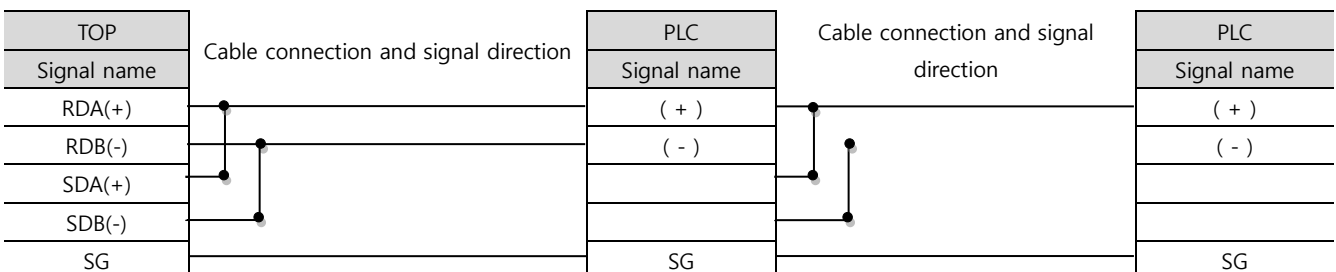
5.1. Cable table 1

■ RS-485 (1:1 connection)

TOP			Cable connection	IGBT Rectifier		
Pin arrangement*Note 1)	Signal name	Pin number		Pin number	Signal name	Pin arrangement*Note 1)
1 5 6 9 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	RDA	1		1	SG	Based on communication cable connector front,
		2		2		
		3		3		
	RDB	4		4		
	SG	5		5		
	SDA	6		6	(+)	
		7		7		
		8		8	(-)	
	SDB	9		9		

*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.

■ RS-485 (1:1 connection)

TOP		Cable connection	IGBT Rectifier		
Pin arrangement*Note 1)	Signal name		Pin number	Signal name	Pin arrangement*Note 1)
SG − +	(+)		1	SG	Based on communication cable connector front,
	(-)		2		
	SG		3		
			4		
			5		
			6	(+)	
			7		
			8	(-)	
			9		

■ RS-485 (1:N connection) – Refer to 1:1 connection to connect in the following way.

TOP	Cable connection and signal direction	PLC	Cable connection and signal direction	PLC
Signal name		Signal name		Signal name
RDA(+)		(+)		(+)
RDB(-)		(-)		(-)
SDA(+)				
SDB(-)				
SG		SG		SG

6. 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.

Device	Bit Address	Word Address	Description	Remarks
VOLTAGE		VOLTAGE	Current voltage value of rectifier	Read-only
CURRENT		CURRENT	Current value of rectifier	Read-only
POWER	POWER	POWER	Power status of rectifier	Read-only
WORK	WORK	WORK	Work status of rectifier	Read-only
ON/START	ON/START	ON/START	Turn rectifier power on or start rectifier operation	Write-only
OFF	OFF	OFF	Turn off rectifier	Write-only
STOP	STOP	STOP	Stop rectifier	Write-only

※ **Write-only Device   Use Method**

① Pop-up window for object's property → ② Effect and action→ ③Setting Conditions → ④Action setting

When setting up action, you add data by setting it up to enter data on relevant device. (Data value irrelevant)