YOKOGAWA Electric Corporation
UT/UP/UM Series
PC Link Driver

Supported version   TOP Design Studio   V1.4.3.0 or higher

CONTENTS

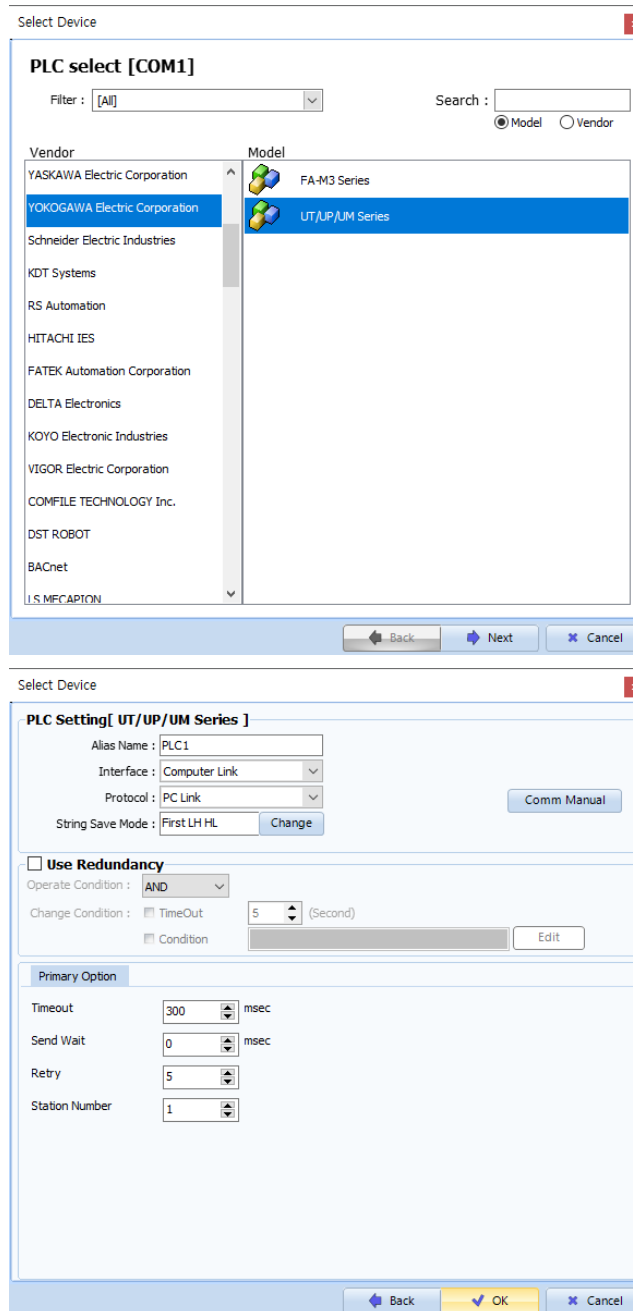We want to thank our customers who use the Touch Operation Panel.

1. System configuration

The system configuration of TOP and "YOKOGAWA Electric Corporation – UT/UP/UM Series Computer Link" is as follows.

Series	CPU	Link I/F	Communication method	System setting	Cable
Temperature Controllers	UT130 UT150 UT152 UT155 UP150	Terminal Block on the controller	RS-485 (2 wire)	3. TOP communication setting 4.1. External device setting 1	5.1. Cable table 1
Digital Indicating Controllers	UT 321 UT 351 UT 420 UT 450 UT 520 UT 551 UT 750 US 1000 UP 351 UP 550 UP 750 UM 331 UM 351 UD 310 UD 320 UD 351	Terminal Block on the controller	RS-485 (2 wire)	3. TOP communication setting 4.1. External device setting 1	5.2. Cable table 2
UT2000	UT2400 UT2800	Terminal Block on the controller	RS-422 (4 wire)	3. TOP communication setting 4.2. External device setting 2	5.3. Cable table 3

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 "YOKOGAWA Electric Corporation".
	PLC	Select an external device to connect to TOP.

Model	Interface	Protocol
UT/UP/UM Series	Computer Link	PC 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 properties > TOP settings] → [Project option > Check "Use HMI settings" > Edit > Serial]

– Set the TOP communication interface in TOP Design Studio.
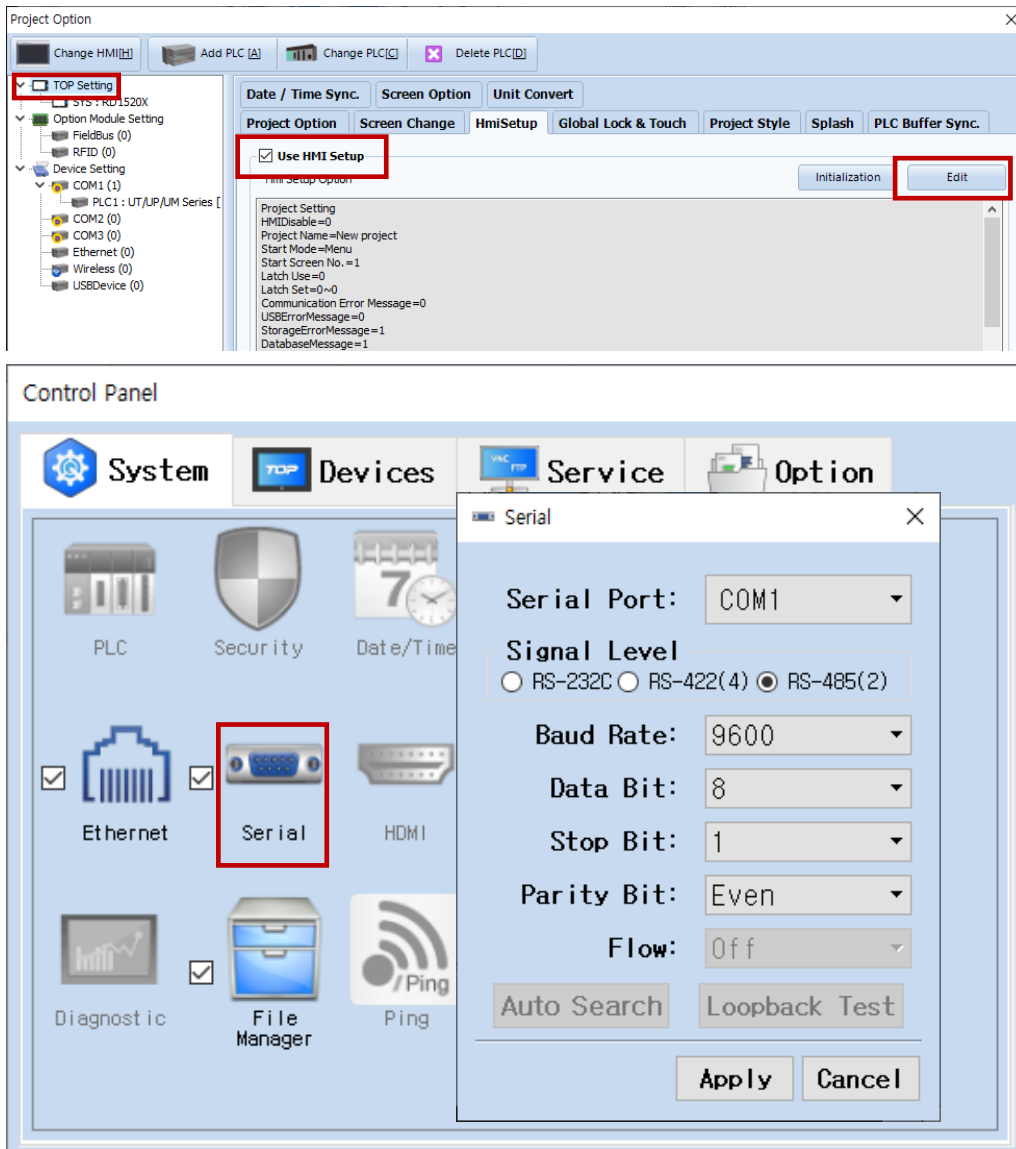
Items	TOP	External device	Remarks
Signal Level (port)	RS-422	RS-485	
	RS-485	RS-422 (UT2000)	
Baud Rate	9600		
Data Bit	8		
Stop Bit	1		
Parity Bit	Even		

* 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 properties > PLC setting > COM > "PLC1 : UT/UP/UM Series"]
   – Set the options of the communication driver of UT/UP/UM Series Computer Link in TOP Design Studio.

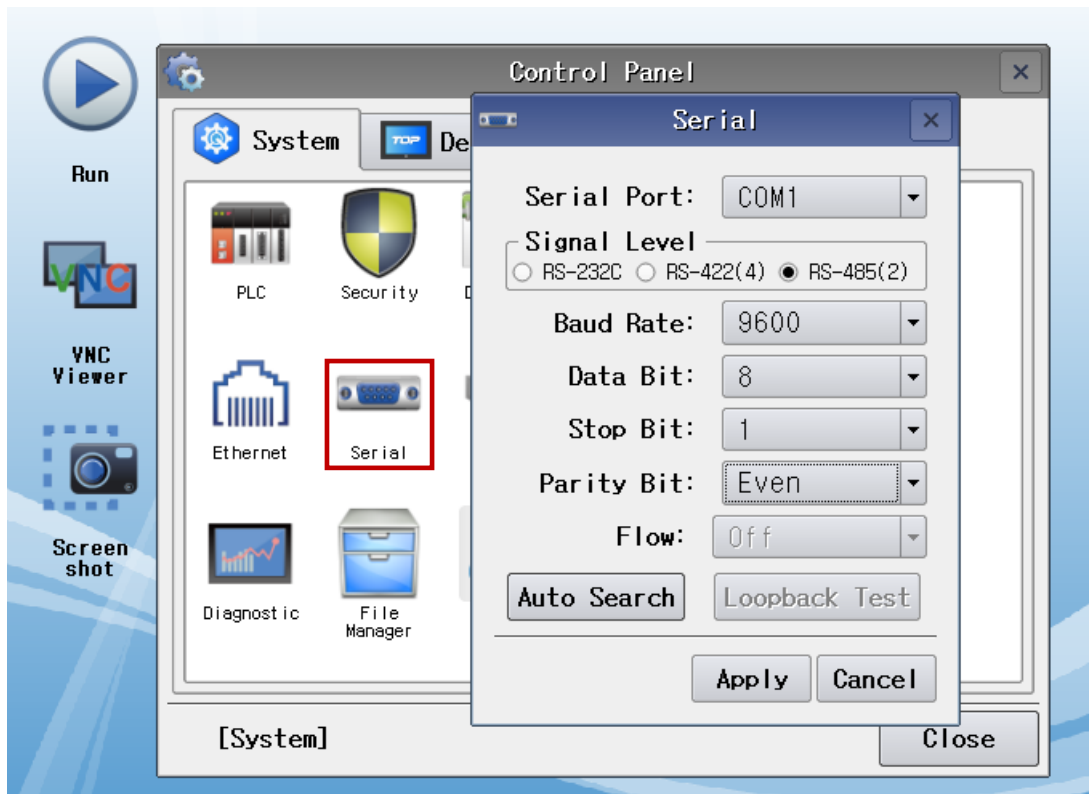| Items	Settings	Remarks
Interface	Select "Computer Link".	Refer to "2. External device selection".
Protocol	Select "PC Link".	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	
Station Number	Enter the prefix of an external device.	

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 <u>drag</u> 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-422	RS-485	
	RS-485	RS-422 (UT2000)	
Baud Rate	9600		
Data Bit	8		
Stop Bit	1		
Parity Bit	Even		

* The above settings are setting <u>examples</u> 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	Select "Computer Link".	Refer to "2. External device selection".
Protocol	Select "PC Link".	
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 Number	Enter the prefix of an external device.	

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
	Port in use		OK	NG	3. Communication setting
	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

4.1 External device setting 1 (Temperature Controllers UT100 Series, Digital Indication Controllers)

Use the keys on the front of the controller to set as follows.

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

⚠ Do not set the same station number between devices on the same unit network.

Step 1. In the [Operating Display] status, press the (SET/ENT) key for more than 3 seconds to move to [Operating Parameter Setting Display] screen.

Step 2. Operate (SET/ENT)key to move to [LOC] screen and to set "-1".

Step 3. Operate (SET/ENT)key to move to [Setup Parameter Setting Display] screen, and then use the (UP/DOWN, SET/ENT) keys to substitute the settings below.

Items	Settings	Settings	Remarks
PSL	0	PC-link communication	Fixed
Adr	1	Station Number	
bPS	9.6	Baud rate : 9600 [BPS]	
Prl	Evn	Parity bit : Even [BIT]	
StP	1	Stop bit : 1 [BIT]	
dLn	8	Data bit : 8 [BIT]	

Step 4. Press the (SET/ENT) key for more than 3 seconds to change to [Operating Display] screen.

4.2 External device setting 1 (UT2000 Series)

Set the communication with the dip switch on the controller.

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

⚠ Do not set the same station number between devices on the same unit network.

Step 1. Turn the Protocol Selection Switch "ON" (PC–link communication).

Step 2. Set the Communication Mode Selection Switch to "2" (9600 / 8 / 1 /even).

Step 3. Set the Station No. Switch to "1" (Station No. 1).

Step 4. Reset the power of the product.

※ When the settings are the same as in the above example, set the serial communication parameters of TOP as follows.

Items	TOP	UT2000
Communication speed	9600 bps	9600 bps
Data Bit	8 bit	8 bit
Stop Bit	1 bit	1 bit
Parity Bit	Even	Even
Station number (communication option)	—	1

(Remark) Communication Mode Selection Switch setting table

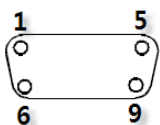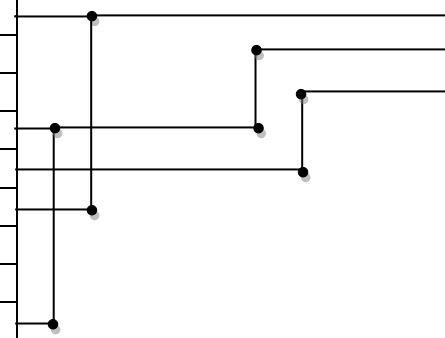| Switch number	Parity bit	Communication speed
0	None.	
1	Odd	9600 bps
2	Even	
3	None.	
4	Odd	4800 bps
5	Even	
6	None.	
7	Odd	2400 bps
8	Even	
9	None.	
A	Odd	1200 bps
B	Even	
C	None.	
D	Odd	600 bps
E	Even	

(Data length: 8 bit / Stop bit: 1 bit)

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 chapter may differ from the recommendations of "YOKOGAWA Electric Corporation".)
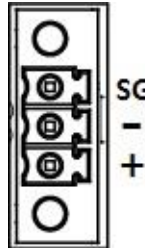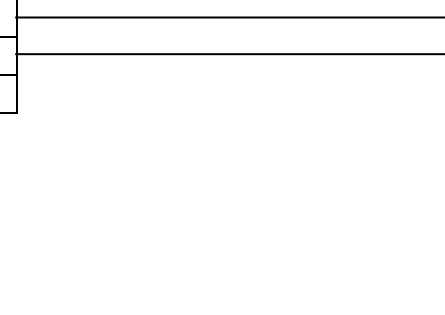
5.1 Cable table 1 (Temperature Controllers)

■ RS-485 (1:1 connection)

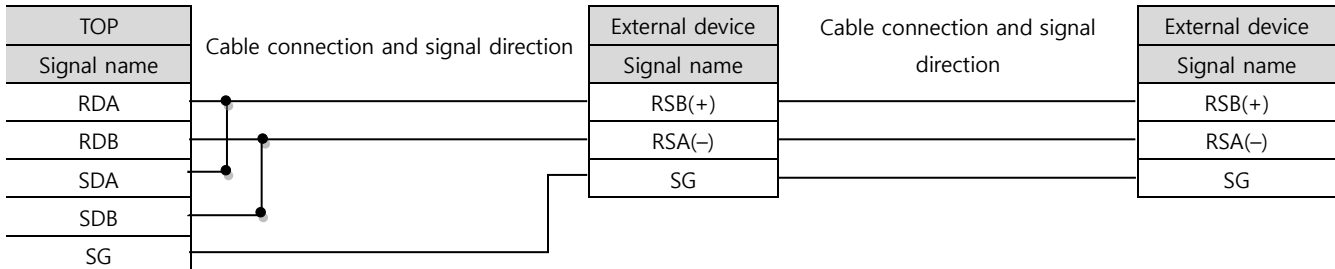| COM			Cable connection	External device	
Pin arrangement*Note 1)	Signal name	Pin number		Signal name	Pin arrangement
1 5 6 9 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	RDA	1		RSB(+)	Terminal block
		2		RSA(−)	
		3		SG	
	RDB	4			
	SG	5			
	SDA	6			
		7			
		8			
	SDB	9			

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

■ RS-485 (1:1 connection)

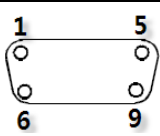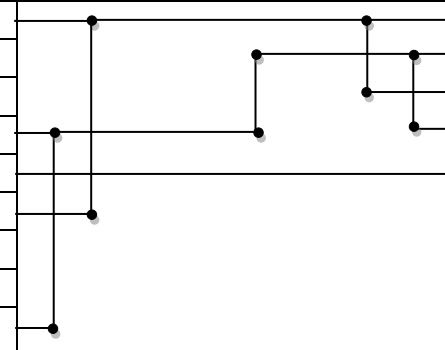| COM		Cable connection	External device	
Pin arrangement*Note 1)	Signal name		Signal name	Pin arrangement
SG − +	+		RSB(+)	Terminal block
	-		RSA(−)	
	SG		SG	

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

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

TOP	Cable connection and signal direction	External device	Cable connection and signal direction	External device
Signal name		Signal name		Signal name
RDA		RSB(+)		RSB(+)
RDB		RSA(−)		RSA(−)
SDA		SG		SG
SDB				
SG				

5.2 Cable table 2 (Digital Indicating Controllers)

■ **RS-485** (1:1 connection)

COM			Cable connection	External device	
Pin arrangement*Note 1)	Signal name	Pin number		Signal name	Pin arrangement
1 5 ⃝ ⃝ ⃝ ⃝ 6 9 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	RDA	1		SDB(+)	Terminal block
		2		SDA(−)	
		3		RSB(+)	
	RDB	4		RSA(−)	
	SG	5		SG	
	SDA	6			
		7			
		8			
	SDB	9			

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

■ **RS-485** (1:1 connection)

COM		Cable connection	External device	
Pin arrangement*Note 1)	Signal name		Signal name	Pin arrangement
SG − +	+		SDB(+)	Terminal block
	-		SDA(−)	
	SG		RSB(+)	
			RSA(−)	
			SG	
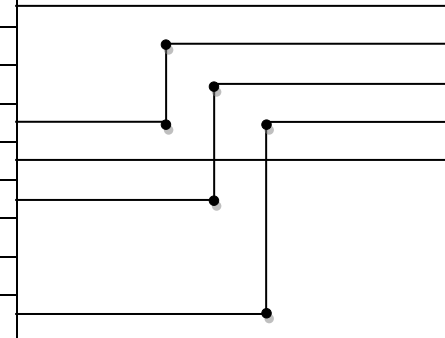
Note 1) The pin arrangement is seen from the connecting side of the cable connector.

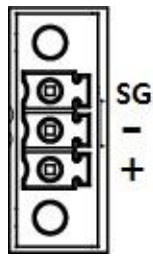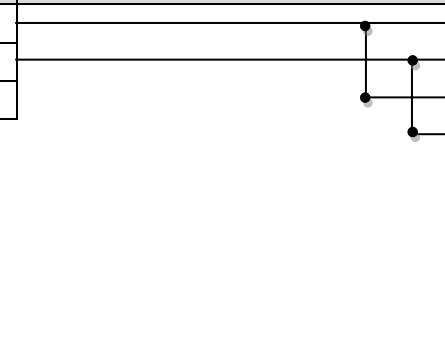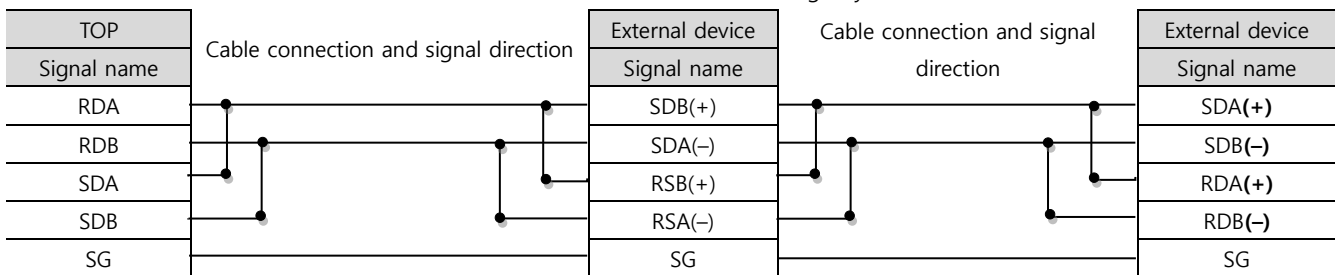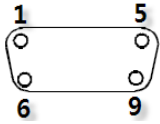■ **RS-485** 1:N connection – Refer to 1:1 connection to connect in the following way.

TOP	Cable connection and signal direction	External device	Cable connection and signal direction	External device
Signal name		Signal name		Signal name
RDA		SDB(+)		SDA(+)
RDB		SDA(−)		SDB(−)
SDA		RSB(+)		RDA(+)
SDB		RSA(−)		RDB(−)
SG		SG		SG

5.3 Cable table 3 (UT2000 Series)

■ **RS-422** (1:1 connection)

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

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

■ **RS-422** 1 : N connection - Refer to 1:1 connection to connect in the following method.

TOP	Cable connection and signal direction	External device	Cable connection and signal direction	External device
Signal name		Signal name		Signal name
RDA		SDB(+)		SDB(+)
RDB		SDA(−)		SDA(−)
SDA		RDB(+)		RDB(+)
SDB		RDA(−)		RDA(−)
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.

> ⚠ The range of available addresses differs depending on the controller model.
>
> Refer to the detailed materials on the register area attached to the product manual for use.

Device	Bit address	Word address	Remarks
Internal Relay	I0001 – I7072		*Note 1)
Data Register	D0001.00 – D9000.15	D0001 – D9000	*Note 1)*Note 2)

*Note 1) The address range contains write-only devices and non-usable addresses. Refer to the detailed materials on the register area attached to the product manual for use.

*Note 2) Pay attention to the use of system memory area according to the controller model.