

Servo&Control Systems : Ultra Sonic Flow Meter

Supported version

TOP Design Studio

V1.4.3 or higher



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

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Describes how to set the TOP communication.

4. External device setting [Page 9](#)

Describes how to set up communication for external devices.

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Describes the cable specifications required for connection.

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

1. System configuration

The system configuration of TOP and "SNC- Flow Meter" is as follows.

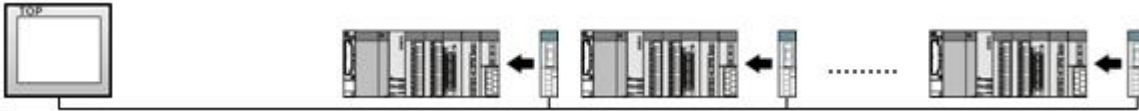
Series	CPU	Link I/F	Communication method	Communication setting	Cable
Flow Meter	-	-	RS-485	3. TOP communication setting	5.1. Cable table 1

■ Connection configuration

- 1:1 (one TOP and one external device) connection – configuration which is possible in RS232C/422/485 communication.

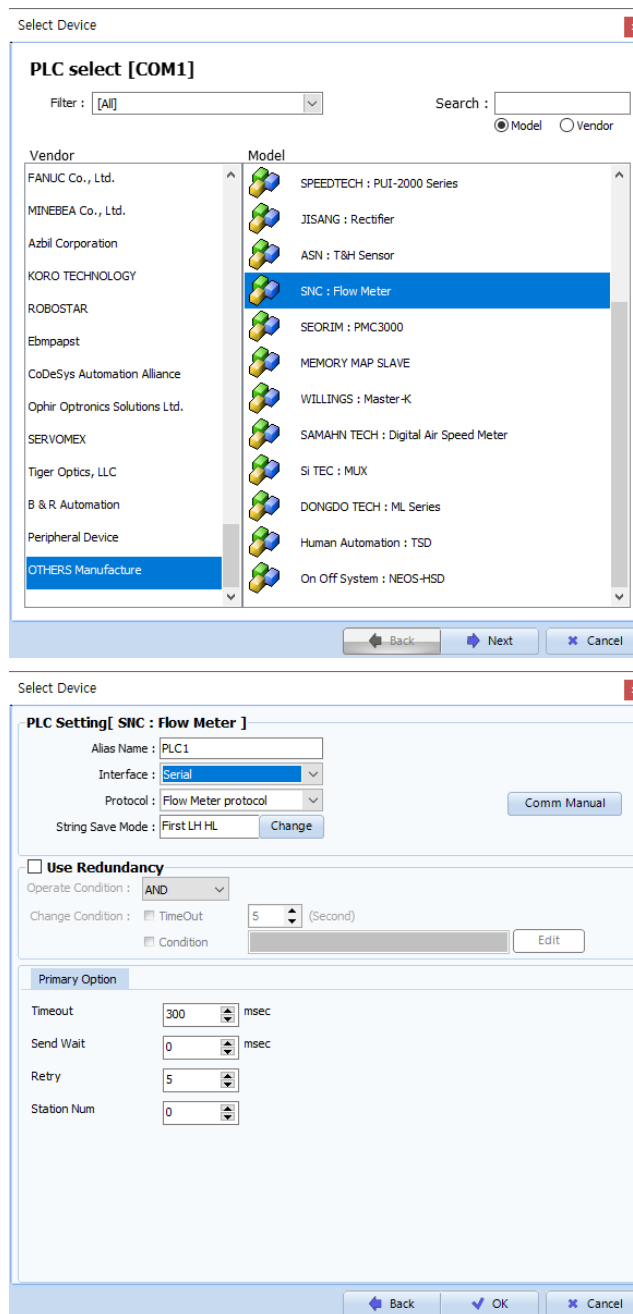


- 1:N (one TOP and multiple external devices) connection – configuration which is possible in RS422/485 communication.



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. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Model</th> <th>Interface</th> <th>Protocol</th> </tr> </thead> <tbody> <tr> <td>Flow Meter</td> <td>Flow Meter</td> <td>Flow Meter protocol</td> </tr> </tbody> </table> <p>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.</p>	Model	Interface	Protocol	Flow Meter	Flow Meter
Model	Interface	Protocol					
Flow Meter	Flow Meter	Flow Meter protocol					

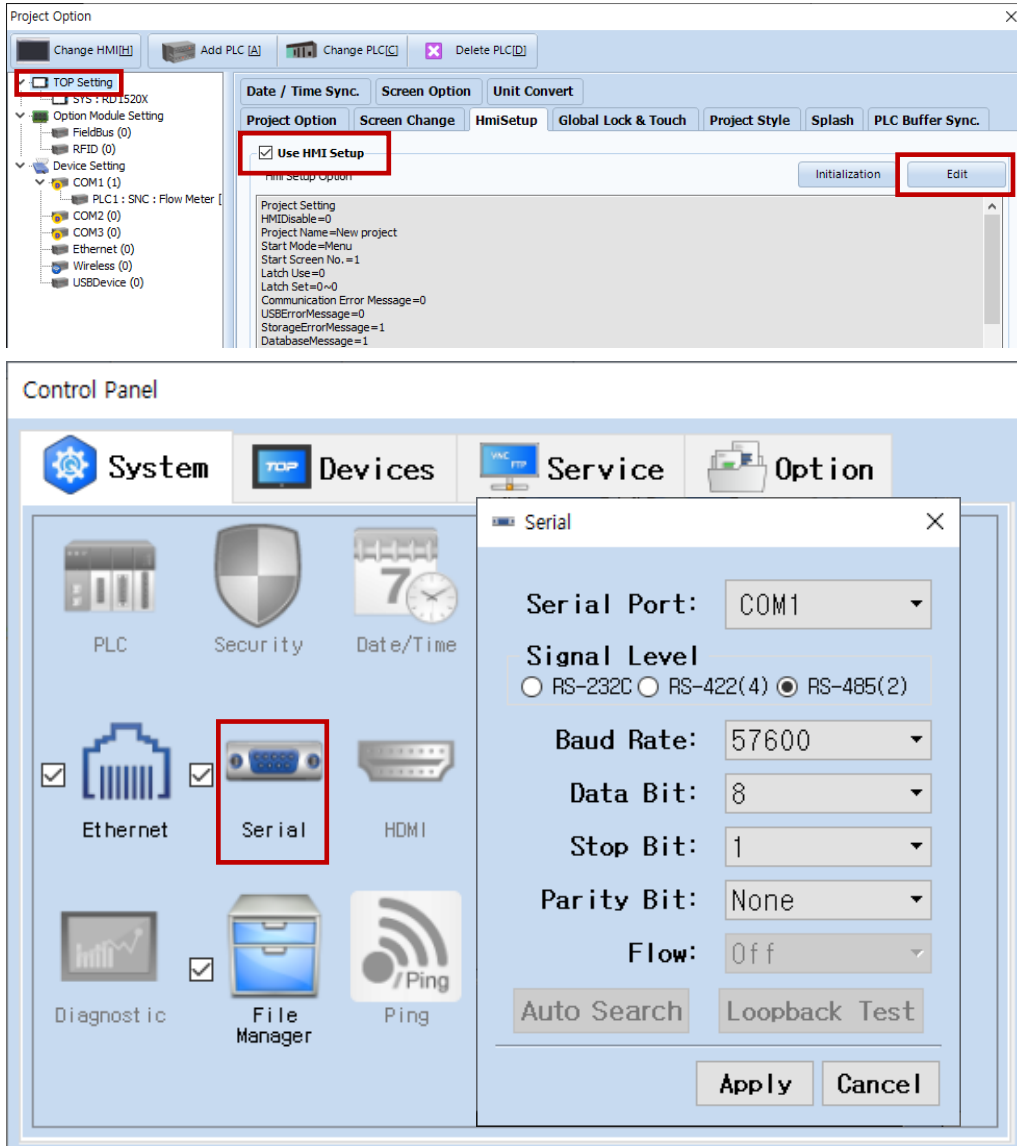
3. TOP communication setting

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-485	RS-485	
Baud Rate	57600		Fixed
Data Bit	8		Fixed
Stop Bit	1		Fixed
Parity Bit	None		Fixed

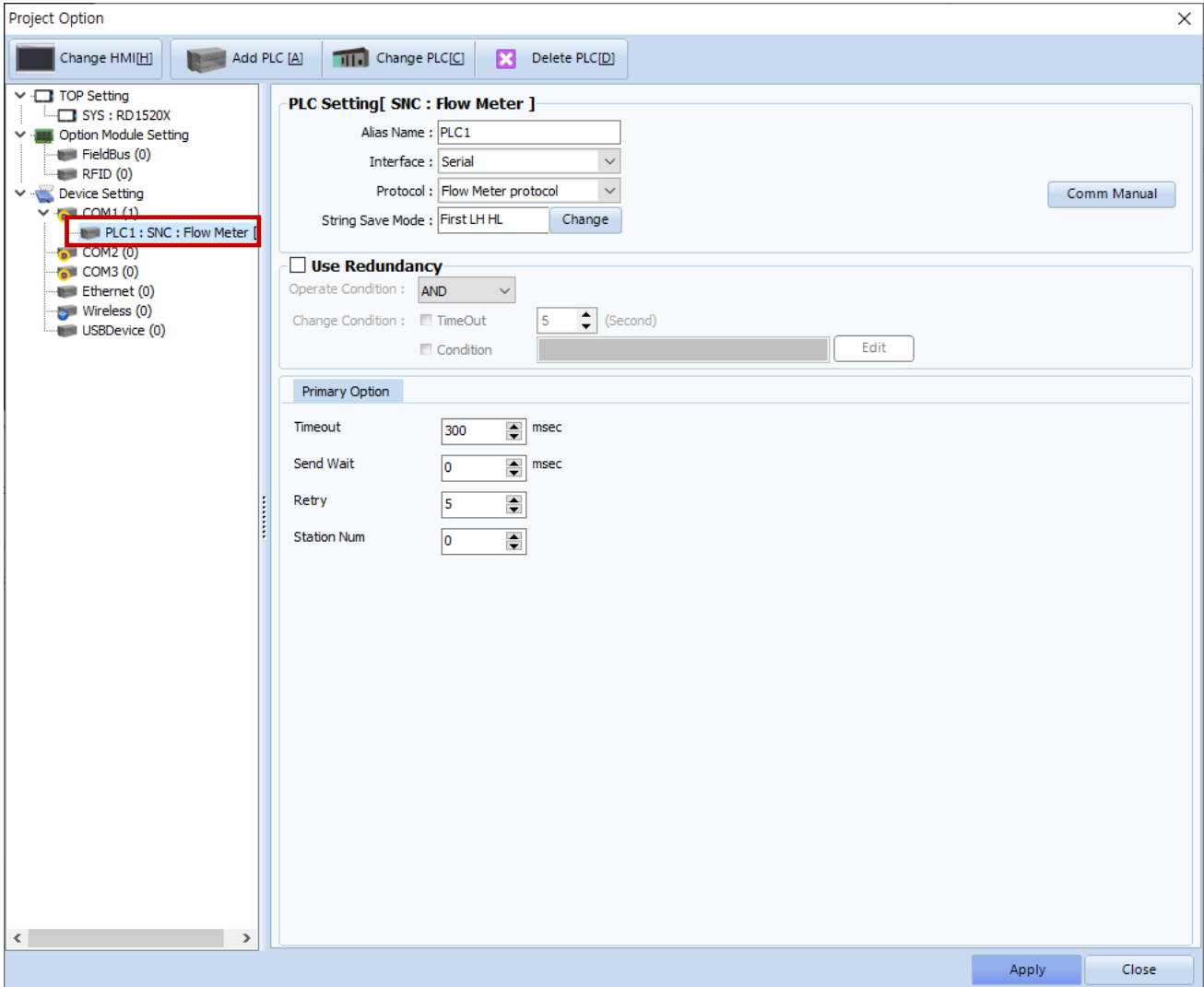
* The above settings are examples recommended by the company.

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 settings > COM > "Flow Meter"]

– Set the options of the 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.	

3.2. Communication setting in TOP

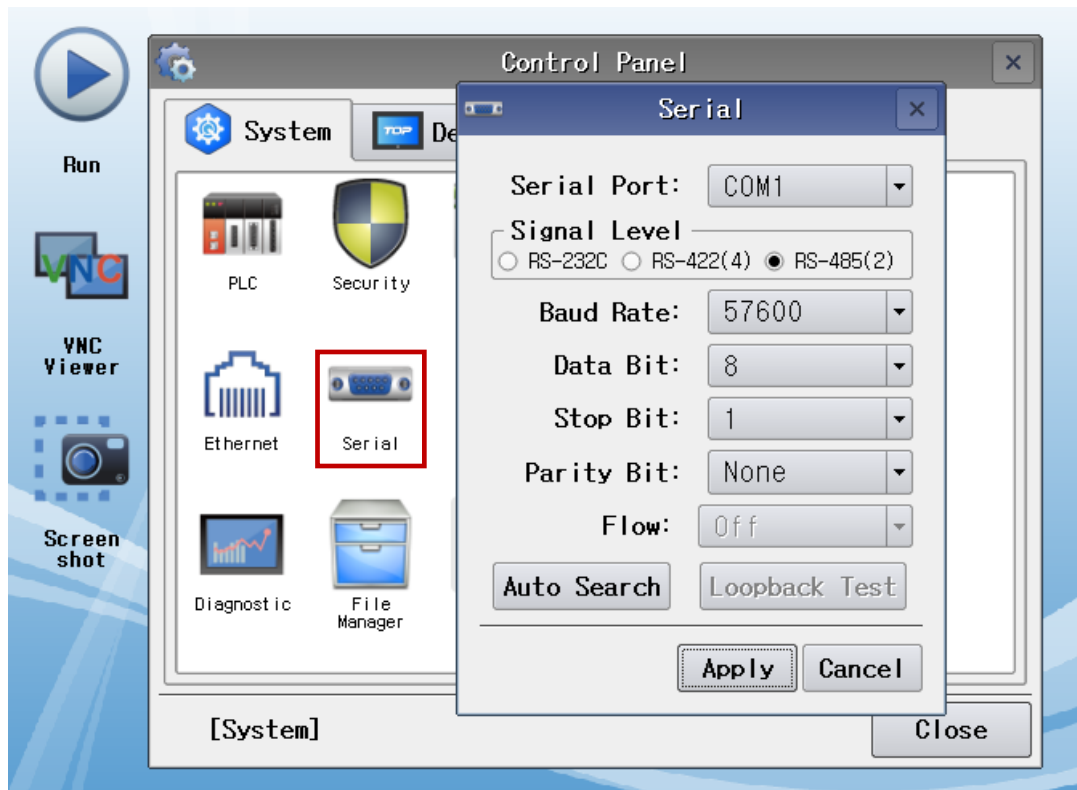
* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- 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]



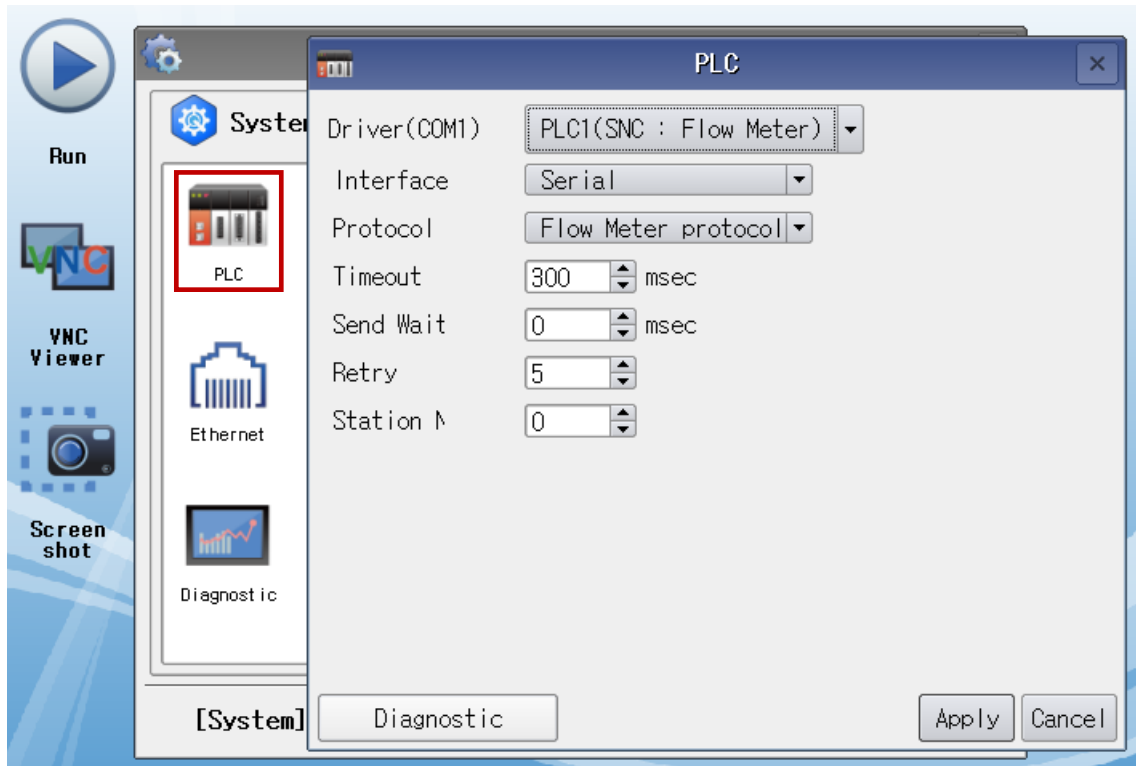
Items	TOP	External device	Remarks
Signal Level (port)	RS-485	RS-485	
Baud Rate	57600		Fixed
Data Bit	8		Fixed
Stop Bit	1		Fixed
Parity Bit	None		Fixed

* 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 number	Set the station number of the communication target 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 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

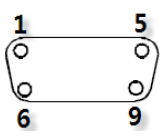
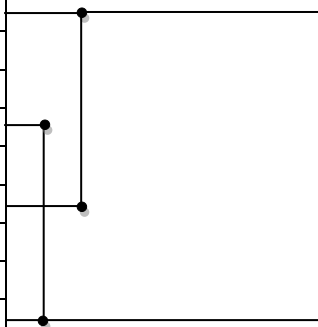
Configure the communication setting of the external device by referring to its user manual.

5. Cable table

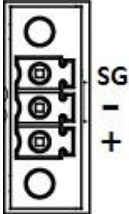

This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.
 (The cable diagram described in this chapter may differ from the recommendations of "SNC-Flow Meter".)

■ 1:1 connection

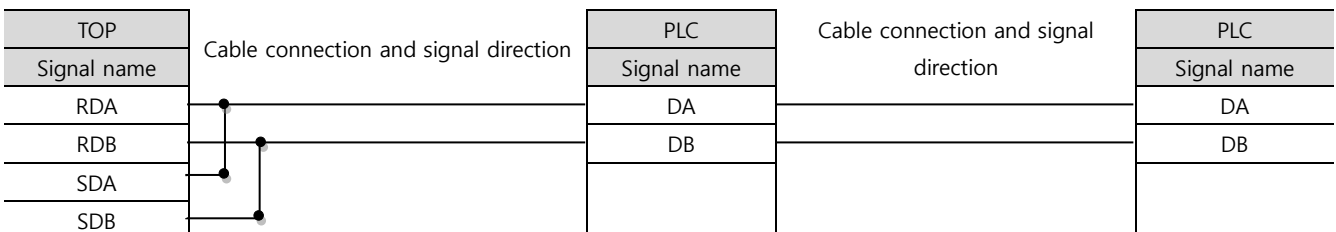
TOP COM Port (9 pin)

TOP COM			Cable connection	PLC	
Pin arrangement* <i>Note 1)</i>	Signal name	Pin number		Signal name	
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	RDA	1		DA(Pin 1)	
				2	DB(Pin 2)
			3		
	RDB	4			
	SG	5			
	SDA	6			
			7		
			8		
	SDB	9			

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

TOP COM		Cable connection	External device
Pin arrangement	Signal name		Signal name
	+		DA(Pin 1)
	-		DB(Pin 2)

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



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.

- General command

Command	Property	Detailed description	Minimum value	Maximum value	Initial value
R000	Read-only	Instantaneous flow (Unit: mL/min)	-2000	2000	0
R001	Read-only	Accumulated flow (Unit: mL/min)	0	99999	0
R006	Write-only	Zero adjustment command	0	1	0
R007	Write-only	Accumulation reset command	0	1	0
R008	Read-only	Status	0	63	-
R010	Read/Write	Weighing minus detection value (Unit: mL)	-127	127	-40
R015	Read/Write	Low Cut (Unit: mL/min) – Top % setting	1	255	40
R016	Read/Write	Open Collector Output 1 0: Comparative output (instantaneous flow rate, upper limit) mL/min 1: Comparative output (instantaneous flow rate, lower limit) mL/min 2: Comparative output (accumulated flow rate, upper limit) mL/min 3: Comparative output (accumulated flow rate, lower limit) mL/min 4: Total clear when it is 0 (For LCD PR) 5: Average data move ON (For photo) 6: Average data move OFF (For photo)	0	5	0
R017	Read/Write	Open Collector Output 2 0: Comparative output (instantaneous flow rate, upper limit) mL/min 1: Comparative output (instantaneous flow rate, lower limit) mL/min 2: Comparative output (accumulated flow rate, upper limit) mL/min 3: Comparative output (accumulated flow rate, lower limit) mL/min 4: Fail output	0	4	0
R018	Read/Write	Comparative output 1 (Unit: mL/min or mL) lower limit	2000	0	100
R019	Read/Write	Comparative output 2 (Unit: mL/min or mL) upper limit	2000	0	1000
R020	Read/Write	Input setting 0: No function 1: Zero adjustment 2: Accumulation reset 3: Instantaneous comparison -> Out1 output (For LCD PR)	0	3	0

Command	Property	Detailed description	Minimum value	Maximum value	Initial value
R025	Read/Write	D0 - Maintain fail data (1: maintain) Burnout D1 – TKK OLD (19200) D2 – Flow Fast Operation D3 – Measure Delay No Change D4 – Pulse Start High/Low D5 – TOFCO Protocol D7 – Always 1	0	255	0
R031	Read/Write	Communication Error (2Sec/Step, 0 o'clock not checked)	0	25	2
R032	Read/Write	High-speed communication Delay (1mSec/Step)	0	250	10
R040	Read/Write	Full Scale Pulse (Pulse)	50	9999	8000
R041	Read/Write	Compensation Value (Pulse)	50	9999	100
R042	Read/Write	Max Flow Rate Value(10 mL / Step) TKK	1	6000	200
R044	Read/Write	Auto Zero (Pulse)	0	9999	30
R050	Read/Write	Discharge error ON time setting (125mSec/Step)	127	127	30
R051	Read/Write	Discharge error OFF time setting (125mSec/Step)	127	127	30
R055	Read/Write	Flow rate display mode (0:1 mL, 1:0.1 mL)	0	1	0

*In case of an error, the instantaneous flow rate is output as 29999 (response).

- Analog commands

Command	Property	Detailed description	Minimum value	Maximum value	Initial value
R060	Read/Write	Analog calibration mode setting	0	1	0
R061	Read/Write	20mA (maximum flow rate) value	0	65535	54710
R062	Read/Write	0~24mA analog output test value	0	65535	0
R063	Read/Write	4mA (Zero flow rate) value	0	65535	10954
R064	Read/Write	Analog factor	100	999	437

- Serial Number & program Version

Command	Property	Detailed description	Minimum value	Maximum value	Initial value
R080	Read/Write	Flow Serial No1 (A02S: Product name)	0	65535	
R081	Read/Write	Flow Serial No2 (1001: year/month)	0	65535	
R082	Read/Write	Flow Serial No3 (No.)	0	65535	
R083	Read/Write	Match Serial No1 (S)	0	65535	
R084	Read/Write	Match Serial No2 (year/month)	0	65535	
R085	Read/Write	Match Serial No3 (No.)	0	65535	
R086	Read/Write	Amp Serial No1 (A01SN)	0	65535	
R087	Read/Write	Amp Serial No2 (No.)	0	65535	
R098	Read-only	Version	100	999	
R099	Read-only	Date	0908	9999	

- Amp Hardware Test Command

Command	Property	Detailed description	Minimum value	Maximum value	Initial value
R300	Read/Write	Hardware Test Mode	0	1	0
R301	Read-only	DIP S/W Value (0b11XXXXXX)	-	-	-
R302	Read-only	Zero Key, Zero Input(0b110000XX)	-	-	-

- Parameter Cal Command

Command	Property	Detailed description	Minimum value	Maximum value	Initial value
R100	Read/Write	Zero point Value (Origin)	-2000	2000	0
R101	Read-only	Fluctuating zero value	-2000	2000	0
R103	Read/Write	Input amplification ratio (Vth)	0	127	32
R105	Read/Write	Calibration Delay Time Value	20	999	136
R116	Read/Write	K Factor (flow rate)	100	9999	1000
R117	Read/Write	Specific Gravity	100	9999	1000
R118	Read/Write	Kinematic Viscosity	100	9999	1000

- Calibration command

Command	Property	Detailed description	Minimum value	Maximum value	Initial value
R110	Read/Write	Zero point value (ORG)	-2000	2000	0
R112	Read-only	Precision value (Error)	0	125	0
R113	Read/Write	Input amplification ratio (ORG)	0	127	32
R115	Read/Write	Calibration Delay Time Value(ORG)	20	999	136
R190	Read-only	Frequency value (R190~R193)	8500	15000	
R200	Read-only	Current Time Value (Current value - Zero value)	0	32000	0
R201	Read/Write	CAL 1 value	0	9999	2000
R216	Read/Write	CAL 16 value	0	9999	2000
R251	Read/Write	CAL 1 Factor	2500	5000	3200
R266	Read/Write	CAL 16 Factor	2500	5000	3200

- Save command

Command	Property	Detailed description	Minimum value	Maximum value	Initial value
R800	Write-only	Parameter Save			
R801	Write-only	Calibration Save			
R802	Write-only	Total Initial			