

# SHINSUNG E&G Co., Ltd.

## MCUL32 Series

### Serial Driver

Supported version

TOP Design Studio

V1.4.6.39 or higher



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

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### **3. TOP communication setting** [Page 4](#)

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### **4. External device setting** [Page 10](#)

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 "SHINSUNG E&G Co., Ltd. – MCUL32 Series" is as follows.

Series	Link I/F	Communication method	Communication setting	Cable
MCUL32	PC Comm. Port (RJ-11/RJ-12)	RS-485	<a href="#">3. TOP communication setting</a> <a href="#">4. External device setting</a>	<a href="#">5. Cable table</a>

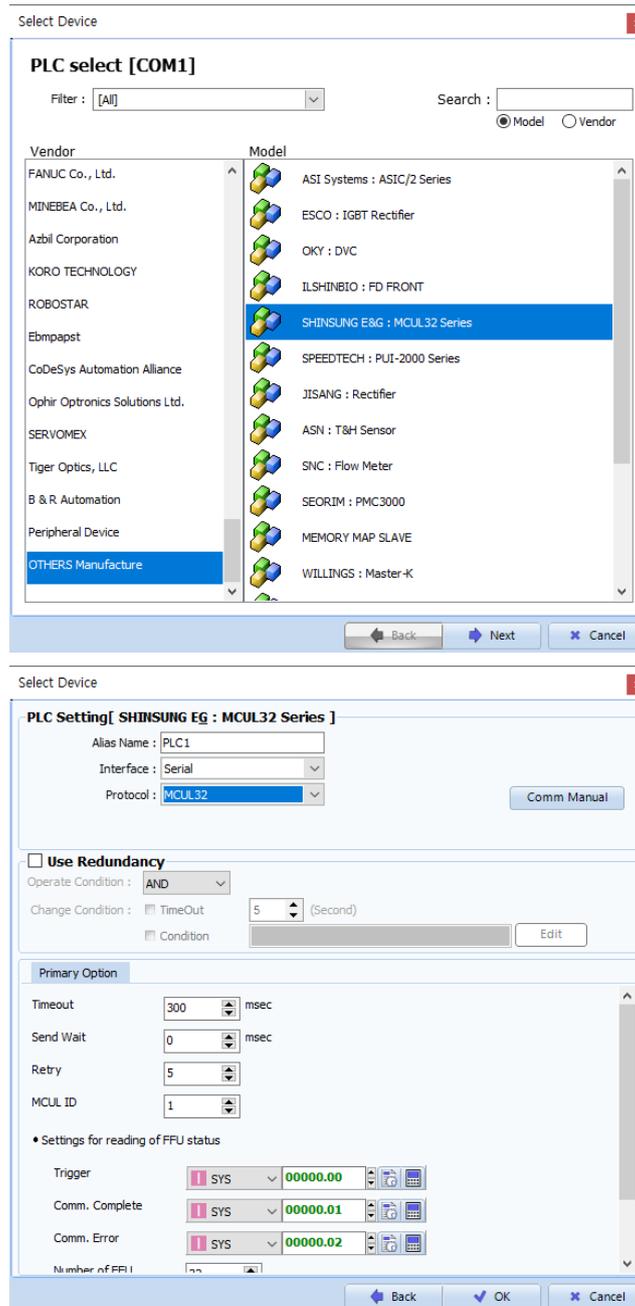
## ■ Connectable configuration

- 1:1 (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. Select "OTHERS Manufacture".
	External device	Select external device. Select "SHINSUNG E&G: MCUL32 Series".  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.

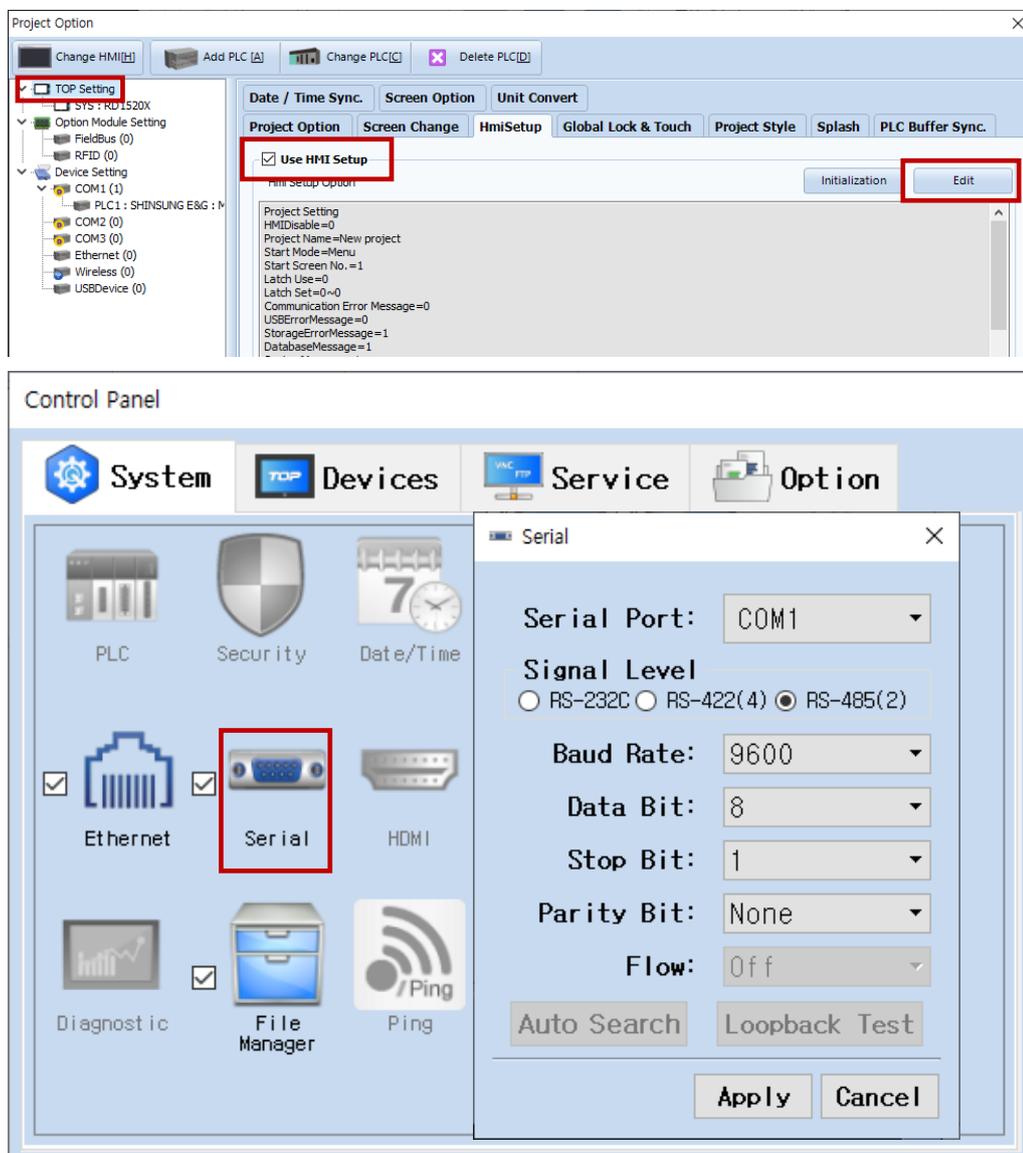
### 3. TOP communication setting

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.



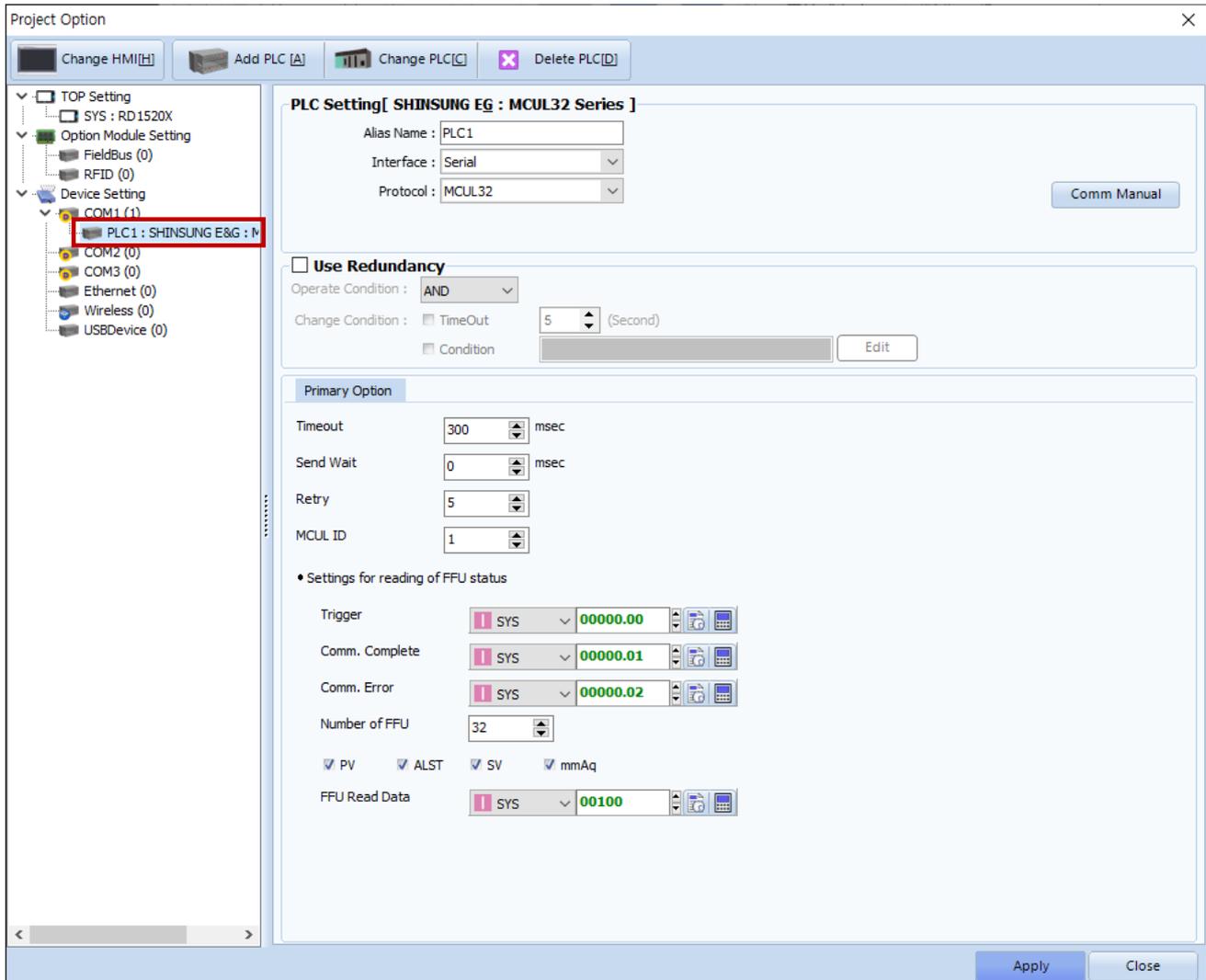
Items	TOP	External device	Remarks
Signal Level (port)	RS-485	RS-485	
Baud Rate		9600	
Data Bit		8	
Stop Bit		1	
Parity Bit		NONE	

\* 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 properties > PLC settings > COM > "PLC1 : SHINSUNG E&G : MCUL32 Series" ]  
 – Set the options of the communication driver of MCUL32 Series in TOP Design Studio.

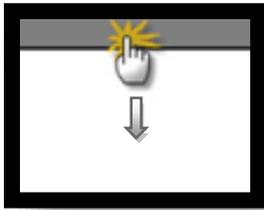


Items	Settings	Remarks
Interface	Select "Serial".	<a href="#">2. External device selection</a>
Protocol	Select the communication protocol between the TOP and an external device.	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next request.	
Retry	Configures the number of attempts for communication upon failure.	
MCUL ID	Enter the ID of MCUL to be connected.	
<b>Setting for FFU status read</b>		
Trigger	Set the address that operates the Read.	
Comm. Complete	Set the address that turns ON when communication is normally completed.	
Comm. Error	Set the address that turns ON when there is an error in communication.	
Number of FFU	Enter the number of FFUs.	
PV, ALST, SV, mmAq	Check FFU data to read status.	
FFU Read Data	Set the starting address to save FFU data.	

### 3.2. Communication setting in TOP

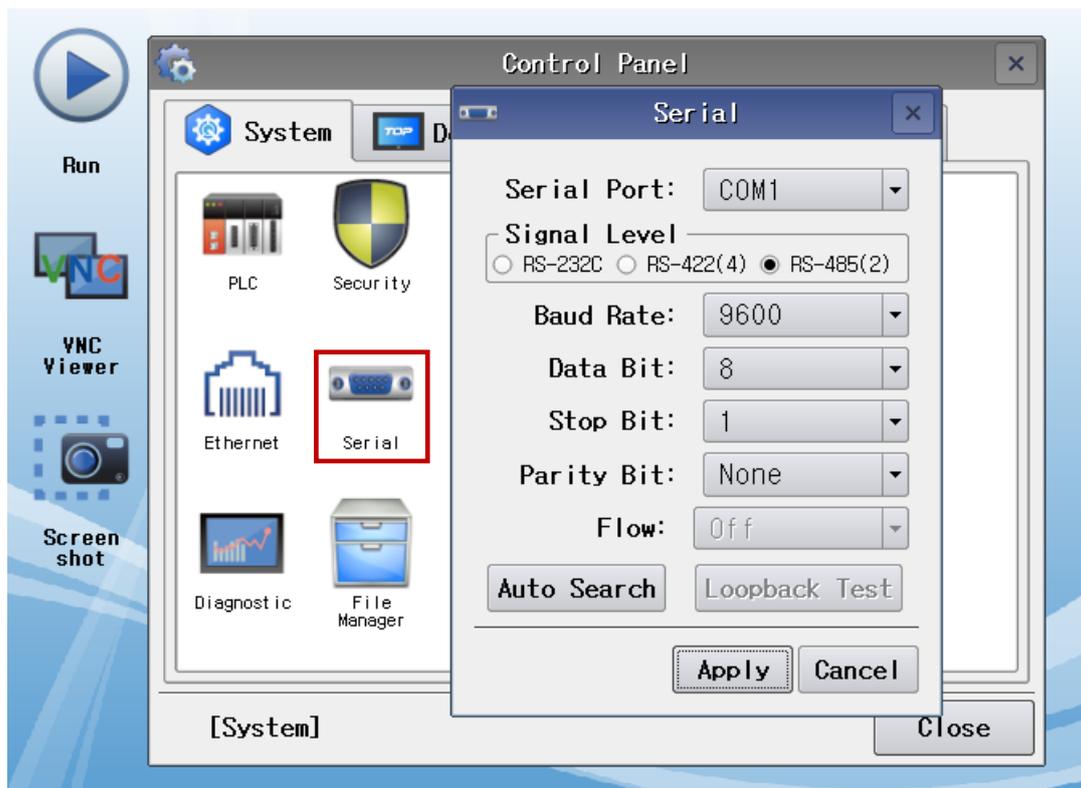
\* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

■ 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 ]



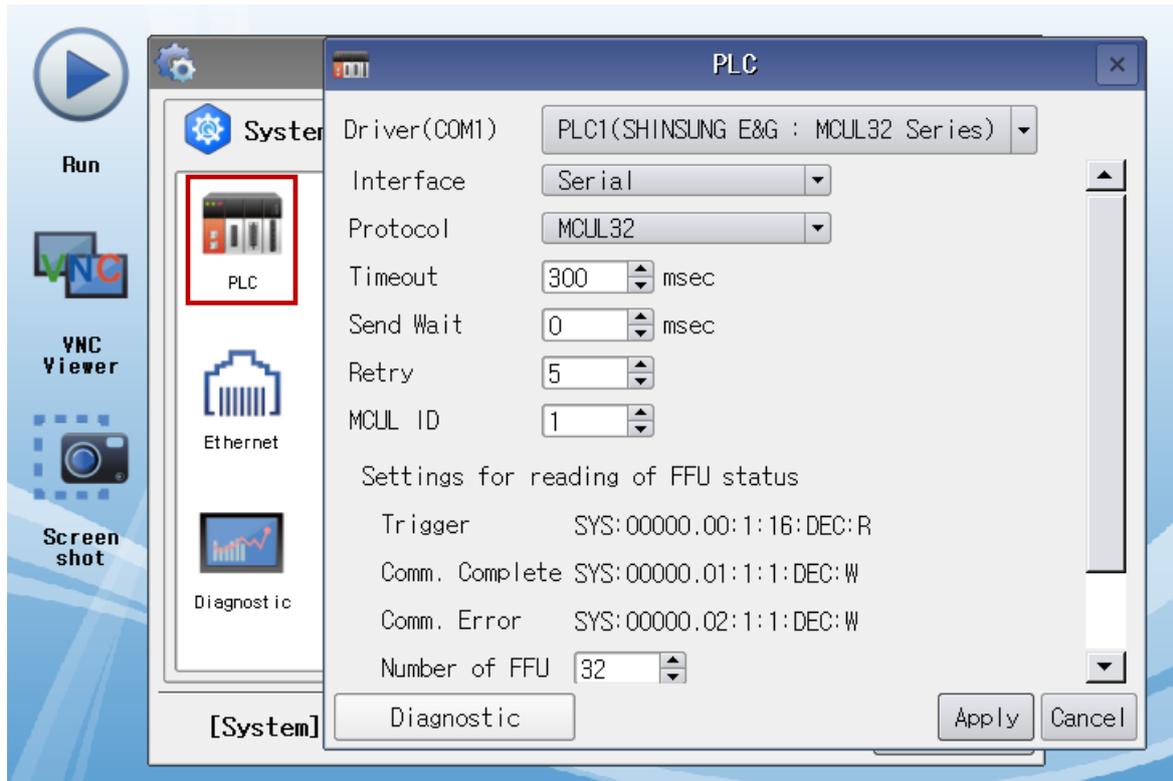
Items	TOP	External device	Remarks
Signal Level (port)	RS-485	RS-485	
Baud Rate		9600	
Data Bit		8	
Stop Bit		1	
Parity Bit		NONE	

\* 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

■ [ Main screen > Control panel > PLC ]



Items	Settings	Remarks
Interface	Select "Serial".	<a href="#">2. External device selection</a>
Protocol	Select 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 request.	
Retry	Configures the number of attempts for communication upon failure.	
MCUL ID	Enter the ID of MCUL to be connected.	
<b>Setting for FFU status read</b>		
Trigger	Set the address that operates the Read.	
Comm. Complete	Set the address that turns ON when communication is normally completed.	
Comm. Error	Set the address that turns ON when there is an error in communication.	
Number of FFU	Enter the number of FFUs.	
PV, ALST, SV, mmAq	Check FFU data to read status.	
FFU Read Data	Set the starting address to save FFU data.	

### 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.

<b>OK</b>	<b>Communication setting normal</b>
<b>Time Out Error</b>	<b>Communication setting abnormal</b> - Check the cable, TOP, and external device setting status. <b>(Reference: Communication diagnostics sheet)</b>

- 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	<a href="#">1. System configuration</a>	
	Connection cable name	OK	NG		
TOP	Version information	OK	NG	<a href="#">2. External device selection</a> <a href="#">3. Communication setting</a>	
	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	<a href="#">4. External device setting</a>	
	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	<a href="#">6. Supported addresses</a> (For details, please refer to the PLC vendor's manual.)	

## 4. External device setting

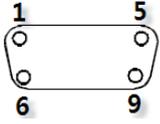
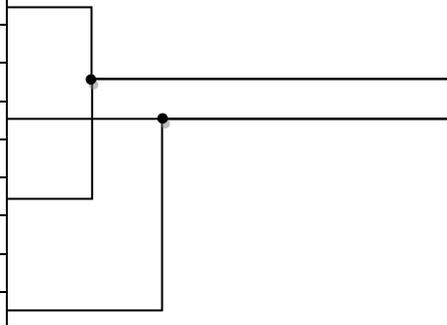
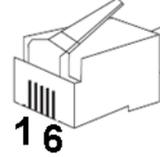
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Set the equivalent communication settings to that of the TOP by referring to the vendor's user manual.

## 5. Cable table

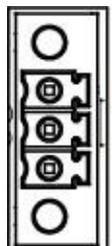
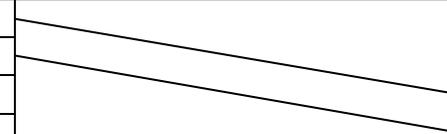
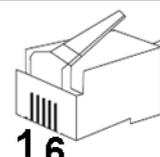
This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.  
 (The cable diagram described in this chapter may differ from the recommendations of "SHINSUNG E&G Co., Ltd.")

### ■ RS-485 (1:1 connection)

COM			Cable connection	External device			
Pin arrangement* <i>Note 1</i>	Signal name	Pin number		Pin number	Signal name		
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	RDA(+)	1		1		 <p>Based on communication cable connector front, 6 pin male RJ-12 (Male, convex)</p>	
				2	2		
				3	3		+
	RDB(-)	4		4	4		-
	SG	5		5	5		
	SDA(+)	6		6	6		
				7			
				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)

COM		Cable connection	External device		
Pin arrangement	Signal name		Pin number	Signal name	
 <p>SG - +</p>	+		1		 <p>Based on communication cable connector front, 6 pin male RJ-12 (Male, convex)</p>
	-		2		
	SG		3	+	
			4	-	
		5			
		6			

## 6. Operation and processing of data requests

Describes the FFU status read request operation of the MCUL32 Series communication driver, and the processing method of response data.

The MCUL32 communication driver requests FFU data to the external device (MCUL32) by the bit value of the trigger address. The trigger address can be set in the [communication option setting](#) window.

When the FFU status read trigger bit value is ON, status data is saved as many as the number of FFUs in the order of FFU ID, PV, AL&ST, SV, pressure (mmAq) from the address set in FFU Read Data. (Only checked PV, AL&ST, SV, pressure (mmAq) are requested and processed.)

Ex 1) If FFU Read Data address is set to D00100, Number of FFU is set to 32, and PV, ALST, SV and mmAq are all checked, the data is saved as follows.

D00100 : FFU ID 1  
 D00101: PV value of No.1 FFU  
 D00102: AL&ST value of No.1 FFU  
 D00103: SV value of No.1 FFU  
 D00104: Pressure value (mmAq) of No.1 FFU  
  
 D00105 : FFU ID 2  
 D00106: PV value of No.2 FFU  
 D00107: AL&ST value of No.2 FFU  
 D00108: SV value of No.2 FFU  
 D00109: Pressure value (mmAq) of No.2 FFU  
 . . .  
 D00255 : FFU ID 32  
 D00256: PV value of No.32 FFU  
 D00257: AL&ST value of No.32 FFU  
 D00258: SV value of No.32 FFU  
 D00259: ressure value (mmAq) of No.32 FFU

Ex 2) If FFU Read Data address is set to D00100, Number of FFU is set to 32, and PV and SV are all checked, the data is saved as follows.

D00100 : FFU ID 1  
 D00101: PV value of No.1 FFU  
 D00102: SV value of No. 1 FFU  
  
 D00103 : FFU ID 2  
 D00104: PV value of No. 2 FFU  
 D00105: SV value of No. 2 FFU  
 . . .  
 D00193 : FFU ID 32  
 D00194: PV value of No. 32 FFU  
 D00195: SV value of No. 32 FFU