

Robostar Co.,Ltd

RCS-8000 Series

Serial Driver

Supported version

TOP Design Studio

V1.4.11.23 or higher



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

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Describes the addresses which can communicate with an external device.

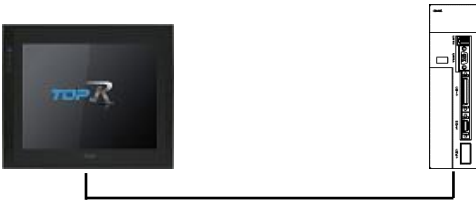
1. System configuration

The system configuration of TOP and ROBOSTAR – RCS-8000 Series is as follows:

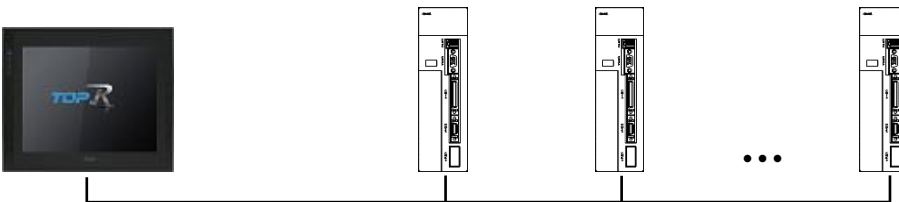
Series	Link I/F	Communication method	System setting	Cable
RCS-8000	CN3 (Serial Port for PC/Teach Pendant)	RS-232C	3. TOP communication setting	5. Cable table
		RS-422	4. External device setting	

■ Connectable configuration

- 1:1 connection

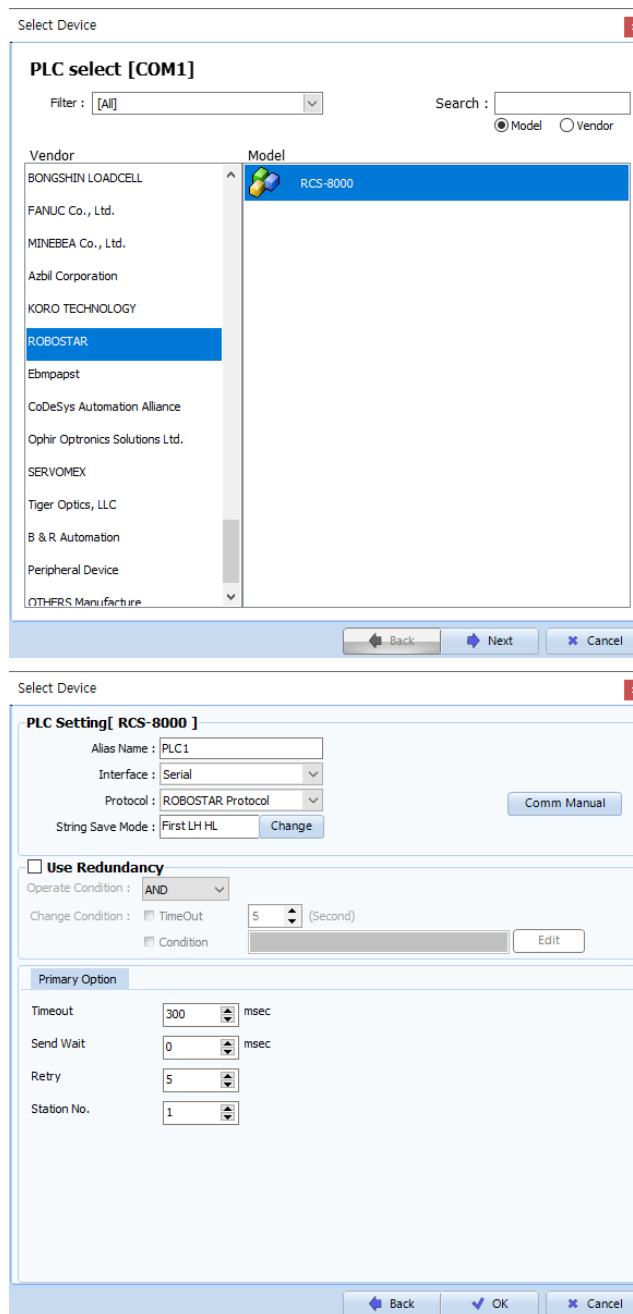


- 1:N connection



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 "ROBOSTAR".					
	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>RCS-8000</td> <td>Serial</td> <td>ROBOSTAR 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	RCS-8000	Serial
Model	Interface	Protocol					
RCS-8000	Serial	ROBOSTAR Protocol					

3. TOP communication setting

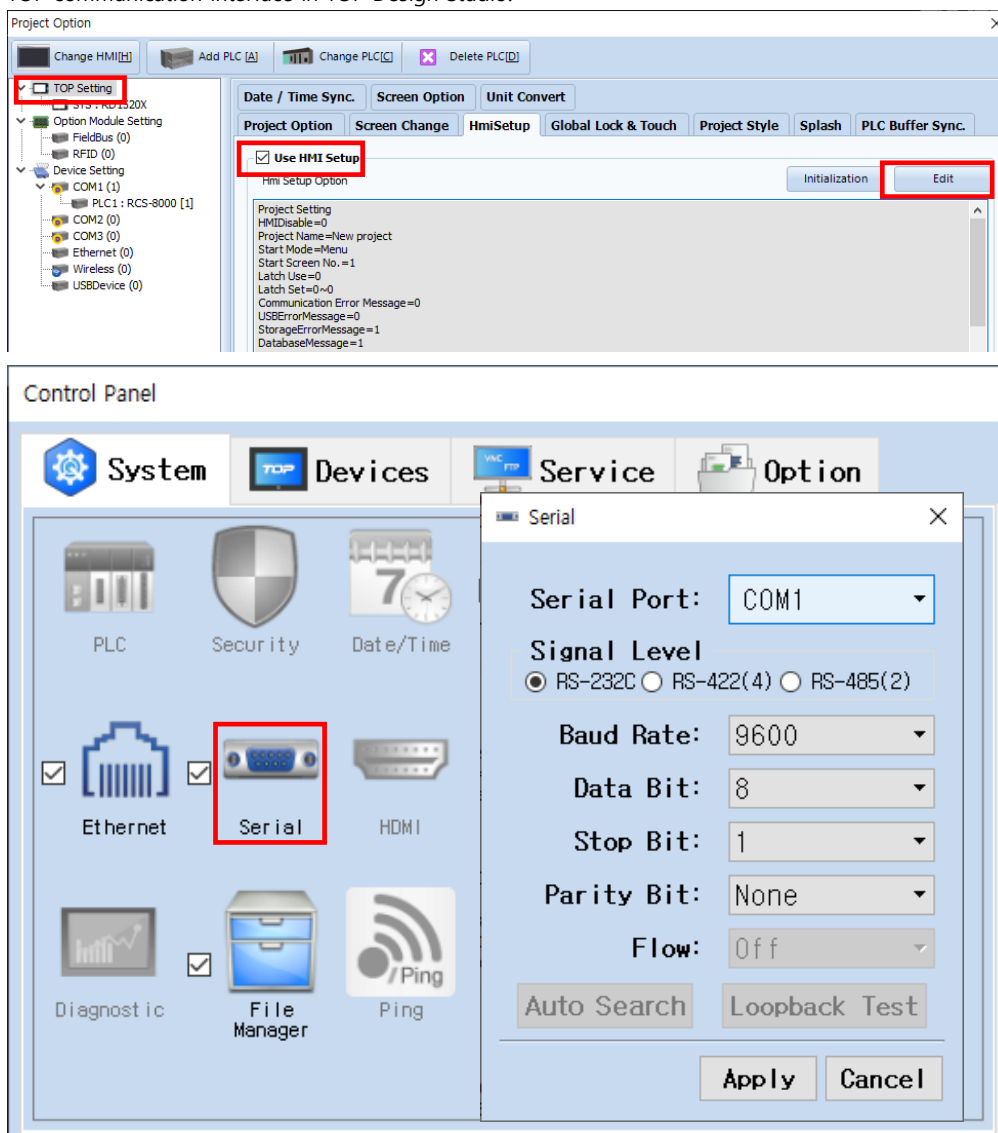
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

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

– Set the TOP communication interface in TOP Design Studio.



Items	TOP	External device	Remarks
Signal Level (port)	RS-232C RS-422	RS-232C RS-422	
Baud Rate	9600		
Data Bit	8		
Stop Bit	1		
Parity Bit	None.		

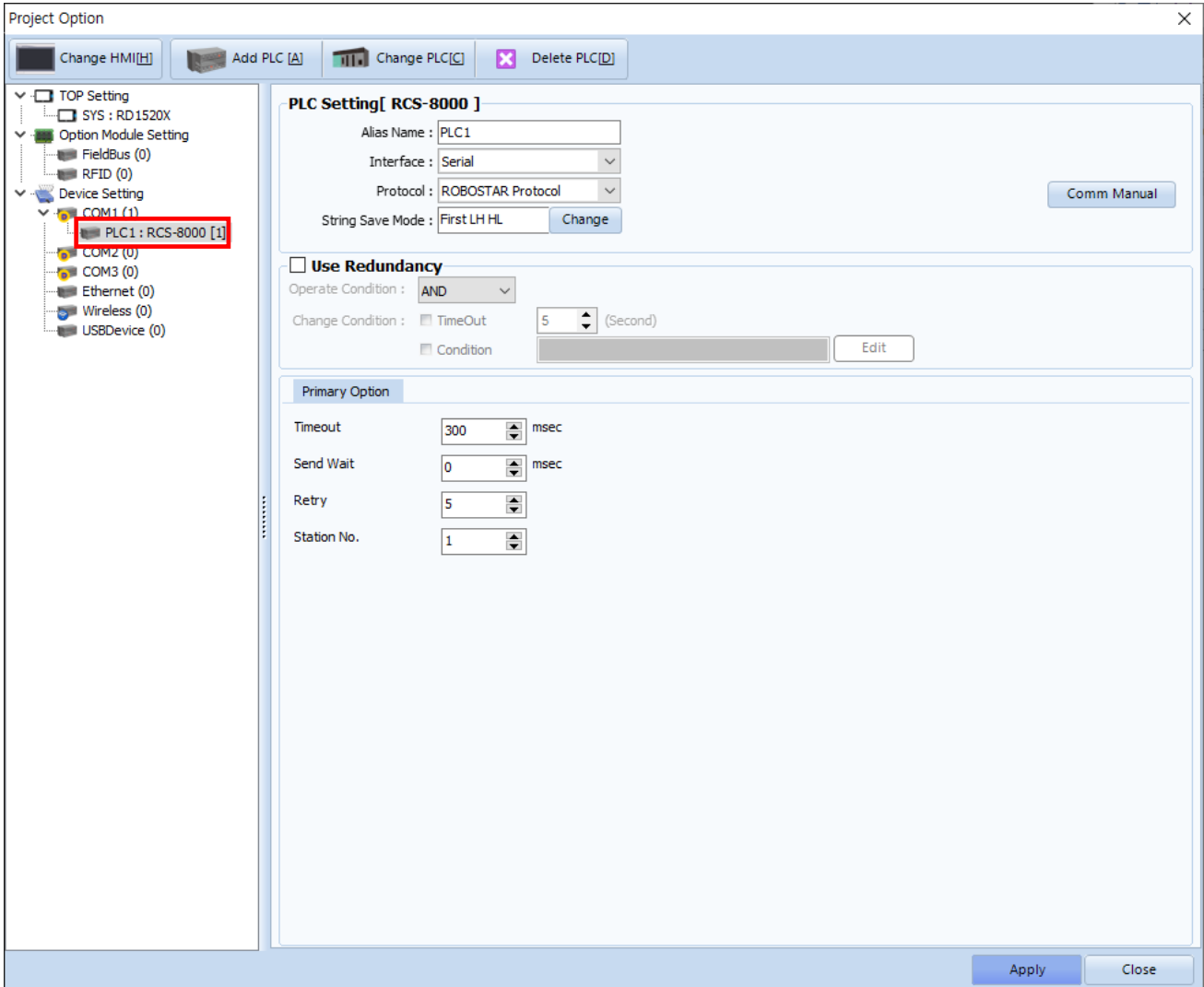
* The above settings are examples recommended by the company.

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 Property] → [Device Setting > COM > RCS-8000]

– Set the options of the RCS-8000 communication driver in TOP Design Studio.



Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External device selection".
Protocol	Select "ROBOSTAR Protocol".	
TimeOut (ms)	Set the time to wait for a response from an external device.	
SendWait (ms)	Set the waiting time before sending a data request to an external device.	
Station No.	Enter the prefix of an external device.	

3.2. Communication setting in TOP

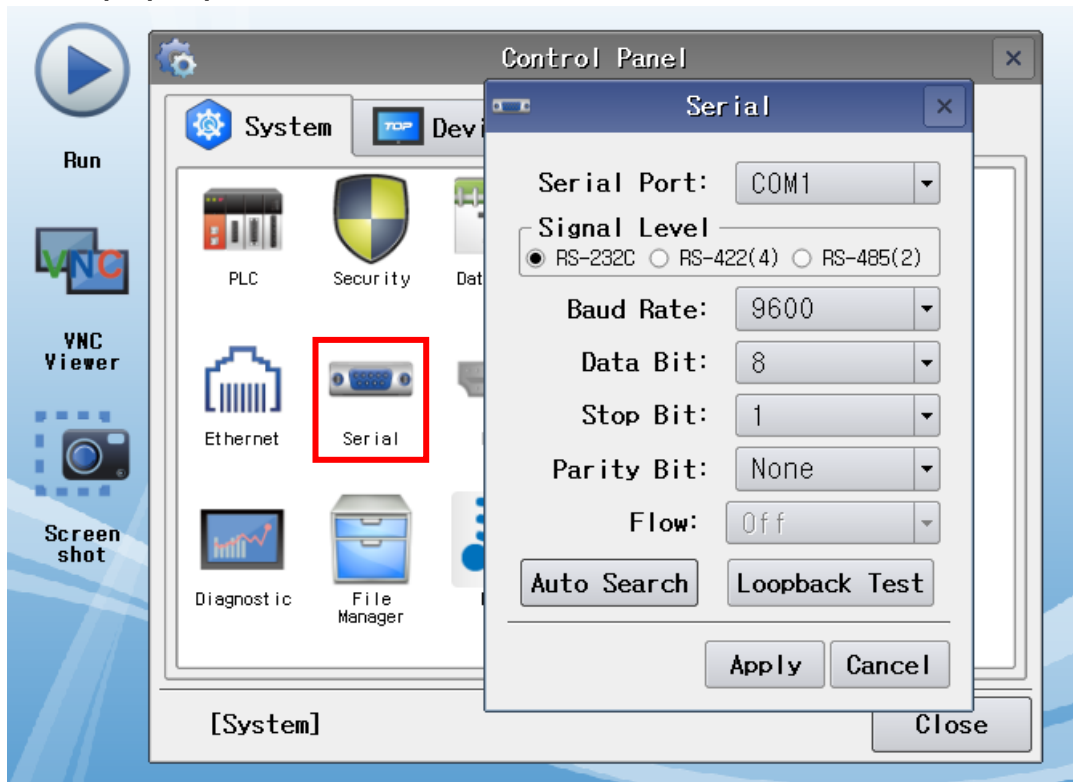
* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.



(1) Communication interface setting

- [Control Panel] → [Serial]



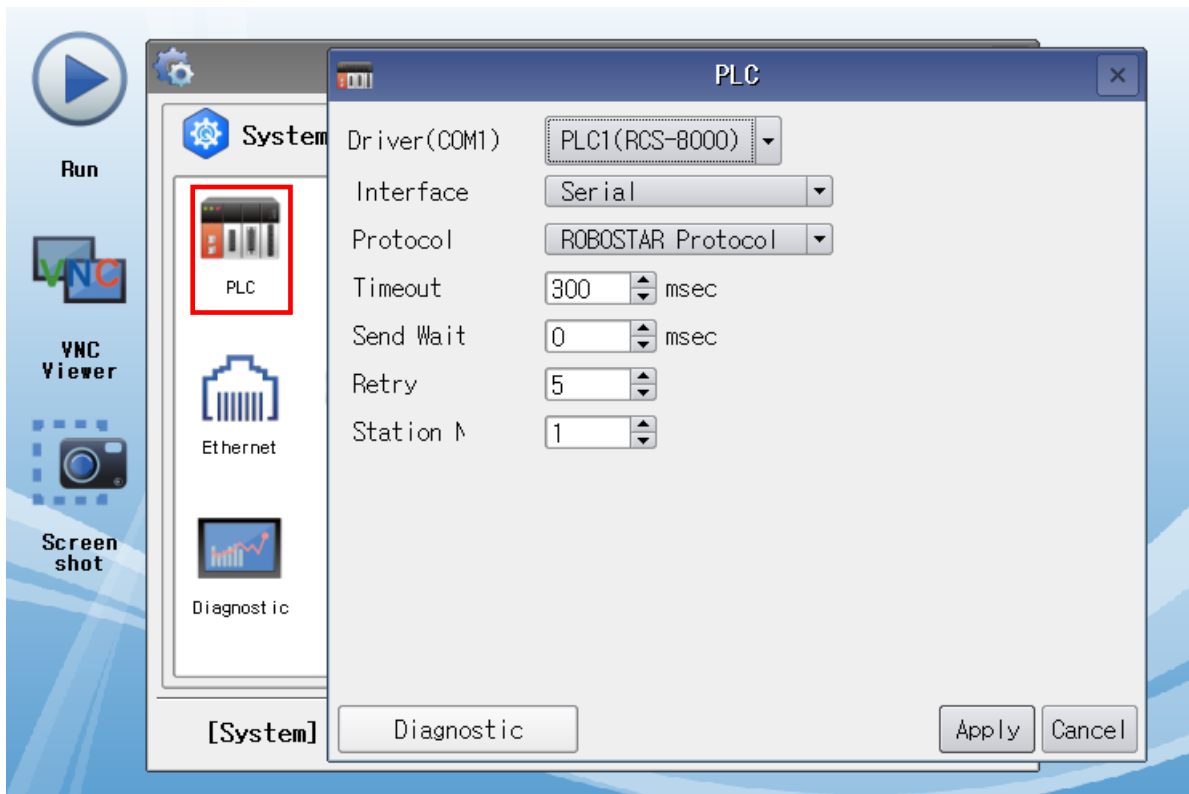
Items	TOP	External device	Remarks
Signal Level (port)	RS-232C RS-422	RS-232C RS-422	
Baud Rate		9600	
Data Bit		8	
Stop Bit		1	
Parity Bit		None.	

* 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

■ [Control Panel] → [PLC]



Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External device selection".
Protocol	Select "ROBOSTAR Protocol".	
TimeOut (ms)	Set the time to wait for a response from an external device.	
SendWait (ms)	Set the waiting time before sending a data request to an external device.	
Station No.	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 that the settings of the connected ports in [Control Panel] → [Serial] are the same as the settings of the external device.

- Diagnosis of whether the port communication is normal or not
 - Touch "Communication Diagnostics" in [Control Panel] → [PLC].
 - Check whether communication is connected or not.

Communication diagnostics succeeded	Communication setting normal
Error message	Communication setting abnormal - Check the cable, TOP, and external device settings. (Refer to 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	

4. External device setting

- Refer to the user manual of the vendor and configure the communication channel options.

Step 1. Turn on the [F1] controller and select Teach Pendant.

Step 2. Press [ENT].

Step 3. Select [F3] PARA.

Step 4. Select [F3] OPER.

Step 5. Select [F4] SET.

Step 6. Select [F1] COM.

Step 7. Select a port to use and configure the communication speed.

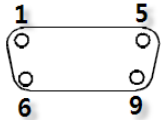
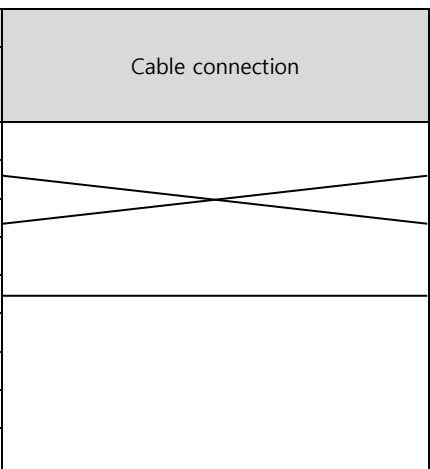
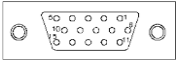
Setting Value	Speed
0	9600 bps
1	19200 bps
2	38400 bps
3	115200 bps

5. Cable table

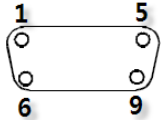
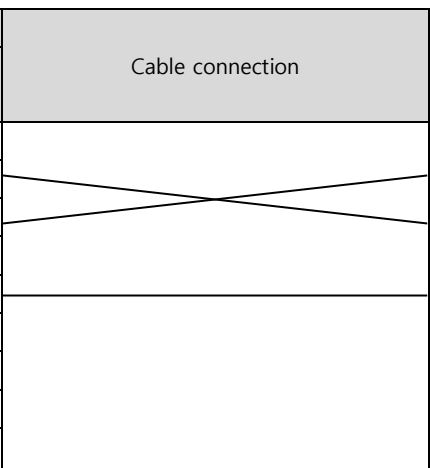
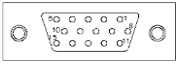
This chapter introduces a cable diagram for normal communication between the TOP and the external device.

(The cable diagram described in this section may differ from the recommendations of "ROBOSTAR")

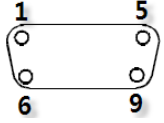
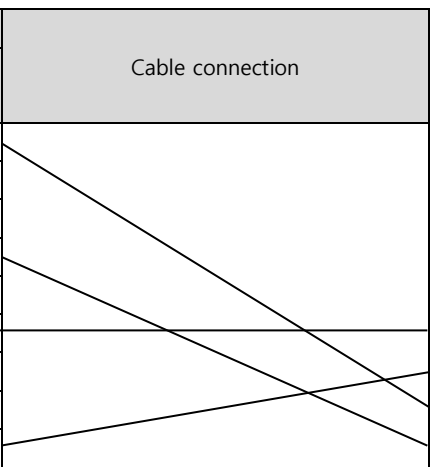
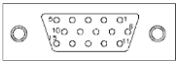
■ RS-232C (CN3 COM1)

TOP			Cable connection	External device		
Pin arrangement ^{*Note 1)}	Signal name	Pin number		Pin number	Signal name	Pin arrangement
 <p>Based on communication cable connector front, D-SUB 9 Pin</p>		1				 <p>D-SUB SOLD 15Pin</p>
	RD	2		2	RD	
	SD	3		3	SD	
		4				
	SG	5		5	SG	
		6				
		7				
		8				
		9				

■ RS-232C (CN3 COM2)

TOP			Cable connection	External device		
Pin arrangement ^{*Note 1)}	Signal name	Pin number		Pin number	Signal name	Pin arrangement
 <p>Based on communication cable connector front, D-SUB 9 Pin</p>		1				 <p>D-SUB SOLD 15Pin</p>
	RD	2		9	RD	
	SD	3		10	SD	
		4				
	SG	5		5	SG	
		6				
		7				
		8				
		9				

■ RS-422 (CN3 RS-422)

TOP			Cable connection	External device			
Pin arrangement ^{*Note 1)}	Signal name	Pin number		Pin number	Signal name	Pin arrangement	
 <p>Based on communication cable connector front, D-SUB 9 Pin</p>	RDA	1				 <p>D-SUB SOLD 15Pin</p>	
				2			
				3			
	RDB	4					
				5			
	SDA	6			12		RX+
				7			
				8	13		RX-
	SDB	9			14		TX+
			15	TX-			

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.

Address	Description	Bit	Word	Authorization	Remarks
BBB	I/O	BBB00.00 ~ BBB41.07	BBB00 ~ BBB40	R/W	
INT	Integer type variable	INT000.00 ~ INT255.15	INT000 ~ INT255	R/W	
POS	Position type variable	POS0000.00 ~ POS1023.31	POS0000 ~ POS1023	R/W	
ERR	Robot status	ERR0.00 ~ ERR0.15	ERR0	R	*Note 1)
MSG	Ongoing alarm code	MSG0.00 ~ MSG0.15	MSG0	R	
SPD	Controller speed	SPD0.00 ~ SPD0.31	SPD0	R/W	
JOB	Operating job number	JOB0.00 ~ JOB0.31	JOB0	R/W	
CRP	Location coordinates of robot	CRP0.00 ~ CRP1.31	CRP0 ~ CRP1	R	*Note 2)
JOG	Incremental movement by data input	JOG0.00 ~ JOG0.31	JOG0	W	
EMG	Emergency stop	EMG0.00 ~ EMG0.15	EMG0	W	
FUN	Other commands	FUM0.00 ~ FUN7.15	FUN0 ~ FUN7	W	*Note 3)

*Note 1)

Bit	0	1	2	3	4	5	6	7
Status	RUN	INPOS	1	ALARM	1	1	None.	None.

Bit	8	9	10	11	12	13	14	15
Status	ORIGIN	SERVO ON	None.	None.	1	1	None.	None.

*Note 2)

CRP0: Pulse, CRP1: Joint

*Note 3)

Address	Description
FUN0	Run robot JOB
FUN1	Stop robot JOB
FUN2	Reset robot JOB
FUN3	Return-to-origin execution
FUN4	JOG move execution -
FUN5	JOG move execution +
FUN6	Continuous JOB move execution
FUN7	JOB move stop