

MINEBEA Co., Ltd.

Digital Indicator CSD Series

Command Mode Serial Driver

Supported version

TOP Design Studio

V1.4.7.2 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.

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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 "MINEBEA Co., Ltd. – Digital Indicator CSD Series Command Mode Serial" is as follows:

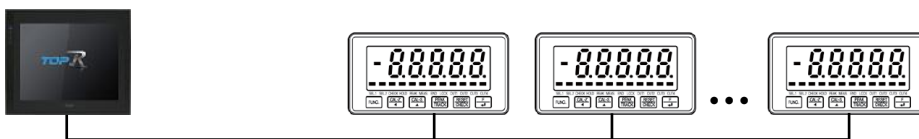
Series	Link I/F	Communication method	Communication setting	Cable
CSD-912B-EX CSD-912-EX CSD-903 CSD-904-EX CSD-891B CSD-815B CSD-701B CSD-709 CSD-819C CSD-401	Serial port	RS-232C RS-422/485	3. TOP communication setting 4. External device setting	5. Cable table

■ Connectable configuration

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

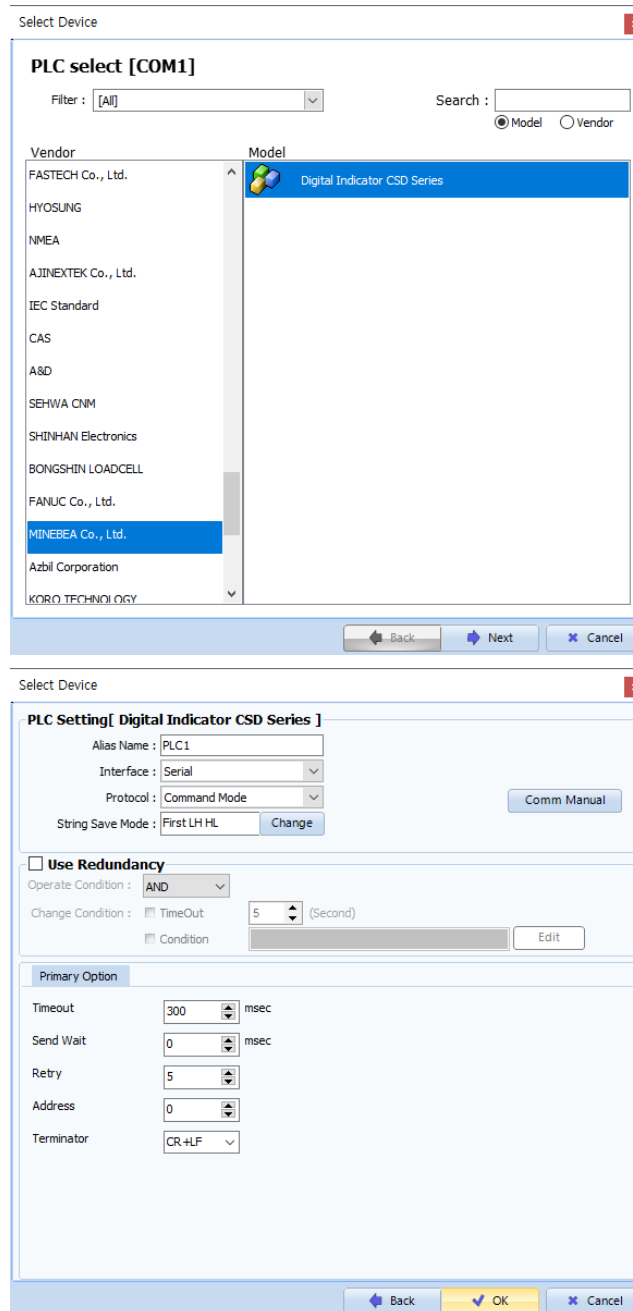


- 1:N (one TOP and multiple external devices) connection



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 "MINEBEA Co., Ltd."					
	External device	Select external device. <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>Digital Indicator CSD Series</td> <td>Serial</td> <td>Command Mode</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	Digital Indicator CSD Series	Serial
Model	Interface	Protocol					
Digital Indicator CSD Series	Serial	Command Mode					

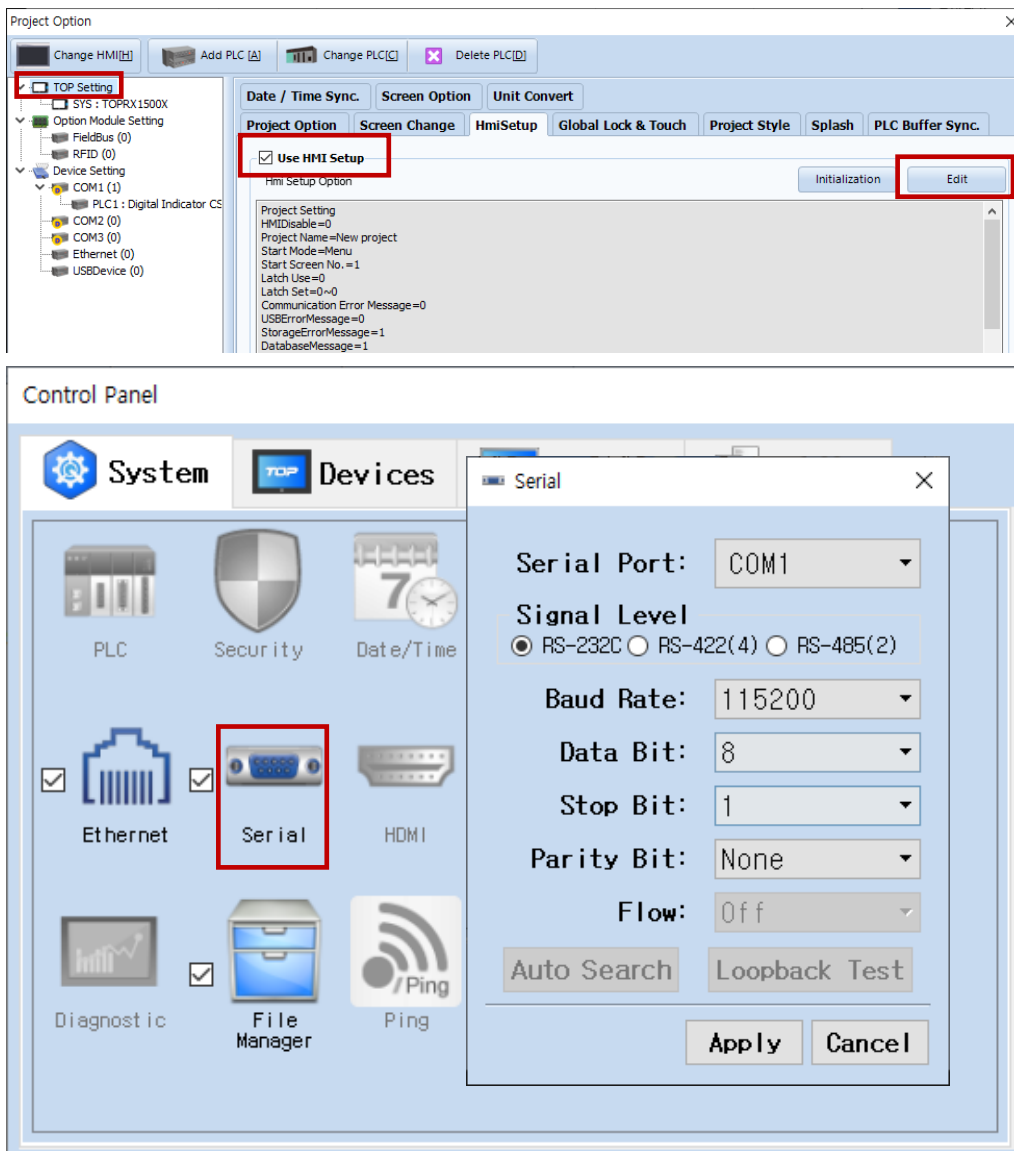
3. TOP communication setting

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 Options > "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-485	RS-232C / RS-422 / RS-485	
Baud Rate	115200		
Data Bit	8		
Stop Bit	1		
Parity Bit	NONE		

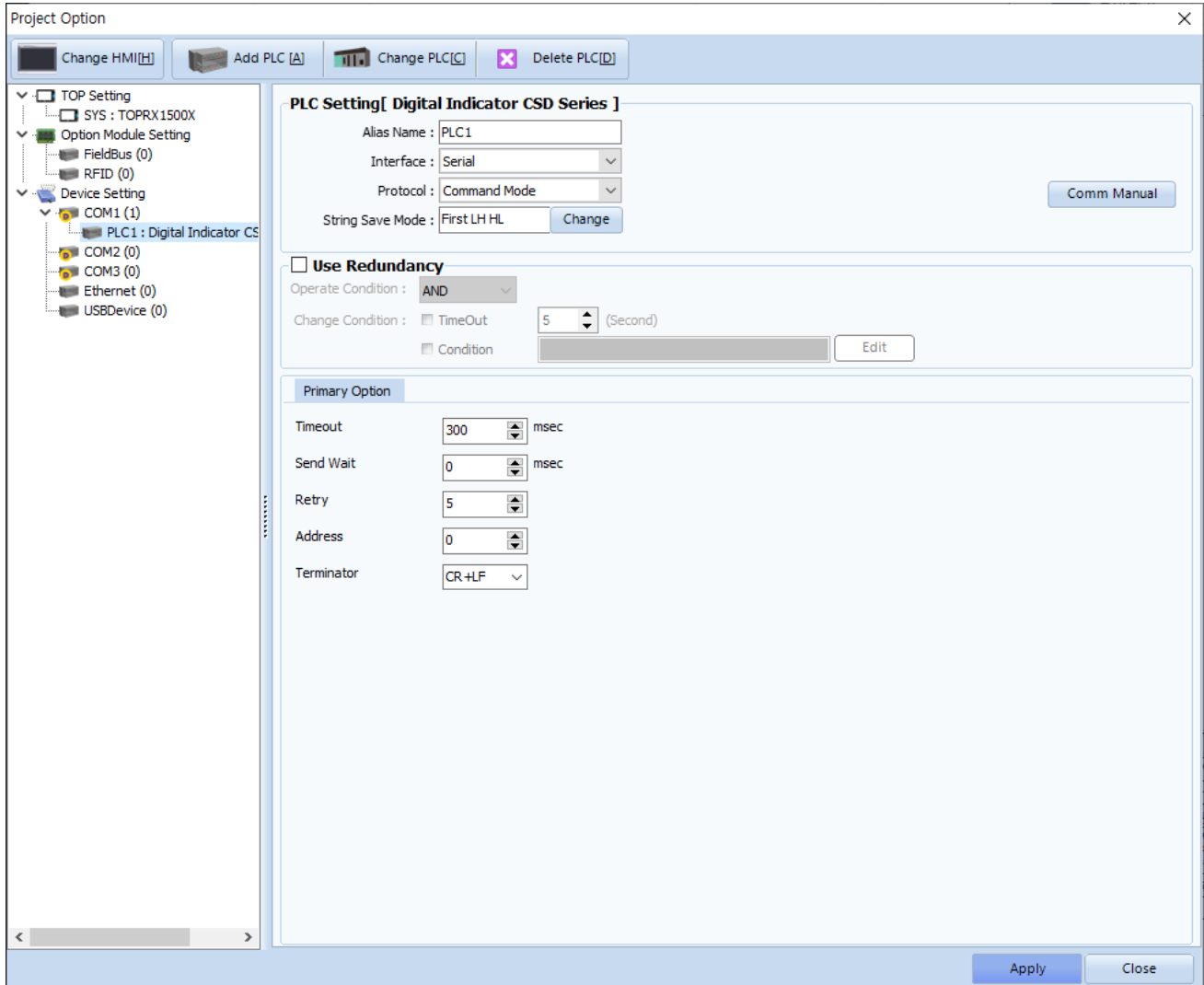
* The above settings are examples recommended by the company.

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 > PLC Settings > COM > "PLC1 : Digital Indicator CSD Series"]

– Set the options of the Digital Indicator CSD Series Command Mode Serial communication driver in TOP Design Studio.

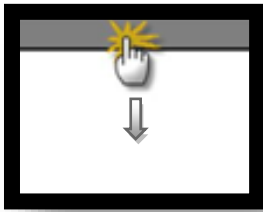


Items	Settings	Remarks
Interface	Select "Serial".	2. External device selection
Protocol	Select "Command Mode".	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next request.	
Address	Set the external device communication address (prefix).	
Terminator	Set the frame end code.	

3.2. Communication setting in TOP

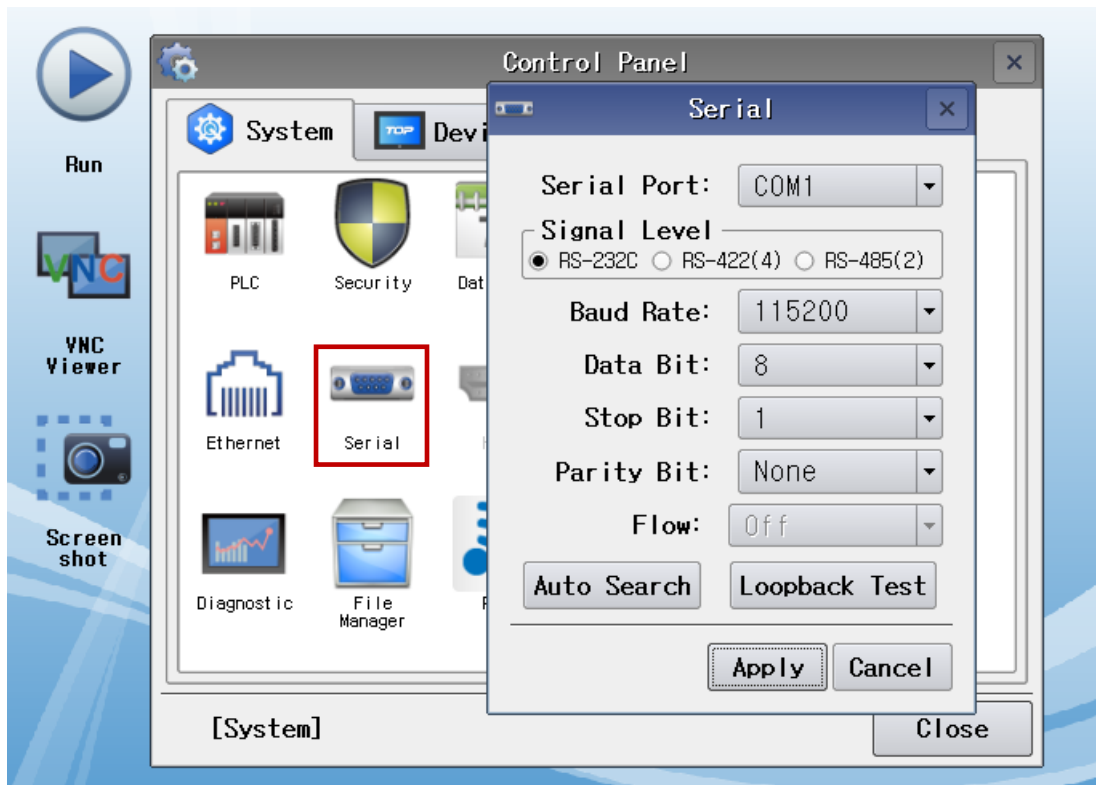
* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- 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]



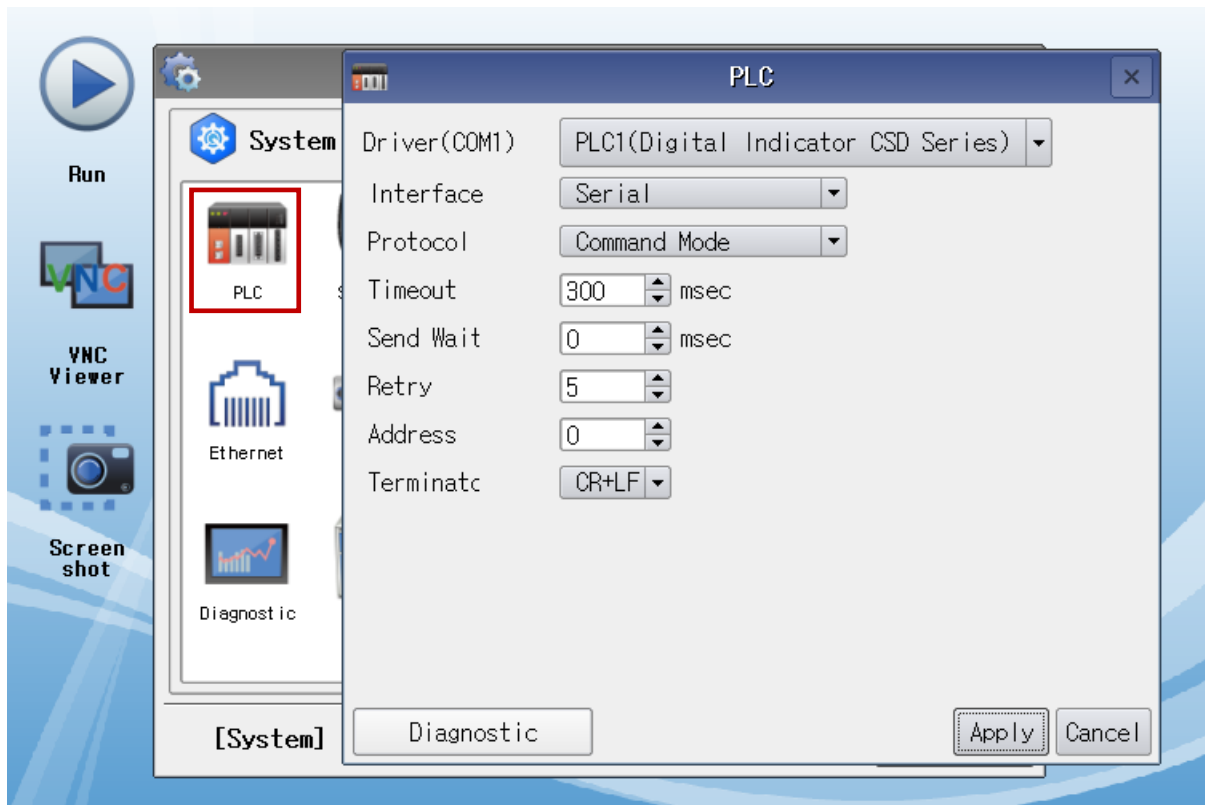
Items	TOP	External device	Remarks
Signal Level (port)	RS-232C / RS-422 / RS-485	RS-232C / RS-422 / RS-485	
Baud Rate	115200		
Data Bit	8		
Stop Bit	1		
Parity Bit	NONE		

* 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".	2. External device selection
Protocol	Select "Command Mode".	
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.	
Address	Set the external device communication address (prefix).	
Terminator	Set the frame end code.	

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.)	

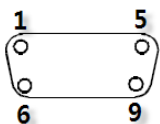
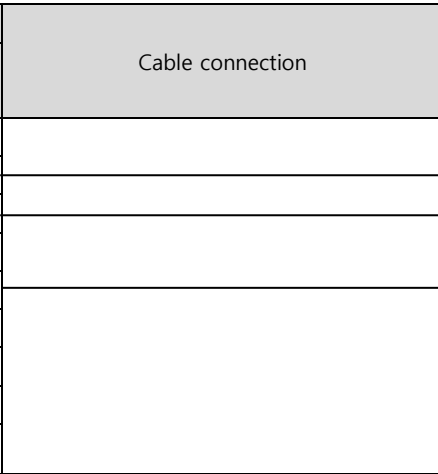
4. External device setting

Set the equivalent communication settings to that of the TOP by referring to MINEBEA Co., Ltd.'s user manual.

5. Cable table

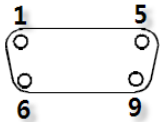
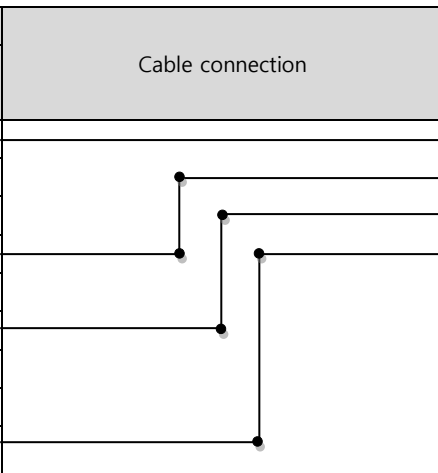
This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.
 (The cable diagram described in this section may differ from the recommendations of "MINEBEA Co., Ltd.")

■ RS-232C (1:1 connection)

COM			Cable connection	External device	
Pin arrangement* Note 1)	Signal name	Pin number		Signal name	
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	CD	1			
	RD	2		TXD	
	SD	3		RXD	
	DTR	4			
	SG	5		SG	
	DSR	6			
	RTS	7			
	CTS	8			
		9			

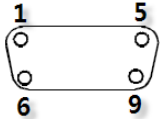
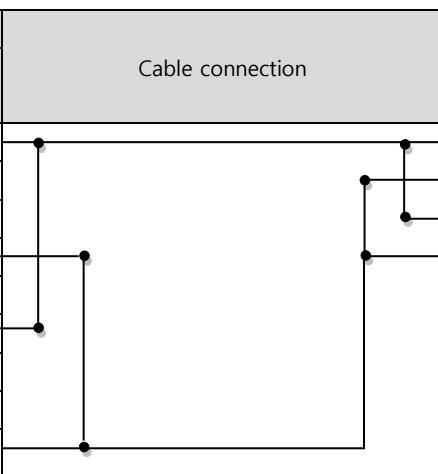
***Note 1)** The pin arrangement is as seen from the connecting side of the cable connection connector.

■ RS-422 (1:1 connection)

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

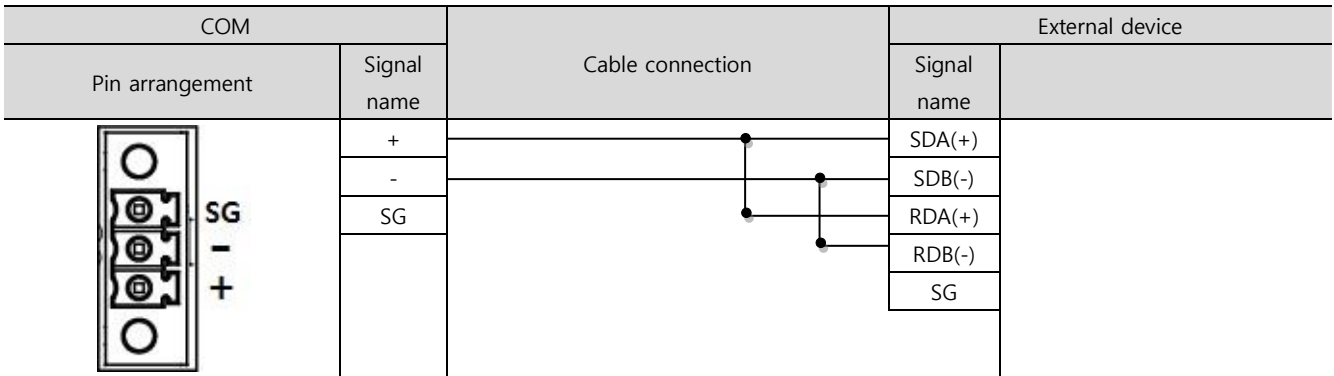
***Note 1)** The pin arrangement is as seen from the connecting side of the cable connection connector.

■ RS-485 (1:1 connection)

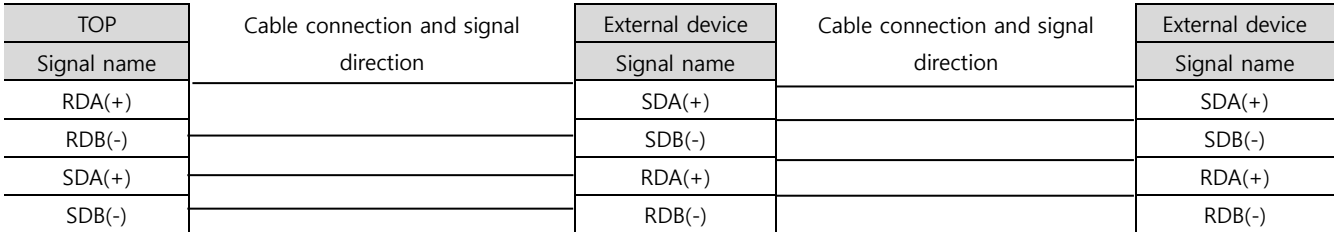
COM			Cable connection	External device	
Pin arrangement* Note 1)	Signal name	Pin number		Signal name	
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	RDA(+)	1		SDA(+)	
		2		SDB(-)	
		3		RDA(+)	
	RDB(-)	4		RDB(-)	
	SG	5		SG	
	SDA(+)	6			
		7			
		8			
	SDB(-)	9			

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

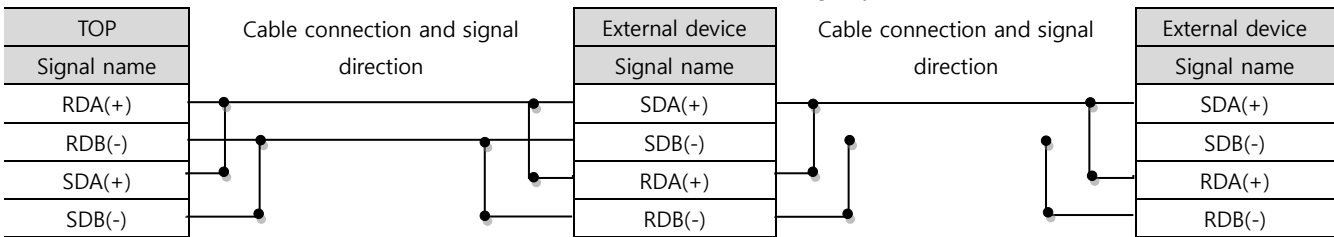
■ RS-485 (1:1 connection)



■ RS-422 (1:N connection) – Refer to 1:1 connection to connect in the following way.



■ RS-485 (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.

In TOP Design Studio, Digital Indicator CSD Series Command Mode Serial communication driver devices require entry of Command No. in CSD Command Mode. Refer to the manual of the model and use supported Command No.

Address example)

R20 : when reading data request Command No. 20

R70/W80:01 : Function No. is 01, when reading data, request Command No. 70, write 80

CMD50 : Command No. 50 Command transmission

DEVICE	BIT	WORD	R/W	Remarks
R20	-	R20	R	
R21	-	R21	R	
R22	-	R22	R	
R23	-	R23	R	
R24	-	R24	R	
R25	-	R25	R	
R26	DATA	R26:DATA	R	
	STATUS1	R26:STATUS1.00~R26:STATUS1.04	R	*Note 1)
	STATUS2	R26:STATUS2.00~R26:STATUS2.01	R	*Note 2)
	UNIT	R26:UNIT.00~R26:UNIT.09	R	*Note 3)
R30/W60	-	R30/W60	R/W	
R31/W61	-	R31/W61	R/W	
R32/W62	-	R32/W62	R/W	
R33/W63	-	R33/W63	R/W	
R34/W64	-	R34/W64	R/W	
R35/W65	-	R35/W65	R/W	
R36/W66	-	R36/W66	R/W	
R37/W67	-	R37/W67	R/W	
R38/W68	-	R38/W68	R/W	
R39/W69	-	R39/W69	R/W	
R40	R40.00 ~ R40.08	R40	R	
R41	R41.00 ~ R41.08	R41	R	
R42	R42.00 ~ R42.08	R42	R	
R43	R43.00 ~ R43.08	R43	R	
R45	R44.00 ~ R44.08	R44	R	
R46	R45.00 ~ R45.08	R45	R	
CMD50	CMD50	CMD50	W	
CMD51	CMD51	CMD51	W	
CMD52	CMD52	CMD52	W	
CMD53	CMD53	CMD53	W	
CMD54	CMD54	CMD54	W	
CMD55	CMD55	CMD55	W	
CMD56	CMD56	CMD56	W	
CMD57	CMD57	CMD57	W	
CMD58	CMD58	CMD58	W	
CMD59	CMD59	CMD59	W	
CMD5A	CMD5A	CMD5A	W	

DEVICE	BIT	WORD	R/W	Remarks
CMD5B	CMD5B	CMD5B	W	
CMD5C	CMD5C	CMD5C	W	
CMD5D	CMD5D	CMD5D	W	
CMD5E	CMD5E	CMD5E	W	
CMD5F	CMD5F	CMD5F	W	
CMD5G	CMD5G	CMD5G	W	
CMD5H	CMD5H	CMD5H	W	
CMD5I	CMD5I	CMD5I	W	
CMD5J	CMD5J	CMD5J	W	
R70/W80(8D)	R70/W80(8D) : 00.00 ~ 99.31	R70/W80(8D) : 00 ~ 99	R/W	*Note 4)
R71/W81(8D)	R71/W81(8D) : 00.00 ~ 99.31	R71/W81(8D) : 00 ~ 99	R/W	
R72/W82(8D)	R72/W82(8D) : 00.00 ~ 99.31	R72/W82(8D) : 00 ~ 99	R/W	
R73/W83(8D)	R73/W83(8D) : 00.00 ~ 99.31	R73/W83(8D) : 00 ~ 99	R/W	
R74/W84(8D)	R74/W84(8D) : 00.00 ~ 99.31	R74/W84(8D) : 00 ~ 99	R/W	
R75/W85(8D)	R75/W85(8D) : 00.00 ~ 99.31	R75/W85(8D) : 00 ~ 99	R/W	
R70/W80(10D)	R70/W80(10D) : 00.00 ~ 99.31	R70/W80(10D) : 00 ~ 99	R/W	*Note 5)
R71/W81(10D)	R71/W81(10D) : 00.00 ~ 99.31	R71/W81(10D) : 00 ~ 99	R/W	
R72/W82(10D)	R72/W82(10D) : 00.00 ~ 99.31	R72/W82(10D) : 00 ~ 99	R/W	
R73/W83(10D)	R73/W83(10D) : 00.00 ~ 99.31	R73/W83(10D) : 00 ~ 99	R/W	
R74/W84(10D)	R74/W84(10D) : 00.00 ~ 99.31	R74/W84(10D) : 00 ~ 99	R/W	
R75/W85(10D)	R75/W85(10D) : 00.00 ~ 99.31	R75/W85(10D) : 00 ~ 99	R/W	
R71/W70	R71/W70 : 00.00 ~ 99.31	R71/W70 : 00 ~ 99	R/W	
R79	-	R79	R	
R80	-	R80	R	
R81	-	R81	R	
R82	-	R82	R	
R83	-	R83	R	
R84	-	R84	R	
R85	-	R85	R	
R86	-	R86	R	
R87	-	R87	R	

*Note 1) R26:DATA must be registered on the same screen or read from the script to display normal data.

Data when each bit is ON. (There could be differences among models.)

Bit	CSD-□□□	CSD-709
0	OVERLOAD	OVERLOAD
1	STABLE	TRACK
2	UNSTABLE	PEAK
3		MEAS
4		END

*Note 2) R26:DATA must be registered on the same screen or read from the script to display normal data.

Data when each bit is ON. (There could be differences among models.)

Bit	CSD-□□□	CSD-709
0	NET	PEAK
1	GROSS	TRACK

*Note 3) R26:DATA must be registered on the same screen or read from the script to display normal data.

Data when each bit is ON. (There could be differences among models.)

Bit	CSD-□□□	CSD-709
0	g	g
1	kg	Kg
2	t	Lb
3	lb	T
4	N	N
5	kN	kN
6		P
7		kP
8		MP

*Note 4) Request data in frames if the data is 8 digits or less.

R70/W80 (8D):□□ when entering □□is Function No.

*Note 5) Request data in frames if the data is 10 digits or less.

R70/W80 (10D):□□ when entering □□is Function No.