

M2I Corporation

TOP Master

Serial Driver

Supported version

TOP Design Studio

V1.0 or higher



CONTENTS

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

- 1. System configuration** [Page 2](#)
Describes connectable devices and network configurations.
- 2. External device selection** [Page 3](#)
Select a TOP model and an external device.
- 3. TOP communication setting** [Page 4](#)
Describes how to set the TOP communication.
- 4. External device setting** [Page 10](#)
Describes how to set up communication for external devices.
- 5. Cable table** [Page 11](#)
Describe the cable specifications required for connection.
- 6. Supported addresses** [Page 13](#)
Refer to this section to check the data addresses which can communicate with an external device.
- Appendix. M2I Protocol** [Page 14](#)
Describes the M2I protocol.

1. System configuration

The system configuration of TOP and external devices is as follows:

Series	CPU	Link I/F	Communication method	System setting	Cable
All devices supporting TOP Slave		Serial port	RS-232C RS-422 (4wire) RS-485 (2wire)	3. TOP communication setting 4. External device setting	5. Cable table

■ Connectable configuration

- 1:1 connection

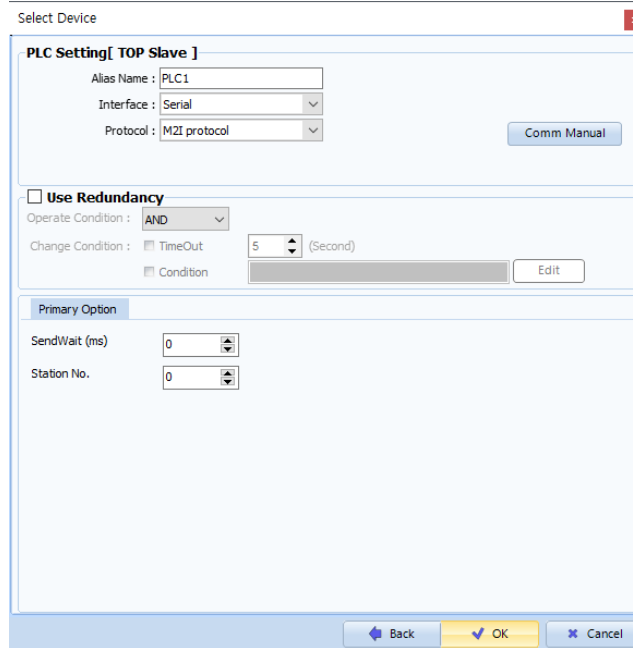
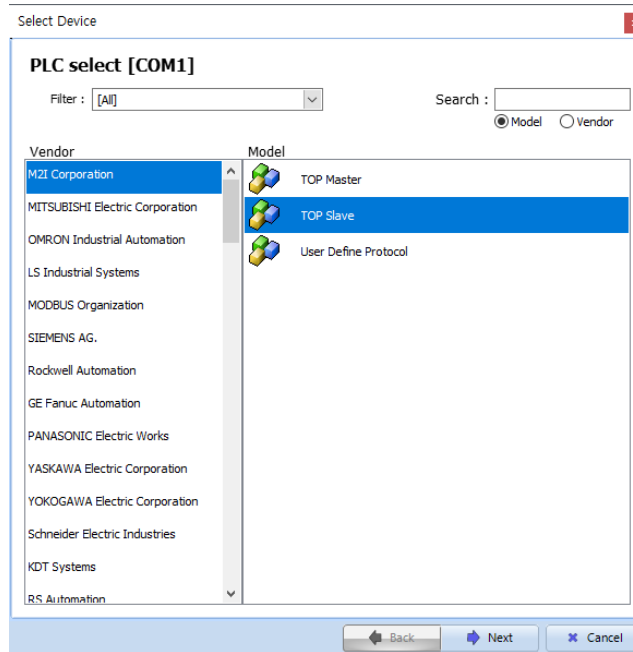


- N:1 connection



2. External device selection

- Select a TOP model and a port, and then select an external device.



Settings		Contents					
TOP	Model	Select the TOP model.					
External device	Vendor	Select the vendor of the external device to be connected to the TOP. Select "M2I Corporation".					
	PLC	Select the external device to be connected to the TOP. <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th>Model</th> <th>Interface</th> <th>Protocol</th> </tr> </thead> <tbody> <tr> <td>TOP Slave</td> <td>Serial</td> <td>M2I 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	TOP Slave	Serial
Model	Interface	Protocol					
TOP Slave	Serial	M2I Protocol					

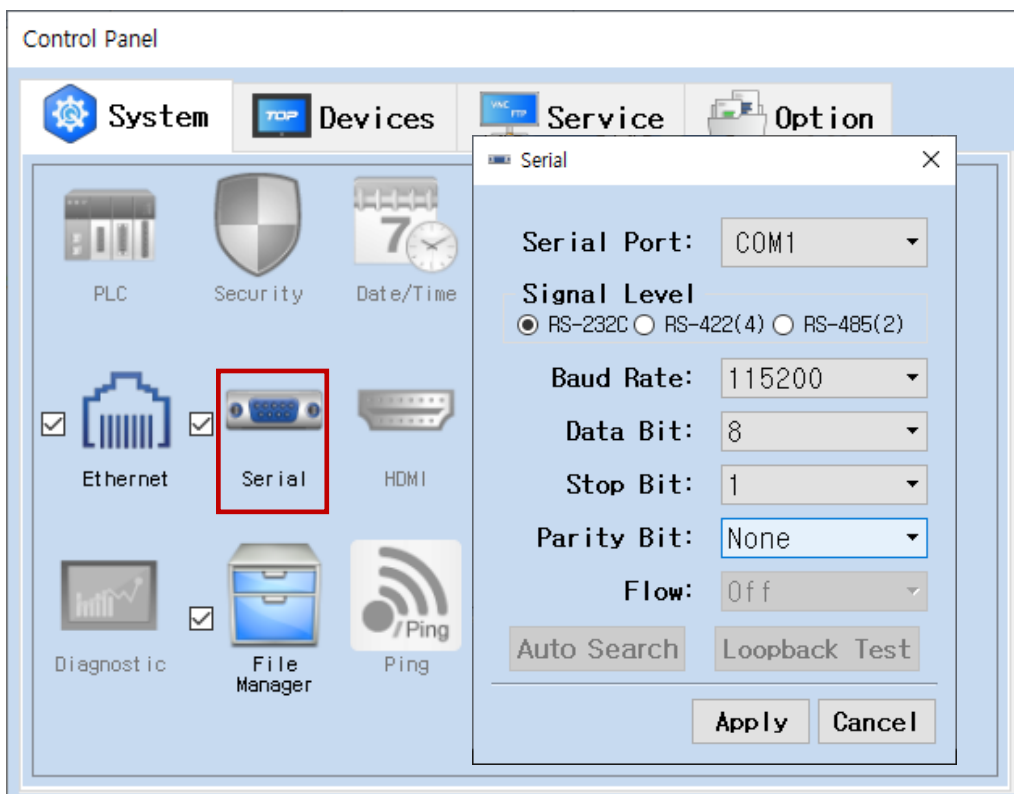
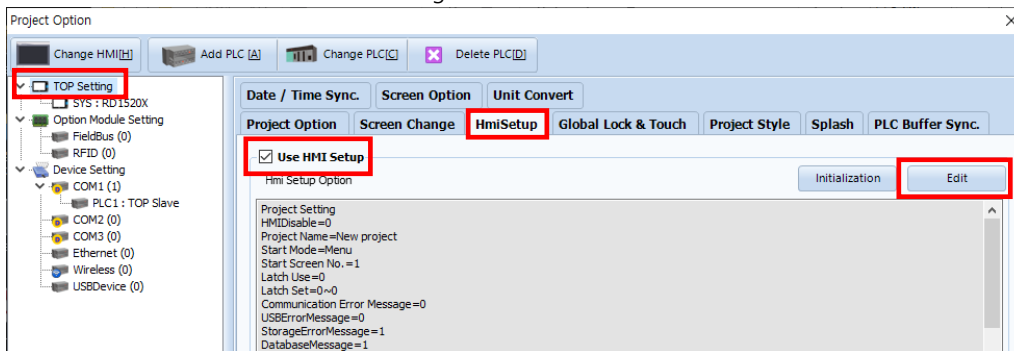
3. TOP communication setting

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.



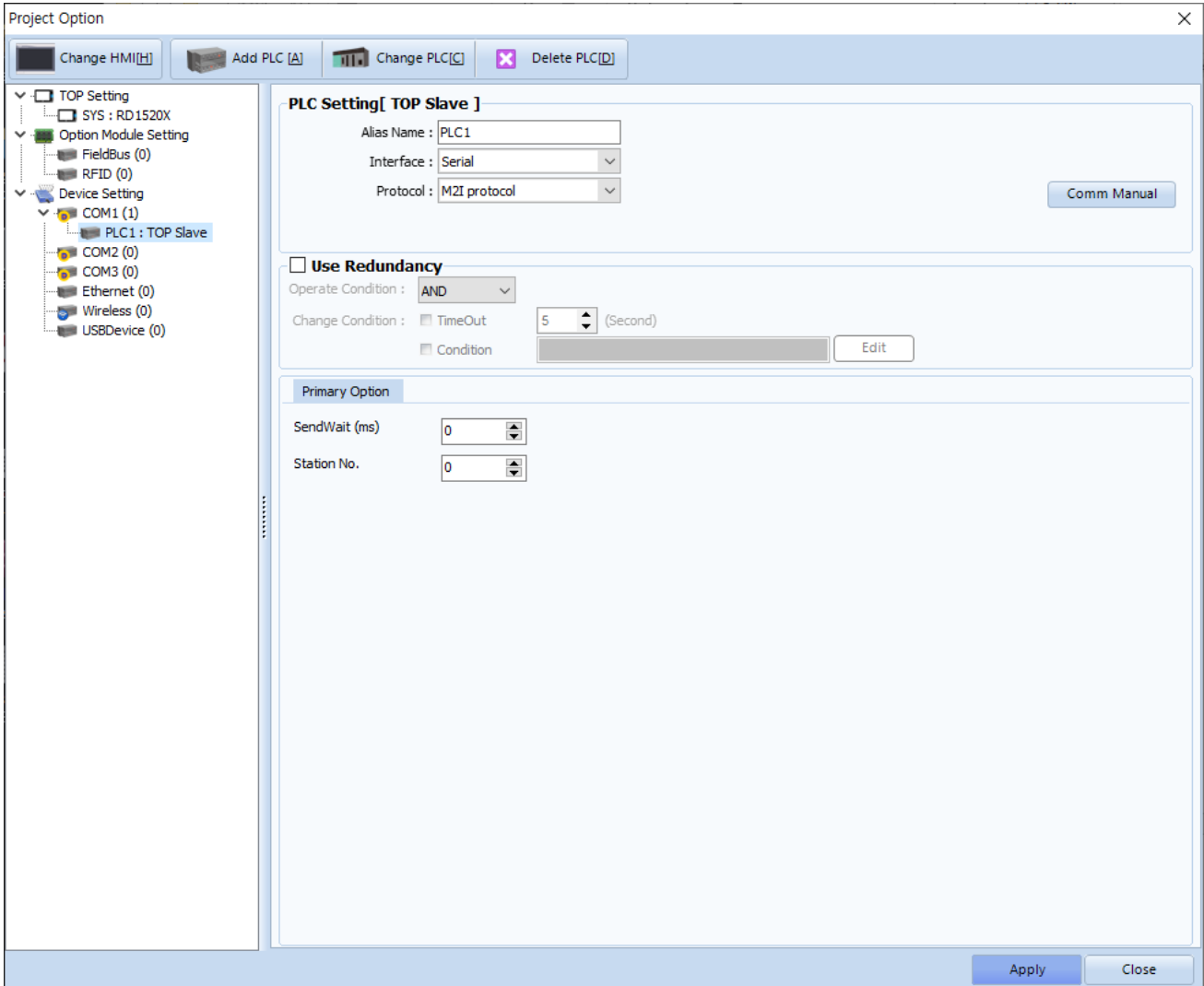
Items	TOP	External device	Remarks
Signal Level	RS-232C / RS-422 / RS-485	RS-232C / RS-422 / RS-485	
Baud Rate		115200	
Data Bit		8	
Stop Bit		1	
Parity Bit		None.	

* 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. (COM3 supports only RS-485.)
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 > COM1 > PLC1 : TOP Slave]
 - Set the options of the TOP Slave communication driver in TOP Design Studio.

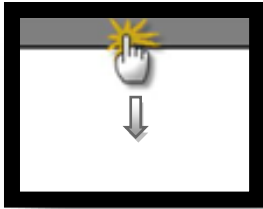


Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External device selection" .
Protocol	Select the communication protocol between the TOP and an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	
Station No.	Enter the prefix of TOP.	

3.2. Communication setting in TOP

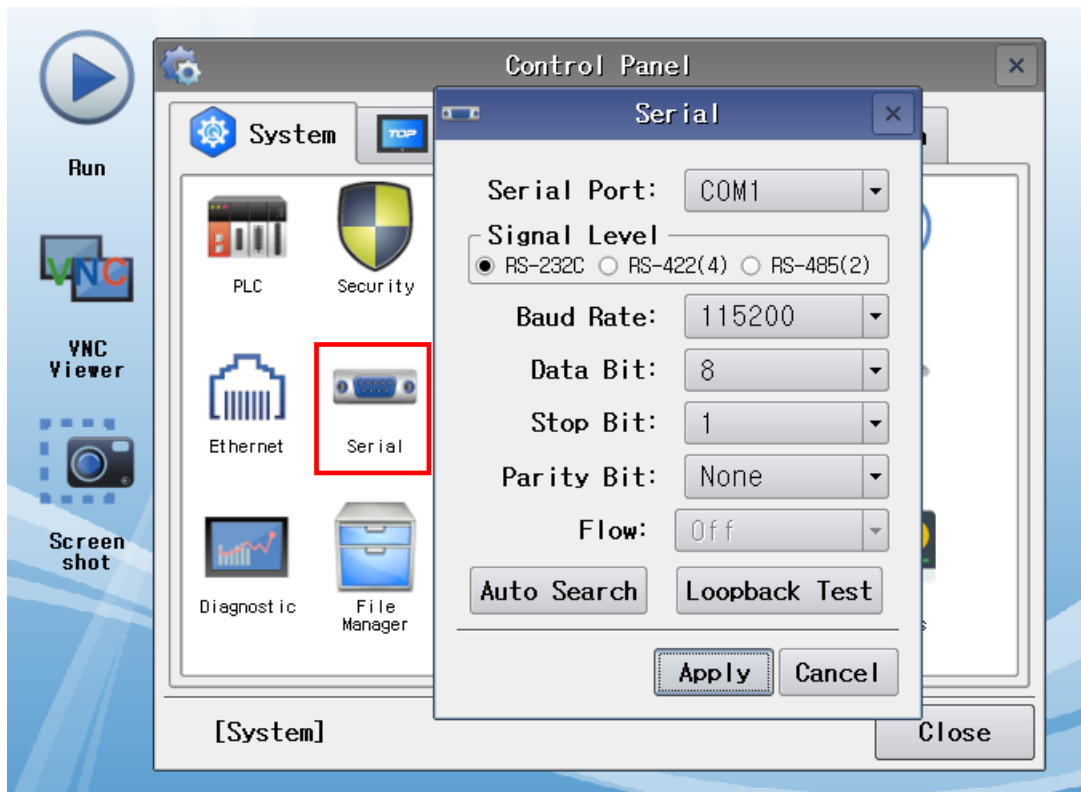
* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- 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]



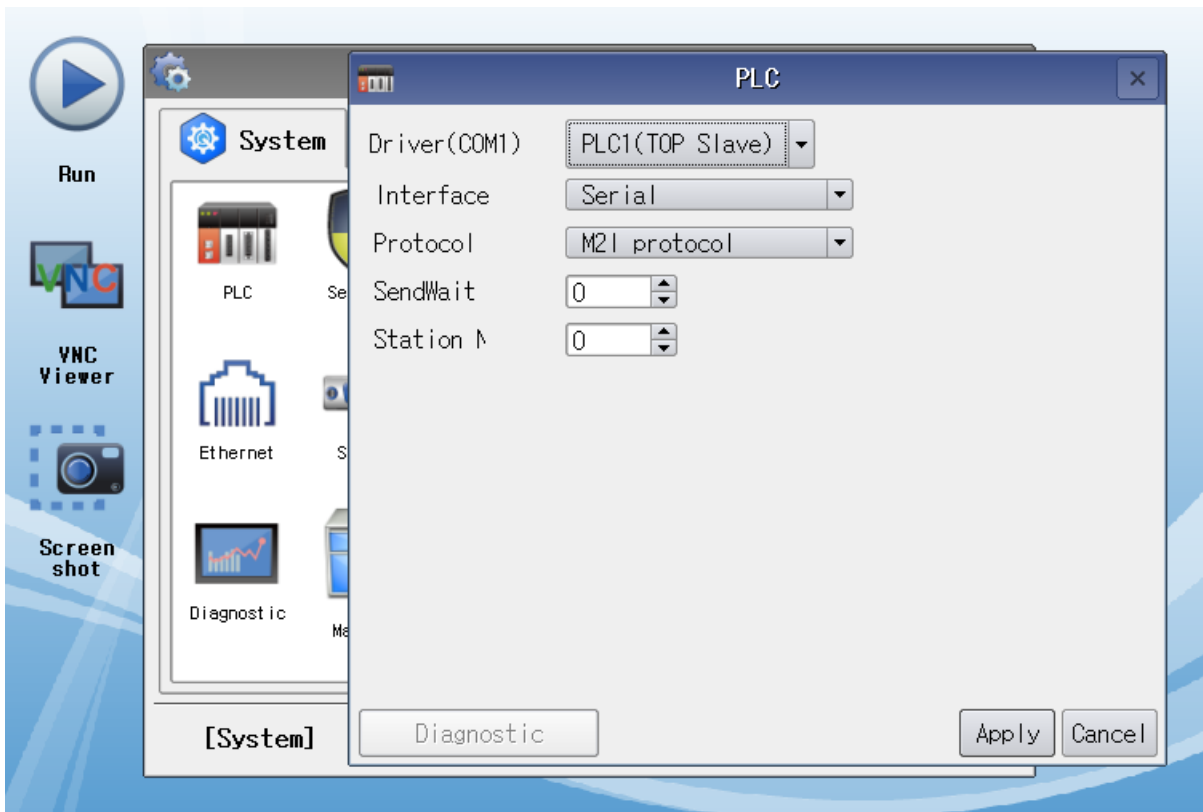
Items	TOP	External device	Remarks
Signal Level	RS-232C / RS-422 / RS-485	RS-232C / RS-422 / RS-485	
Baud Rate	115200		
Data Bit	8		
Stop Bit	1		
Parity Bit	None.		

* 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. (COM3 supports only RS-485.)
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 the communication protocol between the TOP and an external device.	
String Save Mode	Set the byte order of data when entering the string data.	
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.	
Retry	Set the number of request retries when the data request result is no response/negative response.	
Station No.	Enter the prefix of an external device.	

3.3 Communication diagnostics

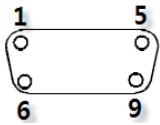
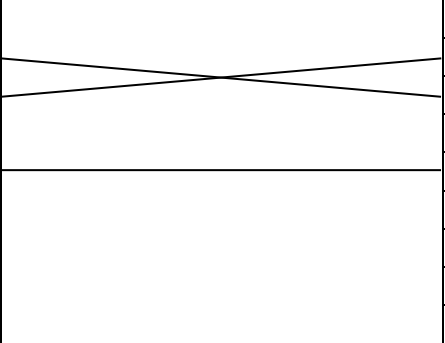
Slave/Server communication drivers cannot diagnose their counterpart devices.

4. External device setting

Refer to the vendor's user manual to identically configure the communication settings of the external device to that of the TOP.

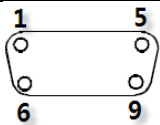
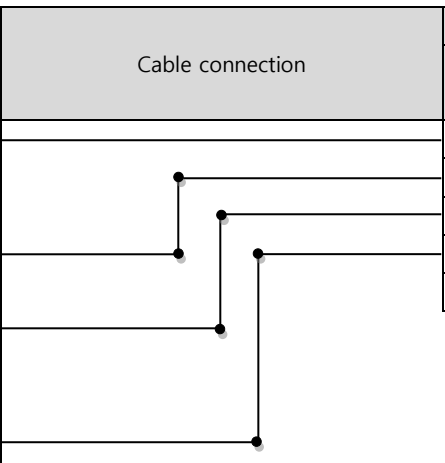
5. Cable table

■ RS-232C (1:1 connection)

COM1 / COM2			Cable connection	External device	
Pin arrangement* Note 1)	Signal name	Pin number		Signal name	Pin arrangement
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	RD	2		RD	
	SD	3		SD	
	SG	5		SG	

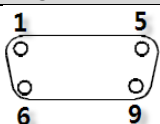
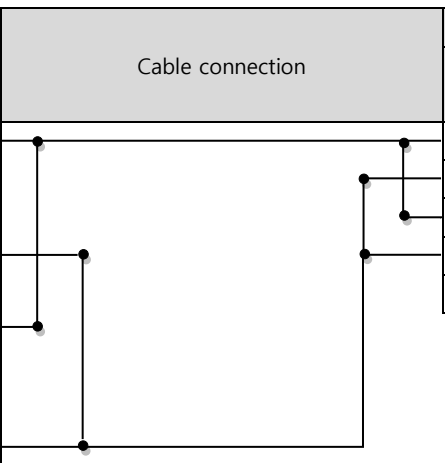
***Note 1)** The pin arrangement is as seen from the connecting side of the cable connection connector.

■ RS-422 (1:1 connection)

COM1 / COM2			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			

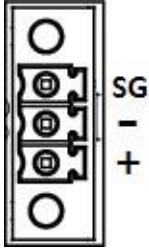
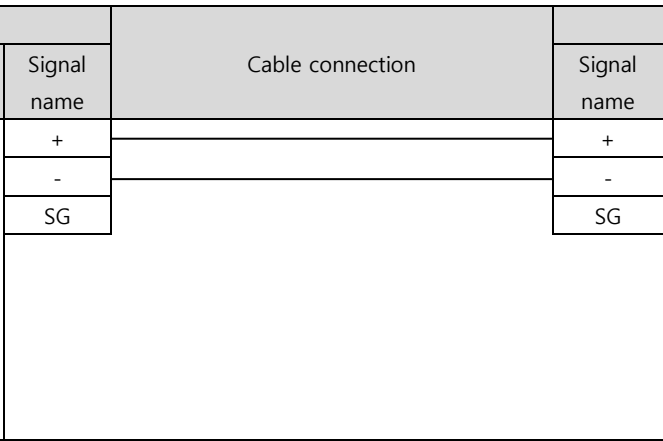
***Note 1)** The pin arrangement is as seen from the connecting side of the cable connection connector.

■ RS-485 (1:1 connection)

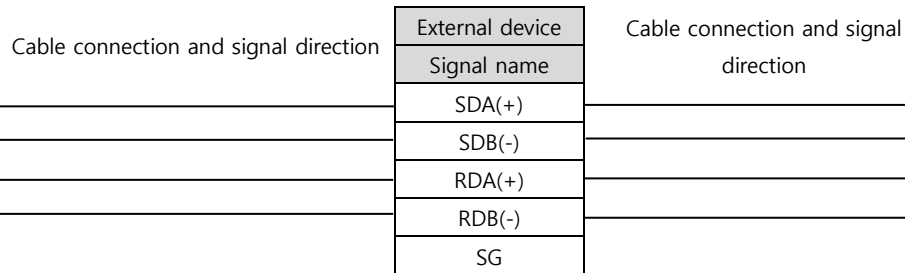
COM1 / COM2			Cable connection	External device	
Pin arrangement* Note 1)	Signal name	Pin number		Signal name	
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	RDA(+)	1		SDA(+)	
		2		SDB(-)	
		3		RDA(+)	
	RDB(-)	4		RDB(-)	
	SG	5		SG	
	SDA(+)	6			
		7			
		8			
	SDB(-)	9			

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

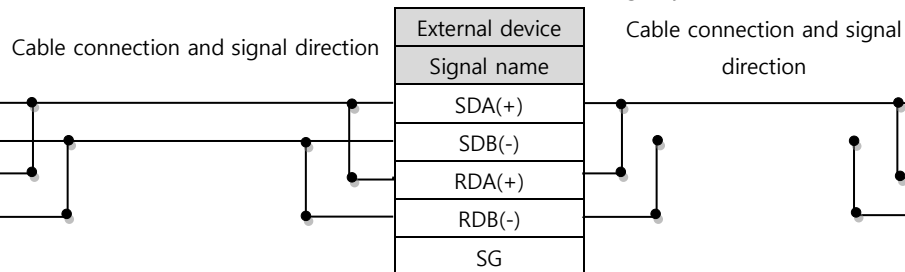
■ RS-485 (1:1 connection)

COM3		Cable connection	External device	
Pin arrangement	Signal name		Signal name	
	+		+	
	-		-	
	SG		SG	

■ RS-422 (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(+)		SDA(+)		SDA(+)
RDB(-)		SDB(-)		SDB(-)
SDA(+)		RDA(+)		RDA(+)
SDB(-)		RDB(-)		RDB(-)
SG		SG		SG

■ 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(+)		SDA(+)		SDA(+)
RDB(-)		SDB(-)		SDB(-)
SDA(+)		RDA(+)		RDA(+)
SDB(-)		RDB(-)		RDB(-)
SG		SG		SG

6. Supported addresses

The devices available in TOP are as follows:

Address	Bit	Word
Internal address (SYS)	0000.00 ~ 9999.15	0000 ~ 9999

Appendix. M2I Protocol

This chapter describes the M2I protocol.

There are two types of M2I protocol commands: READ/WRITE, which use ASCII code.

	Frame	Contents	Direction
Read	Read request	System buffer request to read data.	Master → Slave
	Read response	Response to read request	Master ← Slave
Write	Write request	Request to write data on system buffer	Master → Slave
	Write response	Response to write request	Master ← Slave

1. Read request

	Size (Byte)	ASCII	HEX	Contents
Start code	1	ENQ	0x05	Start code of requested frame
Prefix	2	01 (Dec)	0x3031	SLAVE device prefix
Command	1	R	0x52	Read data command
Address	4	0100 (Dec)	0x3031, 0x3030	System buffer address of SLAVE device
Quantity	2	0x10 (Hex)	0x3130	Amount of data
End code	1	EOT	0x04	Code that denotes the end of a frame
BCC	2	0xD9 (Hex)	0x4439	The last byte of the summed value from prefix to end code

The example in the table above depicts a read request frame of 16 word data from system buffer number 100.

2. Read request

	Size (Byte)	ASCII	HEX	Contents
Start code	1	ACK	0x06	Start code of response frame
Prefix	2	01 (Dec)	0x30, 0x31	Device prefix
Command	1	R	0x52	Read data command
Data	4 x n	0x1234 (Hex) 0x5678 (Hex) ... 0xFFFF (Hex)	0x3132, 0x3334 0x3536, 0x3738 ... 0x4646, 0x4646	Data
End code	1	EOT	0x04	Code that denotes the end of a frame
BCC	2	0xB7 (Hex)	0x4237	The last byte of the summed value from prefix to end code

The example in the table above depicts a response frame of n data from the system buffer address that received the read request.

3. Write request

	Size (Byte)	ASCII	HEX	Contents
Start code	1	ENQ	0x05	Start code of requested frame
Prefix	2	01 (Dec)	0x3031	SLAVE device prefix
Command	1	W	0x57	Data write command
Address	4	0100 (Dec)	0x3031, 0x3030	System buffer address of SLAVE device
Quantity	2	0x01 (Hex)	0x3031	Amount of data
Data	4 x n	0x1234 (Hex)	0x3132, 0x3334	Data
End code	1	EOT	0x04	Code that denotes the end of a frame
BCC	2	0xAB (Hex)	0x4439	The last byte of the summed value from prefix to end code

The example in the table above depicts a frame that requests writing the data 1234 onto 1 address from system buffer 100.

4. Write request

	Size (Byte)	ASCII	HEX	Contents
Start code	1	ACK	0x06	Start code of response frame
Prefix	2	01 (Dec)	0x30, 0x31	Device prefix
Command	1	W	0x57	Data write command
End code	1	EOT	0x04	Code that denotes the end of a frame
BCC	2	0xBC (Hex)	0x4243	The last byte of the summed value from prefix to end code

5. BCC error response

	Size (Byte)	ASCII	HEX	Contents
Start code	1	NAK	0x15	Start code of negative response frame
Prefix	2	01 (Dec)	0x30, 0x31	Device prefix
Command	1	2	0x32	BCC error
End code	1	EOT	0x04	Code that denotes the end of a frame
BCC	2	0xAC (Hex)	0x4143	The last byte of the summed value from prefix to end code