

# LS Industrial Systems

## MASTER-K (10S/30S/60S/100S) Series

### LOADER Driver

Supported version TOP Design Studio V1.0 or higher



## CONTENTS

We would like to thank our customers for using M2I's "Touch Operation Panel (M2I TOP) Series". Read this manual and familiarize yourself with the connection method and procedures of the "TOP and external device".

- 1. System configuration** [Page 2](#)

Describes the devices required for connection, the setting of each device, cables, and configurable systems.
- 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. Cable table** [Page 9](#)

Describes the cable specifications required for connection.
- 5. Supported addresses** [Page 10](#)

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

# 1. System configuration

The system configuration of TOP and "LS Industrial Systems – K Series 10S, 30S, 60S, 100S CPU" is as follows:

Series	CPU	Link I/F	Communication method	System setting	Cable
10S	K14□-D□□	CPU Direct	RS-232C	<a href="#">3.1 Settings example 1 (Page 4)</a>	<a href="#">5.1. Cable table 1 (Page 8)</a>
30S	K14P-D□□				
60S	K56P-DRS				
100S	K2P-02S K2PC-02S				

## ■ Connection configuration

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



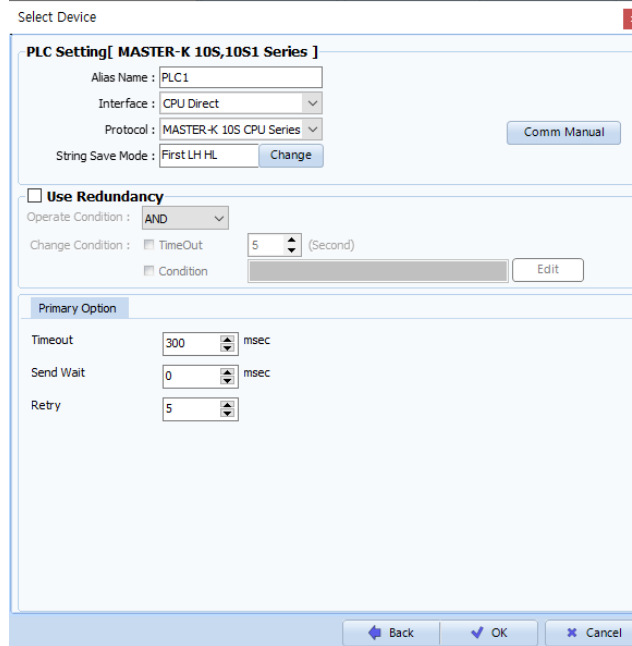
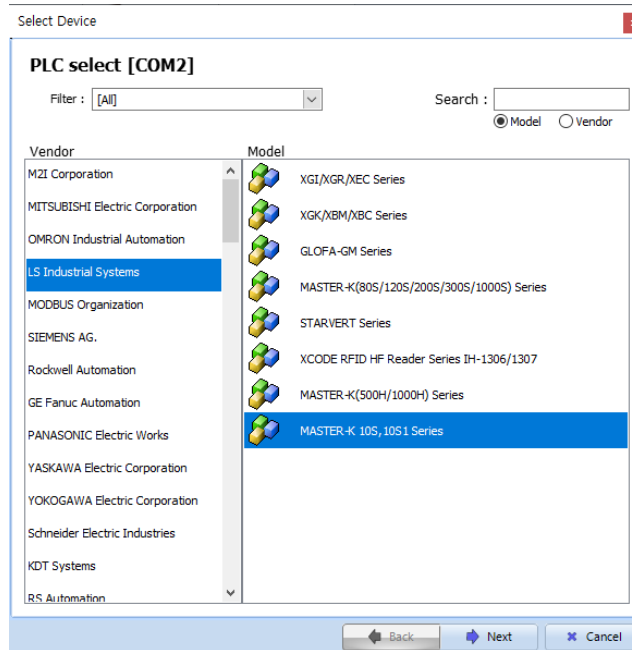
- 1:N (one TOP and multiple external devices) connection



## 2. External device selection

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

### (1) TOP setting



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 "LS Industrial Systems".					
	PLC	Select an external device to connect to TOP. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: black; color: white;">Model</th> <th style="background-color: black; color: white;">Interface</th> <th style="background-color: black; color: white;">Protocol</th> </tr> </thead> <tbody> <tr> <td>MASTER-K(10S)Series</td> <td>Loader</td> <td>MASTER-CPU</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	MASTER-K(10S)Series	Loader
Model	Interface	Protocol					
MASTER-K(10S)Series	Loader	MASTER-CPU					

### 3. TOP communication setting

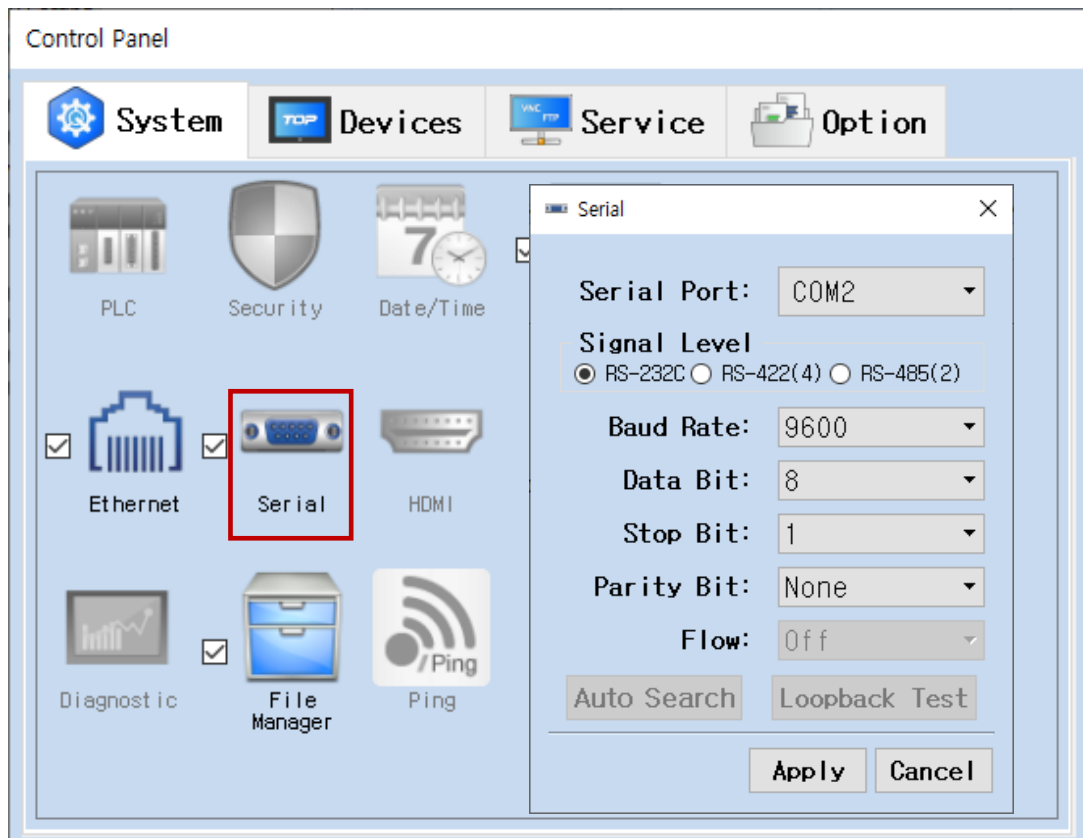
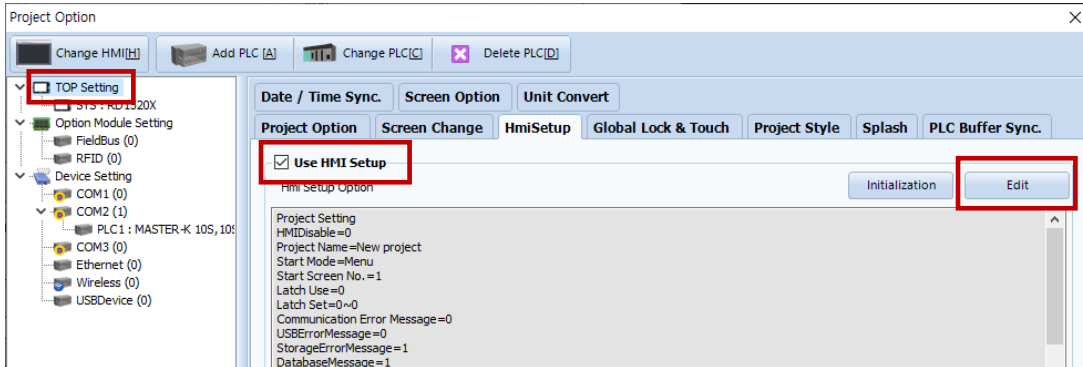
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

#### 3.1 Communication setting in TOP Design Studio

##### (1) Communication interface setting

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

– Set the TOP communication interface in TOP Design Studio.

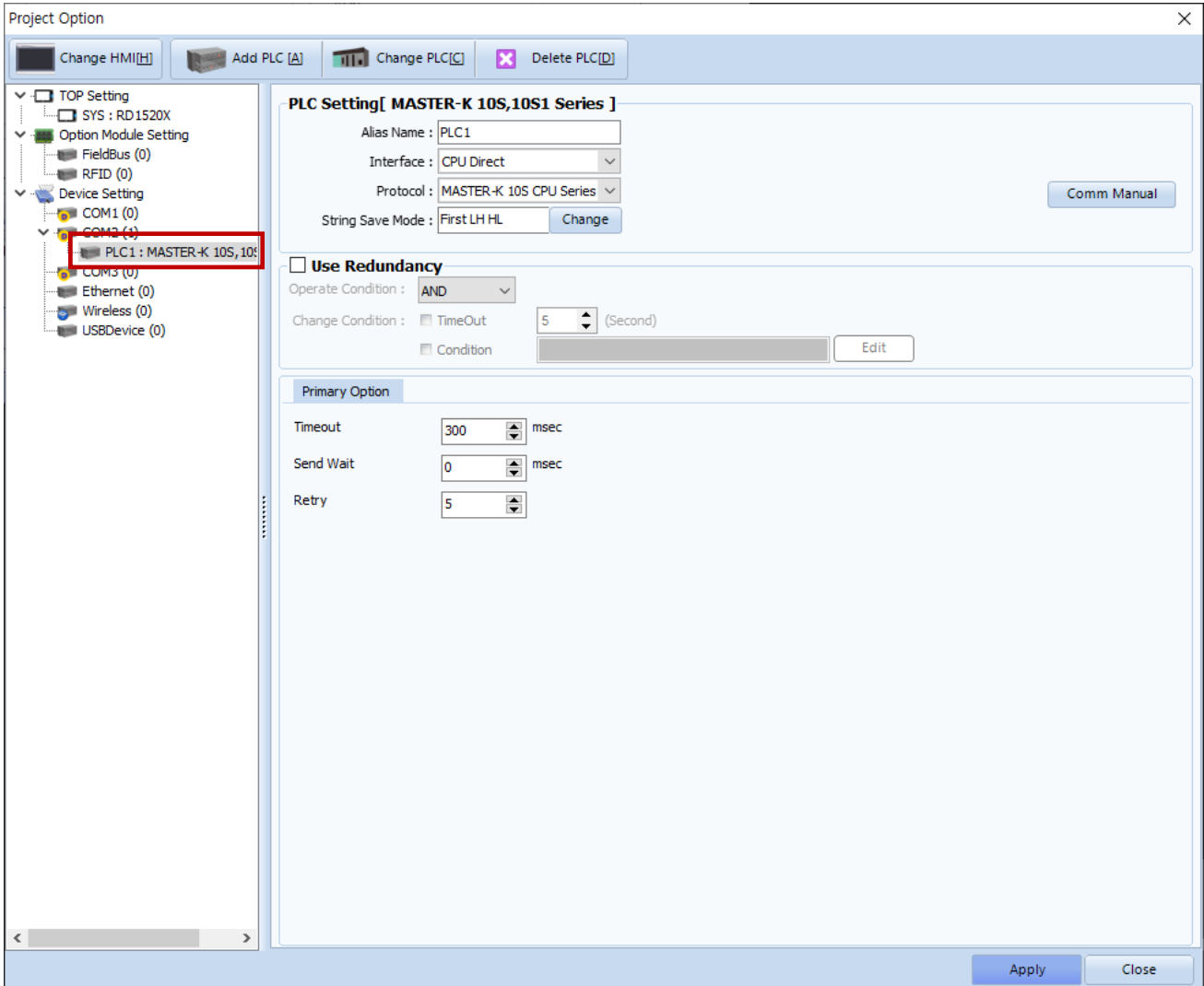


Items	TOP	External device	Remarks
Signal Level (port)	RS-232C	RS-232C (CPU port)	Fixed
Baud Rate		9600	Fixed
Data Bit		8	Fixed
Stop Bit		1	Fixed
Parity Bit		None.	Fixed

\* The above settings are examples recommended by the company.

**(2) Communication option setting**

- [ Project > Project Property > Device Setting > COM > "PLC1 : MASTER- LINK"]
- Set the options of the MASTER- LINK Series communication driver in TOP Design Studio.

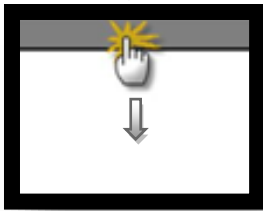


Items	Settings	Remarks
Interface	Select "CPU Direct".	<a href="#">Refer to "2. External device selection".</a>
Protocol	Select "MASTER-K 10S CPU Series".	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	
Retry	Select amount of redelivery attempts upon communication failure.	

### 3.2. Communication setting in TOP

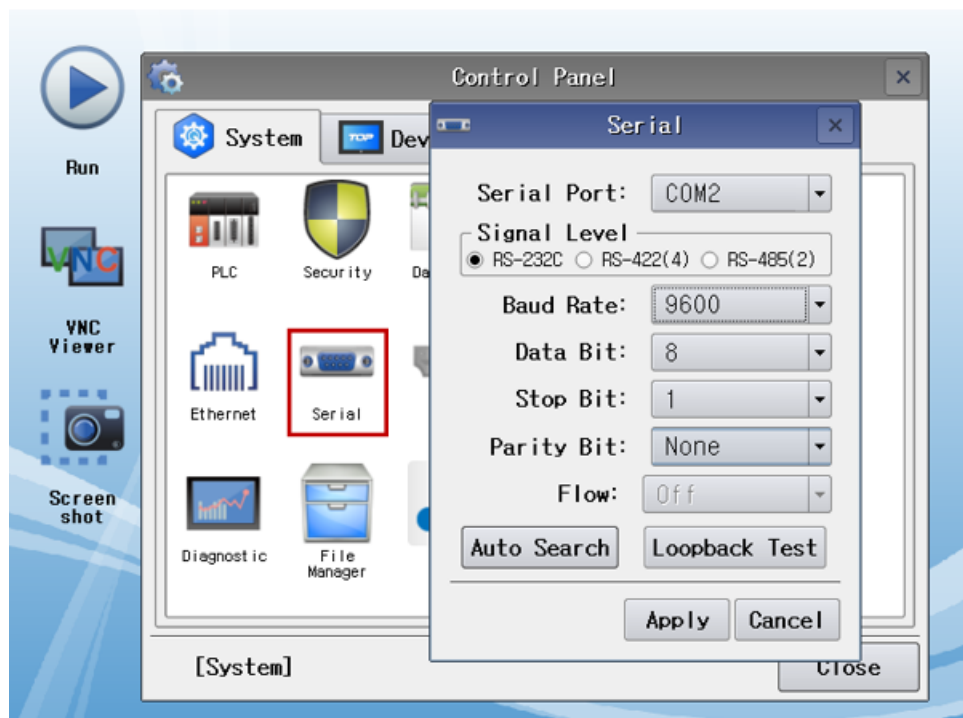
\* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- 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]



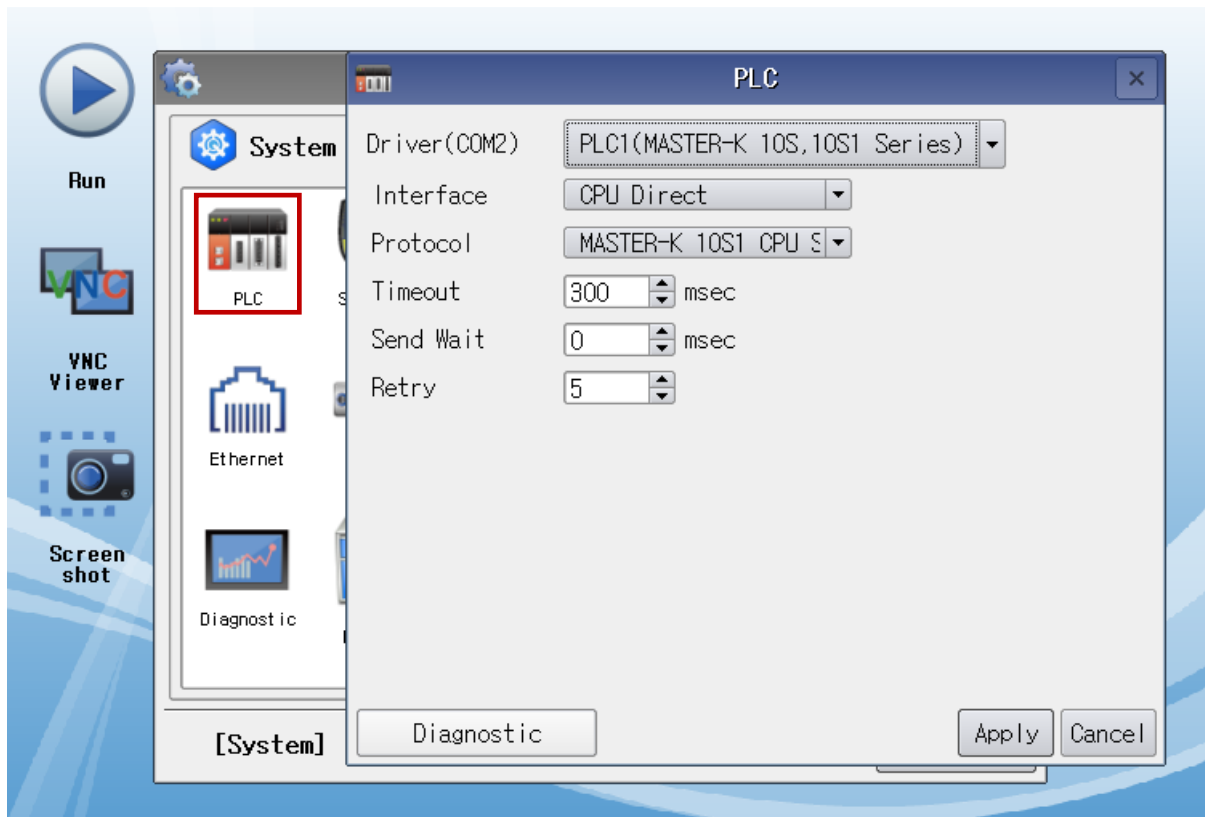
Items	TOP	External device	Remarks
Signal Level (port)	RS-232C	RS-232C (CPU port)	Fixed
Baud Rate	9600		Fixed
Data Bit	8		Fixed
Stop Bit	1		Fixed
Parity Bit	None.		Fixed

\* 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	Select "CPU Direct".	<a href="#">Refer to "2. External device selection".</a>
Protocol	Select "MASTER-K 10S CPU Series".	<a href="#">Refer to "2. External device selection".</a>
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	Select amount of redelivery attempts upon communication failure.	

### 3.3 Communication diagnostics

- Check the interface setting status between the TOP and 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>

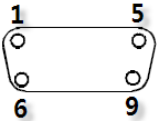
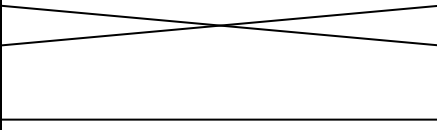
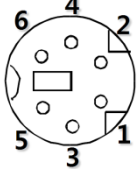
- Communication diagnostics sheet
  - If there is a problem with the communication connection with an external terminal, please check the settings in the sheet below.

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. 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 "LS Industrial Systems Co., Ltd.")

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

## 5. 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.

	Bit Address	Word Address	32 bits	Remarks
Input / Output Relay	P000 – P63F	P00 – P63	L / H <b>*Note 1)</b>	
Auxiliary Relay	M000 – M191F	M00 – M191		
Keep Relay	K000 – K31F	K00 – K31		
Special Relay	F000 – F63F	F00 – F63		Cannot be written
Timer	T0000.00 – T1255.15	T0000 – T1255		
Counter	C0000.00 – C1255.15	C0000 – C1255		
Step Relay		S0000 – S0099		
Data Register	D0000.00 – D9999.15	D0000 – D9999		

**\*Note 1)** The lower 16BIT data of 32BIT data is saved in the address whose screen has been registered, and the upper 16BIT data is saved in the address next to the address whose screen has been registered.

Ex. When saving 32BIT data hexadecimal data 12345678 in address D00100, it is saved to 16BIT device address as follows:

Items	32BIT	16BIT	
	Address	D00100	D00101
Input data (hexadecimal)	12345678	5678	1234