MITSUBISHI Electric Corporation
MELSEC FX2N Positioning Controller Series
CPU Direct Driver

Supported version TOP Design Studio V1.4.3 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

The system configuration of TOP and "MITSUBISHI Electric Corporation - MELSEC FX2N Positioning Controller Series" is as follows:

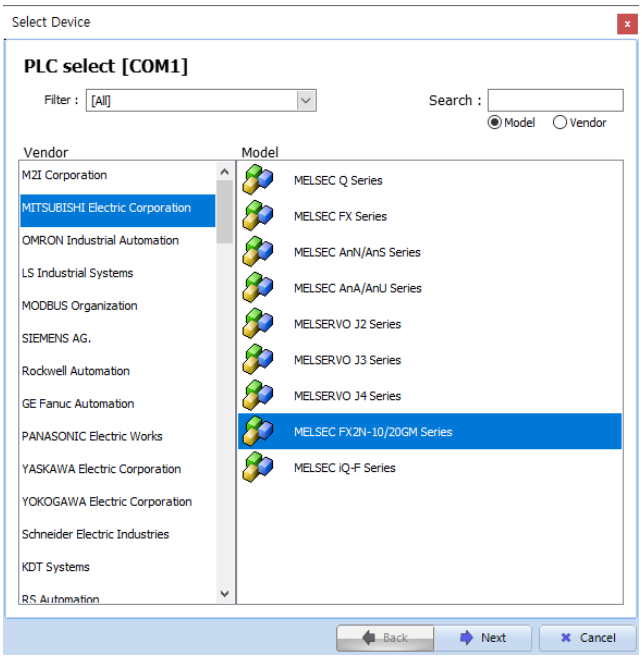
Series	CPU	Link I/F	Communication method	Communication setting	Cable
MELSEC-FX	FX2N-10GM FX2N-20GM	CPU Direct	RS-422 (4 wire)	3. TOP communication setting 4. External device setting	5. Cable table

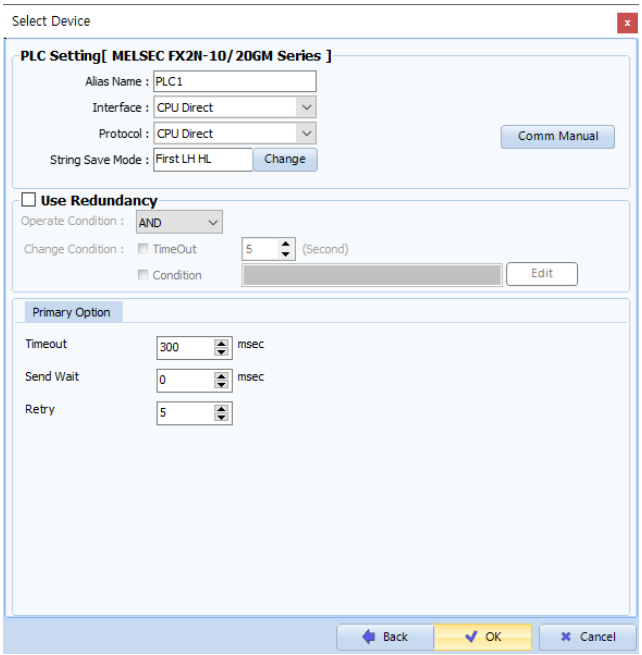
■ Connection configuration

・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 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 “MITSUBISHI Electric Corporation”.
	PLC	Select an external device to connect to TOP.

Model	Interface	Protocol
MELSEC FX2N-10/20GM Series	CPU Direct	CPU Direct

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

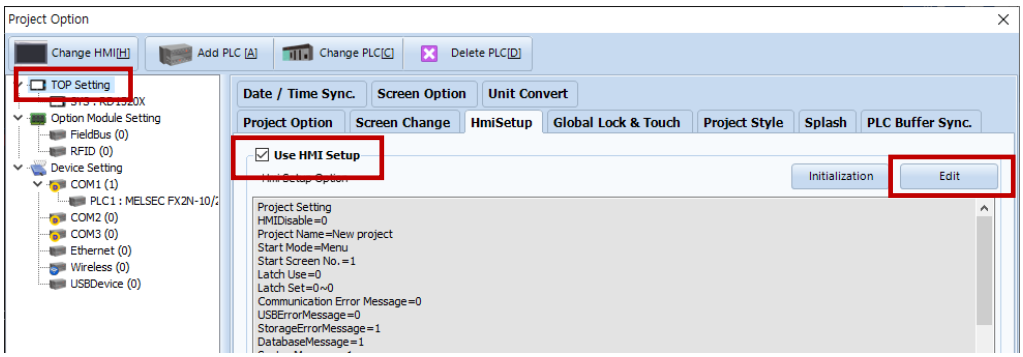
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

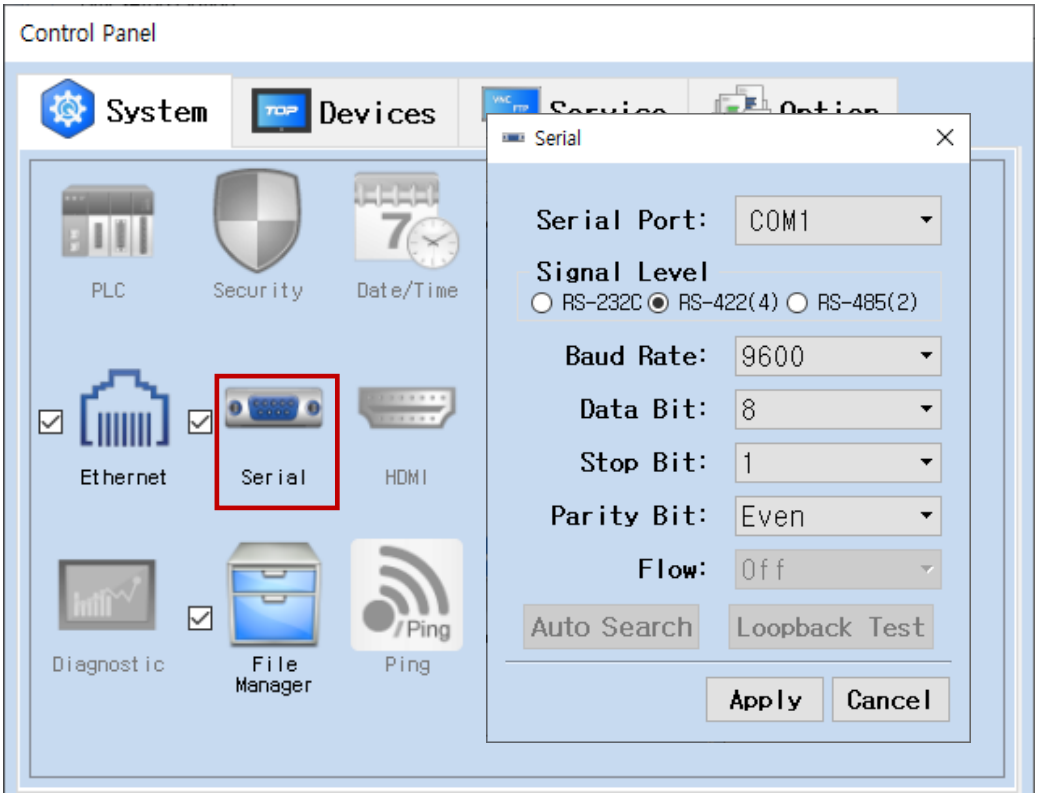
3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

■ [Project > Project 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-422	RS-422 (CPU port)	Fixed
Baud Rate	9600		Fixed
Data Bit	8		Fixed
Stop Bit	1		Fixed
Parity Bit	Even		Fixed

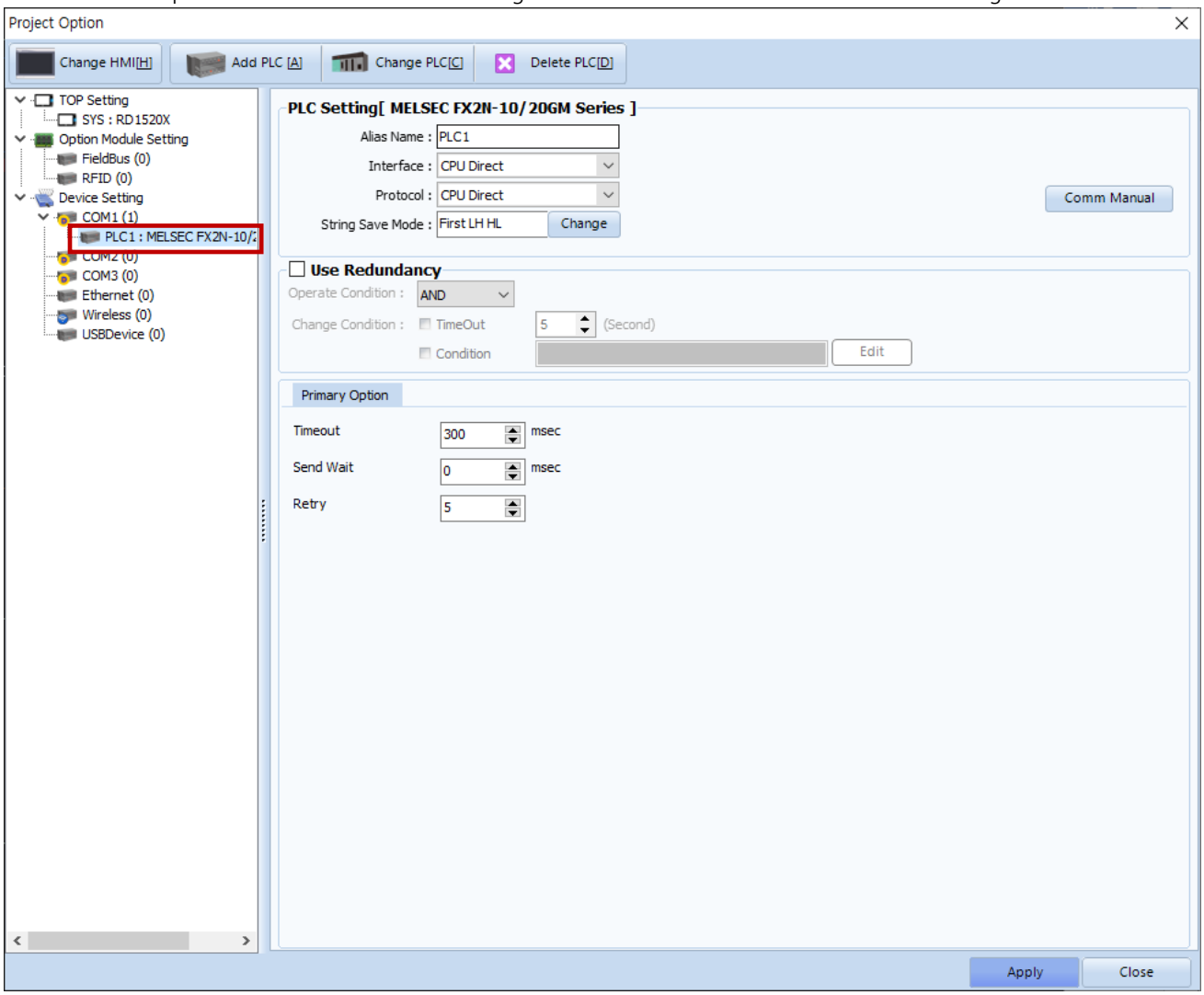
* The above settings are examples recommended by the company.

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 > "PLC1 : MELSEC FX2N-10/20GM Series"]

– Set the options of the MELSEC FX2N Positioning Controller Series communication driver in TOP Design Studio.

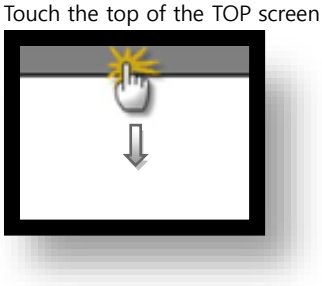


Items	Settings	Remarks
Interface	Select "CPU Direct".	Fixed
Protocol	Select "CPU Direct".	Fixed
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	

3.2. Communication setting in TOP

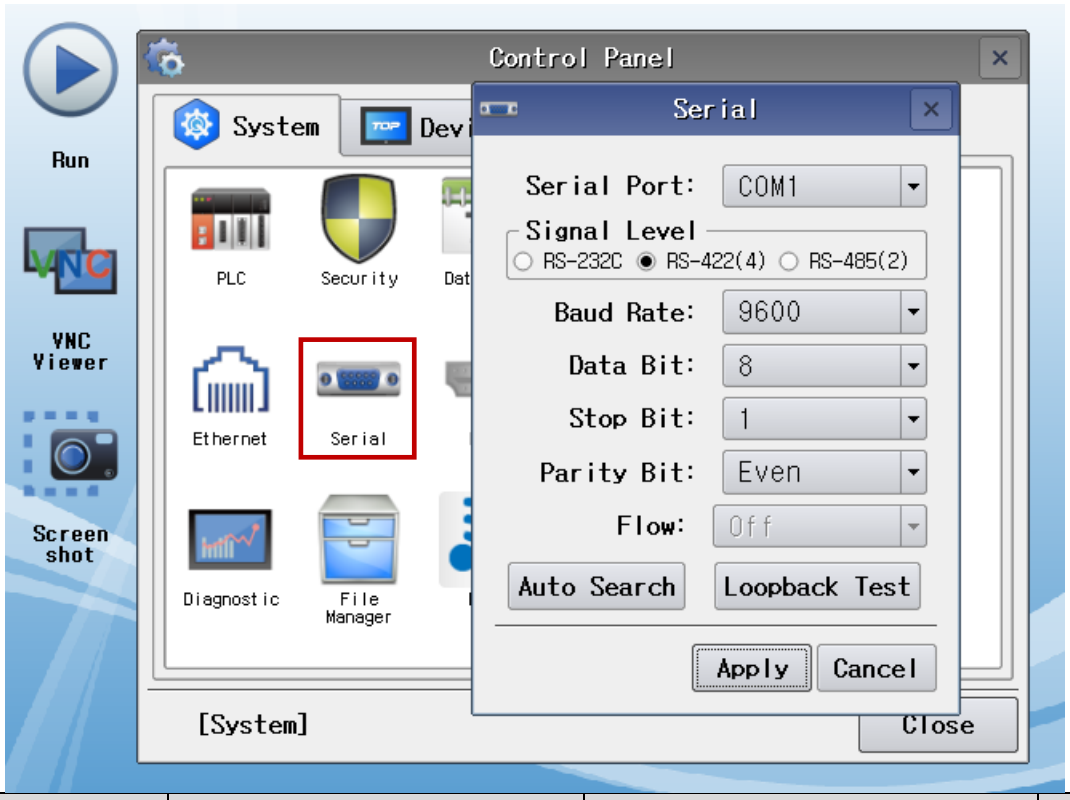
*** This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.**

■ 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]



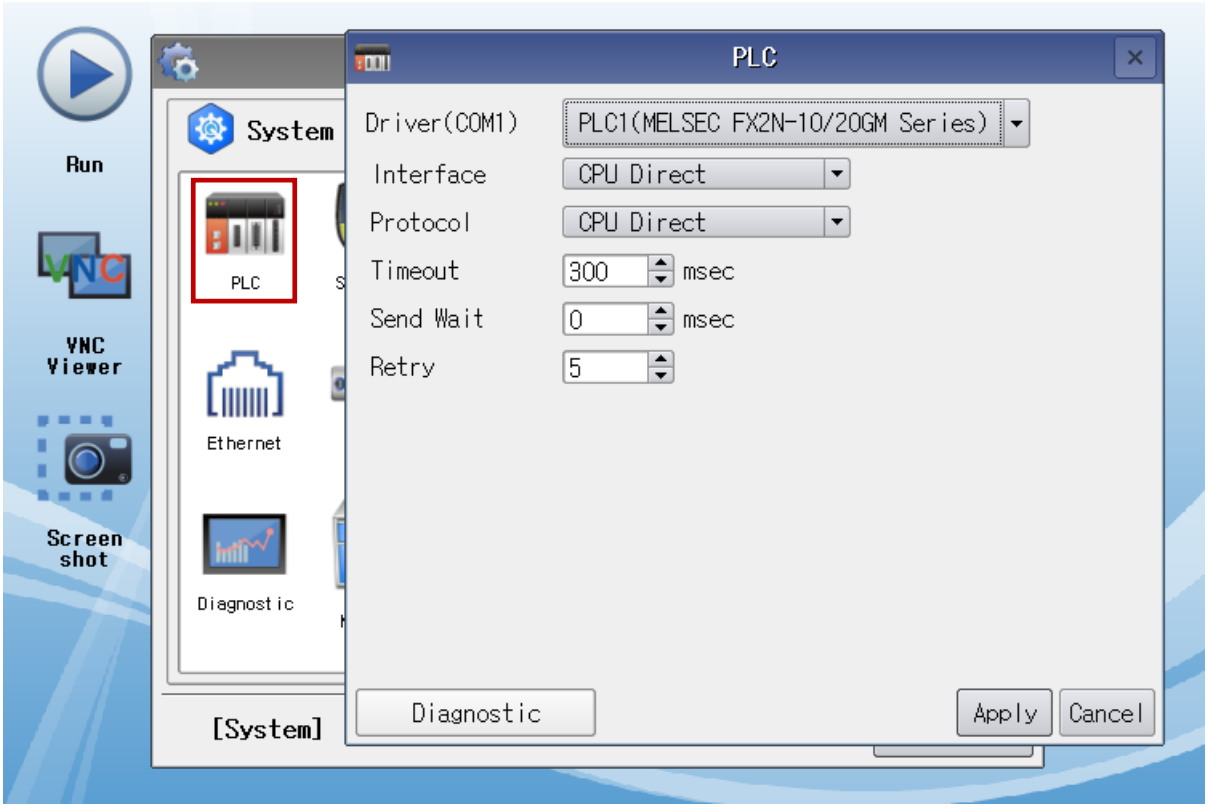
Items	TOP	External device	Remarks
Signal Level (port)	RS-422	RS-422 (CPU port)	Fixed
Baud Rate	9600		Fixed
Data Bit	8		Fixed
Stop Bit	1		Fixed
Parity Bit	Even		Fixed

* 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”.	Fixed
Protocol	Select “CPU Direct”.	Fixed
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.	

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 port (COM1/COM2) 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.)

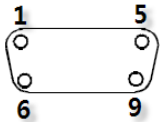
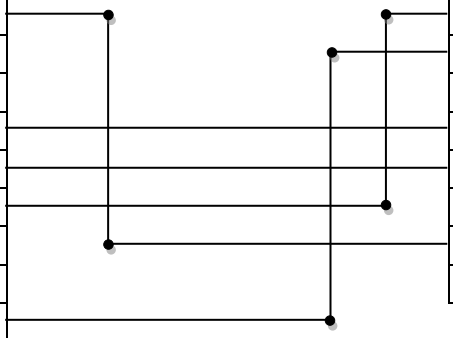
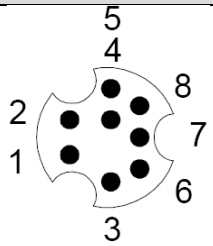
4. External device setting

- The communication interface for the MELSEC FX2N-10/20GM Series CPU Port does not require a separate configuration.

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 "Mitsubishi Electric Corporation")

■ **RS-422** (1:1 connection)

COM			Cable connection	MELSEC FX Positioning Controller	
Pin arrangement*Note 1)	Signal name	Pin number		Pin number	Pin arrangement*Note 1)
 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	RDA	1		1	 Based on communication cable connector front, MINI-DIN 8 Pin male (male, convex)
		2		2	
		3		3	
	RDB	4		4	
	SG	5		5	
	SDA	6		6	
		7		7	
		8		8	
	SDB	9			

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

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.

Type	Remarks	Bit Address	Word Address	32 bit	Property
Input	Bit	X000 – X067 X372 – X377	X000 – X067 X372 – X377	L/H*Note 4)	*Note 1)
Output	Bit	Y000 – Y067	Y000 – Y067		*Note 1)
Internal relay	Bit	M0000 – M0511	M0000 – M0511		*Note 2)
Special relay	Bit	M9000 – M9175	M9000 – M9175		*Note 2)
Data register	Word	D0000.00 – D3999.15	D0000 – D3999		
File register	Word	D4000.00 – D6999.15	D4000 – D6999		*Note 3)
Special register	Word	D9000.00 – D9599.15	D9000 – D9599		

*Note 1) Octal notation

*Note 2) Registers as a multiple of 16 when using word as the M device.

*Note 3) Requires separate configuration of "PARA.101" in order to use the file register.

*Note 4) When using 32 bit, saves 16 bit data of registered addresses and any subsequent addresses to the bottom and top, respectively.

Ex) If D00100;s data is "1234", then given that D00101's data is "5678", 32 bit will be used for D00100

Items	16BIT		32BIT
Address	D00100	D00101	D00101
Data (hexadecimal)	1234	5678	56781234