Rockwell Automation, Inc.

PLC 5 Series

DF1 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

The system configuration of the "PLC-5 Series" of "Rockwell Automation., Inc." is as follows:

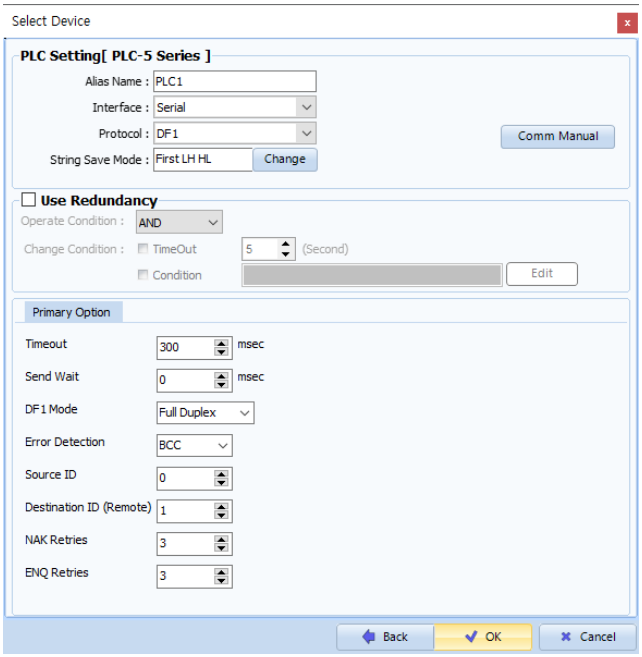
Series	CPU	Link I/F	Communication method	System setting	Cable
PLC-5	PLC-5/11 PLC-5/20 PLC-5/30 PLC-5/40 PLC-5/40L PLC-5/60 PLC-5/60L	Channel 0	RS-232C	3.1 Settings example 1 (Page 4)	5.1. Cable table 1 (Page 9)
			RS-422 (4 wire)	3.2 Settings example 2 (Page 6)	5.2. Cable table 2 (Page 12)

■ Connectable 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 "**Rockwell Automation, Inc**".
	PLC	Select an external device to connect to TOP. Select "PLC-5 Series". 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

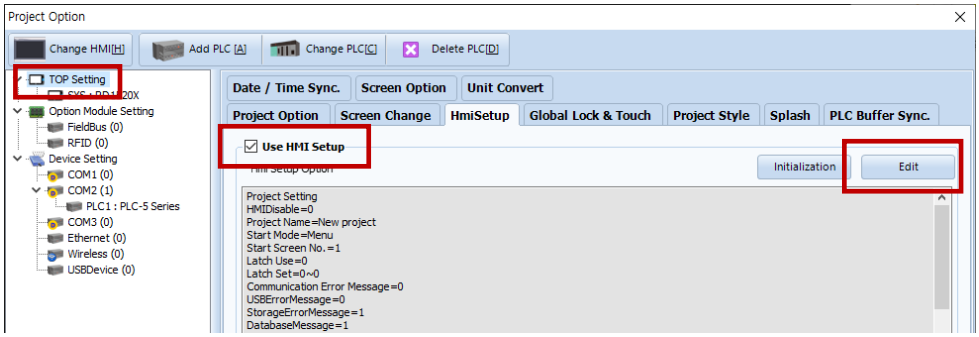
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

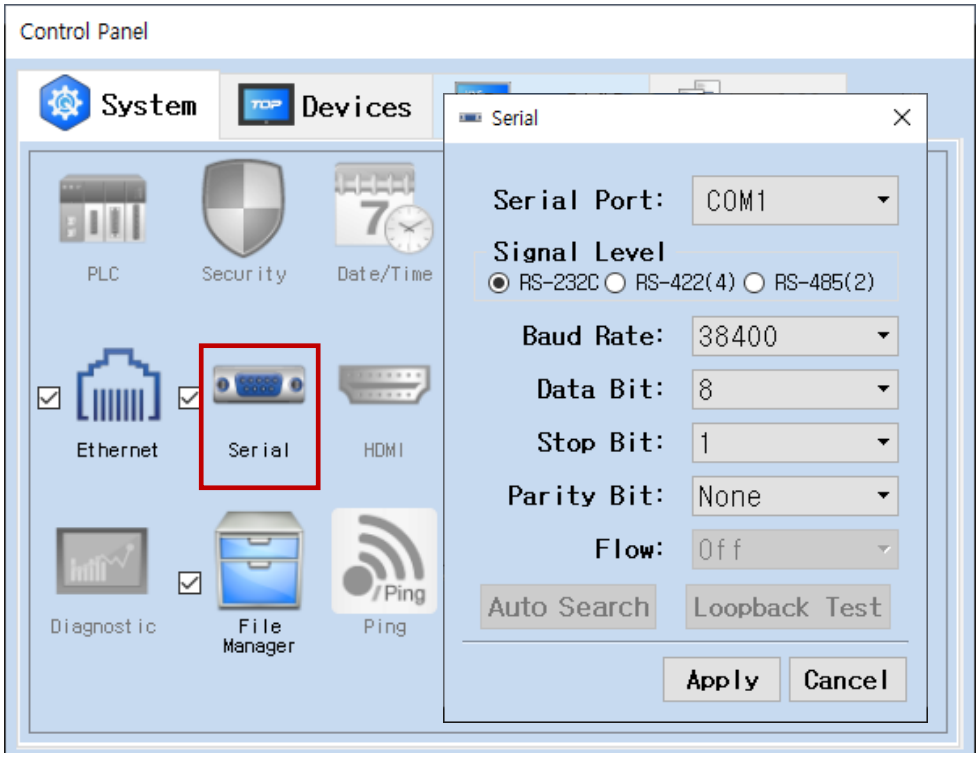
3.1 Communication setting in TOP Design Studio

(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-232C	RS-422	RS-485	RS-232C RS-422/485	
Baud Rate	38400				
Data Bit	8				
Stop Bit	1				
Parity Bit	None.				

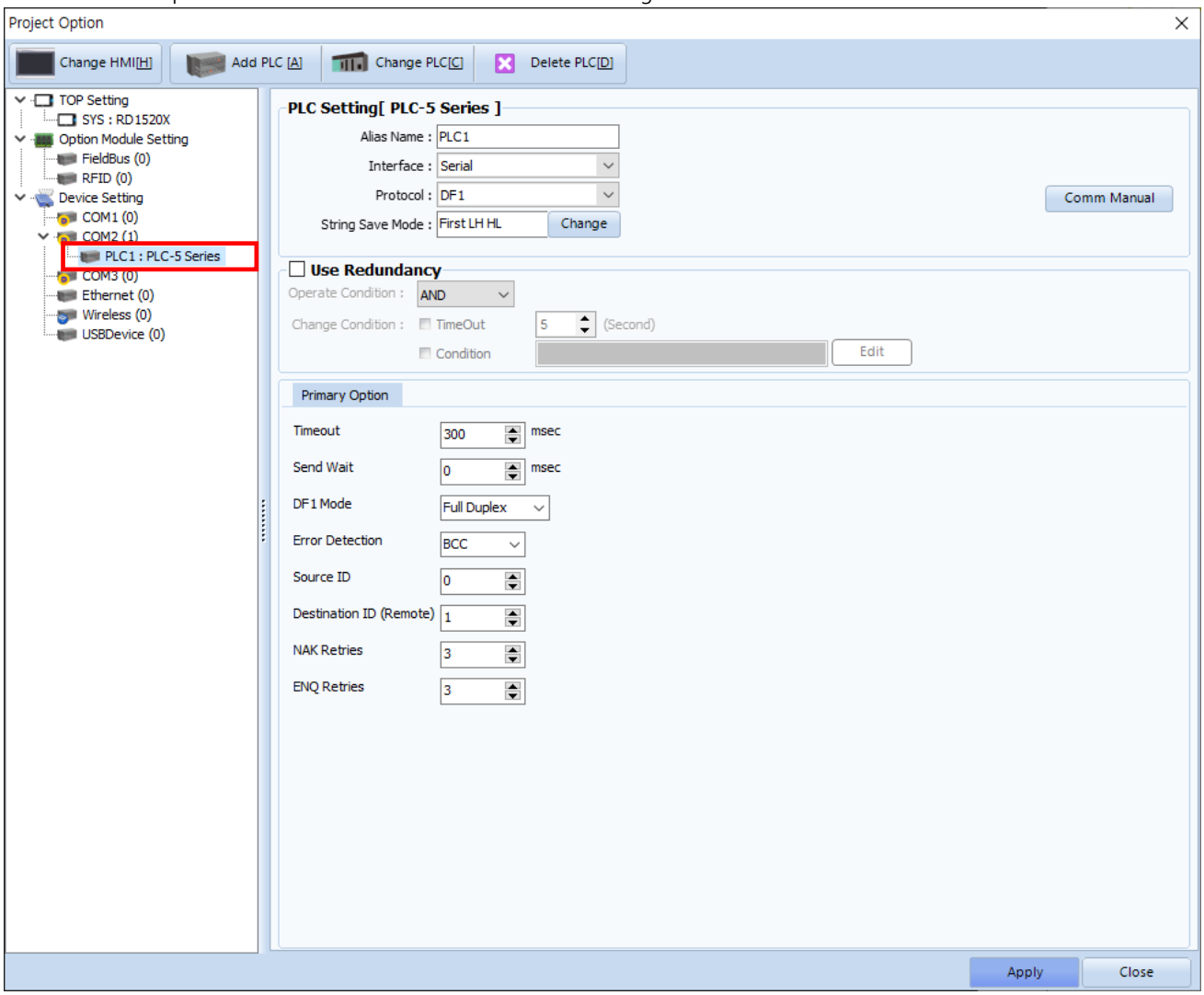
* The above settings are examples recommended by the company.

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 > COM> "PLC1 : **Control/Compact Logix Series**"]

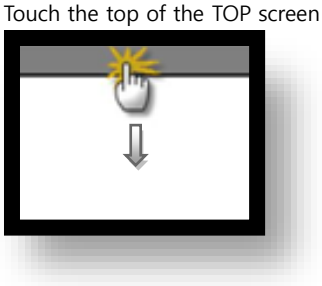
– Set the options of the DF1 communication driver in TOP Design Studio.



3.2. Communication setting in TOP

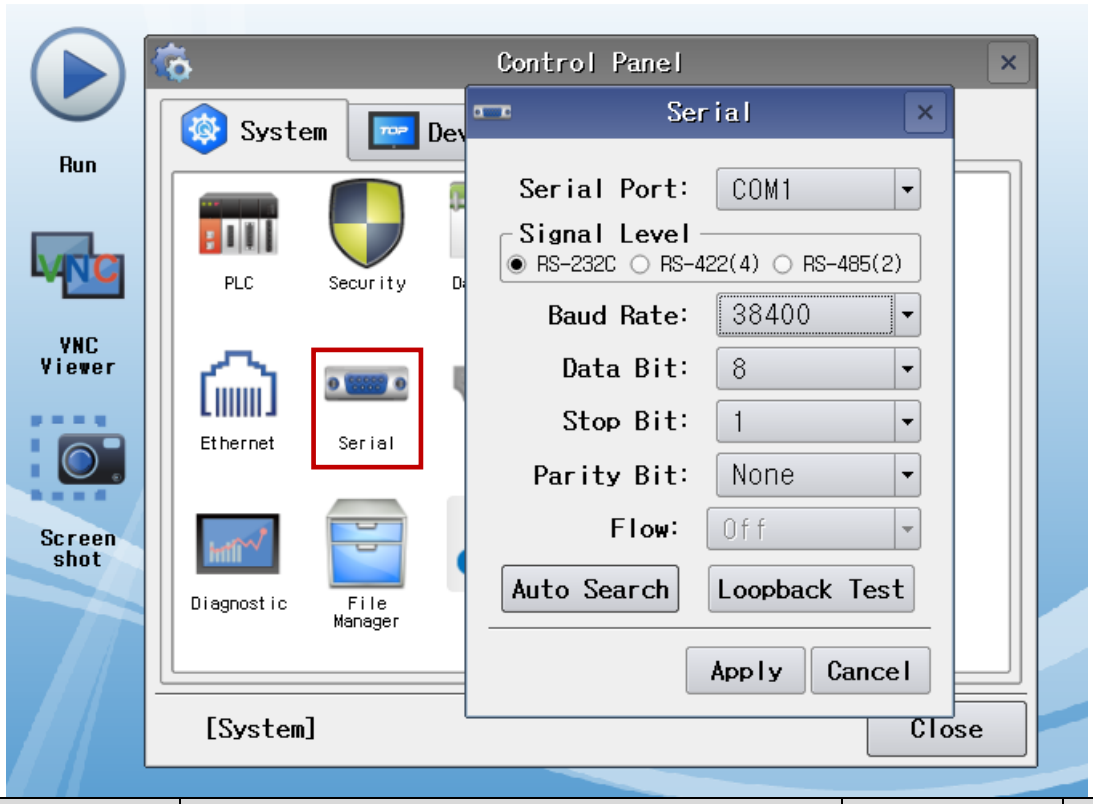
*** This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.**

■ 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]



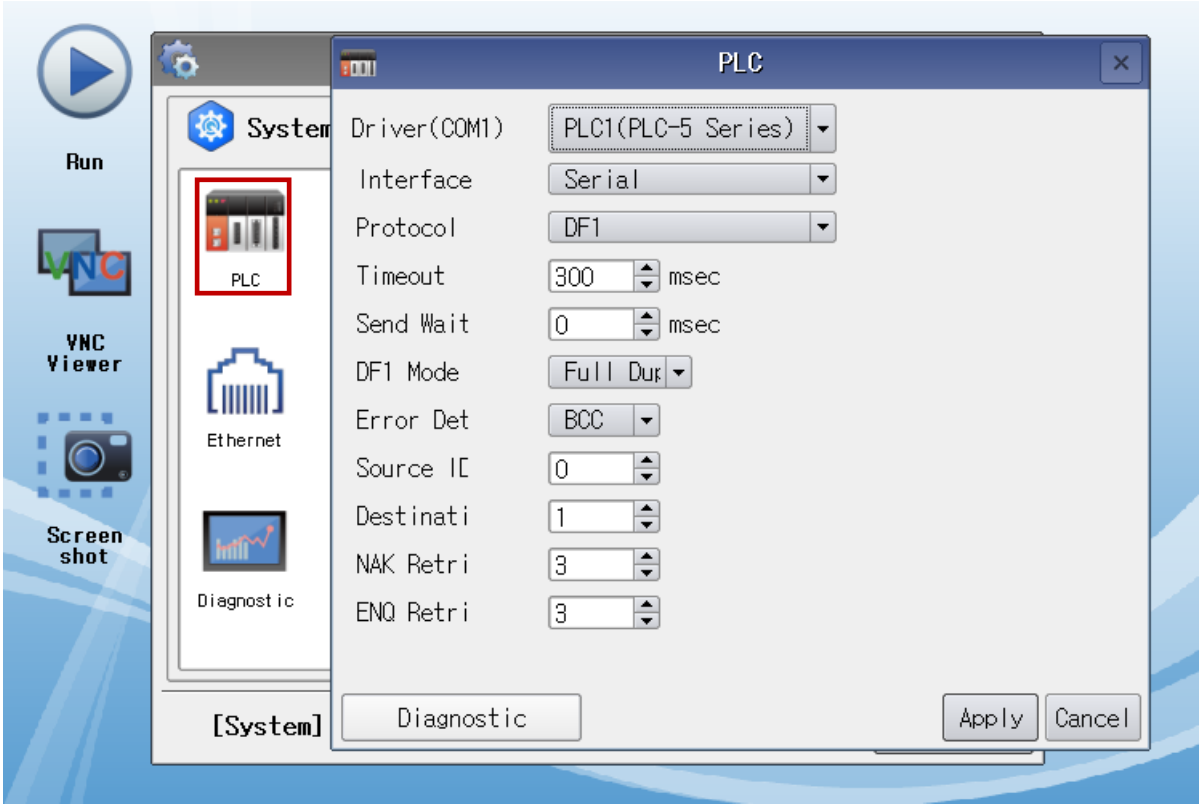
Items	TOP			External device	Remarks
Signal Level (port)	RS-232C	RS-422	RS-485	RS-232C RS-422/485	
Baud Rate	38400				
Data Bit	8				
Stop Bit	1				
Parity Bit	None.				

* 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

■ [Main Screen > Control Panel > PLC]



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 as below using ""Control/CompactLogix Series" Ladder Software "RSLogix5". For more detailed setting method than that described in this example, refer to the PLC user manual.

Do not use duplicate Source ID (prefix) for external devices connected to the same unit network.

1. From the "RSLogix 5" project window, double-click [Channel Configuration] to open the "Channel Configuration" window.

2. From the "Channel Configuration" window, select the [Chan. 0 –System] tab and configure as follows.

Setup Items		Setup Description	Remarks
Driver		DF1 Half Duplex Slave	Fix
Baud Rate		38400	
Parity		NONE	
Stop Bits		1	
Source ID (Station Address)		0	
Protocol Control	Control	No Handshaking	Fix
	Error Detection	BCC	Fix
	Embedded	Enabled	Fix
	Duplicate Packet Detect	No Check	Fix
	ACK Timeout	50	
	NAK Retries	3	
	ENQ Retries	3	

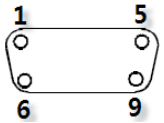
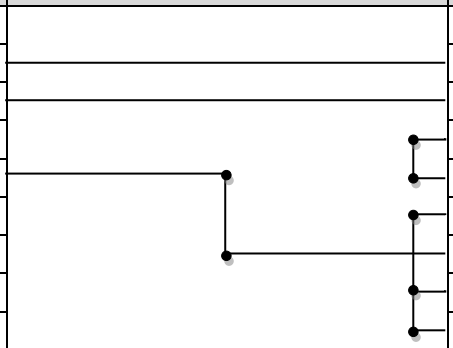
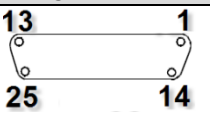
3. Download the configurations with the PLC.

5. Cable table

This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.
(The cable diagrams described in this section may differ from the external device vendor's recommendations.)

■ 1:1 connection RS-232

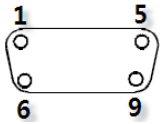
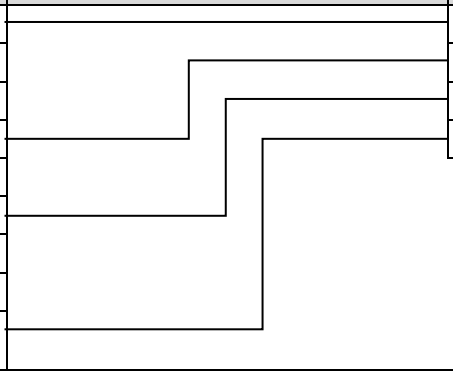
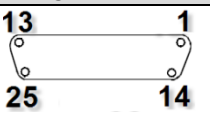
(A) TOP COM Port (9 pin)

COM			Cable connection	External device		
Pin arrangement*Note 1)	Signal name	Pin number		Pin number	Signal name	Pin arrangement*Note 1)
 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	CD	1		1	GND	 Based on communication cable connector front, D-SUB 25 Pin female (female, concave)
	RD	2		2	TXD	
	SD	3		3	RXD	
	DTR	4		4	RTS	
	SG	5		5	CTS	
	DSR	6		6	DSR	
	RTS	7		7	COM	
	CTS	8		8	DCD	
		9		20	DTR	

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

■ 1:1 connection RS-422

(A) TOP COM Port (9 pin)

COM			Cable connection	External device		
Pin arrangement*Note 1)	Signal name	Pin number		Pin number	Signal name	Pin arrangement*Note 1)
 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	RDA	1		14	SDA	 Based on communication cable connector front, MINI-DIN 25 Pin female (female, concave)
		2		2	SDB	
		3		16	RDA	
	RDB	4		3	RDB	
		5				
	SDA	6				
		7				
		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.

Device notation | ➔ Device Name File Number : Element

Device		Bit Address		Word Address	32 bits	Remarks
Output File		O000:000.00 – O000:377.15		O000:000 – O000:377		
Input File		I001:000.00 – I001:377.15		I001:000 – I001:377		
Bit File		B003:000.00 – B099:999.15		B003:000 – B099:999		
Timer File	Coil	Done	TC003:000.13 – TC099:999.13	–		
		Timing	TC003:000.14 – TC099:999.14			
		Enable	TC003:000.15 – TC099:999.15			
	Preset	–		TP003:000 – TP099:999		
	Accumulated	–		TA003:000 – TA099:999		
Counter File	Coil	Update Acc	CC003:000.10 – CC099:999.10	–	L/H	
		Underflow	CC003:000.11 – CC099:999.11			
		Overflow	CC003:000.12 – CC099:999.12			
		Done	CC003:000.13 – CC099:999.13			
		Down Enable	CC003:000.14 – CC099:999.14			
		Up Enable	CC003:000.15 – CC099:999.15			
	Preset	–		CP003:000 – CP099:999		
	Accumulated	–		CA003:000 – CA099:999		
Integer File		N003:000.00 – N099:999.15		N003:000 – N099:999		