MEMORY LINK SLAVE

Serial Driver

Supported version TOP Design Studio V1.4.6.26 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 12

Describes the cable specifications required for connection.

5. Supported addresses Page 14

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

6. Interrupt function Page 15

Describes how the TOP sends Interrupt Output message to the external device.

1. System configuration

The system configuration of TOP and Memory Link Slave communication driver is as follows:

Series	Link I/F	Communication method	System setting	Cable
-	Serial	RS-232C	3. TOP communication setting	4. Cable table
		RS-422 (4 wire)		
		RS-485 (2 wire)		

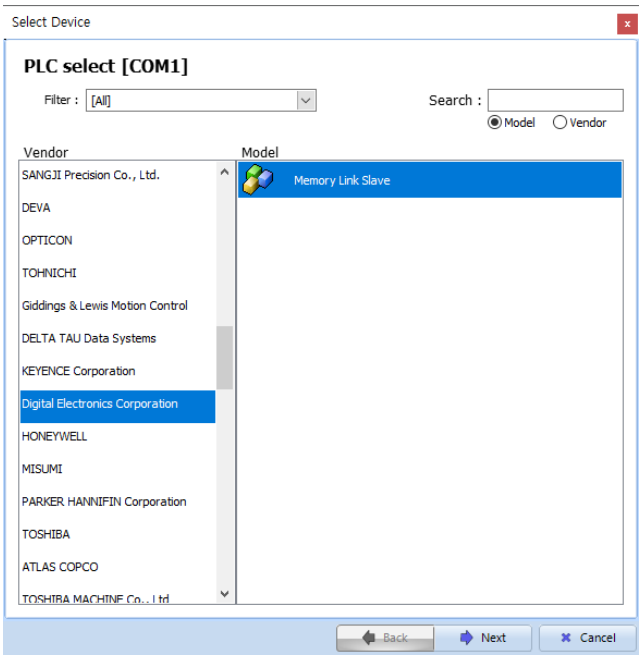
■ Connection configuration

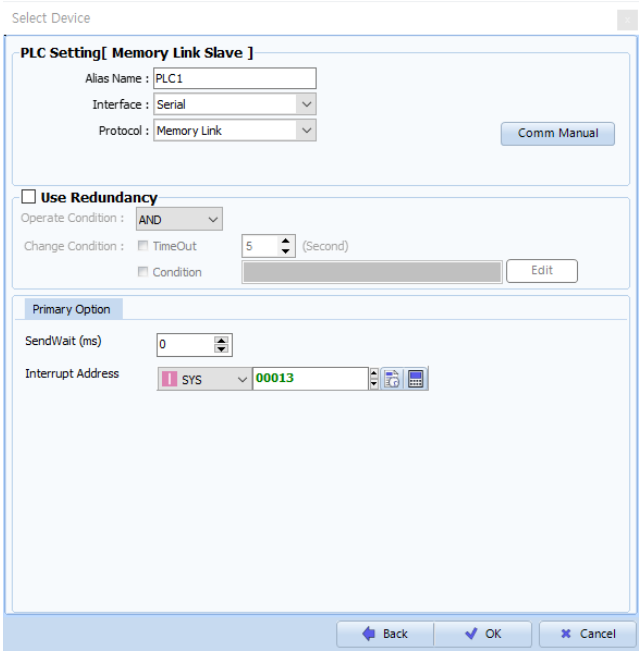
・1:N (one external device and one TOP) connection – configuration which is possible in RS232C/422/485 communication.

・1:N (one external device and multiple TOPs) connection – configuration which is possible in RS422/485 communication.

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 **Digital Electronics Corporation**.
	PLC	Select the TOP communication driver.

Model	Interface	Protocol
Memory Link Slave	Serial	Set Users

Supported Protocol	
Memory Link	Extended Memory Link

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

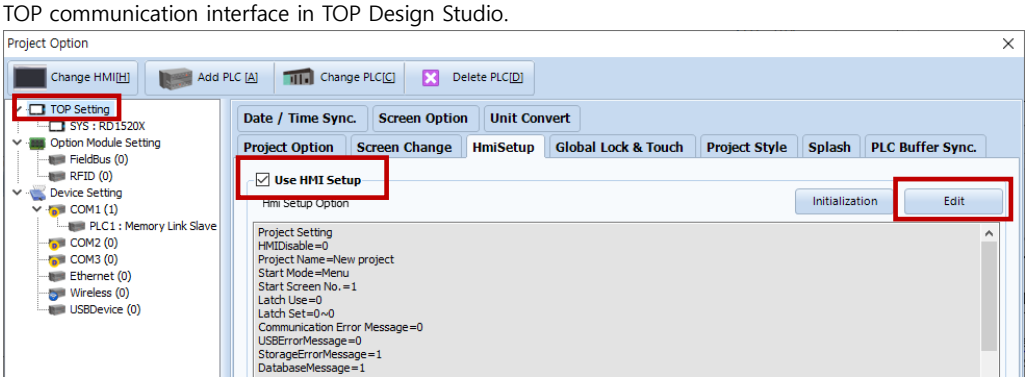
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

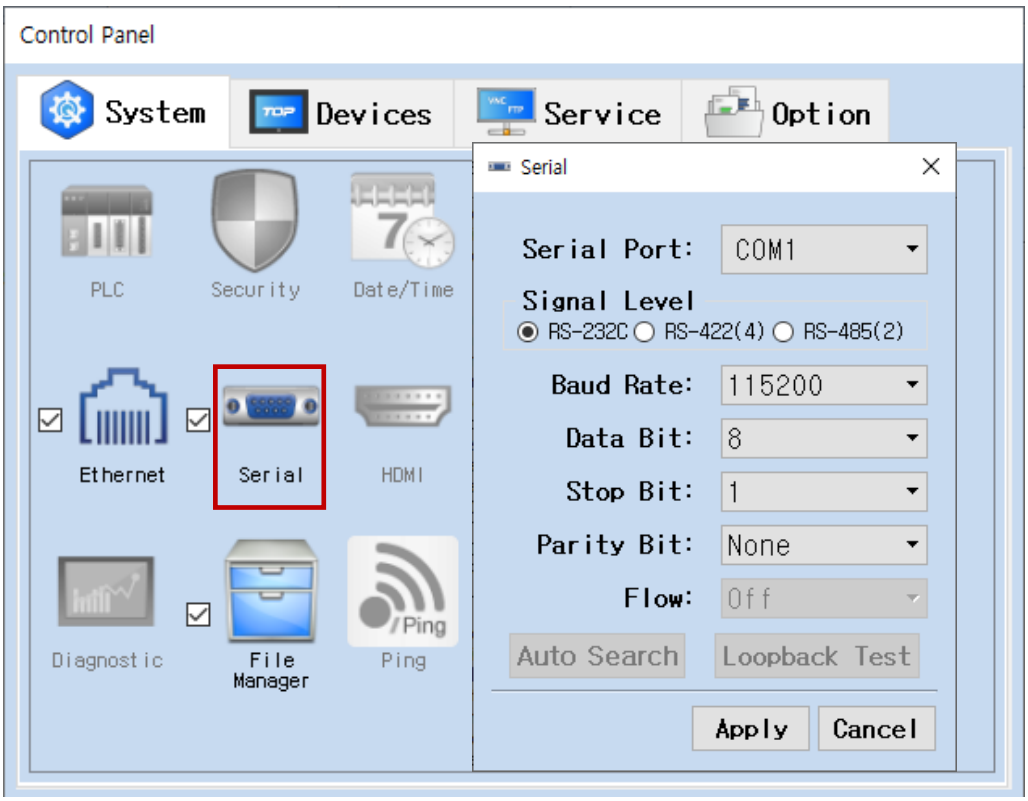
3.1 Communication setting in TOP Design Studio

(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 / RS-485	
Baud Rate	115200		
Data Bit	8		
Stop Bit	1		
Parity Bit	NONE		

* The above settings are examples recommended by the company.

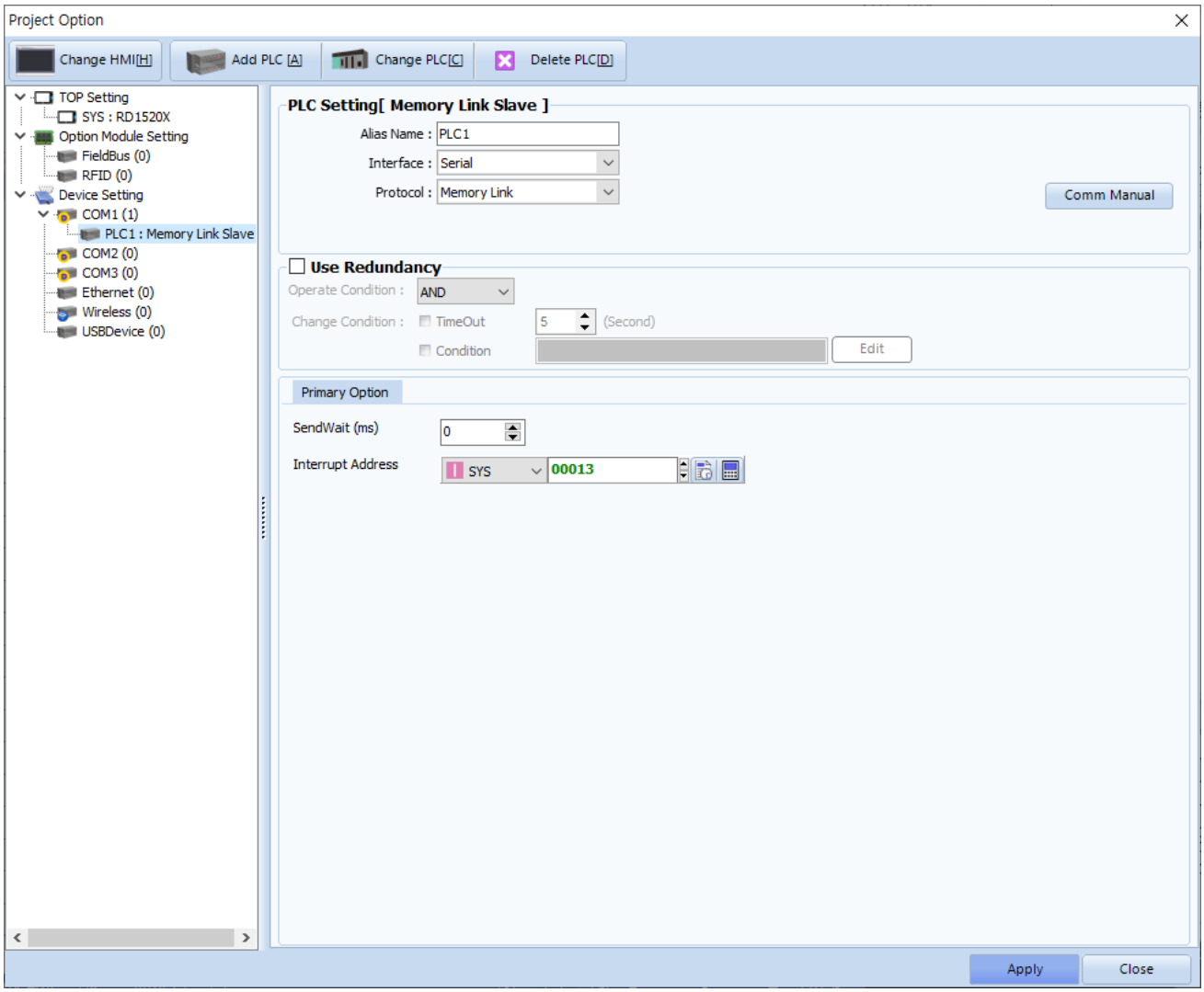
Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select 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 > Device Setting > COM > "PLC1 : Memory Link Slave"]

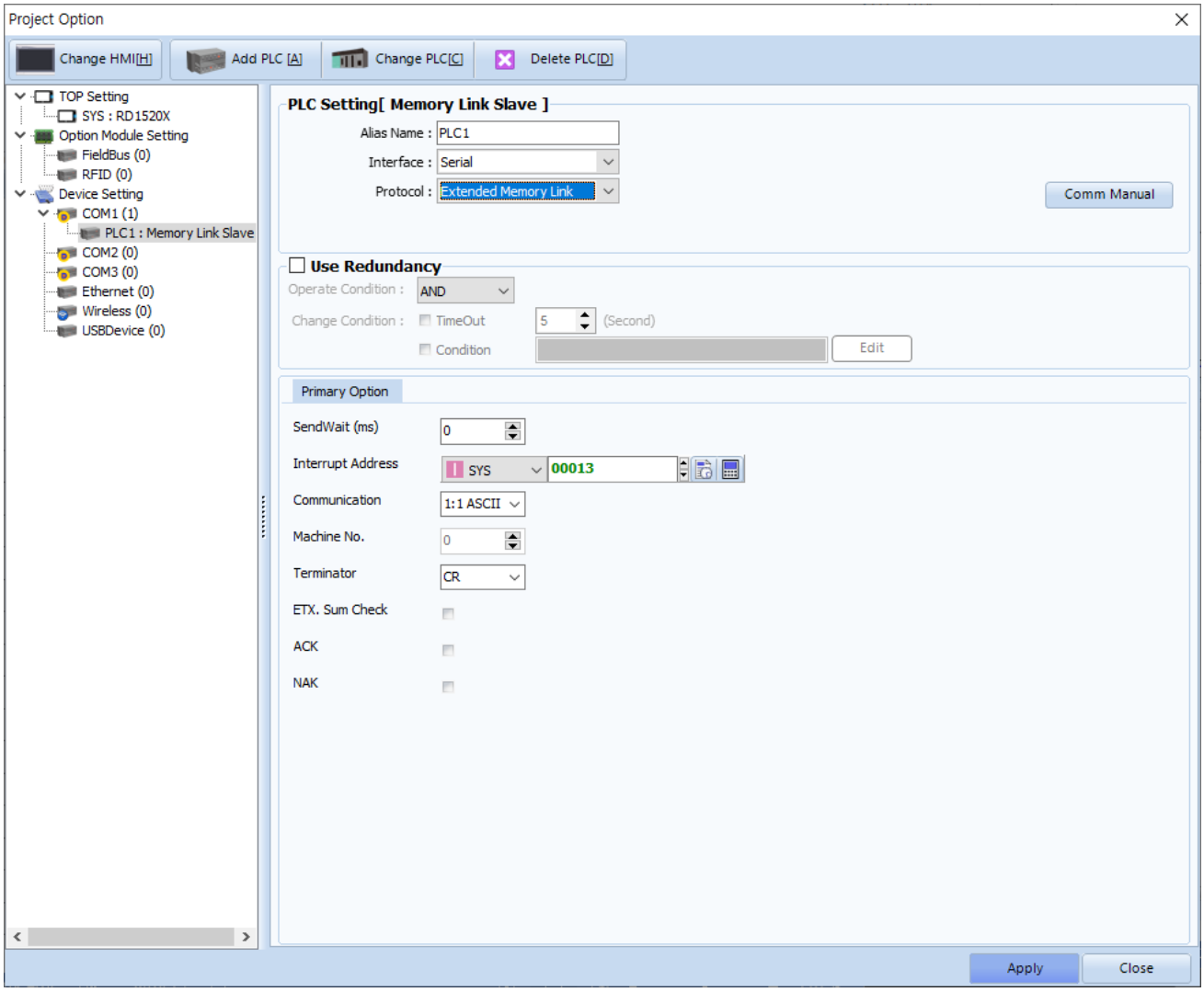
– Set the options of the Memory Link Slave communication driver in TOP Design Studio.

① **Protocol: configured upon selecting Memory Link**



Items	Settings	Remarks
Interface	Select "Serial".	2. External device selection
Protocol	Select the communication protocol between the TOP and an external device.	
Interrupt Address	Configures the internal address for executing the Interrupt function.	6. Interrupt function

② **Protocol: configured upon selecting Extended Memory Link**



Items	Settings	Remarks
Interface	Select "Serial".	2. External device selection
Protocol	Select the communication protocol between the TOP and an external device.	
Interrupt Address	Configures the internal address for executing the Interrupt function.	6. Interrupt function
Communication	Select the communication mode.	
Machine No.	Designates the TOP number to be used for communication	*Note 1)
Terminator	Selects the frame end code.	*Note 2)
ETX. Sum Check	Check whether ETX. Sum Check is used or not.	
ACK	Check whether ACK response is used or not.	
NAK	Check whether NAK response is used or not.	

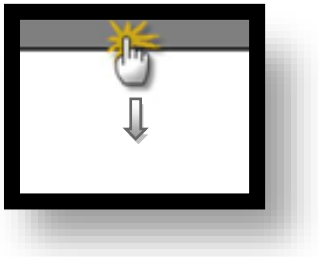
*Note 1) Activates when communication mode is 1:N.

*Note 2) Activates when communication mode is ASCII.

3.2. Communication setting in TOP

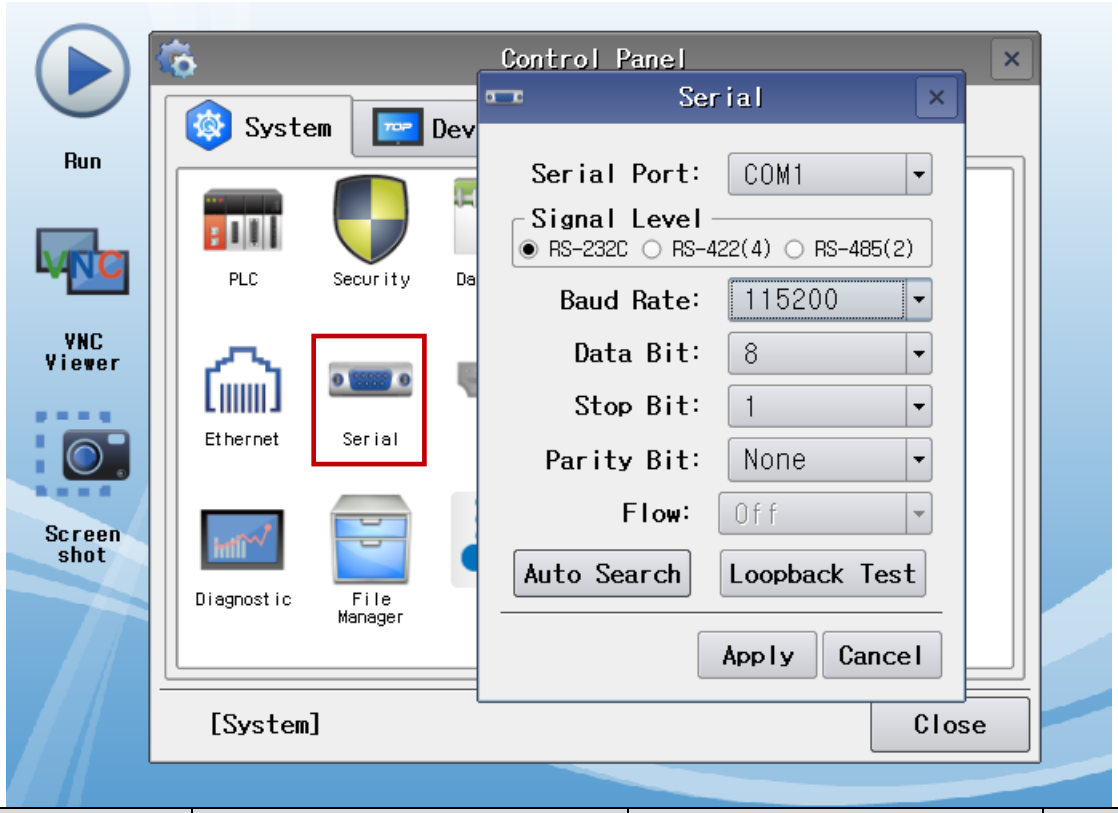
*** This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.**

■ 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
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Data Bit	8		
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Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
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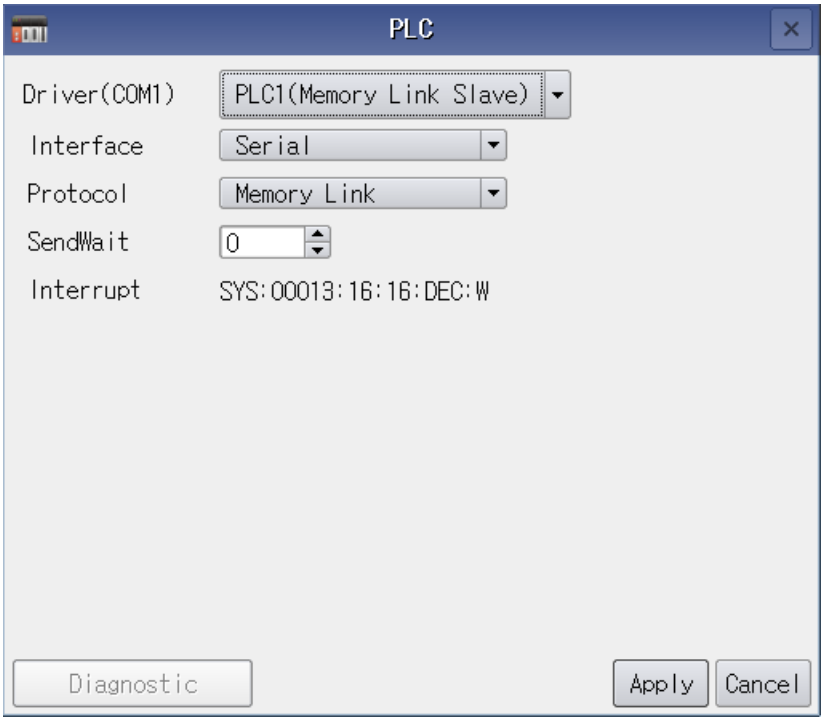
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.

(2) Communication option setting

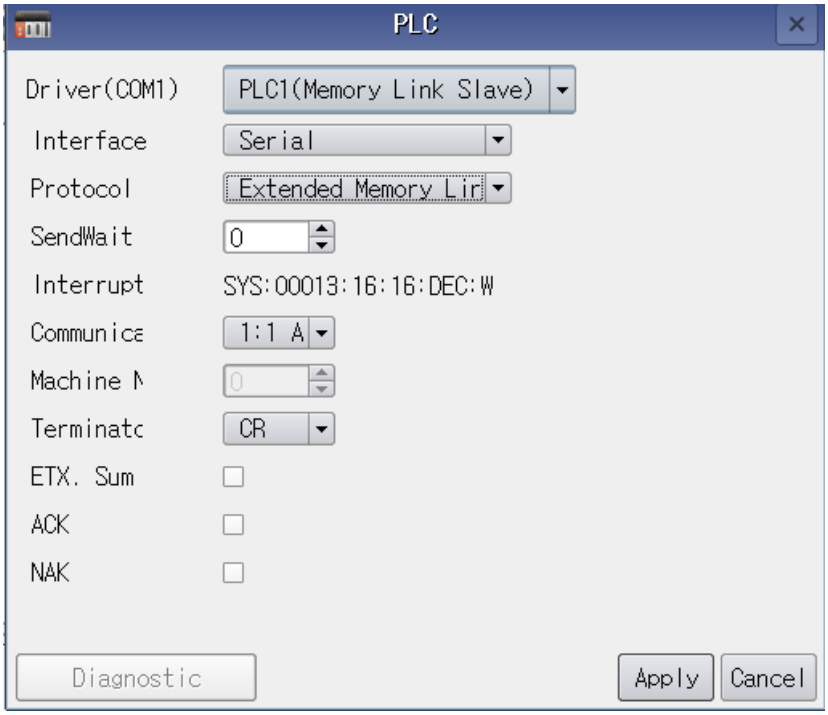
■ [Main Screen > Control Panel > PLC]

① **Protocol: configured upon selecting Memory Link**



Items	Settings	Remarks
Interface	Select “Serial”.	2. External device selection
Protocol	Select the communication protocol between the TOP and an external device.	
Interrupt Address	Configures the internal address for executing the Interrupt function.	6. Interrupt function

② **Protocol: configured upon selecting Extended Memory Link**



Items	Settings	Remarks
Interface	Select "Serial".	2. External device selection
Protocol	Select the communication protocol between the TOP and an external device.	
Interrupt Address	Configures the internal address for executing the Interrupt function.	6. Interrupt function
Communication	Select the communication mode.	
Machine No.	Designates the TOP number to be used for communication	*Note 1)
Terminator	Selects the frame end code.	*Note 2)
ETX. Sum Check	Check whether ETX. Sum Check is used or not.	
ACK	Check whether ACK response is used or not.	
NAK	Check whether NAK response is used or not.	

*Note 1) Activates when communication mode is 1:N.

*Note 2) Activates when communication mode is ASCII.

3.3 Communication diagnostics

■ 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

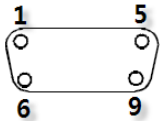
- If there is a problem with the communication connection with an external terminal, please check the settings in the sheet below.

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	
	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	5. Supported addresses (For details, please refer to the PLC vendor's manual.)

4. Cable table

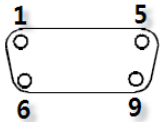
This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.
(The cable diagrams described in this section may differ from the external device vendor's recommendations.)

■ **RS-232C** (1:1 connection)

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

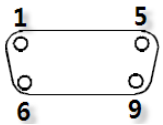
*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.

■ **RS-422** (1:1 connection)

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

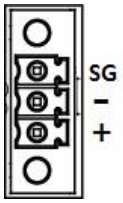
*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.

■ **RS-485** (1:1 connection)

COM			Cable connection	External device	
Pin arrangement*Note 1)	Signal name	Pin number		Signal name	
 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	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	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	PLC	Cable connection and signal direction	PLC
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	PLC	Cable connection and signal direction	PLC
Signal name		Signal name		Signal name
RDA(+)		SDA(+)		SDA(+)
RDB(-)		SDB(-)		SDB(-)
SDA(+)		RDA(+)		RDA(+)
SDB(-)		RDB(-)		RDB(-)
SG		SG		SG

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.

Internal address	Bit Address	Word Address	Remarks
SYS	00000.00 – 10239.15	00000 – 10239	*Note 1)

*Note 1) TOP-VIEW can use values between 0 to 102399.

6. Interrupt function

Describes how the TOP carries out the Interrupt Output operation to the external device.

By entering the TOP's configured internal address into the "Interrupt Address", the TOP sends an Interrupt Output message to the external device. A value lower than 1 byte of the entered value is applied to the Interrupt Output data, where the address resets to 0 upon sending the message.