# RS Automation

# X8 Series

# X8_Xnet Serial

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

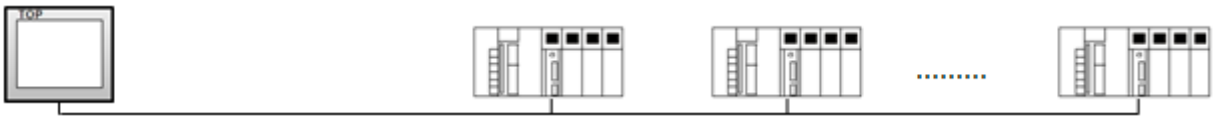
The system configuration of TOP and "RS Automation – X8 Series" is as follows:

| Series | CPU | Link I/F | Communication method | System setting | Cable |
|---|---|---|---|---|---|
| X8 | X8-M32DDT<br>X8-M14DDT<br>X8-M16DDR | CPU Port | RS–232C | 3.1 Settings example 1 (Page 4) | 5.1. Cable table 1 (Page 5) |
| | | | RS–485 (2 wire) | 3.2 Settings example 2 (Page 4) | 5.1. Cable table 2 (Page 5) |

## ■ Connection configuration

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

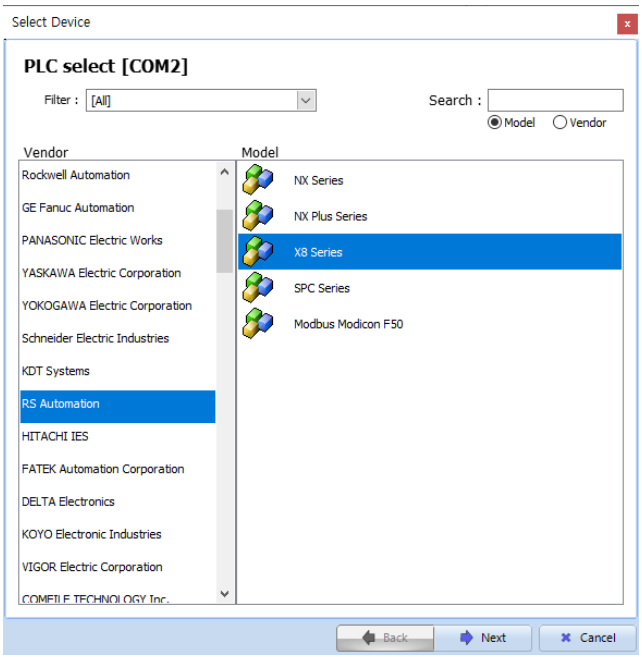
• 1:N (one TOP and multiple external devices) connection – configuration which is possible in RS422 communication.

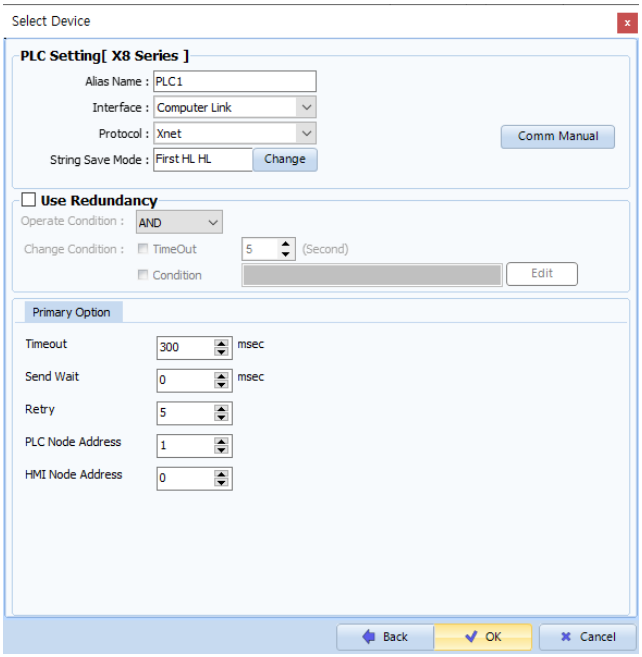


• N:1 connection (multiple TOPs and one external device) connection – configuration which is possible in RS422 MultiLink communication.

# 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.<br>Select “RS Autoamtion”. |
| | PLC | Select an external device to connect to TOP.<br>Select “X8 Xnet”.<br>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

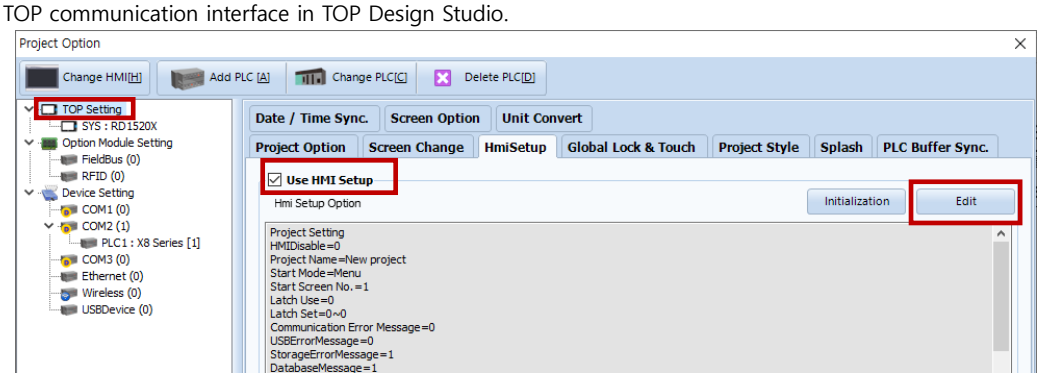
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

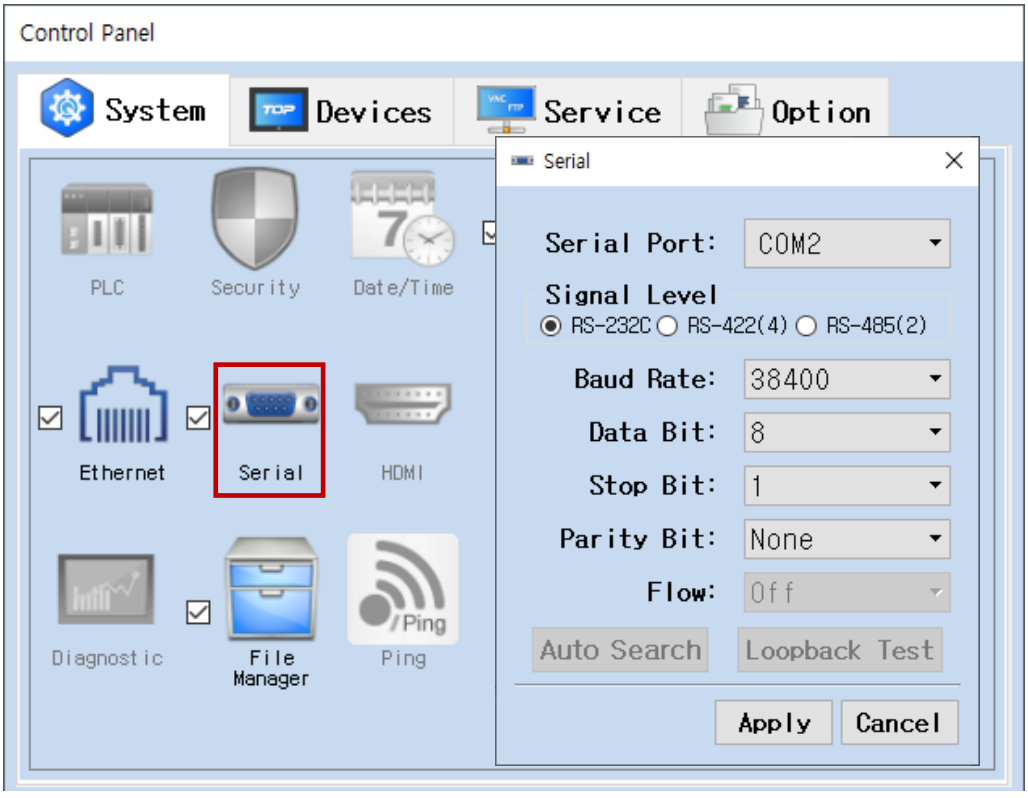
## 3.1 Communication setting in TOP Design Studio

### (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<br>RS-422/485 | |
| Baud Rate | 115200 | | | | |
| Data Bit | 8 | | | | |
| Stop Bit | 1 | | | | |
| Parity Bit | none | | | | |

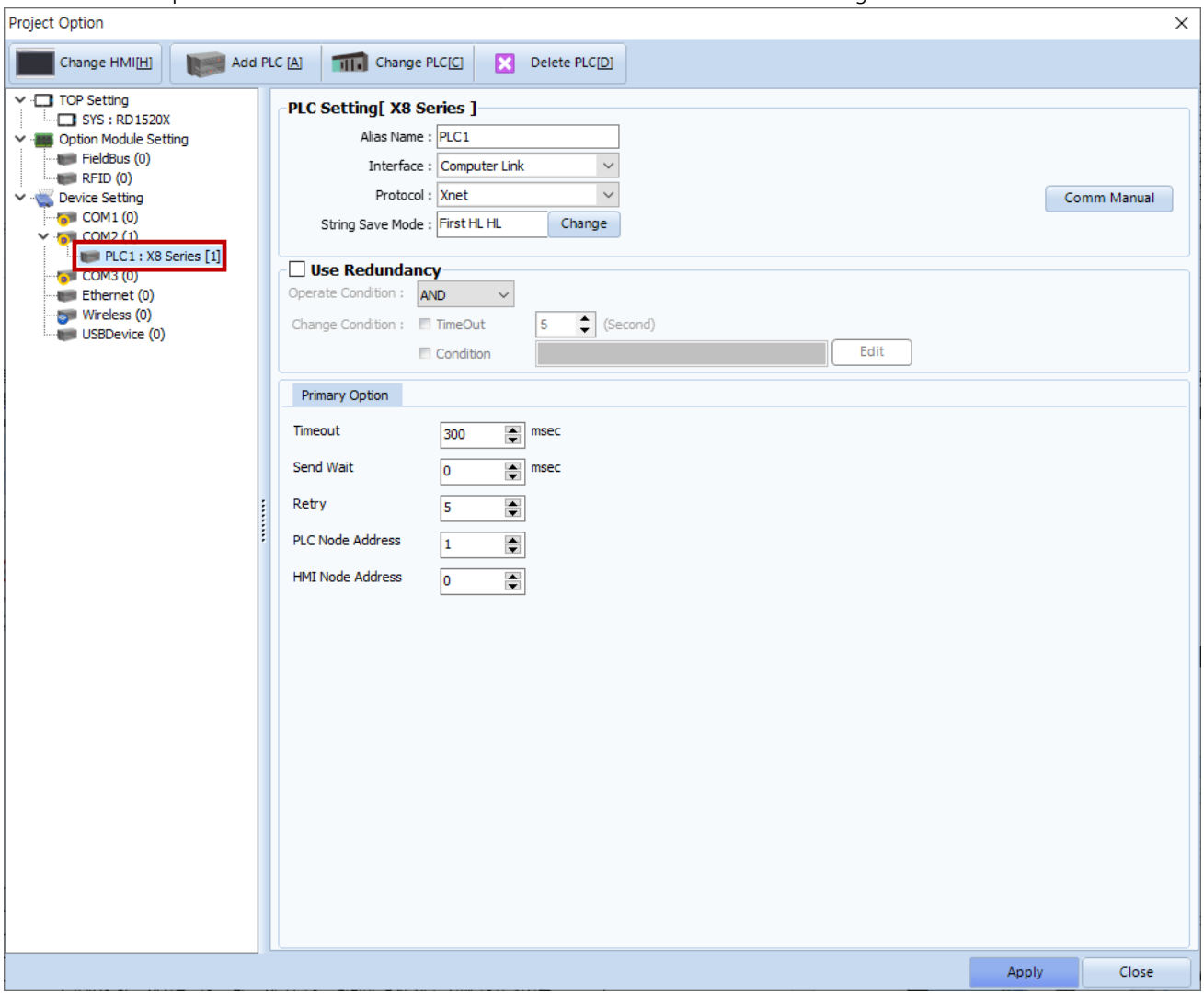
* The above settings are examples recommended by the company.

| 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 : X8 Series"]

– Set the options of the RS Automation X8 Series communication interface in TOP Design Studio.

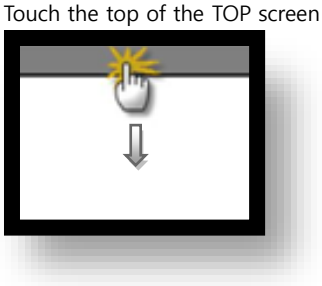



| Items | Settings | Remarks |
|---|---|---|
| Interface | Select "Serial". | Fixed |
| Protocol | Select the serial communication protocol between the TOP and an external device. | |
| TimeOut | Set the time for the TOP to wait for a response from an external device. | |
| SendWait | Set the waiting time between TOP's receiving a response from an external device and sending the next command request. | |
| PLC Node address | Configure the external device node. | |
| HMI Node address | Configure the TOP node. | |

## 3.2. Communication setting in TOP

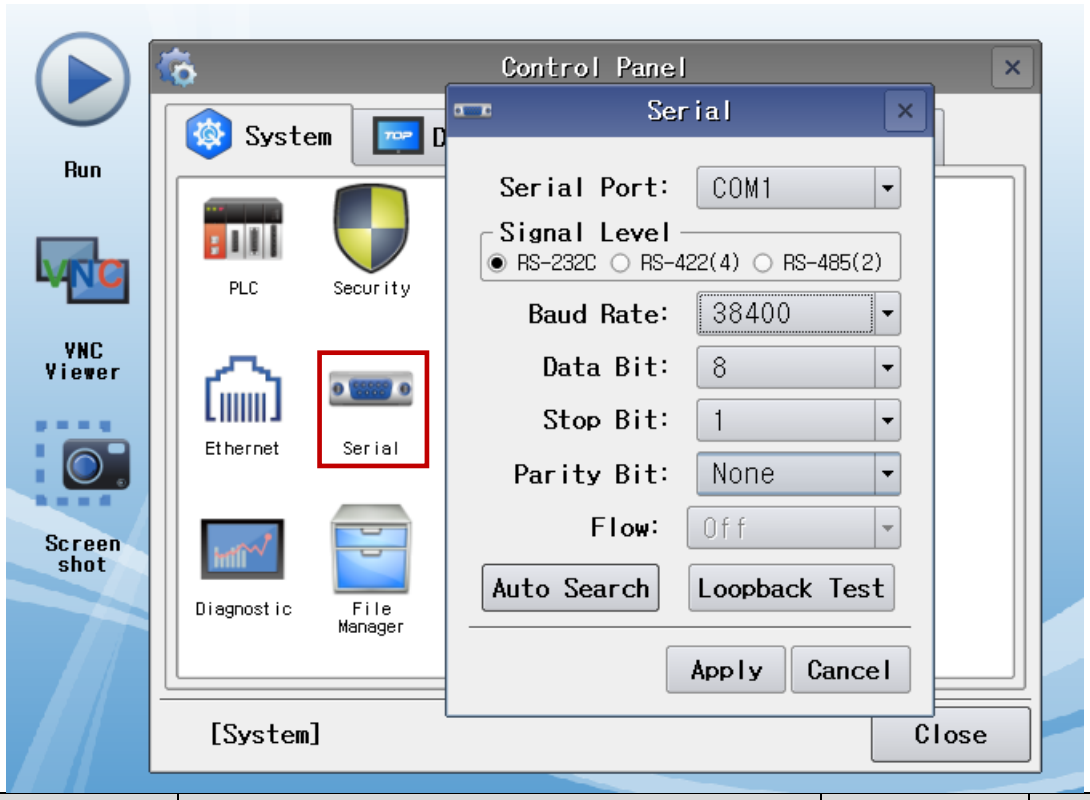
*** This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.**

■ 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]



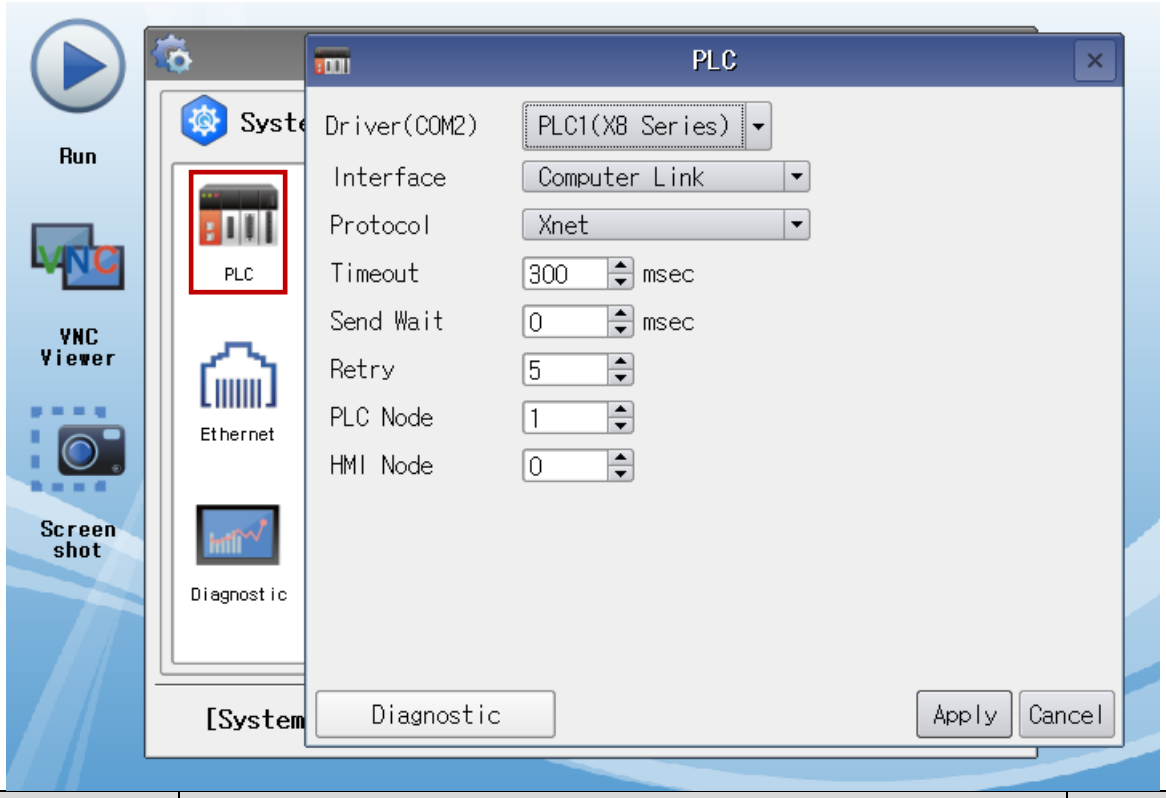

| Items | TOP | | | External device | Remarks |
|---|---|---|---|---|---|
| Signal Level (port) | RS-232C | RS-422 | RS-485 | RS-232C<br>RS-422/485 | |
| Baud Rate | 115200 | | | | |
| Data Bit | 8 | | | | |
| Stop Bit | 1 | | | | |
| Parity Bit | none | | | | |

* 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]




| Items | Settings | Remarks |
|---|---|---|
| Interface | Select "Serial". | Fixed |
| Protocol | Select the serial communication protocol between the TOP and an external device. | |
| TimeOut | Set the time for the TOP to wait for a response from an external device. | |
| SendWait | Set the waiting time between TOP's receiving a response from an external device and sending the next command request. | |
| PLC Node address | Configure the external device node. | |
| HMI Node address | Configure the TOP node. | |

## 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**<br>- 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<br>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<br>(For details, please refer to the PLC vendor's manual.) |

# 4. External device setting

Set as below using "X8 Series Ladder Software XGPC".

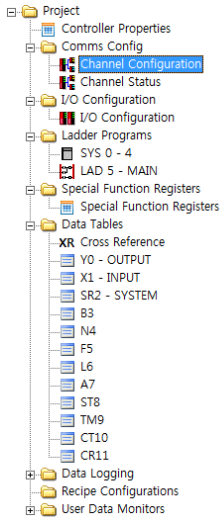
Reboot the external device after downloading the configuration

For a more detailed setting method than described in this example, refer to the user manual of the external device.

Check the node address and line control method.

**Step 1.** Upload the PC and XGPC S/W.

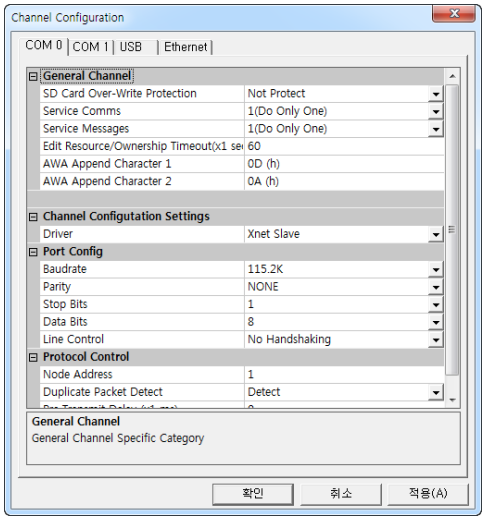
**Step 2.**




From the tool bar left of the XGPC S/W, double click Channel Configuration.

( X8-M Toolbar → 'Comms Config' → 'Channel Configuration' )

**Step 3.**




From the Channel Configuration window, configure the Parameter.

▣ Channel Configuration Settings : Xnet Slave

▣ Port Config

- Buadrate : 115.2K
- Parity : NONE
- Stop Bits : 1
- Data Bits : 8
- Line Control: No Handshaking (During RS 232 communication)

▣ Protocol Control

- Node Address : 1 (PLC node number)
- Duplicate Packet Detect : Detect
- Pre Transmit Delay (x1 ms) : 0

Check the above information and press confirm.

**Step 4.** From the top tool bar go to 'Online' → Click 'Download'.

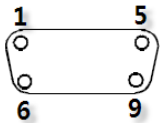
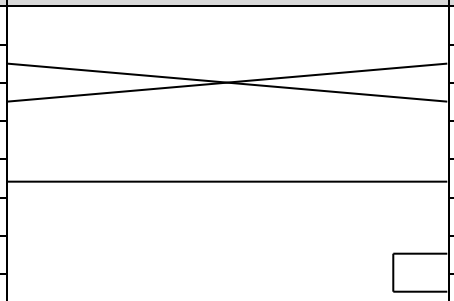
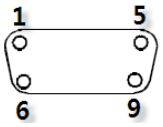
# 5. Cable table

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 "**RS Automation X8 Series**")

## 5.1. Cable table 1

■ **RS-232C** (1:1 connection)

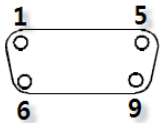
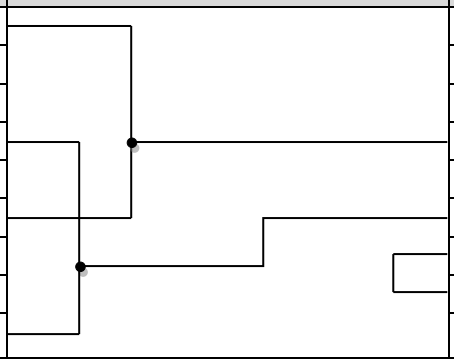
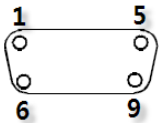
(A) TOP COM Port (9 pin)

| TOP COM | | | Cable connection | "X8 Series" | | |
|---|---|---|---|---|---|---|
| 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 | CD |  Based on communication cable connector front, D-SUB 9 Pin female (male, convex) |
| | RD | 2 | | 2 | RD | |
| | SD | 3 | | 3 | SD | |
| | DTR | 4 | | 4 | 485P+ | |
| | SG | 5 | | 5 | SG | |
| | DSR | 6 | | 6 | 485N- | |
| | RTS | 7 | | 7 | RTS | |
| | CTS | 8 | | 8 | CTS | |
| | NC | 9 | | 9 | NC | |

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

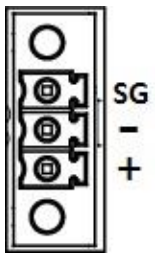
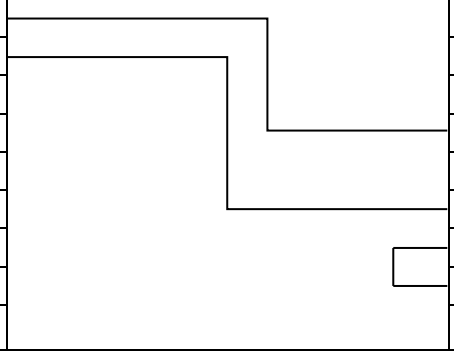
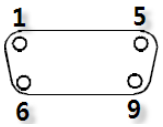
■ **RS-485** (connection)

(B) TOP COM Port (9 pin)

| TOP COM | | | Cable connection | "X8 Series" | | |
|---|---|---|---|---|---|---|
| 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 |  | 1 | CD |  Based on communication cable connector front, D-SUB 9 Pin female (male, convex) |
| | | 2 | | 2 | RD | |
| | | 3 | | 3 | SD | |
| | RDB | 4 | | 4 | 485P+ | |
| | | 5 | | 5 | SG | |
| | SDA | 6 | | 6 | 485N- | |
| | | 7 | | 7 | RTS | |
| | | 8 | | 8 | CTS | |
| | SDB | 9 | | 9 | NC | |

*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 | | Pin number | Signal name | Pin arrangement*Note 1) |
|   | + |  | 1 | CD |  Based on communication cable connector front, D-SUB 9 Pin female (male, convex) |
| | - | | 2 | RD | |
| | SG | | 3 | SD | |
| | | | 4 | 485P+ | |
| | | | 5 | SG | |
| | | | 6 | 485N- | |
| | | | 7 | RTS | |
| | | | 8 | CTS | |
| | | | 9 | NC | |

*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.

| Contents | | Bit Address | Word Address | 32 Bit | Remarks |
|---|---|---|---|---|---|
| Input | X | 1.0.0.0 ~ 1.1535.0.15 | 1.0.0 ~ 1.1535.0 | | |
| Output | Y | 0.0.0.0 ~ 0.1535.0.15 | 0.0.0 ~ 0.1535.0 | | |
| Input(by slot) | X(by slot) | 1.0.0.0 ~ 1:96.511.15 | 1.0.0 ~ 1.96.511 | | *Note 1) |
| Output(by slot) | Y(by slot) | 0.0.0.0 ~ 0.96.511.15 | 0.0.0 ~ 0.96.511 | | *Note 1) |
| System Register | SR | 2.0.0.0 ~ 2.127.0.15 | 2.0.0 ~ 2.127.0 | | |
| Binary | B | 3.0.0.0 ~ 1535.1535.0.15 | 3.0.0 ~ 1535.1535.0 | | |
| Integer | N | 3.0.0.0 ~ 1535.1535.0.15 | 3.0.0 ~ 1535.1535.0 | | |
| Floating Point | F | – | 3.0.0 ~ 1535.1535.0 | | |
| Long | L | 3.0.0.0 ~ 1535.1535.0.15 | 3.0.0 ~ 1535.1535.0 | | |
| ASCII | A | 3.0.0.0 ~ 1535.1535.0.15 | 3.0.0 ~ 1535.1535.0 | | |
| String | ST | – | 3.0.0 ~ 1535.799.41 | | |
| Timer | TM | 3.0.0.0 ~ 1535.1535.4.15 | 3.0.0 ~ 1535.1535.4 | | *Note 2) |
| Timer Preset | TM Preset | 3.0.1.0 ~ 1535.1535.1.31 | 3.0.1 ~ 1535.1535.1 | v | |
| Timer Accumulator | TM Accumulator | 3.0.3.0 ~ 1535.1535.3.31 | 3.0.3 ~ 1535.1535.3 | v | |
| Counter | CT | 3.0.0.0 ~ 1535.1535.4.15 | 3.0.0 ~ 1535.1535.4 | | *Note 3) |
| Counter Preset | CT Preset | 3.0.1.0 ~ 1535.1535.1.31 | 3.0.1 ~ 1535.1535.1 | v | |
| Counter Accumulator | CT Accumulator | 3.0.3.0 ~ 1535.1535.3.31 | 3.0.3 ~ 1535.1535.3 | v | |
| Control | CR | 3.0.0.0 ~ 1535.1535.4.15 | 3.0.0 ~ 1535.1535.4 | | *Note 4) |
| Control Length | CR Length | 3.0.1.0 ~ 1535.1535.1.31 | 3.0.1 ~ 1535.1535.1 | | |
| Control Position | CR Position | 3.0.3.0 ~ 1535.1535.3.31 | 3.0.3 ~ 1535.1535.3 | | |

*Note 1) X (by slot), Y (by slot) Device Format

Ex) Configurations for 1, 2, 3, and 4 of X (by slot) are as follows: (Same for Y (by slot).)

| Notation | X | 1 | .2 | .3 | .4 |
|---|---|---|---|---|---|
| Description | Device Name | Table Address | Slot Number | Word Offset | Bit Position |

*Note 2) TM Address Details

Details for each bit of the 16 bit data of the TM address are as follows.

| 8th Bit | 9th Bit | 13th Bit | 14th Bit | 15th Bit |
|---|---|---|---|---|
| Time Base 0 | Time Base 1 | Done | Timer Timing | Enable |

*Note 3) CT Address Details

Details for each bit of the 16 bit data of the CT address are as follows.

| 11th Bit | 12th Bit | 13th Bit | 14th Bit | 15th Bit |
|---|---|---|---|---|
| Underflow | Overflow | Done | Count Down | Count Up |

*Note 4) CR Address Details

Details for each bit of the 16 bit data of the CR address are as follows.

| 8th Bit | 9th Bit | 10th Bit | 11th Bit |
|---|---|---|---|
| Found | Inhibit | Unload | Error |
| 12th Bit | 13th Bit | 14th Bit | 15th Bit |
| Empty | Done | Enable. Unload | Enable |