# MITSUBISHI Electric Corporation

# MELSEC Q Series

# Computer Link Driver

Supported version TOP Design Studio V1.0 or higher

## CONTENTS

We want to thank our customers who use the Touch Operation Panel.

# 1. System configuration

The system configuration of TOP and "MITSUBISHI Electric Corporation - MELSEC Q Computer Link" is as follows.

| Series | CPU | Link I/F | Communication method | Communication setting | Cable |
|---|---|---|---|---|---|
| MELSEC Q | All CPUs | QJ71C24<br>QJ71C24-R2<br>QJ71C24-R4 | RS-232C | 3. TOP communication setting<br>4. External device setting | 5. Cable table |
| | | QJ71C24N<br>QJ71C24N-R2<br>QJ71C24N-R4 | RS-422/485 | | |
| MELSEC iQ-R | | RJ71C24<br>RJ71C24-R2<br>RJ71C24-R4 | RS-232C | | |
| | | | RS-422/485 | | |

※ In case of communication module QJ71C24, QJ71C24-R2, or QJ71C24-R4, pay attention to the following items.

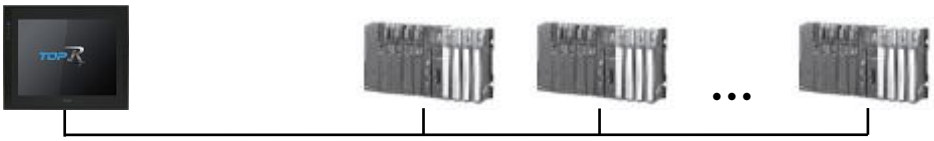
(1) In case of using a communication card, set the sum of channel 1 and channel 2 communication speed to **115200**[BPS] or less.

(2) It is not possible to use with Q□□UDE□ CPU.

■ Connectable configuration

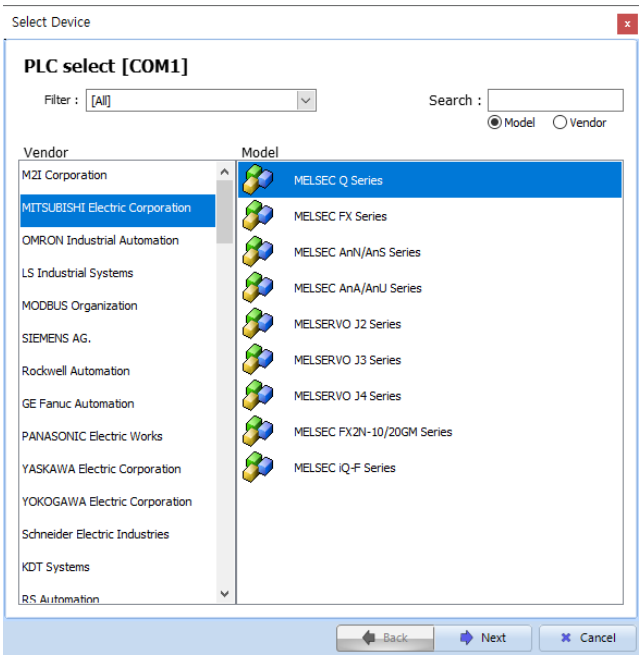
・1:1 connection

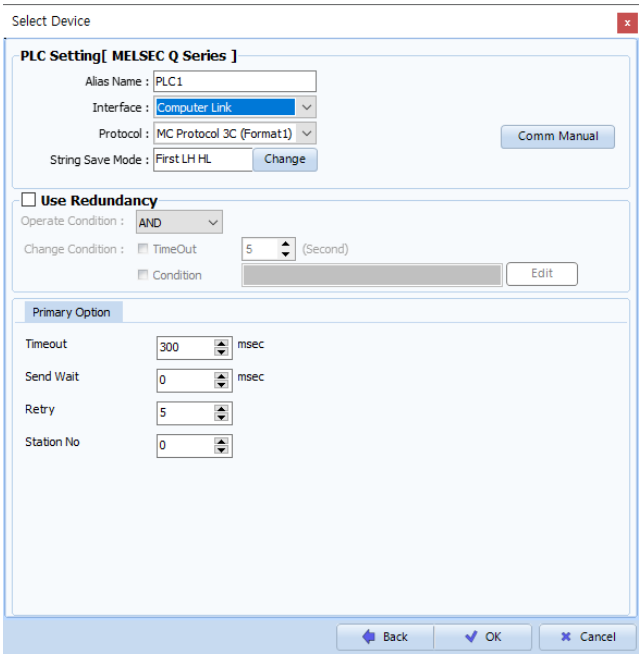
・1:N connection



# 2. External device selection

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




| Settings | | Contents |
|---|---|---|
| TOP | Model | Check the display and process of TOP to select the touch model. |
| External device | Vendor | Select the vendor of the external device to be connected to TOP.<br>Please select “MITSUBISHI Electric Corporation”. |
| | PLC | Select an external device to connect to TOP. |

| Model | Interface | Protocol |
|---|---|---|
| MELSEC Q Series | Computer Link | Set Users |

| Supported Protocol | | |
|---|---|---|
| MC Protocol 3C (Format 1) | MC Protocol 3C (Format 4) | MC Protocol 4C (Format 5)<br>(RS-485 not supported) |

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

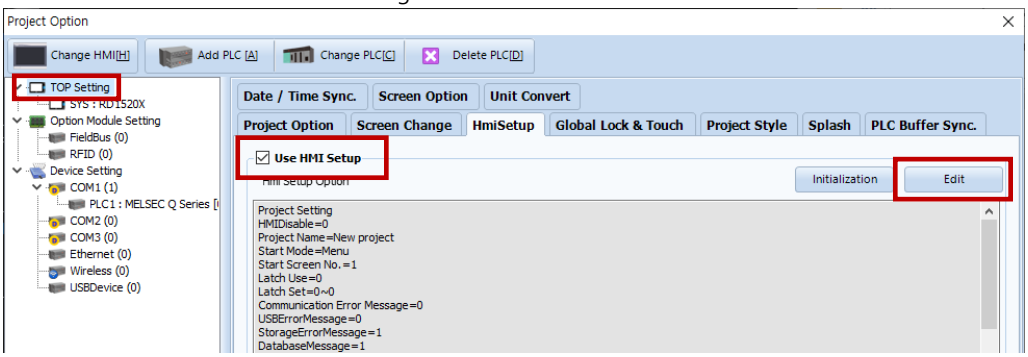
The communication can be set in TOP Design Studio or TOP system menu.

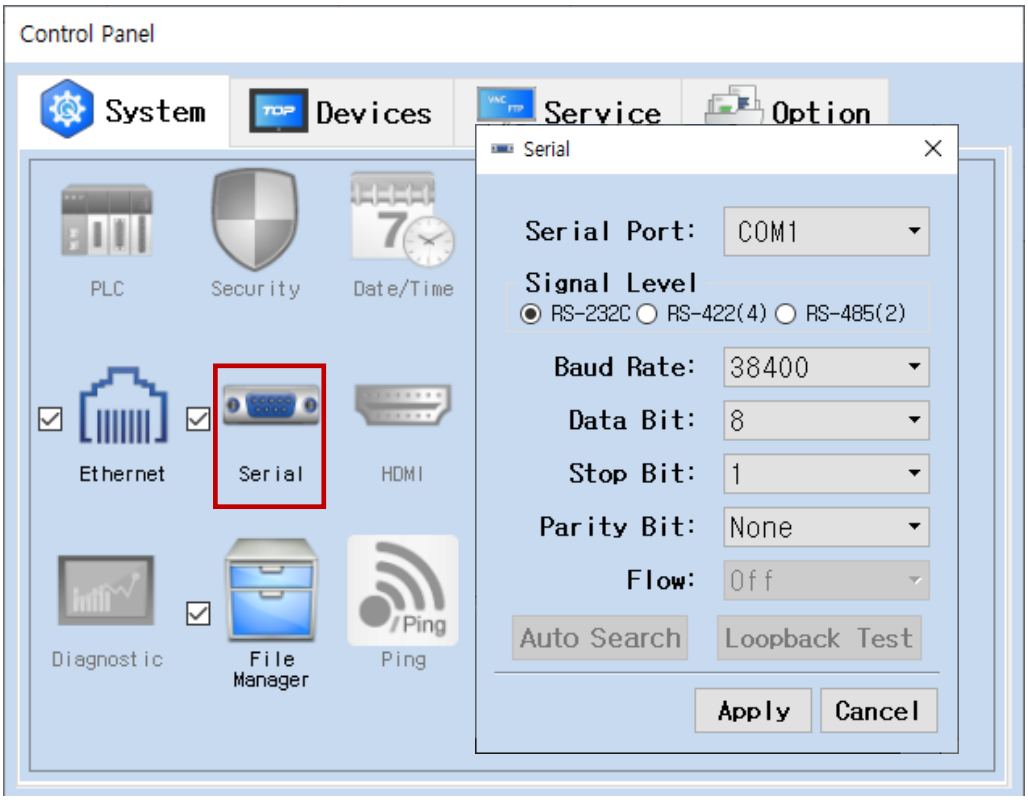
## 3.1 Communication setting in TOP Design Studio

### (1) Communication interface setting

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

– Set the TOP communication interface in TOP Design Studio.




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

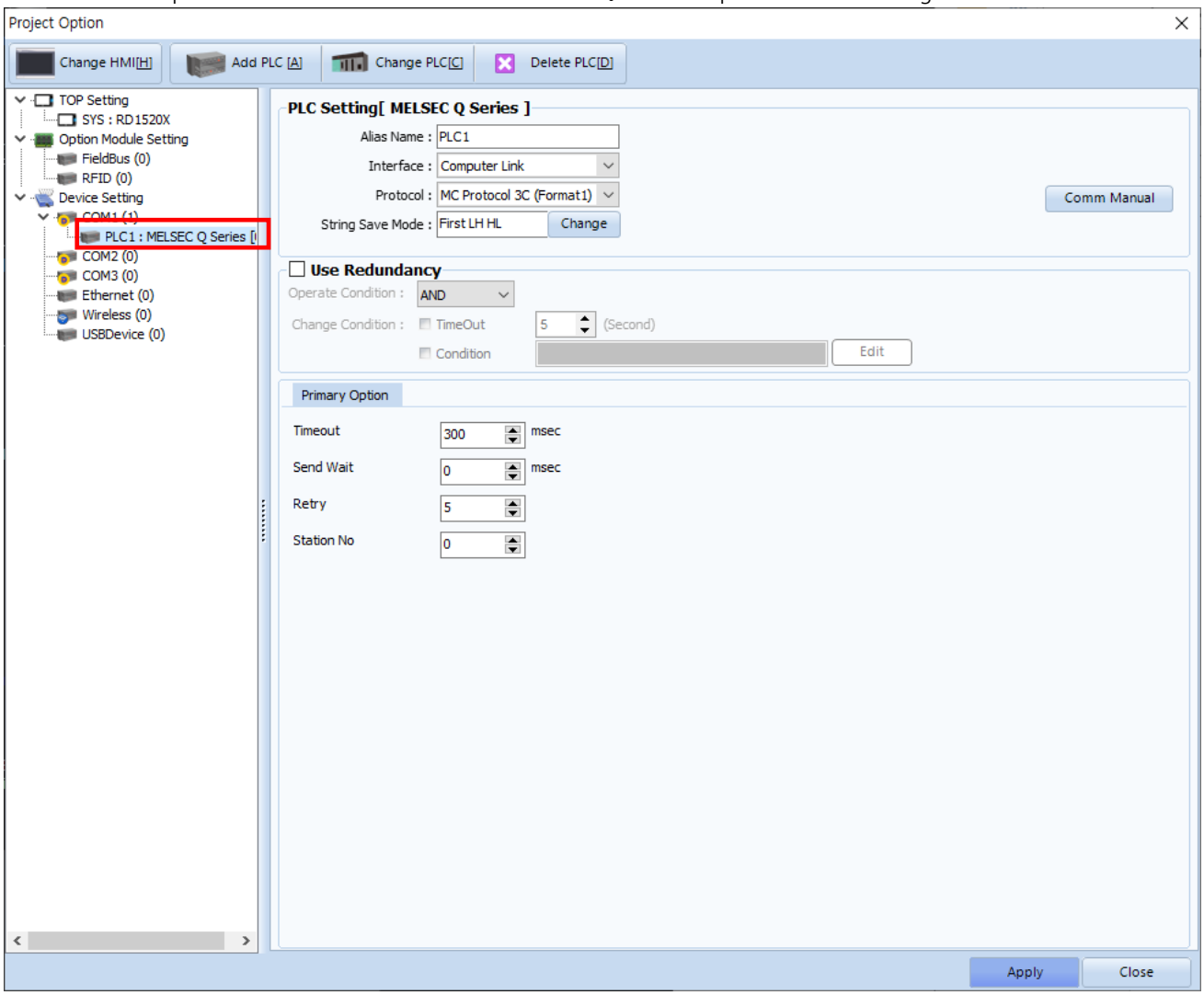
* The above settings are examples recommended by the company.

| 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 properties] → [PLC settings > COM > MELSEC Q Series]

– Set the options of the communication driver of MELSEC Q Series Computer Link in TOP Design Studio.

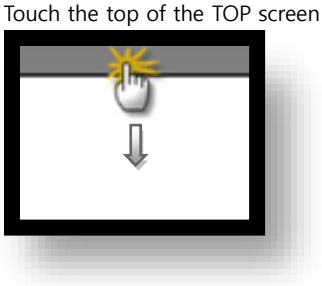



| Items | Settings | Remarks |
|---|---|---|
| Interface | Select “Computer Link”. | Refer to “2. External device selection”. |
| Protocol | Select the communication protocol between the TOP and an external device. | |
| TimeOut (ms) | Set the time to wait for a response from an external device. | |
| SendWait (ms) | Set the waiting time before sending a data request to an external device. | |
| Station No | Enter the prefix of an external device. | |

## 3.2. Communication setting in TOP

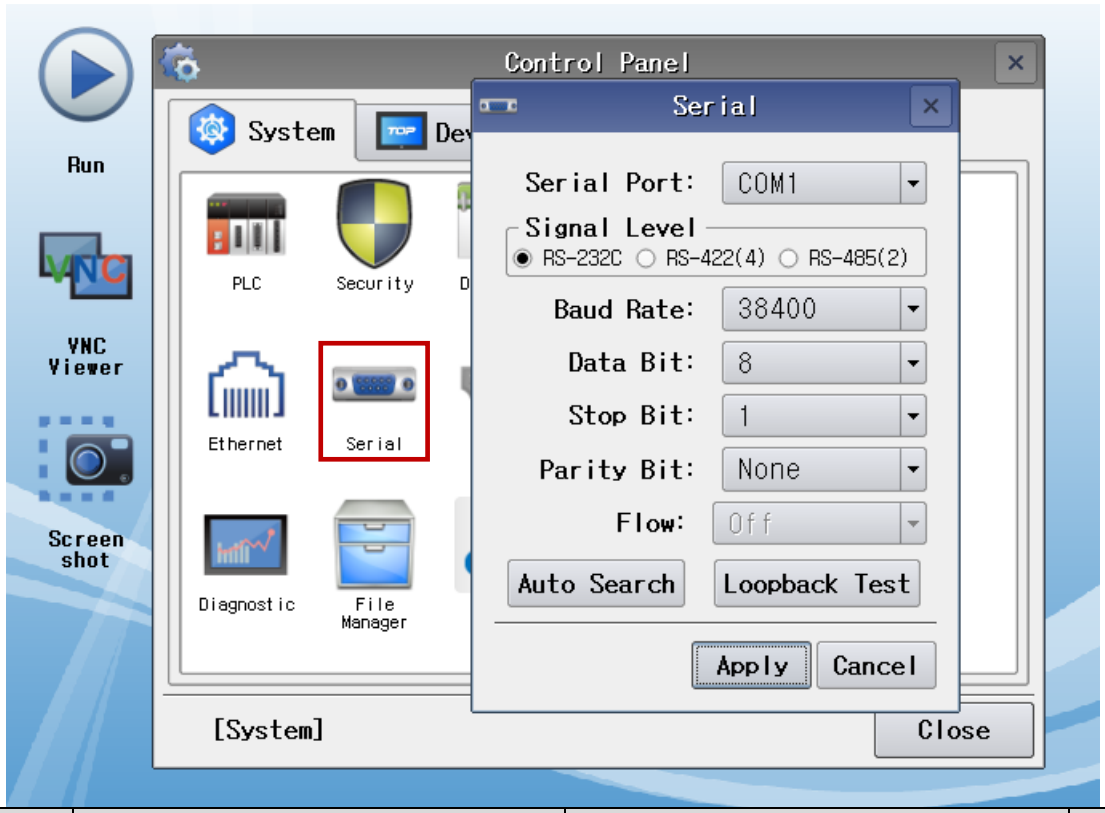
*** This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.**

■ 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 ]



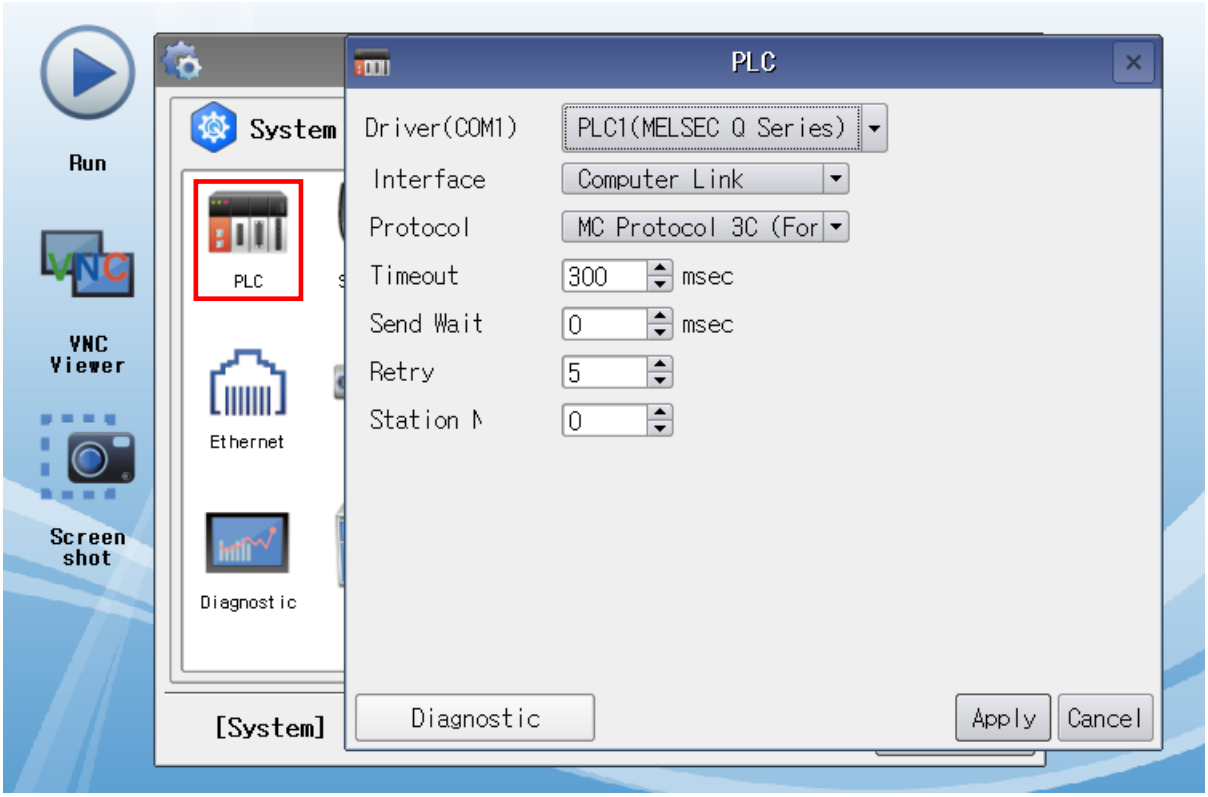

| Items | TOP | External device | Remarks |
|---|---|---|---|
| Signal Level<br>(port) | RS-232C<br>RS-422/485 | RS-232C<br>RS-422/485 | |
| Baud Rate | 38400 | | |
| Data Bit | 8 | | |
| Stop Bit | 1 | | |
| Parity Bit | None. | | |

* 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

■ [Control Panel] → [PLC]




| Items | Settings | Remarks |
|---|---|---|
| Interface | Select "Computer Link". | Refer to "2. External device selection". |
| Protocol | Select the communication protocol between the TOP and an external device. | |
| TimeOut (ms) | Set the time to wait for a response from an external device. | |
| SendWait (ms) | Set the waiting time before sending a data request to an external device. | |
| Station No | Enter the prefix of an external device. | |

## 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 that the settings of the connected ports in [Control Panel] → [Serial] are the same as the settings of the external device.

■ Diagnosis of whether the port communication is normal or not

- Touch "Communication diagnostics" in [Control Panel] → [PLC].
- Check whether communication is connected or not.

| | |
|---|---|
| **Communication diagnostics succeeded** | **Communication setting normal** |
| **Error message** | **Communication setting abnormal**<br>- Check the cable, TOP, and external device settings. (Refer to 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 |

# 4. External device setting

For more detailed setting methods than described in this example, refer to the PLC user manual.

## 4.1 Setting in GX Developer

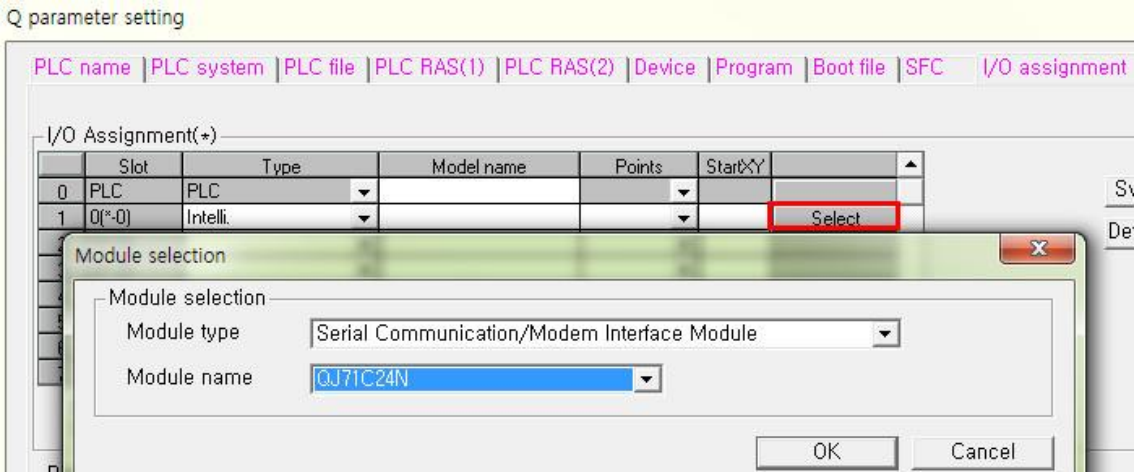
**Step 1.** Double-click [Parameter] > [PLC parameter] in the "GX Developer" project window to pop-up the [Q parameter setting] Dialog Box.

**Step 2.** Select the [I/O Assignment] tab in the [Q parameter setting] Dialog Box.

**Step 3.** Set the **[Type]** of slots equipped with a communication module to **Intelligent**" in the [I/O Assignment(*)] box.

**Step 4.** Click Select in the [I/O Assignment(*)] box.

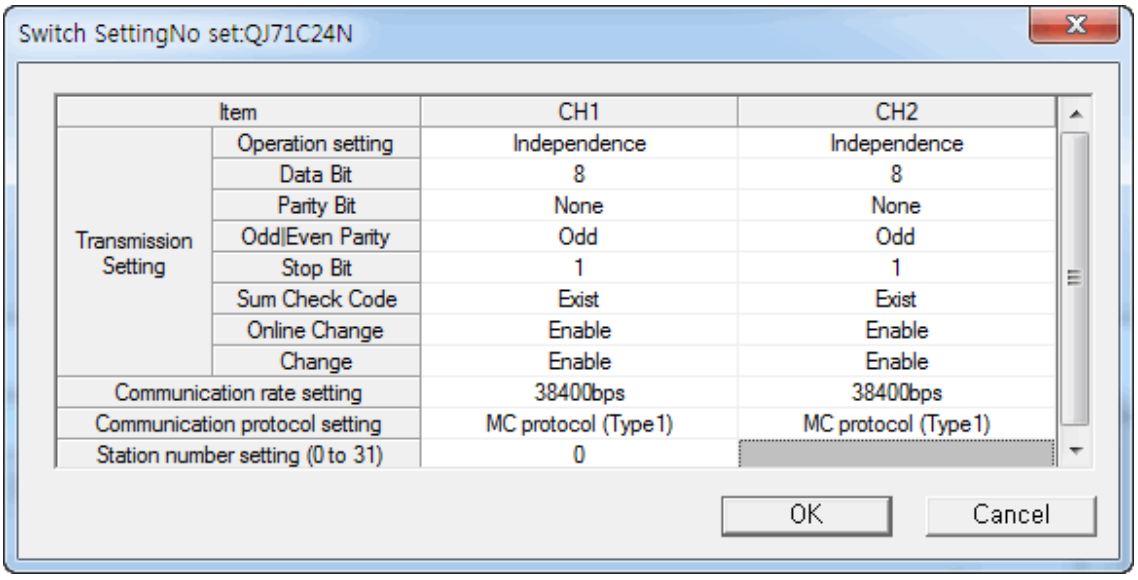
Set the Module type and Module name as a corresponding module in the Module selection window, and then click OK.




**Step 5.** Set each channel in the automatically open Switch SettingNo window.

In general cases, select 38400 bps, MC protocol (Type 1) like CH1.

In case of requiring high-speed communication, select 115200 bps. MC protocol (Type 5) does not support RS485 communication.




**Step 6.** Send the set parameters to [Online] > [Write to PLC], and reset the PLC.

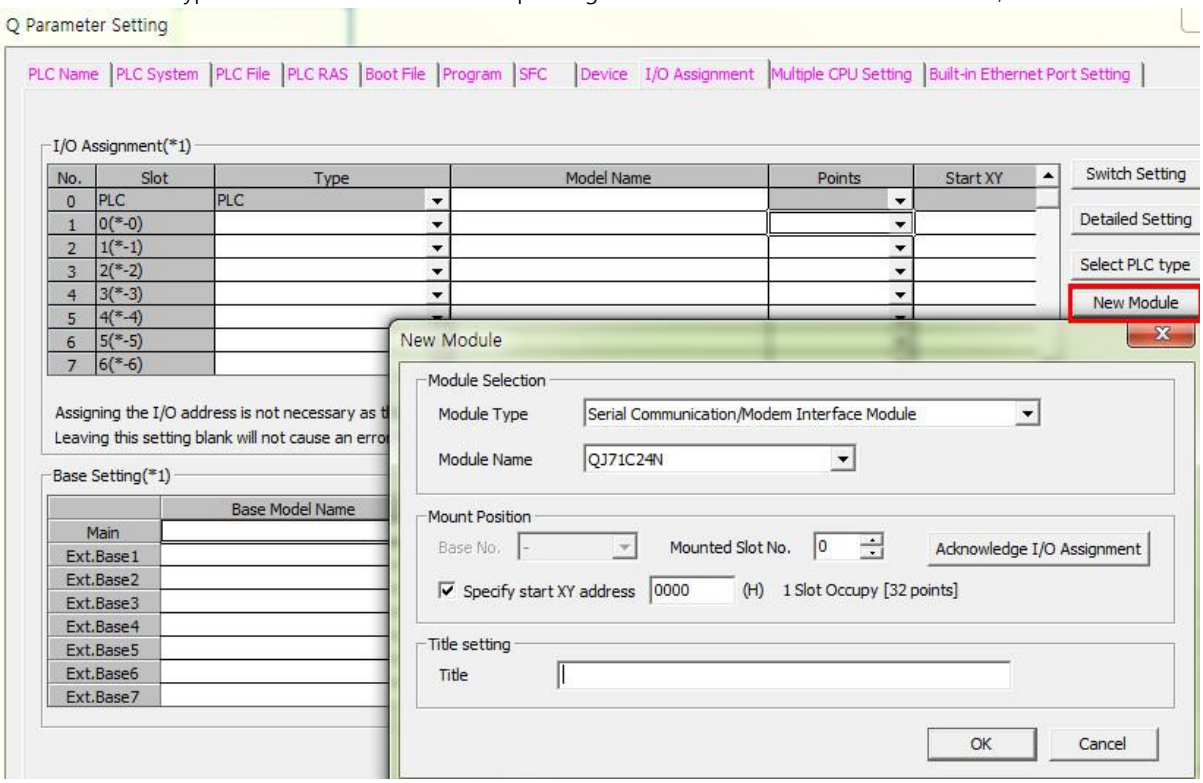
## 4.2 Setting in GX Works2

**Step 1.** Double-click [Parameter] > [PLC parameter] in the "GX Works2" project window to pop-up the [Q parameter setting] Dialog Box.

**Step 2.** Select the [I/O Assignment] tab in the [Q parameter setting] Dialog Box.

Click New Module in the [I/O Assignment(*)] box.

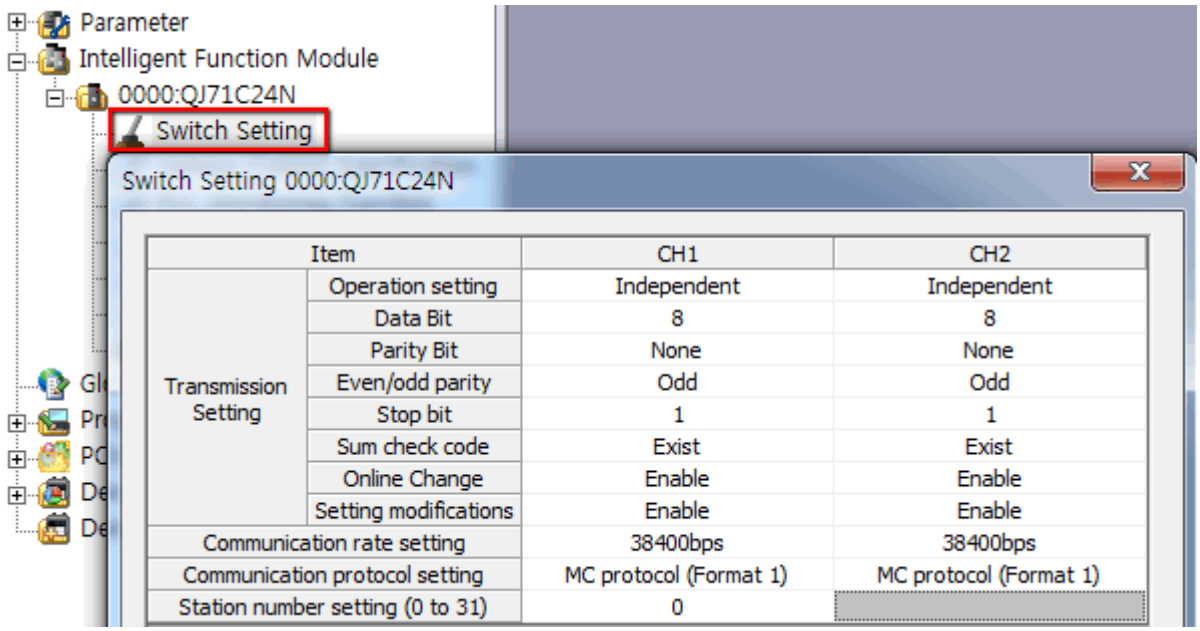
Set the Module type and Module name as a corresponding module in the Module selection window, and then click OK.




**Step 3.** Set each channel in the [Intelligent Function Module] > [Module Name] > Switch Setting window of the project window.

In general cases, select 38400 bps, MC protocol (Type 1) like CH1.

In case of requiring high-speed communication, select 115200 bps. MC protocol (Format 5) does not support RS485 communication.



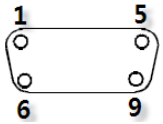
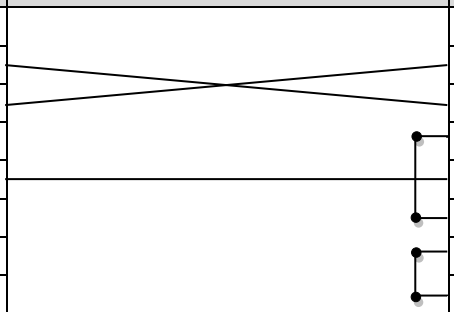
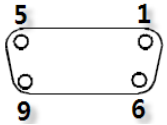

**Step 4.** Send the set parameters to [Online] > [Write to PLC], and reset the PLC.

# 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")

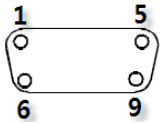
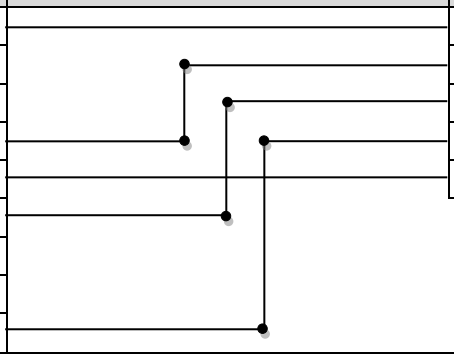
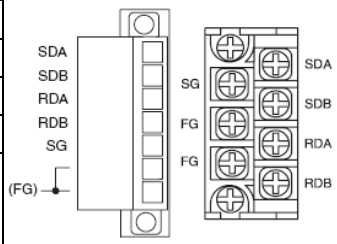
## 5.1. Cable table 1

■ **RS-232C** (1:1 connection)

| COM | | | Cable connection | PLC | | |
|---|---|---|---|---|---|---|
| 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 male (male, convex) |
| | RD | 2 | | 2 | RD | |
| | SD | 3 | | 3 | SD | |
| | DTR | 4 | | 4 | DTR | |
| | SG | 5 | | 5 | SG | |
| | DSR | 6 | | 6 | DSR | |
| | RTS | 7 | | 7 | RTS | |
| | CTS | 8 | | 8 | CTS | |
| | | 9 | | 9 | | |

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

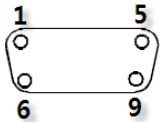
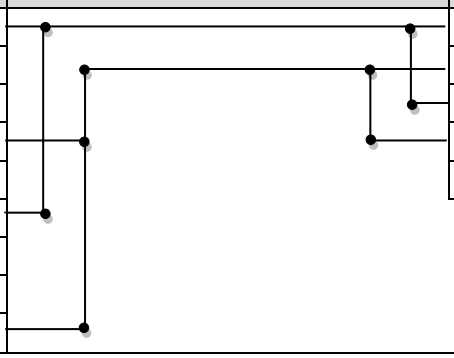
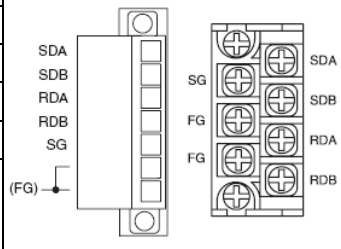
■ **RS-422** (1:1 connection)

| COM | | | Cable connection | PLC | |
|---|---|---|---|---|---|
| Pin arrangement*Note 1) | Signal name | Pin number | | Signal name | Pin arrangement |
|  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 | PLC | |
|---|---|---|---|---|---|
| Pin arrangement*Note 1) | Signal name | Pin number | | Signal name | Pin arrangement |
|  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-422** (1:N connection) – Refer to 1:1 connection to connect in the following way.

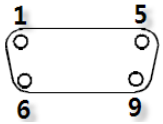
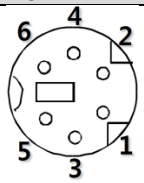
| TOP | Cable connection and signal direction | PLC | Cable connection and signal direction | PLC |
|---|---|---|---|---|
| Signal name | | Signal name | | Signal name |
| RDA | | SDA | | SDA |
| RDB | | SDB | | SDB |
| SDA | | RDA | | RDA |
| SDB | | RDB | | RDB |
| SG | | SG | | SG |

■ **RS-485** (1:N/N:1 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 |

## 5.2. Cable table 2

■ **RS-232C** (1:1 connection)

| COM1 / COM2 | | | Cable connection | PLC | | |
|---|---|---|---|---|---|---|
| Pin arrangement*Note 1) | Signal name | Pin number | | Pin number | Signal name | Pin arrangement*Note 1) |
|  | CD | 1 | | 1 | RD |  |
| | RD | 2 | | 2 | SD | |
| | SD | 3 | | 3 | SG | |
| | DTR | 4 | | 4 | | |
| | SG | 5 | | 5 | DSR | |
| | DSR | 6 | | 6 | DTR | |
| | RTS | 7 | | | | |
| | CTS | 8 | | | | |
| | | 9 | | | | |
| Based on communication cable connector front, D-SUB 9 Pin male (male, convex) | | | | | | Based on communication cable connector front, D-SUB 6 Pin male (male, convex) |

*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 | Bit Address | Word Address | Word Address NOTE | 32 BIT |
|---|---|---|---|---|
| Input Relay | X0000 ~ X1FFF (HEX) | X0000 ~ X1FF0 (HEX) | X***0 *Note 1) | L/H *Note 3) |
| Output Relay | Y0000 ~ Y1FFF (HEX) | Y0000 ~ Y1FF0 (HEX) | Y***0 *Note 1) | |
| Internal Relay | M0000 ~ M61439 | M0000 ~ M61424 | M0000 + 16*n *Note 2) | |
| Special Relay | SM0000 ~ SM2047 | SM0000 ~ SM2032 | SM0000 + 16*n *Note 2) | |
| Latch Relay | L0000 ~ L32767 | L0000 ~ L32752 | L0000 + 16*n *Note 2) | |
| Annunciator | F0000 ~ F32767 | F0000 ~ F32752 | F0000 + 16*n *Note 2) | |
| Edge Relay | V0000 ~ V32767 | V0000 ~ V32752 | V0000 + 16*n *Note 2) | |
| Step Relay | S0000 ~ S8191 | S0000 ~ S8176 | S0000 + 16*n *Note 2) | |
| Link Relay | B0000 ~ BEFFF (HEX) | B0000 ~BEFF0 (HEX) | B***0 *Note 1) | |
| Special Link Relay | SB0000 ~ SB7FF0 (HEX) | SB0000 ~ SB7FF0 (HEX) | SB***0 *Note 1) | |
| Timer (contact) | TS00000 ~ TS25471 | TS00000 ~ TS25456 | | |
| Timer (coil) | TC00000 ~ TC25471 | TC00000 ~ TC25456 | | |
| Aggregate Timer (contact) | SS00000 ~ SS25471 | SS00000 ~ SS25456 | | |
| Aggregate Timer (coil) | SC00000 ~ SC25471 | SC00000 ~ SC25456 | | |
| Counter (contact) | CS00000 ~ CS25471 | CS00000 ~ CS25456 | | |
| Counter (coil) | CC00000 ~ CC25471 | CC00000 ~ CC25456 | | |
| Timer (current value) | TN00000.0 ~ TN25471.15 | TN00000 ~ TN25471 | | |
| Aggregate Timer (current value) | SN00000.0 ~ SN25471.15 | SN00000 ~ SN25471 | | |
| Counter (current value) | CN00000.0 ~CN25471.15 | CN00000 ~ CN25471 | | |
| Data Register | D0000000.0 ~ D4212223.15 | D0000000 ~ D4212223 | Binary Protocol | |
| | D000000.0 ~ D999999.15 | D000000 ~ D999999 | ASCII Protocol | |
| Special Data Register | SD0000.0 ~ SD2255.15 | SD0000 ~ SD2255 | | |
| Link Register | W000000.0 ~ W4045FF.F | W000000 ~ W4045FF | | |
| Link Special | SW0000.0 ~ SW7FFF.F | SW0000 ~ SW7FFF | | |
| Index | Z00.0 ~ Z19.15 | Z00 ~ Z19 | | |
| File Register | | Custom range | | |

*Note 1) For bit addresses with hexadecimal "0~F" notations, use the initial 0 bit as the word address

*Note 2) When using a bit address that uses decimals, use a word address in units of "16"

*Note 3) The lower 16 BIT data of 32 BIT data is saved in the address whose screen has been registered, and the upper 16 BIT 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 | D00100 | D00101 |
| Input data (hexadecimal) | 12345678 | 5678 | 1234 |