

# MITSUBISHI Electric Corporation

## MELSEC A Series

### Computer Link 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".

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Describes the devices required for connection, settings for 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. External device setting** [Page 9](#)

Describes how to set up communication for external devices.

### **5. Cable table** [Page 13](#)

Describes the cable specifications required for connection.

### **6. Supported addresses** [Page 15](#)

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

# 1. System configuration

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

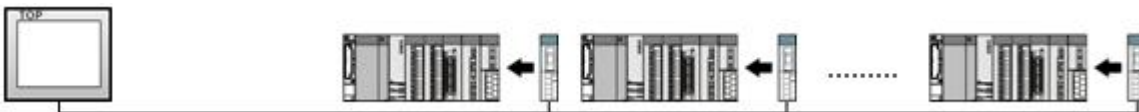
Series	CPU	Link I/F	Communication method	System setting	Cable
MELSEC-A	A1N A2N A2N-S1 A3N	AJ71C24 AJ71C24-S3 AJ71C24-S6 AJ71C24-S8	RS-232C RS-422 ( 4 wire )	3. TOP communication setting 4.1 External device setting 1	5.1. Cable table 1
	A3N	AJ71UC24	RS-232C RS-422 ( 4 wire )		
	A1S A1SJ A1SJH A1SH A2SH	A1SJ71C24-R2 A1SJ71UC24-R2 A1SJ71C24-R4 A1SJ71UC24-R4	RS-232C RS-422 ( 4 wire )	3. TOP communication setting 4.2 External device setting 2	5.2. Cable table 2
	A0J2 A0J2H	A0J2-C214-S1	RS-422 ( 4 wire )	3. TOP communication setting 4.3 External device setting 3	
	A2CCPUC24	CPU built-in Link Port	RS-232C	3. TOP communication setting 4.4 External device setting 4	

## ■ Connection configuration

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

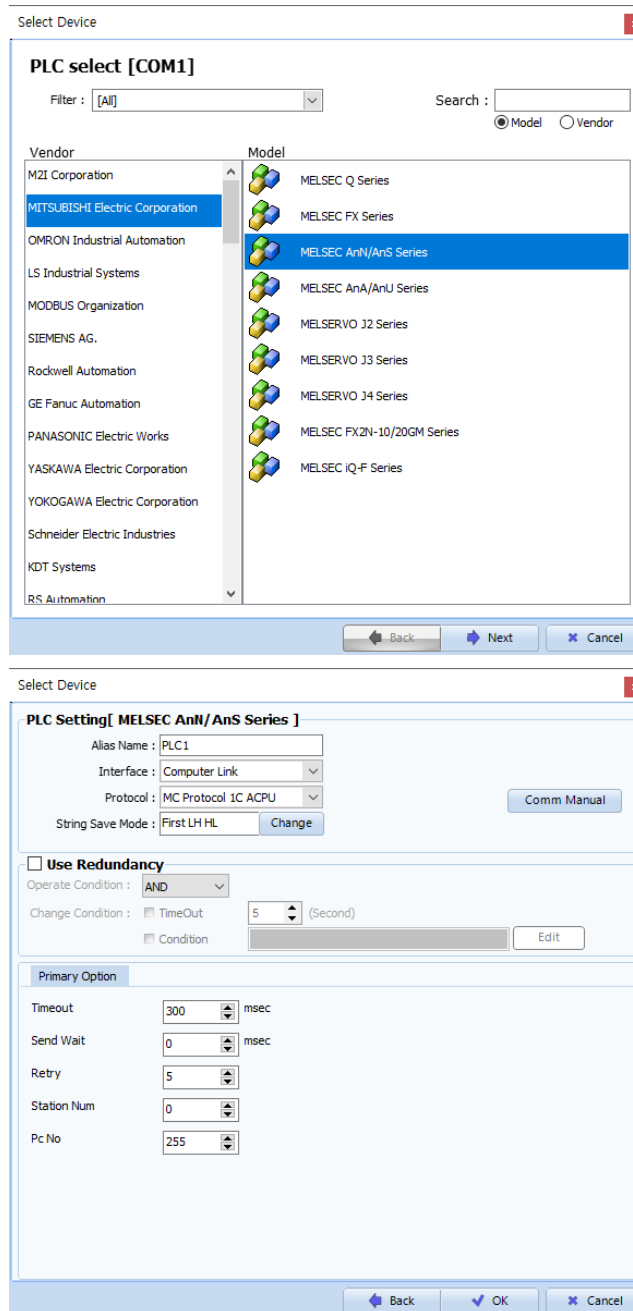


- 1:N (one TOP and multiple external devices) connection – configuration which is possible in RS422/485 communication.



## 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. Please select "MITSUBISHI Electric Corporation".					
	PLC	Select an external device to connect to TOP. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Model</th> <th>Interface</th> <th>Protocol</th> </tr> </thead> <tbody> <tr> <td>MELSEC A Series</td> <td>Computer Link</td> <td>MC Protocol 1C ACPU</td> </tr> </tbody> </table> <p><b>Supported Protocol</b></p> <p>MC Protocol 1C Format 1</p> <p>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.</p>	Model	Interface	Protocol	MELSEC A Series	Computer Link
Model	Interface	Protocol					
MELSEC A Series	Computer Link	MC Protocol 1C ACPU					

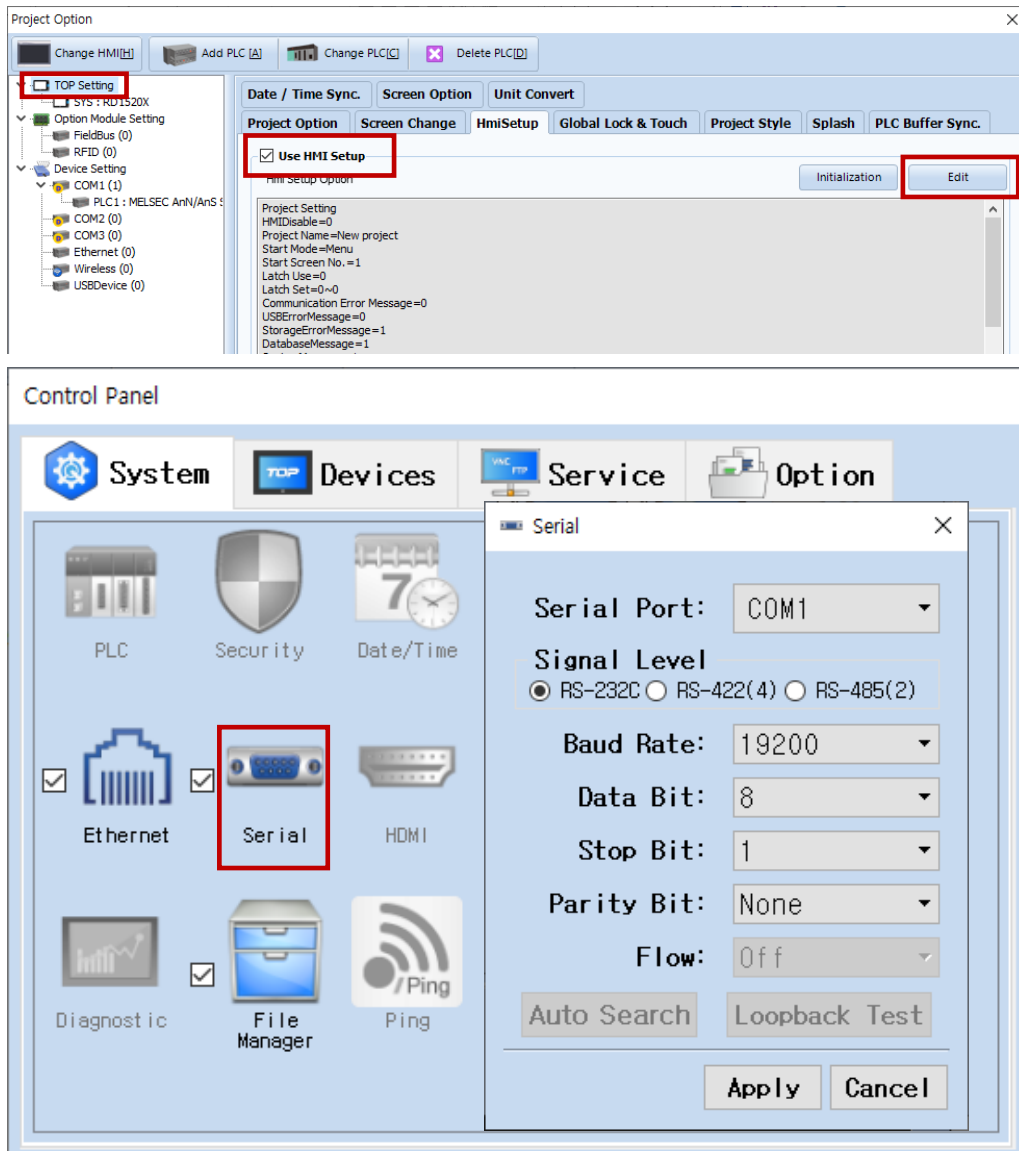
### 3. TOP communication setting

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 properties > TOP settings] → [Project option > Check "Use HMI settings" > Edit > Serial ]
- Set the TOP communication interface in TOP Design Studio.



Items	TOP		External device	Remarks
Signal Level (port)	RS-232C	RS-422	RS-232C RS-422	
Baud Rate	19200			
Data Bit	8			
Stop Bit	1			
Parity Bit	None.			

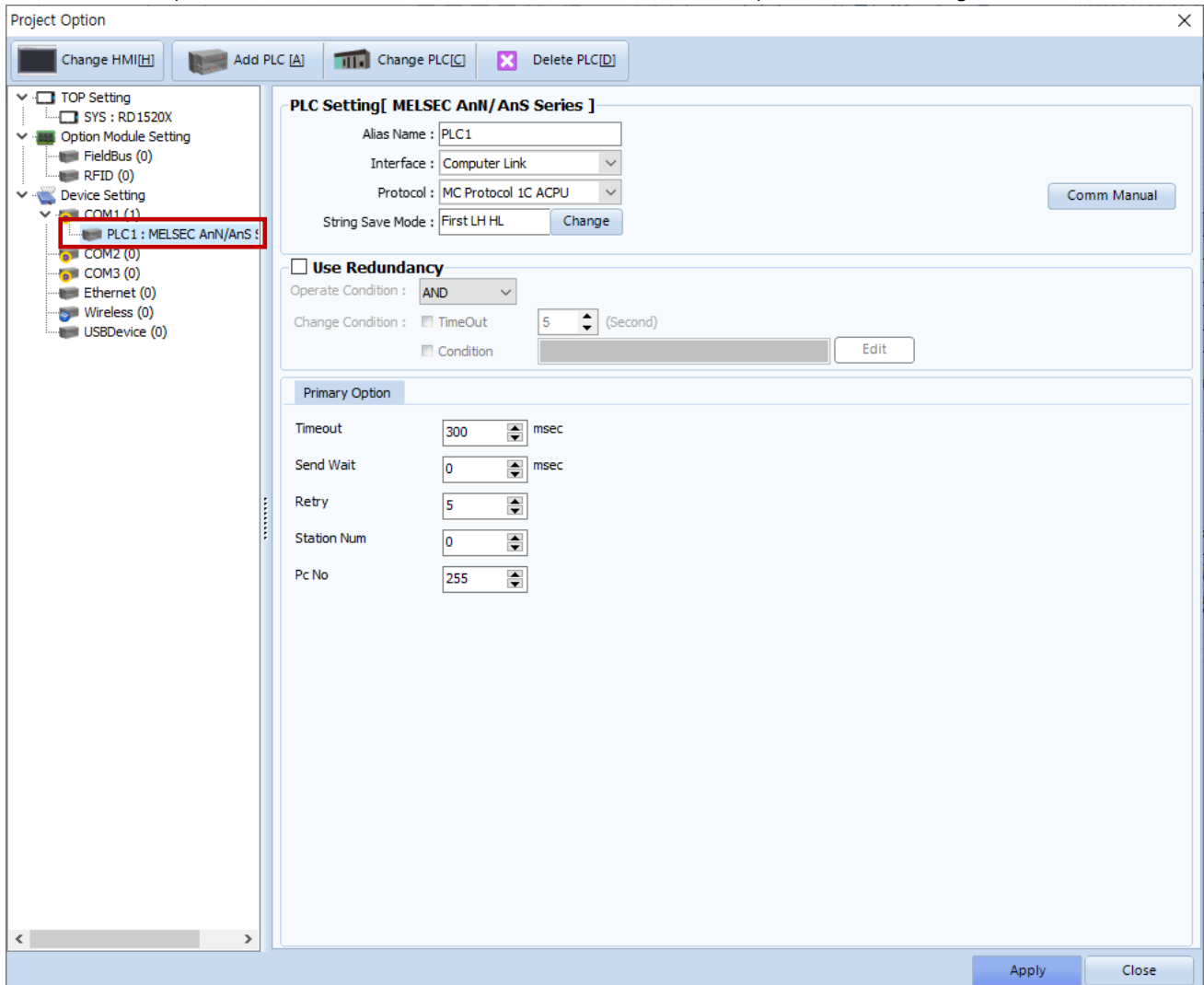
\* The above settings are examples recommended by the company.

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 properties > PLC settings > COM > "PLC1 : MELSEC-A Series"]

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



Items	Settings	Remarks
Interface	Select "Computer Link".	<a href="#">Refer to "2. External device selection".</a>
Protocol	Select "MC Protocol 1C ACPU".	
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.	
Station Num	Enter the prefix of an external device.	
PC No	Set the prefix of TOP.	

### 3.2. Communication setting in TOP

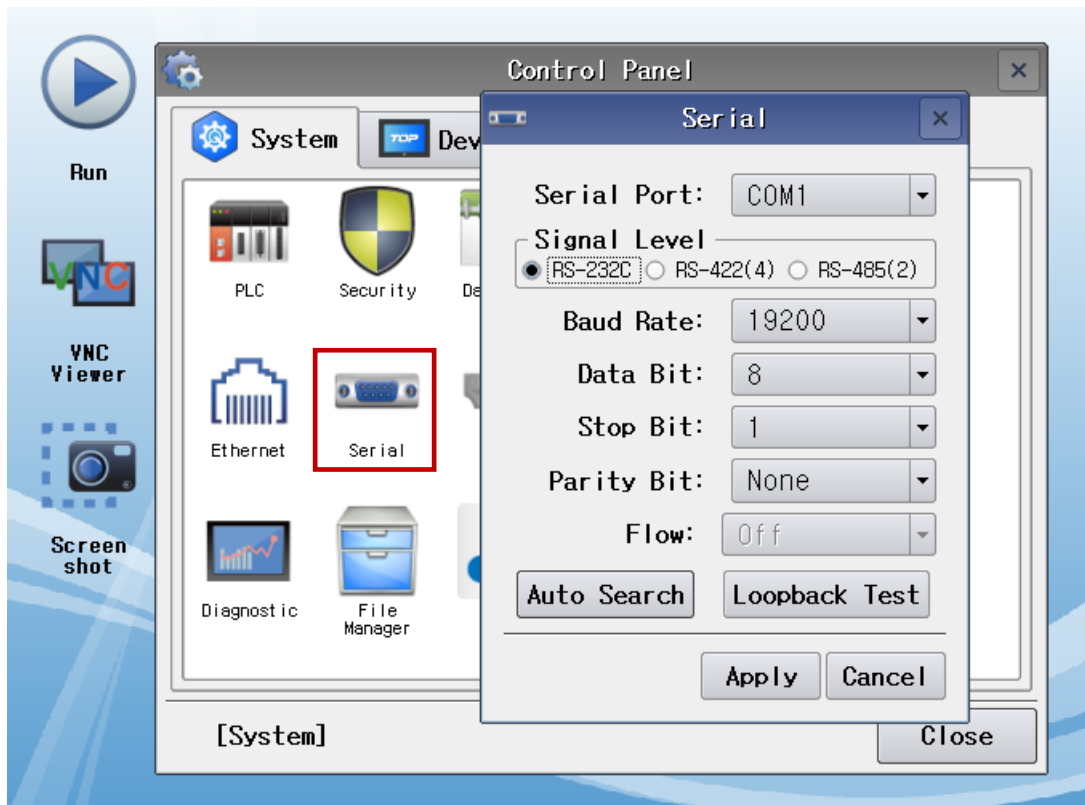
\* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- 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 ]



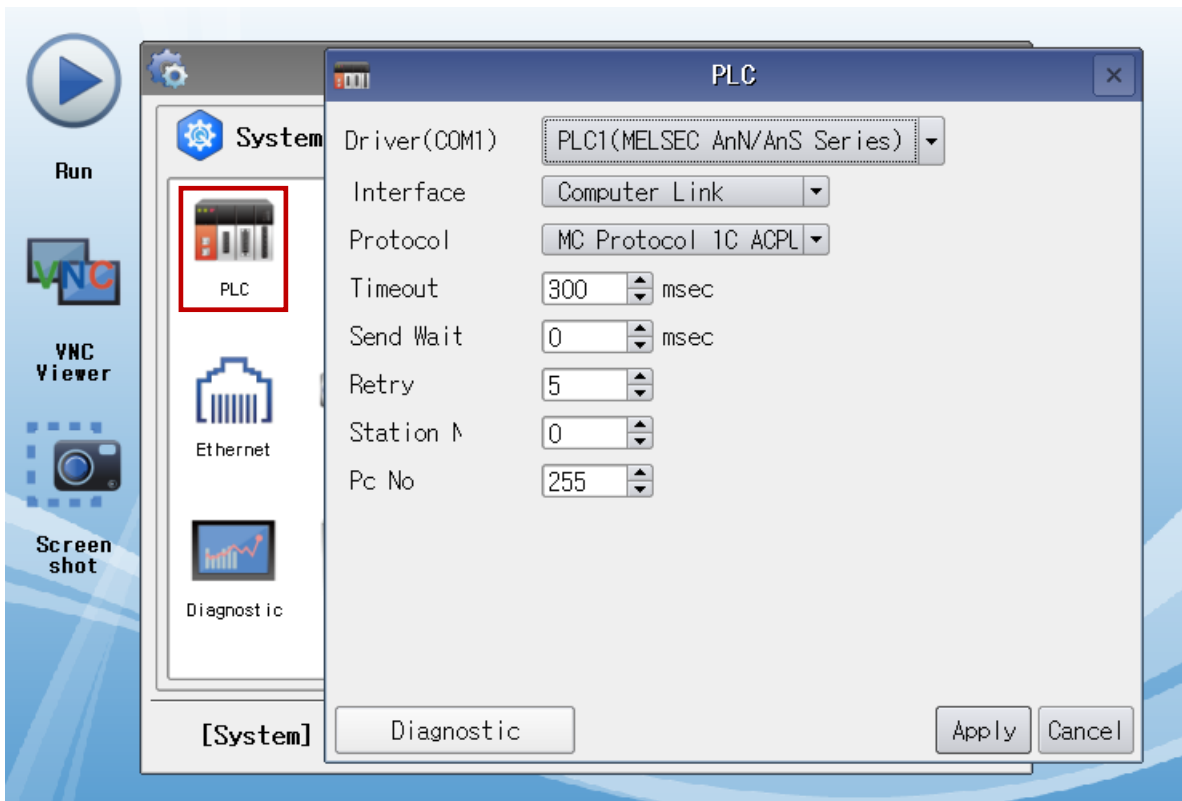
Items	TOP		External device	Remarks
Signal Level (port)	RS-232C	RS-422	RS-232C RS-422	
Baud Rate	19200			
Data Bit	8			
Stop Bit	1			
Parity Bit	None.			

\* 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 "Computer Link".	<a href="#">Refer to "2. External device selection".</a>
Protocol	Select "MC Protocol 1C ACPU".	
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.	
Station Num	Enter the prefix of an external device.	
PC No	Set the prefix of TOP.	

### 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.

<b>OK</b>	<b>Communication setting normal</b>
<b>Time Out Error</b>	<b>Communication setting abnormal</b> - Check the cable, TOP, and external device setting status. <b>(Reference: Communication diagnostics sheet)</b>

- 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	<a href="#">1. System configuration</a>	
	Connection cable name	OK	NG		
TOP	Version information	OK	NG	<a href="#">2. External device selection</a> <a href="#">3. Communication setting</a>	
	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	<a href="#">4. External device setting</a>	
	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	<a href="#">6. Supported addresses</a> (For details, please refer to the PLC vendor's manual.)		



## 4. External device setting

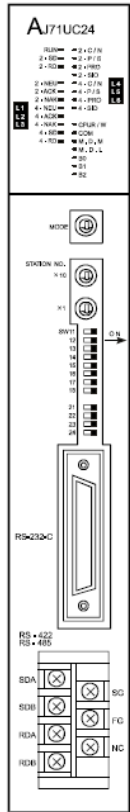
### 4.1 External device setting 1 (AJ71C24, AJ71UC24)

Configure the communication settings using the DIP Switch of the serial communication unit. For a more detailed setting method than that described in this example, refer to the PLC user manual.



Serial communication unit's RUN LED must be ON for communication to be possible.

#### AJ71UC24



**Step 1.** Configure the communication protocol format by configuring the Mode Setting Rotary Switch as shown below.

Signal Level	Settings	Settings
RS-232C	1	Protocol mode format 1
RS-422	5	Protocol mode format 1

\* Use switch settings 1 and 5 for RS-232C and RS-422, respectively

**Step 2.** Configure the communication setting for the Dip Switch.

#### ■ AJ71C24

DIP Switch	Settings	ON			OFF		Setting example *Note 1)	
SW11	Select communication channel	RS-422			RS-232C		OFF	
SW12	Data bit configuration	8			7		ON	
SW13	Transmission speed configuration	2400	4800	9600	19200	Not used		
		ON	OFF	ON	OFF	ON		OFF
		ON	OFF	OFF	ON	ON		ON
SW14		ON	OFF	OFF	ON	ON	ON	
SW15		OFF	ON	ON	ON	ON	ON	
SW16	Parity bit configuration	Valid			Null		OFF	
SW17	Parity bit configuration	Even			Odd		OFF	
SW18	Stop bit configuration	2			1		OFF	
SW21	BCC configuration	Valid			Null		ON	
SW22	WRITE configuration during RUN	Yes			No		ON	
SW23	Transmission-side terminal resistance	Valid			Null		OFF	
SW24	Reception-side terminal resistance	Valid			Null		OFF	

\*Note 1) Settings: Signal "RS-232C" / Speed "19200bps" / Data "8bit" / Stop "1bit" / Parity "None"

#### ■ AJ71C24

DIP Switch	Settings	ON			OFF		Setting example *Note 1)	
SW11	Select communication channel	RS-422			RS-232C		OFF	
SW12	Data bit configuration	8			7		ON	
SW13	Transmission speed configuration	2400	4800	9600	19200	Not used		
		ON	OFF	ON	OFF	ON		OFF
		ON	OFF	OFF	ON	ON		ON
SW14		ON	OFF	OFF	ON	ON	ON	
SW15		OFF	ON	ON	ON	ON	ON	
SW16	Parity bit configuration	Valid			Null		OFF	
SW17	Parity bit configuration	Even			Odd		OFF	
SW18	Stop bit configuration	2			1		OFF	
SW21	BCC configuration	Valid			Null		ON	
SW22	WRITE configuration during RUN	Yes			No		ON	
SW23	Calculator link	Computer Link			Multiple Drop Link		ON	
SW24	Not used							

\*Note 1) Settings: Signal "RS-232C" / Speed "19200bps" / Data "8bit" / Stop "1bit" / Parity "None"

**Step 3.** Configure the communication card prefix by configuring the Station Setting Rotary Switch as shown below.

Station Setting Rotary Switch		Settings
X10	0	Configure serial communication card prefix as "0"
X1	0	

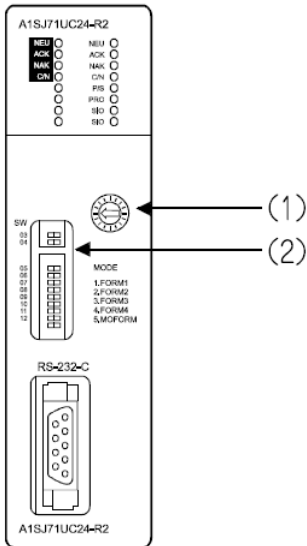
**Step 4.** Restart the power after configuring the Dip Switch.

## 4.2 External device setting 2 (A1SJ71C24, A1SJ71UC24)

Configure the communication settings using the DIP Switch of the serial communication unit. For a more detailed setting method than that described in this example, refer to the PLC user manual.



Serial communication unit's RUN LED must be ON for communication to be possible.



**Step 1.** Configure the communication protocol format by configuring the Mode Setting Rotary Switch as shown below.

Signal Level	Settings	Settings
RS-232C	1	Protocol mode format 1
RS-422	5	Protocol mode format 1

\* Use switch settings 1 and 5 for RS-232C and RS-422, respectively

**Step 2.** Configure the communication setting for the Dip Switch as shown below.

DIP Switch	Settings	ON	OFF	Setting example *Note 1)			
SW01	Not used						
SW02	Calculator link	Computer Link	Multiple Drop Link	ON			
SW03	Not used						
SW04	WRITE configuration during RUN	Yes	No	ON			
SW05	Transmission speed configuration	2400	4800	9600	19200	Not used	
		ON	OFF	ON	OFF	ON	OFF
		ON	OFF	OFF	ON	ON	ON
		OFF	ON	ON	ON	ON	ON
SW08	Data bit configuration	8	7	ON			
SW09	Parity bit configuration	Valid	Null	OFF			
SW10	Parity bit configuration	Even	Odd	OFF			
SW11	Stop bit configuration	2	1	OFF			
SW12	BCC configuration	Valid	Null	ON			

\*Note 1) Setting contents: signal "RS-422" / speed "19200bps" / data "8bit" / stop "1bit" / parity "none"

**Step 3.** Configure the communication card prefix by configuring the Station Setting Rotary Switch as shown below.

Station Setting Rotary Switch	Settings
X10	0
X1	0

Configure serial communication card prefix as "0"

**Step 4.** Restart the power after configuring the Dip Switch.

### 4.3 External device setting 3 (A0J2-C214-S1)

Configure the communication settings using the DIP Switch of the serial communication unit. For a more detailed setting method than that described in this example, refer to the PLC user manual.



Serial communication unit's RUN LED must be ON for communication to be possible.

**Step 1.** Set the Mode Setting Rotary Switch as follows to set the communication protocol type.

Signal level	Settings	Settings
RS-422	5	Protocol mode format 1

**Step 2.** Set the communication setting dip switch as follows.

DIP Switch	Settings	ON			OFF		Setting example *Note 1)
SW10	Calculator link	Computer Link			Multiple Drop Link		ON
SW11	Select Channel	RS-422			RS-232C		ON
SW12	WRITE configuration during RUN	Yes			No		ON
	Transmission speed configuration	2400	4800	9600	19200	Not used	
SW13		ON	OFF	ON	OFF	ON	OFF
SW14		ON	OFF	OFF	ON	ON	ON
SW15		OFF	ON	ON	ON	ON	ON
SW16	Data bit configuration	8			7		ON
SW17	Parity bit configuration	Valid			Null		OFF
SW18	Parity bit configuration	Even			Odd		OFF
SW19	Stop bit configuration	2			1		OFF
SW20	BCC configuration	Valid			Null		ON

\*Note 1) Setting contents: signal "RS-422" / speed "19200bps" / data "8bit" / stop "1bit" / parity "none"

**Step 3.** Set the terminating resistance dip switch as follows.

DIP Switch	Settings	ON	OFF	Recommend
SW21	Not used			OFF
SW22	Transmission-side terminal resistance	Valid	Null	OFF
SW23	Reception-side terminal resistance	Valid	Null	OFF

**Step 4.** Set the station setting rotary switch as follows to set the station number of the communication card.

Station Setting Rotary Switch		Settings
X10	0	Configure serial communication card prefix as "0"
X1	0	

**Step 5.** After setting the dip switch, reset the power.

### 4.4 External device setting 4 (A2CCPUC24 CPU built-in Link port)

Configure the communication settings using the DIP Switch of the serial communication unit. For a more detailed setting method than that described in this example, refer to the PLC user manual.



Serial communication unit's RUN LED must be ON for communication to be possible.

**Step 1.** Set the Mode Setting Rotary Switch as follows to set the communication protocol type.

Signal level	Settings	Settings
RS-232C	1	Protocol mode format 1

**Step 2.** Configure the communication setting for the Dip Switch as shown below.

DIP Switch	Settings	ON			OFF		Setting example <i>*Note 1)</i>
		2400	4800	9600	19200	Not used	
	Transmission speed configuration						
SW11		ON	OFF	ON	OFF	ON	OFF
SW12		ON	OFF	OFF	ON	ON	ON
SW13		OFF	ON	ON	ON	ON	ON
SW14	Data bit configuration	8			7		ON
SW15	Parity bit configuration	Valid			Null		OFF
SW16	Parity bit configuration	Even			Odd		OFF
SW17	Stop bit configuration	2			1		OFF
SW18	BCC configuration	Valid			Null		ON
SW19	Select a main channel.						ON
SW20	WRITE configuration during RUN	Yes			No		OFF

**\*Note 1)** Settings: Signal "RS-232C" / Speed "19200bps" / Data "8bit" / Stop "1bit" / Parity "None"

**Step 3.** Set the station setting rotary switch as follows to set the station number of the communication card.

Station Setting Rotary Switch		Settings
X10	0	Configure serial communication card prefix as "0"
X1	0	

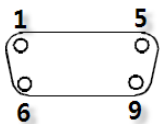
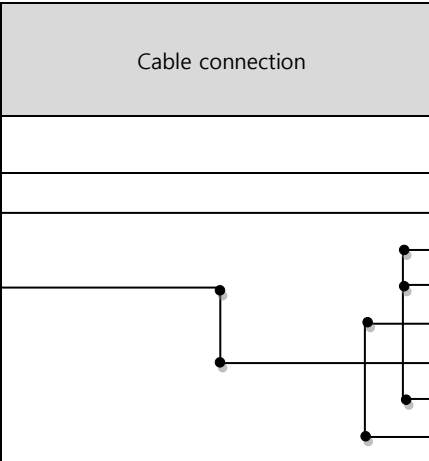
**Step 4.** After setting the dip switch, reset the power.

## 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")

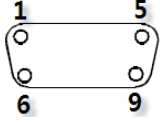
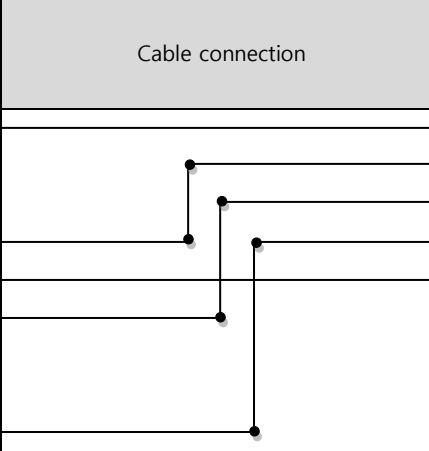
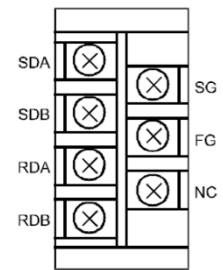
### 5.1 Cable table 1 (AJ71C24, AJ71UC24)

#### ■ RS-232C (1:1 connection)

COM			Cable connection	PLC		
Pin arrangement* <b>Note 1)</b>	Signal name	Pin number		Pin number	Signal name	Pin arrangement* <b>Note 1)</b>
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	CD	1		1	FG	Based on communication cable connector front, D-SUB 25 Pin male (male, convex)
	RD	2		2	SD	
	SD	3		3	RD	
	DTR	4		4	RTS	
	SG	5		5	CTS	
	DSR	6		6	DSR	
	RTS	7		7	SG	
	CTS	8		8	CD	
		9		9	20	

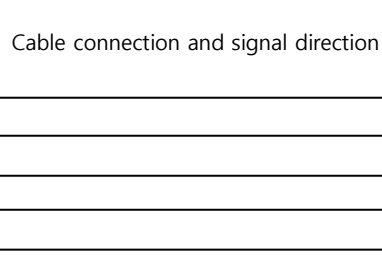
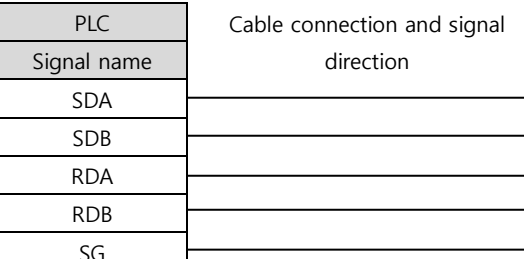
\***Note 1)** The pin arrangement is as seen from the connecting side of the cable connection connector.

#### ■ RS-422 (1:1 connection)

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

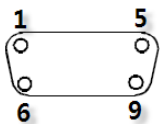
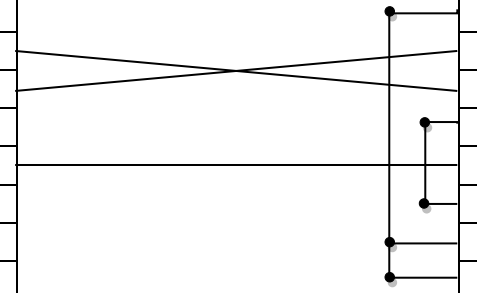
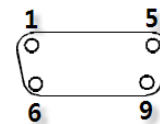
\***Note 1)** The pin arrangement is as seen from the connecting side of the cable connection connector.

#### ■ 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

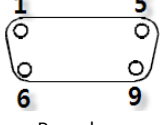
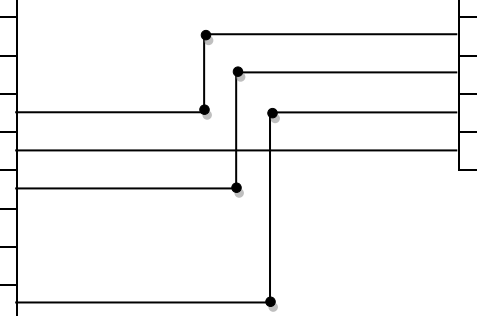
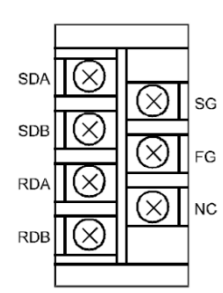
## 5.2 Cable table 2 (A1SJ71C24, A1SJ71UC24, A0J2-C214-S1, A2CCPUC24)

### ■ RS-232C (1:1 connection)

COM			Cable connection	PLC		
Pin arrangement* <b>Note 1)</b>	Signal name	Pin number		Pin number	Signal name	Pin arrangement* <b>Note 1)</b>
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	CD	1		1	CD	 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>
	SD	2		2	RD	
	RD	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* <b>Note 1)</b>	Signal name	Pin number		Signal name	Pin arrangement
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	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

## 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	-		
Timer (coil)	TC00000 ~ TC25471	-		
Counter (contact)	CS00000 ~ CS25471	-		
Counter (coil)	CC00000 ~ CC25471	-		
Timer (current value)	-	TN00000 ~ TN25471		
Counter (current value)	-	CN00000 ~ CN25471		
Data Register	D0000000.0 ~ D4212223.15	D0000000 ~ D4212223	Binary Protocol	
	D000000.0 ~ D999999.15	D000000 ~ D999999	ASCII Protocol	
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	D00101
Input data (hexadecimal)	12345678	5678	1234