MITSUBISHI Electric Corporation

MELSEC AnA/AnU 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".

1. System configuration

The system configuration of TOP and "MITSUBISHI Electric Corporation - MELSEC AnA/AnU Computer Link" is as follows:

Series	CPU	Link I/F	Communication method	System setting	Cable
MELSEC-AnA/AnU	A2ACPU A2ACPU-S1 A3ACPU A2UCPU A2UCPU-S1 A3UCPU A4UCPU	AJ71C24-S6 AJ71C24-S8	RS-232C	3. TOP communication setting 4.1. External device setting 1	5.1. Cable table 1
			RS-422 (4 wire)		
		AJ71UC24	RS-232C		
			RS-422 (4 wire)		
	A2USCPU A2USHCPU-S1	A1SJ71C24-R2 A1SJ71UC24-R2	RS-232C	3. TOP communication setting 4.2. External device setting 2	5.2. Cable table 2
		A1SJ71C24-R4 A1SJ71UC24-R4	RS-422 (4 wire)		

■ Connection configuration

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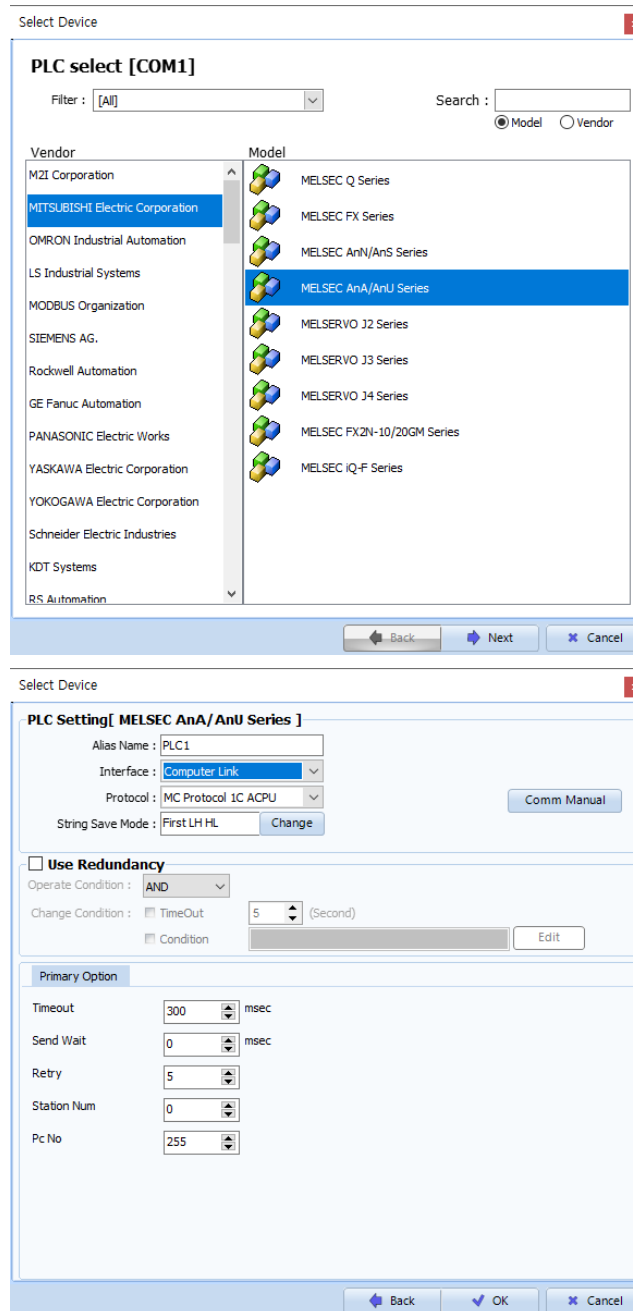

· 1:N (one TOP and multiple external devices) connection – configuration which is possible in RS422/485 communication.
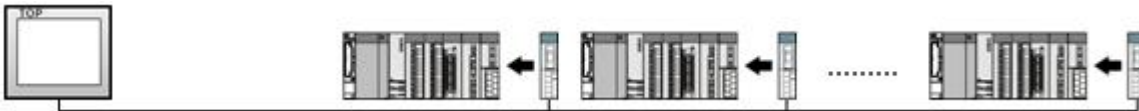
2. External device selection

■ 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.

Model	Interface	Protocol
MELSEC AnA/AnU Series	Computer Link	MC Protocol 1C ACPU

Supported Protocol
MC Protocol 1C Format 1

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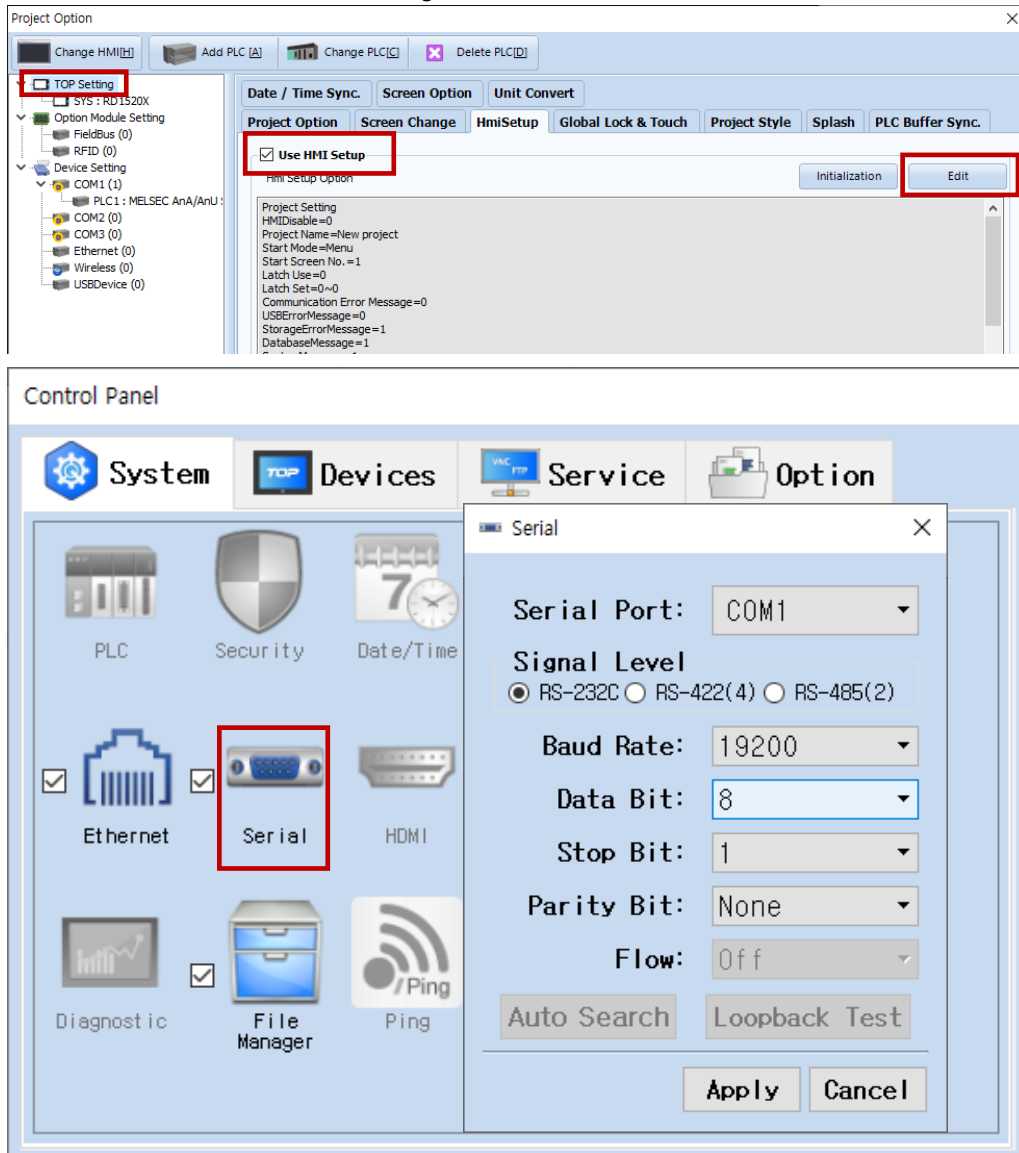
Items	TOP		External device	Remarks
Signal Level (port)	RS-232C	RS-422	RS-232C RS-422	
Baud Rate	19200			
Data Bit	8			
Stop Bit	1			
Parity Bit	None.			

* 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 Property > Device Setting > COM > "PLC1 : MELSEC-AnA/AnU Series"]

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

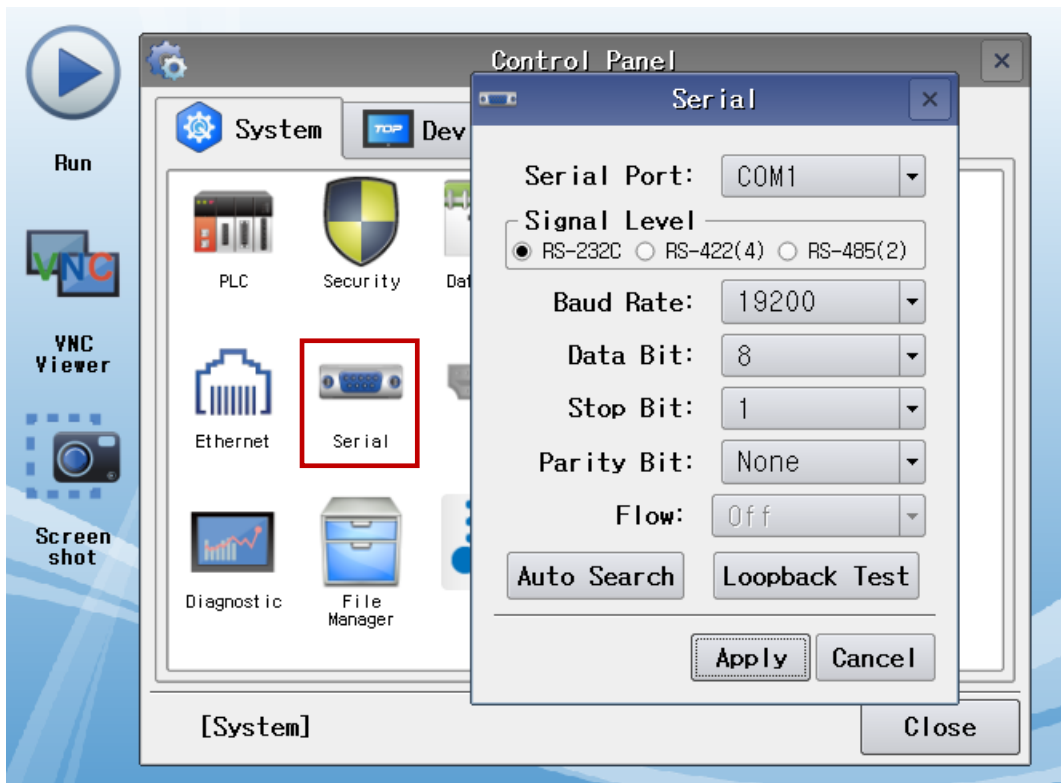| Items	Settings	Remarks
Interface	Select "Computer Link".	Refer to "2. External device selection".
Protocol	Select "MC Protocol 1C ACPU".	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from 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 <u>drag</u> 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".	Refer to "2. External device selection".
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 port (COM1/COM2) 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
	Port in use		OK	NG	3. Communication setting
	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

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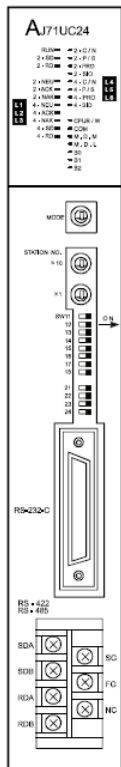
Step 1. Configure the communication protocol format by configuring the Mode Setting Rotary Switch as shown below.

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		Examples of setting *Note 1)
SW11	Select communication channel			RS-422		RS-232C		OFF
SW12	Data bit configuration			8		7		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	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"

■ **AJ71UC24**

DIP Switch	Settings			ON		OFF		Examples of setting *Note 1)
SW11	Select communication channel			RS-422		RS-232C		OFF
SW12	Data bit configuration			8		7		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	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.

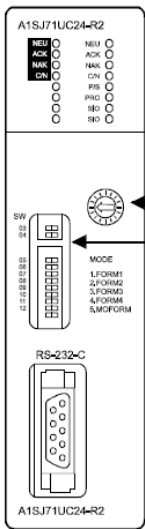| Station Setting Rotary Switch		Settings
X10	0	Configure serial communication card prefix as "0"
X1	0	

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	Examples of setting *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
	Transmission speed configuration	2400	4800	9600	19200	Not used	
SW05		ON	OFF	ON	OFF	ON	OFF
SW06		ON	OFF	OFF	ON	ON	ON
SW07		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) Settings: 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.

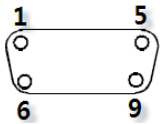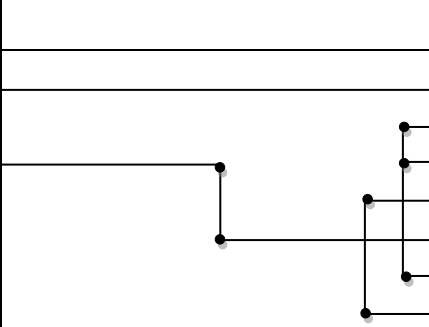| Station Setting Rotary Switch		Settings
X10	0	Configure serial communication card prefix as "0"
X1	0	

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

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")
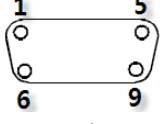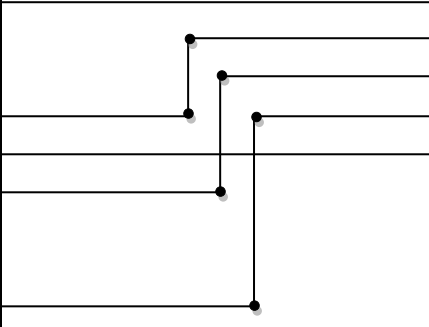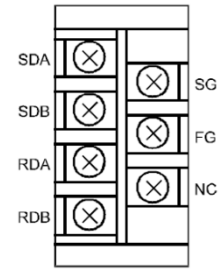
5.1 Cable table 1 (AJ71C24, AJ71UC24)

■ **RS-232C** (1:1 connection)

COM			Cable connection	PLC		
Pin arrangement*Note 1)	Signal name	Pin number		Pin number	Signal name	Pin arrangement*Note 1)
1 5 6 9 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	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		20	DTR	

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

■ **RS-422** (1:1 connection)

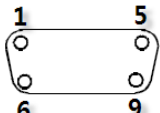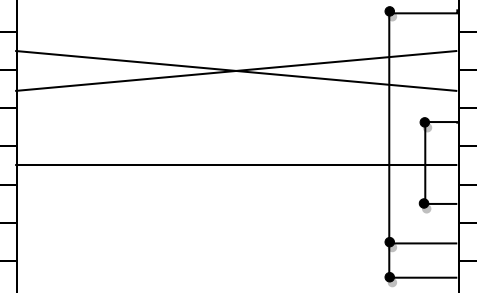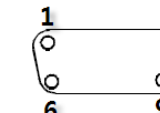| COM			Cable connection	PLC	
Pin arrangement*Note 1)	Signal name	Pin number		Signal name	Pin arrangement
1 5 6 9 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	RDA	1		SDA	SDA SG SDB FG RDA NC RDB
		2		SDB	
		3		RDA	
	RDB	4		RDB	
	SG	5		SG	
	SDA	6			
		7			
		8			
	SDB	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
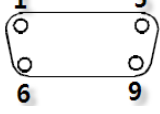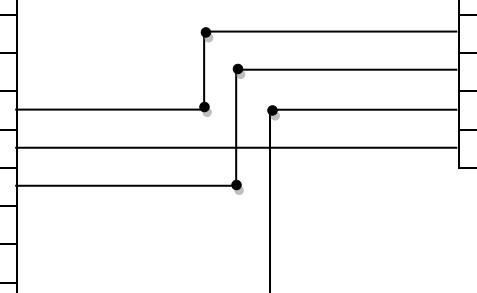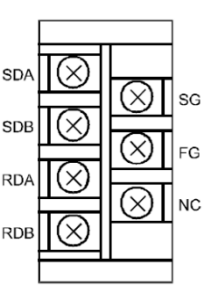
5.2 Cable table 2 (A1SJ71C24, A1SJ71UC24)

■ **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)
	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)

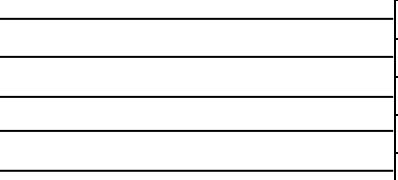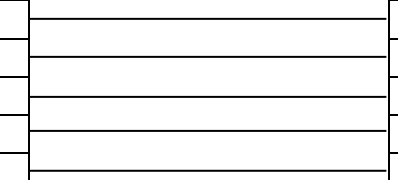| COM			Cable connection	PLC	
Pin arrangement*Note 1)	Signal name	Pin number		Signal name	Pin arrangement
Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	RDA	1		SDA	SDA ⊗ ⊗ SG
		2		SDB	SDB ⊗ ⊗ FG
		3		RDA	RDA ⊗ ⊗ NC
	RDB	4		RDB	RDB ⊗
	SG	5		SG	
	SDA	6			
		7			
		8			
	SDB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

Type	Remarks	Bit-designated address	Word-designated address
Input	Bit	X0000 – X1FFF	X0000 – X1FF0
Output	Bit	Y0000 – Y1FFF	Y0000 – Y1FF0
STEP relay	Bit	S0000 - S2047	
Special relay	Bit	F0000 – F2047	F0000 – F2032
LATCH relay	Bit	L0000 – L8191	
Internal relay	Bit	M0000 – M8191	M0000 – M8176
Special relay	Bit	M9000 - M9255	M9000 – M9240
Timer - Coil	Bit	TC000 - TC2047	
Timer - Contact	Bit	TS0000 – TS2047	
Timer-Current value	Word		TN000 – TN2047
Counter - Coil	Bit	CC000 – CC1023	
Counter - Contact	Bit	CS000 – CS1023	
Counter-Current value	Word		CN000 – CN1023
LINK relay	Bit	B0000 – B1FFF	B0000 – B1FFF
LINK register	Word	W0000.0 – W1FFF.F	W0000 – W1FFF
Data register	Word	D0000.0 – D8191.15	D0000 – D8191
Special register	Word	D9000.0 - D9255.15	D9000 - D9255