

YOKOGAWA Electric Corporation

FA-M3 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 [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. External device setting [Page 9](#)

Describes how to set up communication for external devices.

5. Cable table [Page 12](#)

Describes the cable specifications required for connection.

6. Supported addresses [16 page](#)

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

1. System configuration

The system configuration of TOP and "YOKOGAWA Electric Corporation – FA-M3 Series Computer Link" is as follows.

Series	CPU *Note 1)	Link I/F	Communication method	System setting	Cable
FA-M3	F3SP□□-□N F3SP□□-□H F3SP□□-□S	Programmer Port on the CPU	RS-232C	3. TOP communication setting 4.1. External device setting 1	5.1. Cable table 1
		F3LC11-1F F3LC12-1F F3LC11-1N	RS-232C	3. TOP communication setting 4.2. External device setting 2	5.2. Cable table 2
		F3LC11-2N	RS-422/485	3. TOP communication setting 4.2. External device setting 2	5.3. Cable table 3
		F3LC11-2F	RS-422/485	3. TOP communication setting 4.3 External device setting 3	

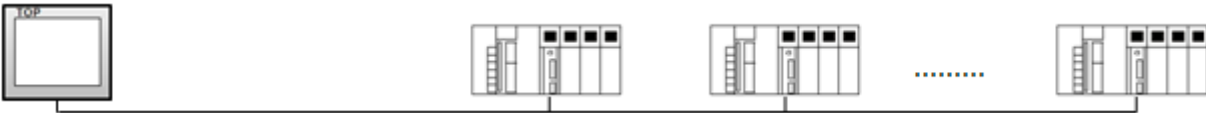
*Note 1) □ The number according to the model name is substituted for the symbol.

■ Connection configuration

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

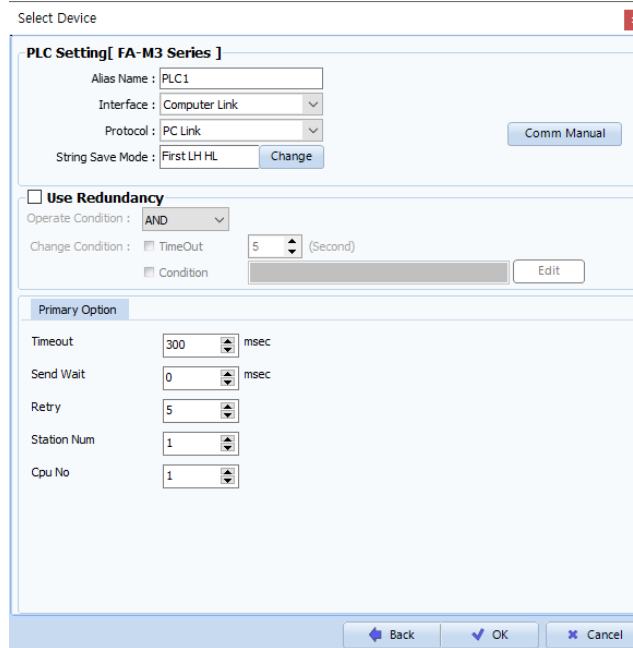
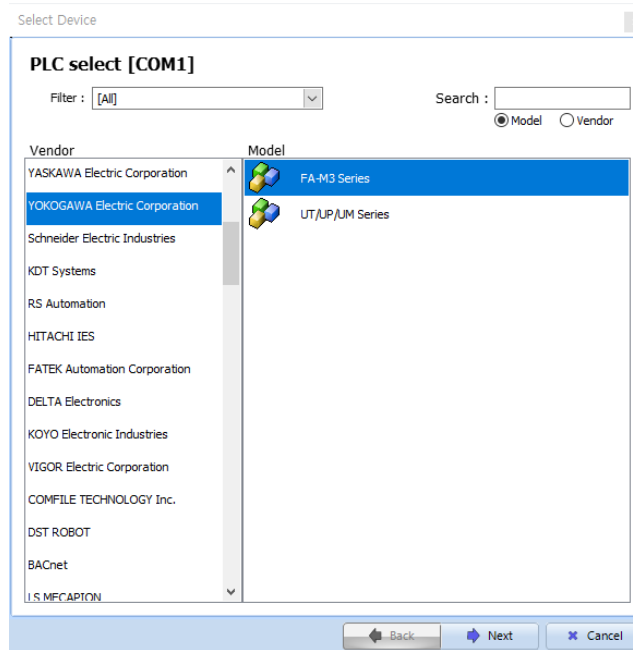


- 1:N (one TOP and multiple external devices) connection – configuration which is possible in RS422 communication.



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 "YOKOGAWA Electric Corporation".					
	PLC	Select an external device to connect to TOP. <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th>Model</th> <th>Interface</th> <th>Protocol</th> </tr> </thead> <tbody> <tr> <td>FA-M3 Series</td> <td>Computer Link</td> <td>PC Link</td> </tr> </tbody> </table> <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	FA-M3 Series	Computer Link
Model	Interface	Protocol					
FA-M3 Series	Computer Link	PC Link					

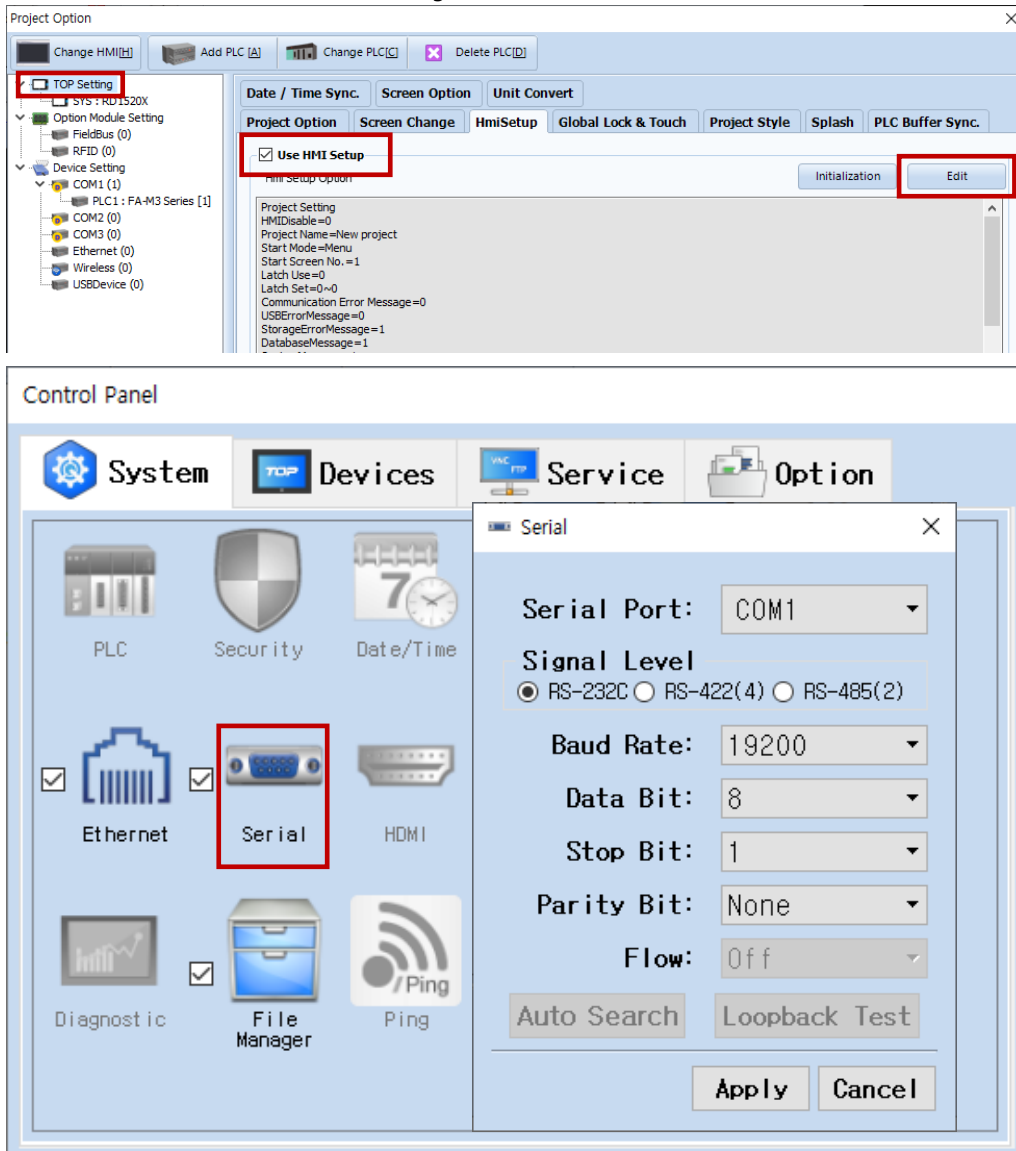
3. TOP communication setting

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
	RS-232C	RS-422	RS-485		
Signal Level (port)	RS-232C	RS-422	RS-485	RS-232C RS-422/485	
Baud Rate	19200				
Data Bit	8				
Stop Bit	1				
Parity Bit	None.				

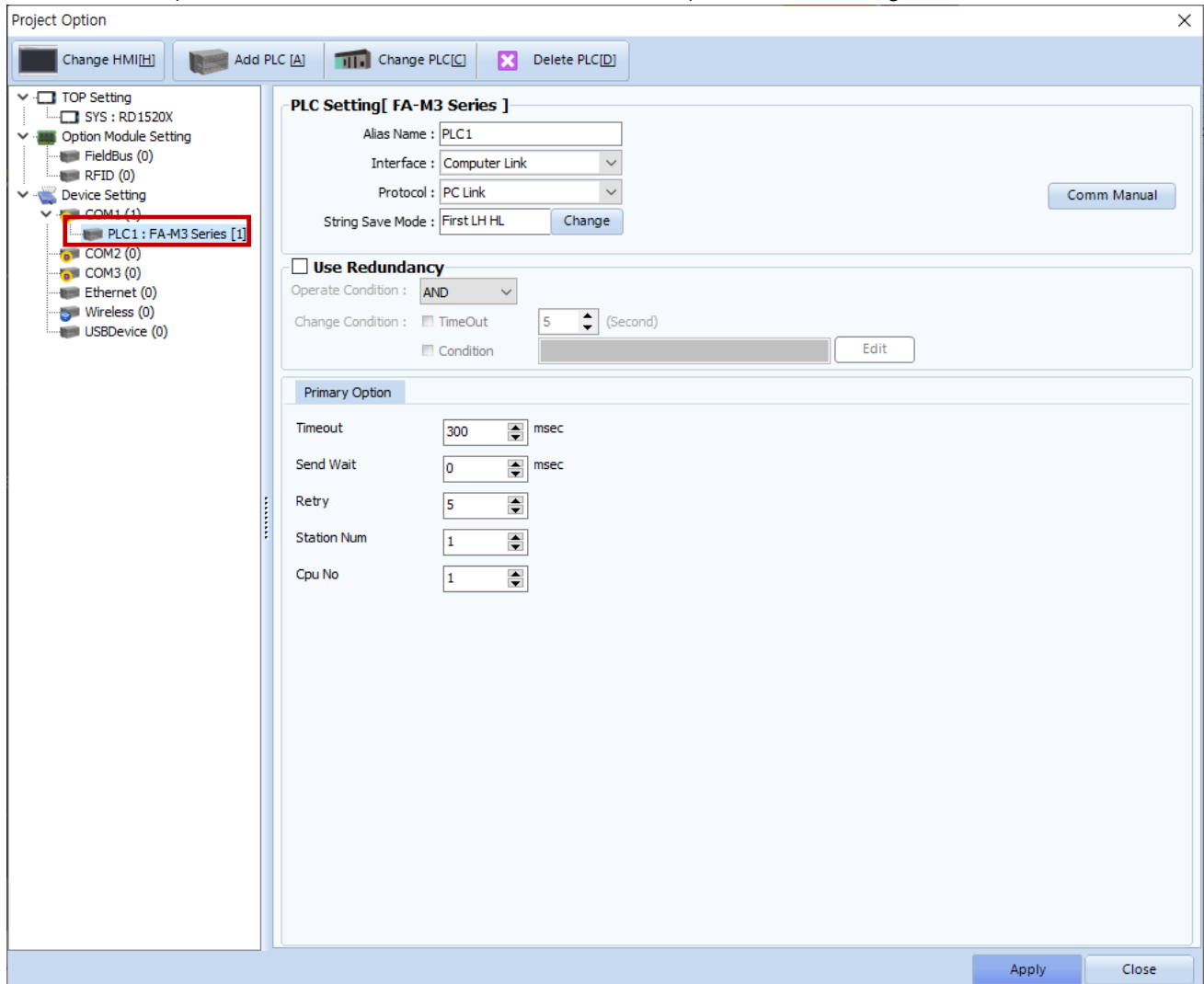
* The above settings are examples recommended by the company.

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 setting > COM > "PLC1 : FA-M3 Series"]

– Set the options of the communication driver of FA-M3 Series Computer Link in TOP Design Studio.



Items	Settings	Remarks
Interface	Select "Computer Link".	Refer to "2. External device selection".
Protocol	Select the serial communication protocol between the TOP and an external device.	
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.	
Cpu No	Enter the CPU no. of the external device.	

3.2. Communication setting in TOP

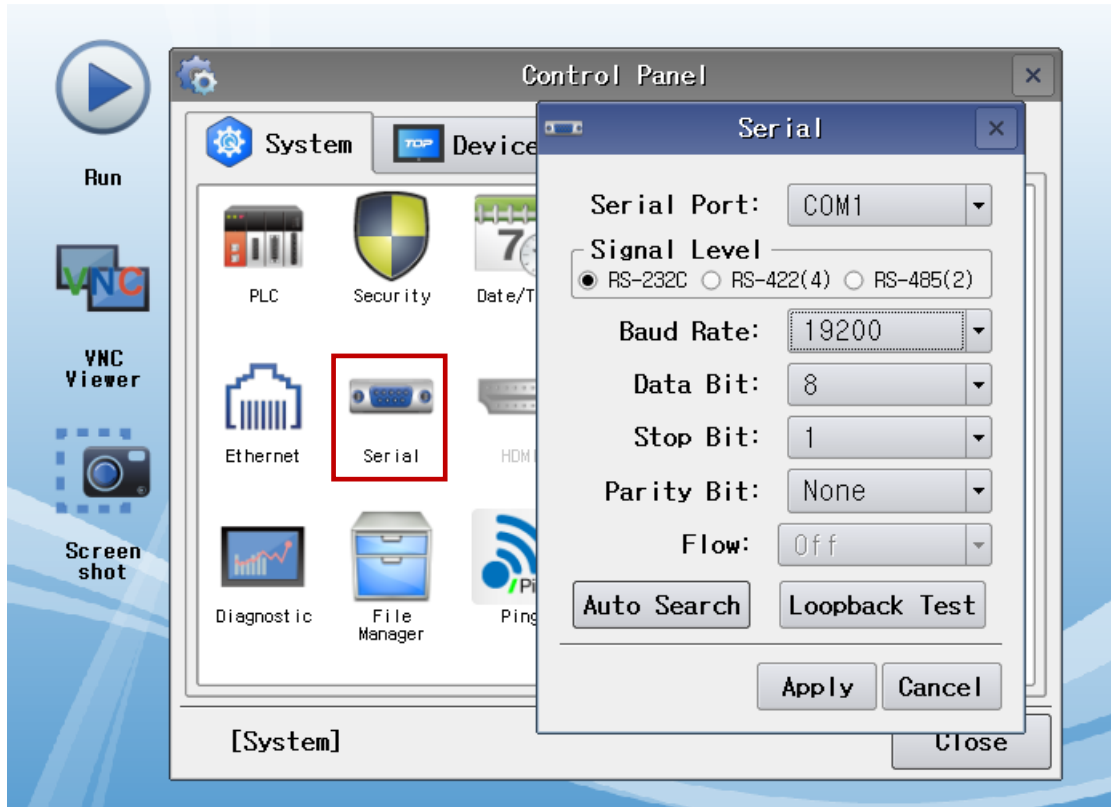
* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- 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]



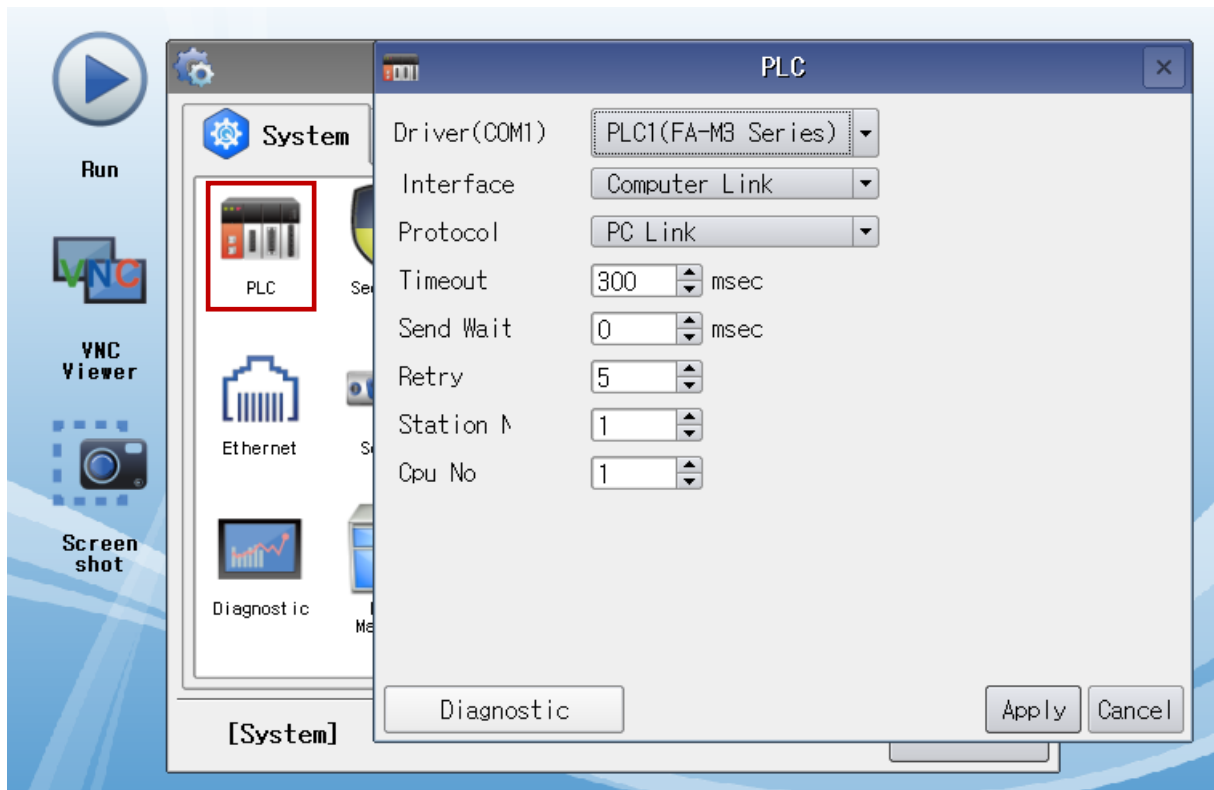
Items	TOP			External device	Remarks
	RS-232C	RS-422	RS-485		
Signal Level (port)	RS-232C	RS-422	RS-485	RS-232C RS-422/485	
Baud Rate	19200				
Data Bit	8				
Stop Bit	1				
Parity Bit	None.				

* 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 the serial communication protocol between the TOP and an external device.	
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.	
Cpu No	Enter the CPU no. of the 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 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 - 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	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.)		

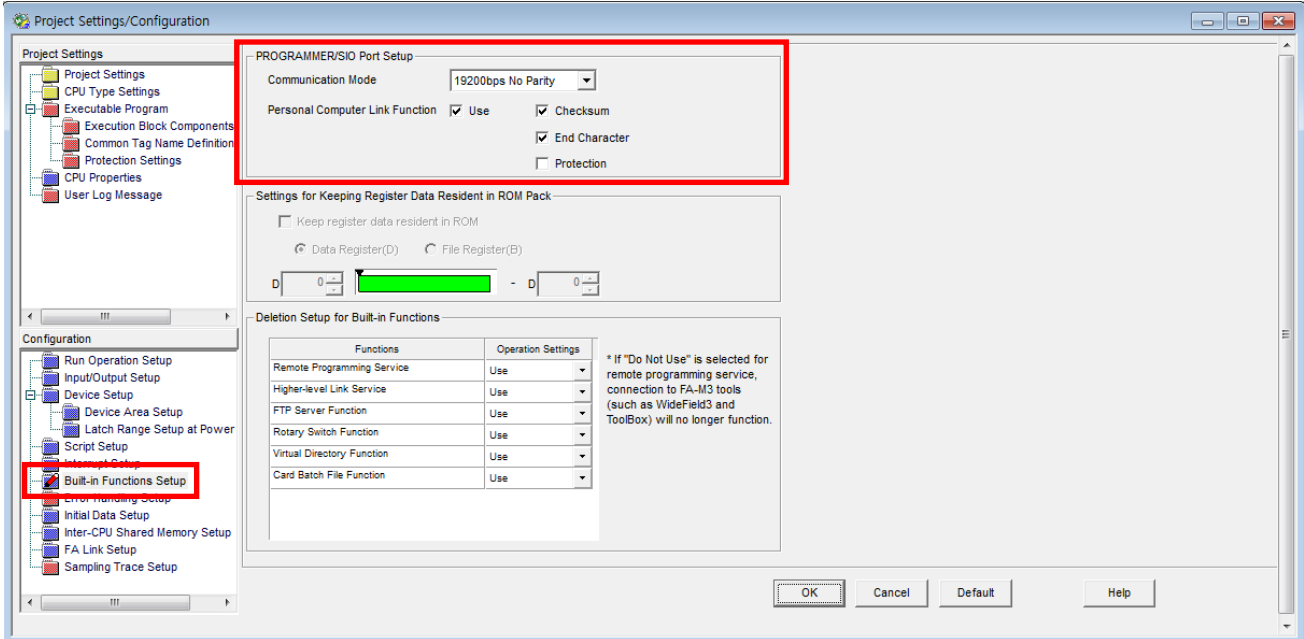
4. External device setting

4.1 External device setting 1 (CPU-embedded Programmer Port)

Set as below using "FA-M3 Series" Ladder Software "WideField3".

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

Step 1. Set as follows in [Project] – [Project Settings] – [Built-in Function Setup].



Items	Settings	Settings	Remarks
Communication Mode	Transmission Speed	19200bps	
	Data Bit	8 bit	
	Stop Bit	1 bit	
	Parity bit	NONE	
Set up CPU Personal Computer Link	Personal Computer Link Function	Check	Fixed
	Checksum	Check	Fixed
	End Character	Check	Fixed
	Protection	Uncheck	Fixed

Step 2. Send the settings to CPU and reset the power.

4.2 External device setting 2 (F3LC11-1F, F3LC12-1F, F3LC11-1N/2N)

Set up the Dip Switch located inside the side cover of the communication card to set up the communication.
For more detailed setting method than that described in this example, refer to the PLC user manual.



For detailed "Dip Switch" setting method, check the manual attached inside the side cover.

Step 1. Station Number Switch setting

Station Number Switch	Settings	Settings	Remarks
Station NO. (x10)	0	Station No.: 1	
Station NO. (x 1)	1		

Step 2. Set the serial communication parameters as follows through the switch on the right side of the computer link module.

① Transmission Speed Switch (SW1) setting

Transmission Speed Switch	Settings	Settings	Remarks
Baudrate	6	19200 bps	

② Data Format Switch (SW2) setting

Data Format Switch	Contents	Off	ON	Settings	Remarks
SW1	Character Length	7 bits	8 bits	On	
SW2	Parity	None	Yes	Off	
SW3		Odd	Even	Off	
SW4	Stop bit	1 bit	2 bits	Off	
SW5	Checksum	None	Yes	On	Fixed
SW6	Ending Character	None	Yes	On	Fixed
SW7	Protection feature	None	Yes	Off	Fixed
SW8 *Note 1)	Security feature	None	Yes	Off	Fixed

Step 3. After completing the setting, reset the power.

※ Precautions for 1:N network configuration

When configuring 1:N network, only the card of the terminating station sets the Terminator Switch. If it is not the card of the terminating station, set it to "OFF".

"4-WIRE" for RS-422 configuration / "2-WIRE" for RS-485 configuration



4.3 External device setting 1 (F3LC11-2F)

Set up the Dip Switch located inside the side cover of the communication card to set up the communication.
For more detailed setting method than that described in this example, refer to the PLC user manual.



For detailed "Dip Switch" setting method, check the manual attached inside the side cover.

Step 1. Station Number Switch setting

Station Number Switch	Settings	Settings	Remarks
Station NO. (x10)	0	Station No.: 1	
Station NO. (x 1)	1		

Step 2. Set the serial communication parameters as follows through the switch on the right side of the computer link module.

① Transmission Speed Switch (SW1) setting

Transmission Speed Switch	Settings	Settings	Remarks
Baudrate	7	19200 bps	

② Data Format Switch (SW2) setting

Data Format Switch	Contents	Off	ON	Settings	Remarks
SW1	Character Length	7 bits	8 bits	On	
SW2	Parity	None	Yes	Off	
SW3		Odd	Even	Off	
SW4	Stop bit	1 bit	2 bits	Off	
SW5	Checksum	None	Yes	On	Fixed
SW6	Ending Character	None	Yes	On	Fixed
SW7	Protection feature	None	Yes	Off	Fixed
SW8	User setting not allowed				

Step 3. After completing the setting, reset the power.

※ Precautions for 1:N network configuration

When configuring 1:N network, only the card of the terminating station sets the Terminator Switch. If it is not the card of the terminating station, set it to "OFF".

"4-WIRE" for RS-422 configuration / "2-WIRE" for RS-485 configuration

5. Cable table

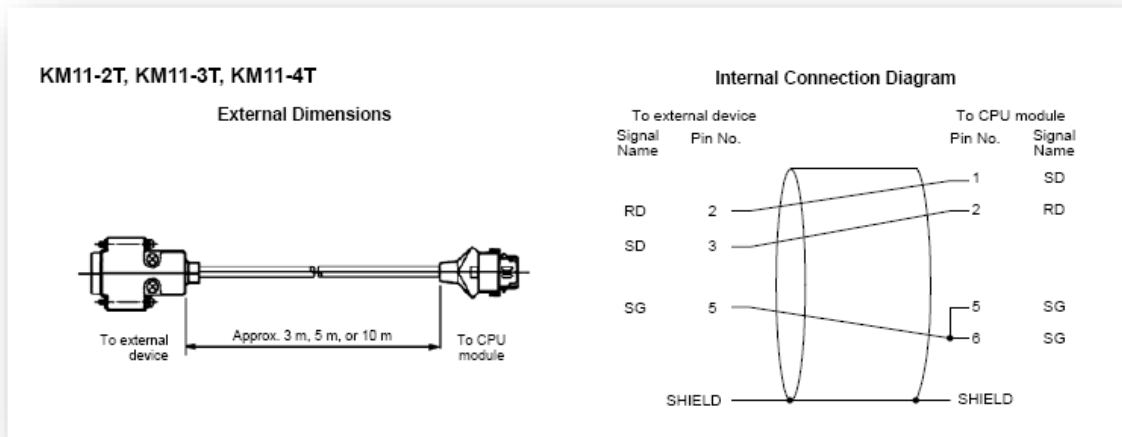
This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.
(The cable diagram described in this chapter may differ from the recommendations of "YOKOGAWA Electric Corporation".)

5.1. Cable table 1

■ RS-232C (1:1 connection)

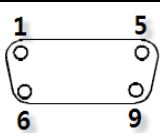
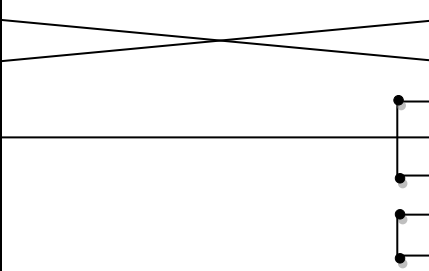
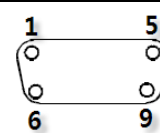


- Use "**KM11-2T, KM11-3T, KM11-4T dedicated cable**" sold by "YOKOGAWA Electric Corporation".
The wiring of the dedicated cable is as the reference picture below.
- When changing the connector according to the TOP model, use the D-Sub "2, 3, 5" pins of "**KM11-2T, KM11-3T, KM11-4T dedicated cable**" directly.



5.2. Cable table 2

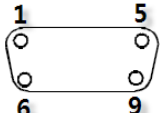
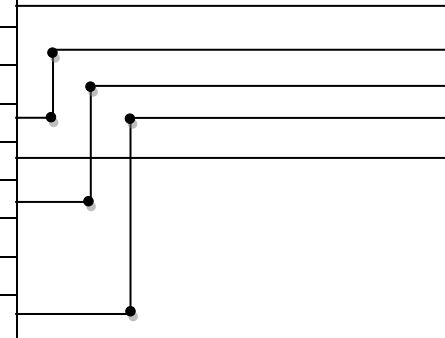
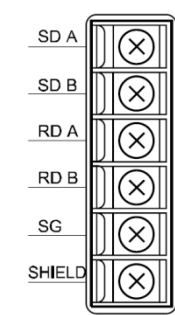
■ RS-232C (1:1 connection)

COM1 / COM2			Cable connection	External device			
Pin arrangement* Note 1)	Signal name	Pin number		Pin number	Signal name	Pin arrangement* Note 1)	
 <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>	
	RD	2		2	RD		
	SD	3		3	3		SD
	DTR	4		4	4		DTR
	SG	5		5	5		SG
	DSR	6		6	6		DSR
	RTS	7		7	7		RTS
	CTS	8		8	8		CTS
				9	9		FG

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

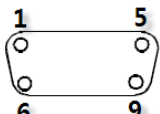
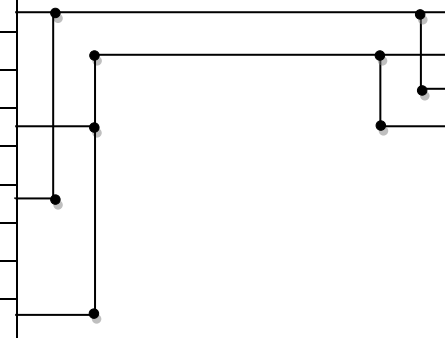
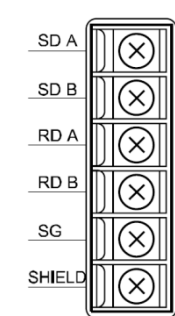
5.3 Cable table 3

■ RS-422 (1:1 connection)

COM1 / COM2			Cable connection	External device	
Pin arrangement* <i>Note 1)</i>	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		SDB(+)	
		2		SDA(-)	
		3		RDB(+)	
	RDB	4		RDA(-)	
	SG	5		SG	
	SDA	6			
		7			
		8			
	SDB	9			

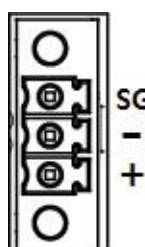
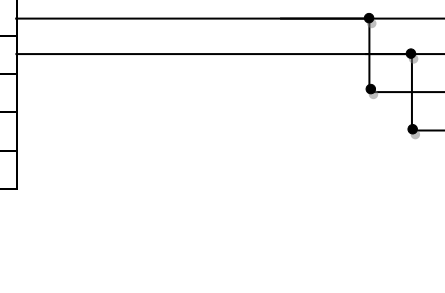
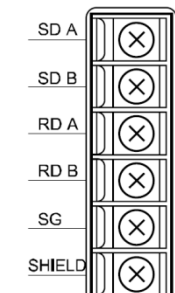
**Note 1)* The pin arrangement is as seen from the connecting side of the cable connection connector.

■ RS-485 (1:1 connection)

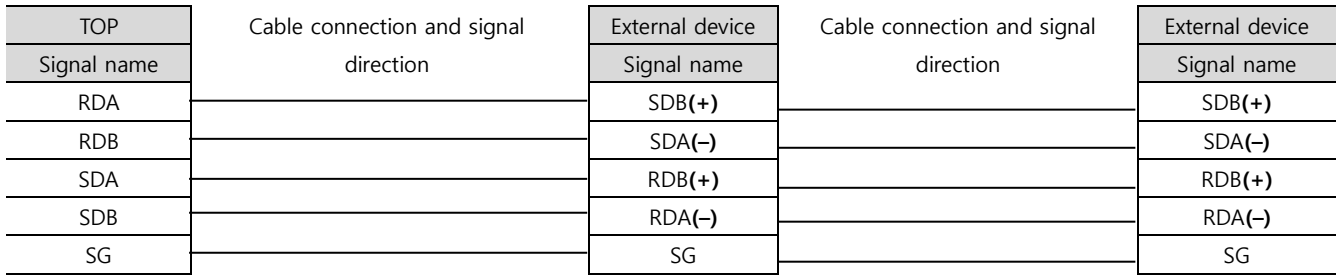
COM1 / COM2			Cable connection	External device	
Pin arrangement* <i>Note 1)</i>	Signal name	Pin number		Signal name	Pin arrangement
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	RDA	1		SDB(+)	
		2		SDA(-)	
		3		RDB(+)	
	RDB	4		RDA(-)	
	SG	5		SG	
	SDA	6			
		7			
		8			
	SDB	9			

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

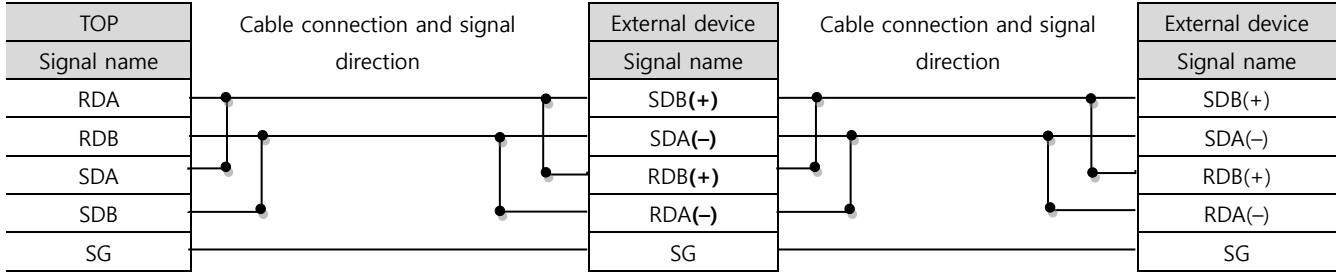
■ RS-485 (1:1 connection)

COM3		Cable connection	External device	
Pin arrangement* <i>Note 1)</i>	Signal name		Signal name	Pin arrangement
	+		SDB(+)	
	-		SDA(-)	
	SG		RDB(+)	
			RDA(-)	
			SG	

■ RS-422 1 : N connection - Refer to 1:1 connection to connect in the following method.



■ RS-485 1 : N connection - Refer to 1:1 connection to connect in the following method.



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.



"TOP Design Studio" represents the CPU's "Device" in accordance with the "FA-M3 Series" Multi-CPU configuration (on Single Unit) as "CPU Number" + "Device Name" (one unit device).

(Example) for Data Register

Multi-CPU	TOP Design Studio Device Name Shown
CPU 1 Data Register	1D
CPU 2 Data Register	2D
CPU 3 Data Register	3D
CPU 4 Data Register	4D

(Note) Multi-CPU configurations can extend to up to four CPUs.

Device	Bit Address	Word Address	32 Bit	Remarks
Input Relay	1X00201 – 4X71664	1X00201 – 4X71649	L/H	*Note 1) Note 2)
Output Relay	1Y00201 – 4Y71664	1Y00201 – 4Y71649		*Note 1)
Internal Relay	1I00001 – 4I65535	1I00001 – 4I65535		
Joint Relay	1E0001 – 4E4096	1E0001 – 4E4081		
Special Relay	1M0001 – 4M9984	1M0001 – 4M9969		
Link Relay	1L00001 – 4L78192	1L00001 – 4L78177		*Note 3)
Timer	Contact	1T0001 – 4T3072		
	Current	———		1TP0001 – 4TP3072
	Setup	———		1TS0001 – 4TS3072
Counter	Contact	1C0001 – 4C3072		
	Current	———		1CP0001 – 4CP3072
	Setup	———		1CS0001 – 4CS3072
Data Register	1D0001.00 – 4D65535.15	1D0001 – 4D65535		
File Register	1B00001.00 – 4B262144.15	1B00001 – 4B262144		
Joint Register	1R0001.00 – 4R4096.15	1R0001 – 4R4096		
Special Register	1Z001.00 – 4Z1024.15	1Z001 – 4Z1024		
Link Register	1W00001.00 – 4W78192.15	1W00001 – 4W78192	*Note 3)	

*Note 1) Instructions for showing Input/Output Relay are as follows..

(Example) X 0[Module Unit No.] 02[Module Slot No.] 01[Terminal No.]		
Items	Setting range	
Module Unit No.	0 – 7	
Module Slot No.	Module unit No is "0"	02 – 16
	Module unit No is "1-7"	01 – 16
Terminal No.	01 – 64	

*Note 2) Read-only Device

*Note 3) Instructions for showing link relay (L), link register (W) are as follows.

(Example) L 7[link Number] 1024[address]		
Items	Setting range	
Link Number	0 – 7	
address	0001 – 71009	