

MITSUBISHI Electric Corporation

MELSEC FX 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, the setting of each device, cables, and configurable systems.
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Select a TOP model and an external device.
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Describes how to set the TOP communication.
- 4. External device setting** [Page 10](#)

Describes how to set up communication for external devices.
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Describes the cable specifications required for connection.
- 6. Supported addresses** [Page 14](#)

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 FX Computer Link" is as follows.

CPU	Link I/F ^{*Note 1)}	Communication method	System setting	Cable
FX3G-14M□ FX3G-24M□	FX3G-232-BD FX3U-232ADP+ FX3G-CNV-ADP	RS-232C	3. TOP communication setting 4. External device setting	5. Cable table
	FX3G-485-BD FX3U-485ADP+FX3G-CNV-ADP	RS422 (4 wire)		
RS-485 (2 wire)				
FX3G-40M□ FX3G-60M□	When using channel 1			
	FX3G-232-BD (connect to the connector 1 of the additional unit) FX3U-232ADP + FX3G-CNV-ADP	RS-232C		
	FX3G-485-BD (connect to the connector 1 of the additional unit) FX3U-485ADP + FX3G-CNV-ADP	RS422 (4 wire)		
		RS-485 (2 wire)		
	When using channel 2			
	FX3G-232-BD (connect to the connector 2 of the additional unit) FX3U-232ADP + FX3U-■ADP + FX3G-CNV-ADP	RS232C		
FX3G-485-BD (connect to the connector 2 of the additional unit) FX3U-485ADP + FX3U-■ADP + FX3G-CNV-ADP	RS422 (4 wire)			
	RS-485 (2 wire)			
FX3UC-□MT/D FX3UC-□MT/DSS	When using channel 1			
	FX3U-232ADP	RS-232C		
	FX3U-485ADP	RS422 (4 wire)		
		RS-485 (2 wire)		
	When using channel 2			
	FX3U-232ADP + FX3U-■ADP	RS-232C		
FX3U-485ADP + FX3U-■ADP	RS422 (4 wire)			
	RS-485 (2 wire)			
FX3UC-32MT-LT FX3U	When using channel 1			
	FX3U-232-BD FX3U-232ADP + FX3U-CNV-BD	RS-232C		
	FX3U-485-BD FX3U-485ADP + FX3U-CNV-BD	RS422 (4 wire)		
		RS-485 (2 wire)		
	When using channel 2			
	FX3U-232ADP + FX3U-□BD, FX3U-232ADP + FX3U-■ADP + FX3U-CNV-BD	RS-232C		
FX3U-485ADP + FX3U-□BD FX3U-485ADP + FX3U-■ADP + FX3U-CNV-BD	RS422 (4 wire)			
	RS-485 (2 wire)			

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CPU	Link I/F ^{*Note 1)}	Communication method	System setting	Cable
FX2N	FX2N-232-BD FX2NC-232ADP + FX2N-CNV-BD	RS-232C	3. TOP communication setting 4. External device setting	5. Cable table
	FX2N-485-BD FX0N-485ADP + FX2N-CNV-BD FX2NC-485ADP + FX2N-CNV-BD	RS422 (4 wire)		
RS-485 (2 wire)				
FX1N FX1S	FX1N-232-BD FX2NC-232ADP + FX1N-CNV-BD	RS-232C		
	FX1N-485-BD FX0N-485ADP + FX1N-CNV-BD FX2NC-485ADP + FX1N-CNV-BD	RS422 (4 wire) RS-485 (2 wire)		
FX2NC FX1NC FX0N	FX2NC-232ADP	RS-232C		
	FX0N-485ADP FX2NC-485ADP	RS422 (4 wire) RS-485 (2 wire)		

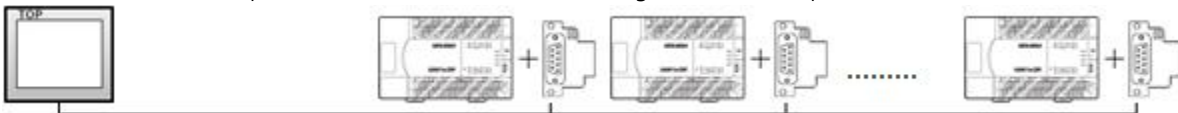
*Note 1) One of (232, 422, 485, USB) is entered in □ in the Link I/F column.
 One of (232, 485) is entered in ■ in the Link I/F column.

■ Connection configuration

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

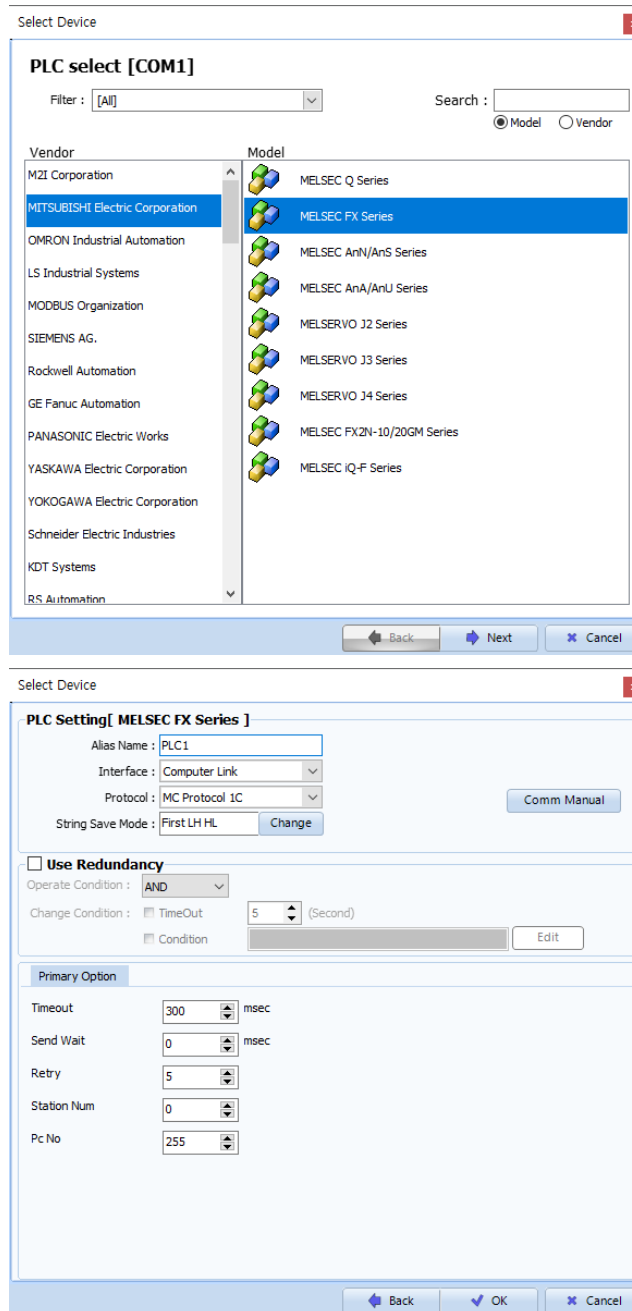


- 1:N (one TOP and multiple external devices) connection – configuration which is possible in RS422/485 communication.



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 style="background-color: #333; color: white;">Model</th> <th style="background-color: #333; color: white;">Interface</th> <th style="background-color: #333; color: white;">Protocol</th> </tr> </thead> <tbody> <tr> <td>MELSEC FX Series</td> <td>Computer Link</td> <td>MC Protocol 1C ACPU</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	MELSEC FX Series	Computer Link
Model	Interface	Protocol					
MELSEC FX Series	Computer Link	MC Protocol 1C ACPU					

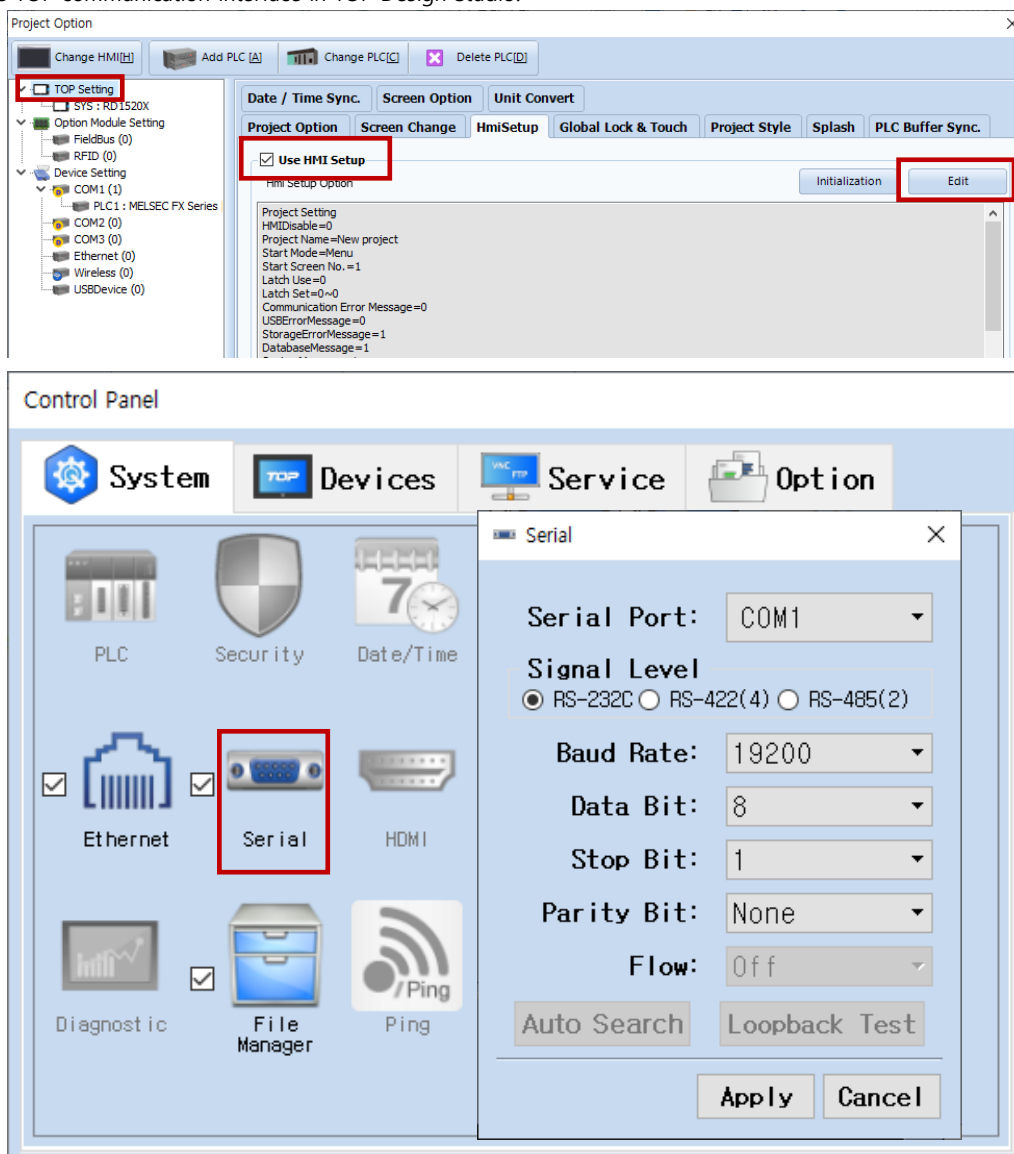
3. TOP communication setting

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.



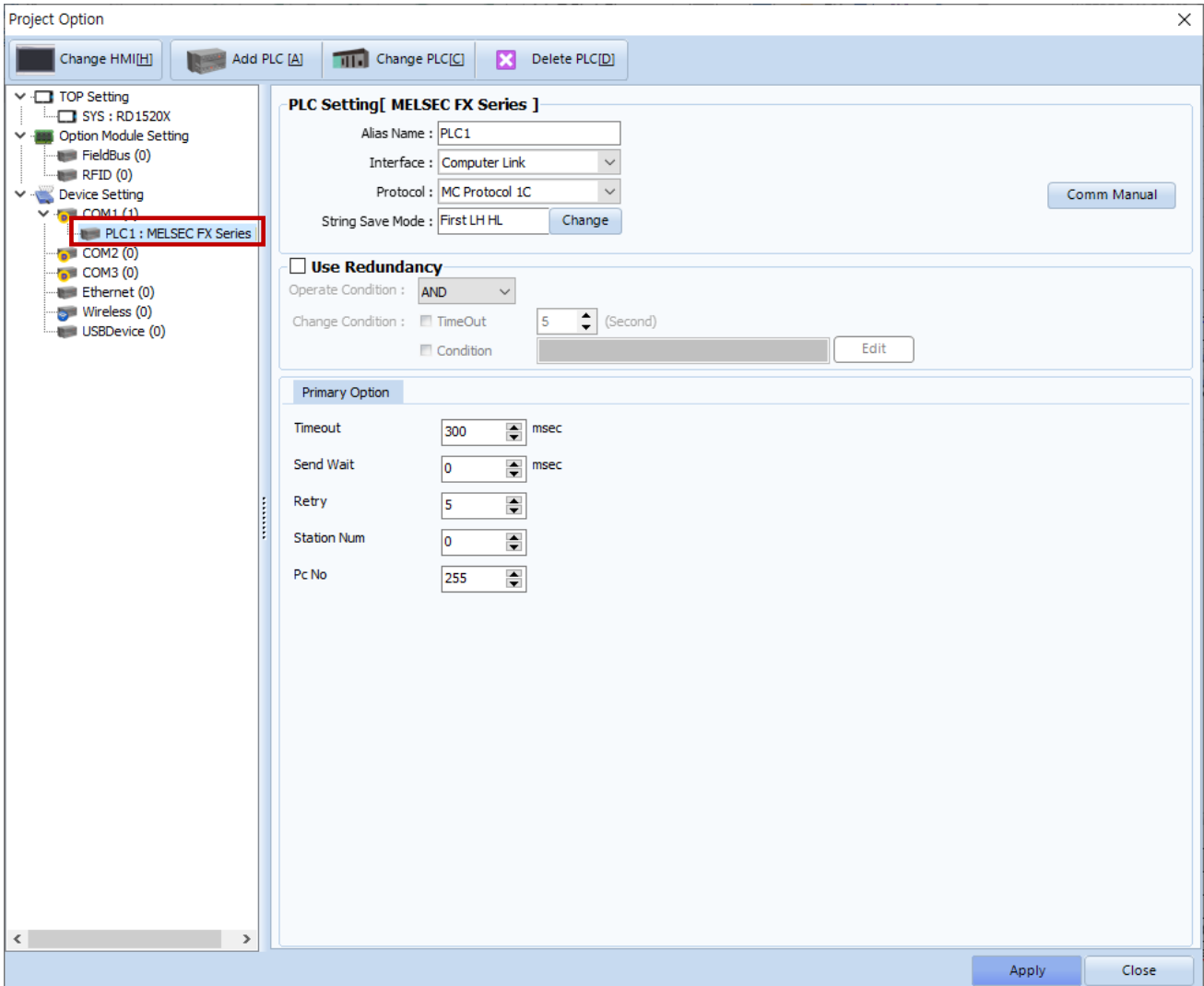
Items	TOP			External device	Remarks
	RS-232C	RS-422	RS-485		
Signal Level (port)	RS-232C	RS-422	RS-485	RS-232C RS-422/485	
Baud Rate	19200				
Data Bit	8				
Stop Bit	1				
Parity Bit	None.				

* 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 Property > PLC Setting > COM > "PLC1 : MELSEC-FX Series"]
- Set the options of the MELSEC-FX Series CPU Direct communication driver in TOP Design Studio.

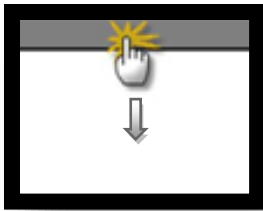


Items	Settings	Remarks
Interface	Select "Computer Link".	Fixed
Protocol	Select "MC Protocol 1C ACPU".	Fixed
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending 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

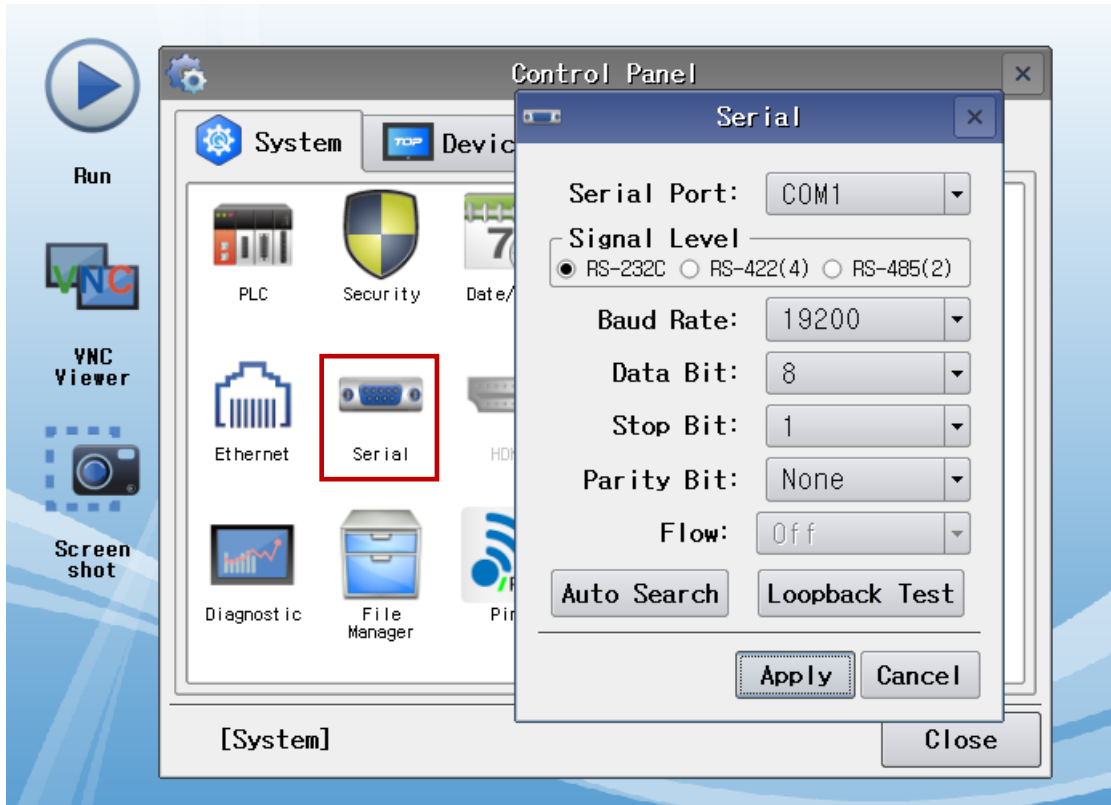
* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- 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]



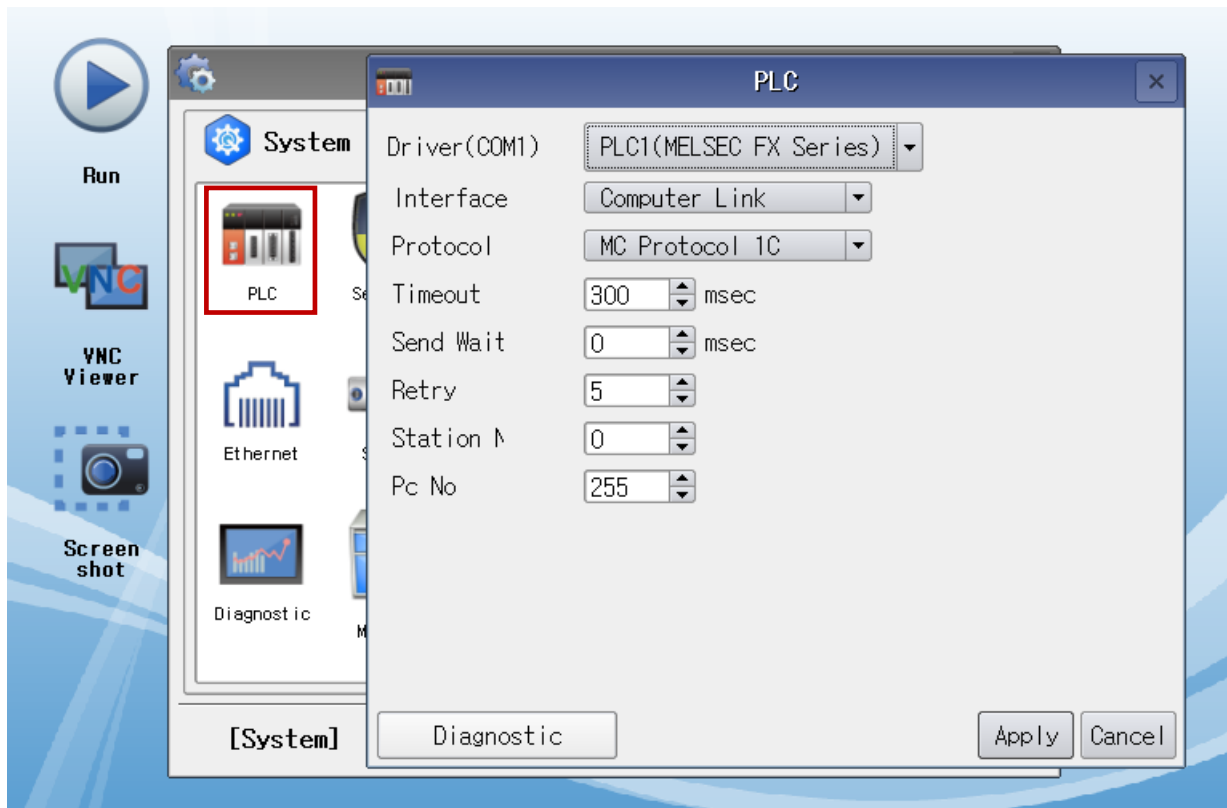
Items	TOP			External device	Remarks
Signal Level (port)	RS-232C	RS-422	RS-485	RS-232C RS-422/485	
Baud Rate	19200				
Data Bit	8				
Stop Bit	1				
Parity Bit	None.				

* 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".	Fixed
Protocol	Select "MC Protocol 1C ACPU".	Fixed
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.

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

Communication setting of MELSEC-FX series has two methods: parameter settings in MELSEC series Ladder Software "GX Developer" or data setting in PLC's "special data register". For more detailed setting methods than described in this example, refer to the PLC user manual.

■ Method 1: Parameter setting in "GX Developer"

Step 1. Double-click [Parameter] > [PLC parameter] in the project window to pop-up the [FX Parameter] dialog box.

Step 2. Select [PC system settings (2)] tab in the [FX Parameter] dialog box, select to use "Operate Communication Setting" and then set as follows.

Items	Selection	Remarks
CH	"CH1" or "CH2"	Select the channel for communication setting. (Items that can be set only on FX3UC, FX3U, and FX3G models.)
Operate Communication Setting	Check to use	(Fixed)
Protocol	Dedicated protocol	(Fixed)
Data length	8bit	
Parity	None	
Stop Bit	1bit	
Transmission Speed	19200	
H/W type	Regular/RS-232C	
Sum check	Check to use	(Fixed)
Transmission control procedure	Form1(without CR,LF)	(Fixed)
Station number setting	00	
Time out judge time	1	

■ Select "RS-485" in "H/W type" for RS-422/485.

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

Step 3. [Online] > Transmit the parameter set to [Write to PLC] and reset the PLC.

■ Method 2: Enter data to "special data register" in PLC.

Enter data to the special data register of MELSEC-FX. After input, reset the power of PLC.

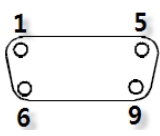
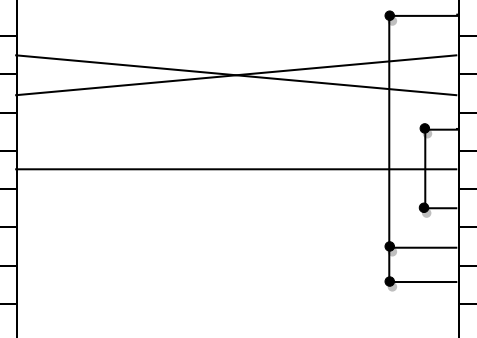
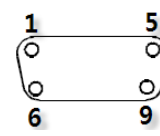
To set the content set in the setting goal, enter the data as follows.

Special register items		Data	
Channel 1	Channel 2 (FX3UC, FX3U, FX3G.)	Setting data(Hexadecimal)	Remarks
D8120	D8420	6891	RS-232C serial parameter setting data
		6091	RS-422/485 serial parameter setting data
D8121	D8421	0	PLC station number
D8129	D8429	1	Time out judge time

5. Cable table

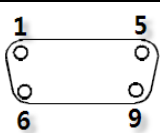
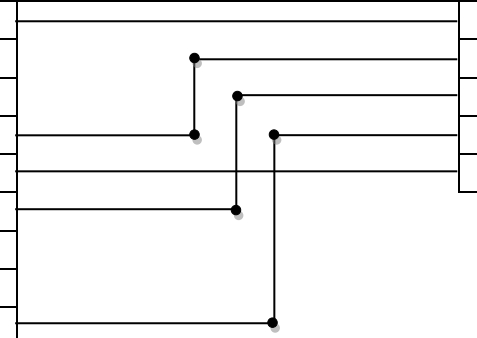
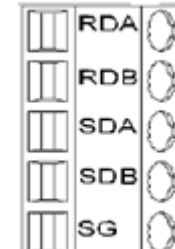
This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.
 (The cable diagram described in this section may differ from the recommendations of "Mitsubishi Electric Corporation")

■ 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)	
 <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	9		

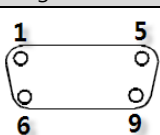
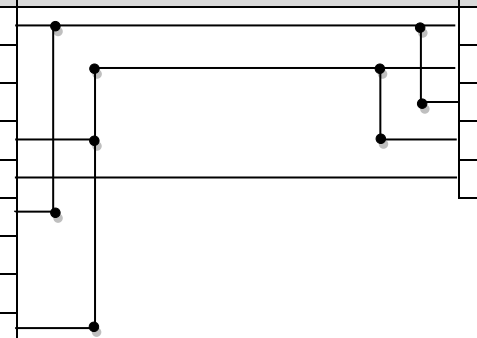
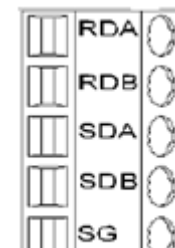
***Note 1)** The pin arrangement is as seen from the connecting side of the cable connection connector.

■ RS-422 (1:1 connection)

COM			Cable connection	PLC	
Pin arrangement* Note 1)	Signal name	Pin number		Signal name	Pin arrangement
 <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			

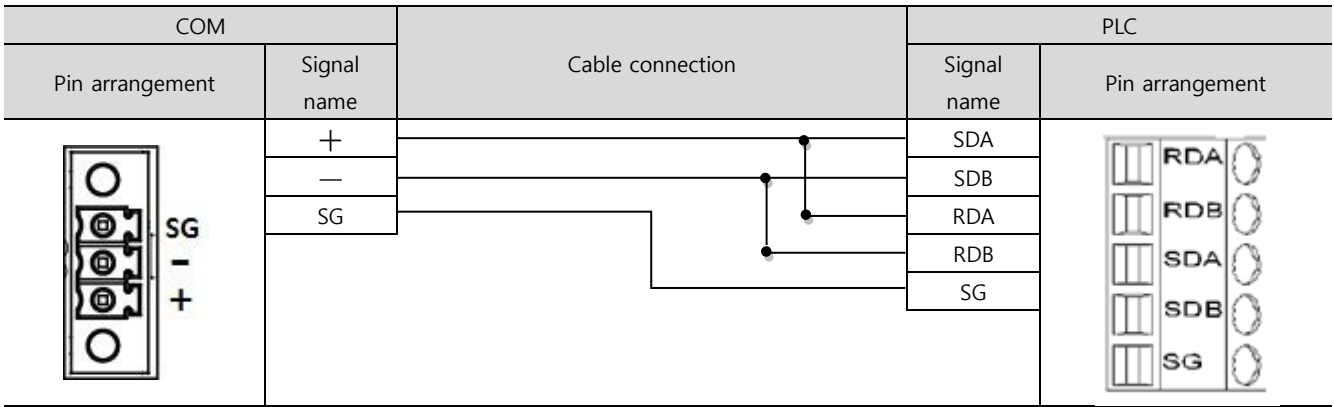
***Note 1)** The pin arrangement is as seen from the connecting side of the cable connection connector.

■ RS-485 (1:1 connection)

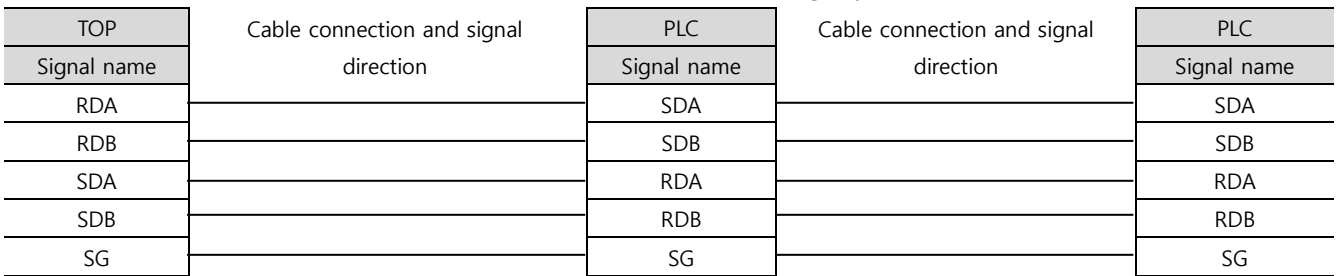
COM			Cable connection	PLC	
Pin arrangement* Note 1)	Signal name	Pin number		Signal name	Pin arrangement
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	RDA	1		SDA	
		2		SDB	
		3		RDA	
	RDB	4		RDB	
	SG	5		SG	
	SDA	6			
		7			
		8			
	SDB	9			

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

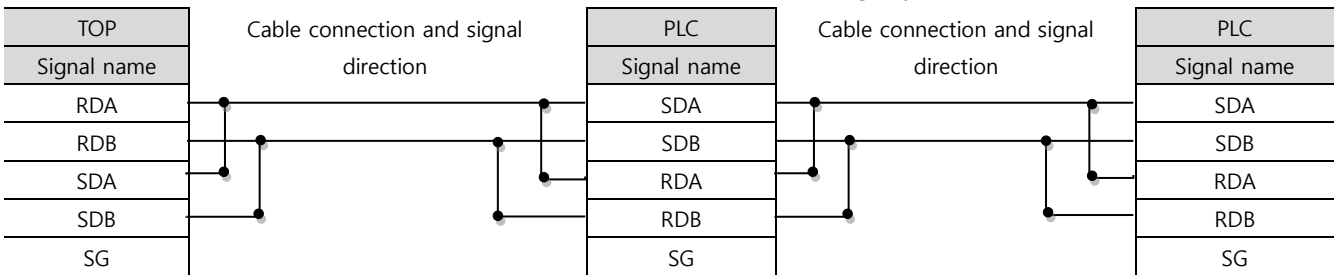
■ RS-485 (1:1 connection)



■ RS-422(1:N connection) – Refer to 1:1 connection to connect in the following way:



■ RS-485 (1:N/N:1 connection) – Refer to 1:1 connection to connect in the following way.



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 designation address	Word designation address	32 bit	Property
Input	Bit	X0000 – X0377	X0000 – X0360	L/H *Note 1)	*Note 2) Note 3)
Output	Bit	Y0000 – Y0377	Y0000 – Y0360		*Note 3)
STEP relay	Bit	S0000 – S8191	S0000 – S8176		
Internal relay	Bit	M0000 – M7679	M0000 – M7664		
Special relay	Bit	M8000 – M8511	M8000 – M8496		*Note 4)
Data register	Word	D0000.00 – D0999.15	D0000 – D0999		
		D1000.00 – D7999.15	D1000 – D7999		
Special register	Word	D8000.00 – D8511.15	D8000 – D8511		*Note 4)
Timer - Contact	Bit	T000 – T511	—————		
Timer-Current value	Word	—————	TN000 – TN511		
Counter - Contact	Bit	C000 – C255	—————		
Counter-Current value	Word	—————	CN000 – CN199		
Counter-Current value	DWord	—————	CN200 – CN255		*Note 5)

*Note 1) The lower 16BIT data of 32BIT data is saved in the screen registered address, and the upper 16BIT data is saved in the address next to the screen registered address.

Ex. When saving 32 BIT data hexadecimal data 12345678 in address D00100, it is saved to 16 BIT device address as follows:

Items	32BIT	16BIT	
	Address	D00100	D00101
Input data (hexadecimal)	12345678	5678	1234

*Note 2) It has a non-writable area. Please use it with caution.

*Note 3) When used as a word address, it is used in units of 20 (Octal-decimal). (Ex: X0, X20, X40, ..., X160)

*Note 4) As it may be used as a special area according to the address by the system, it may not be possible to execute Write Data. Refer to the manual of the external device for use.

*Note 5) 32 BIT device