MITSUBISHI Electric Corporation
MELSEC-FX Series
CPU Direct Driver

Compatible version	OS	4.0.0.0 or higher
	XDesignerPlus	4.0.0.0 or higher

CONTENTS

Thank you for using M2I's "Touch Operation Panel(M2I TOP) Series". Please read out this manual and make sure to learn connection method and process of TOP – External device"

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1. System configuration

System Configuration of TOP and "MITSUBISHI Electric Corporation's MELSEC-FX Series ETHERNET" is as follows.

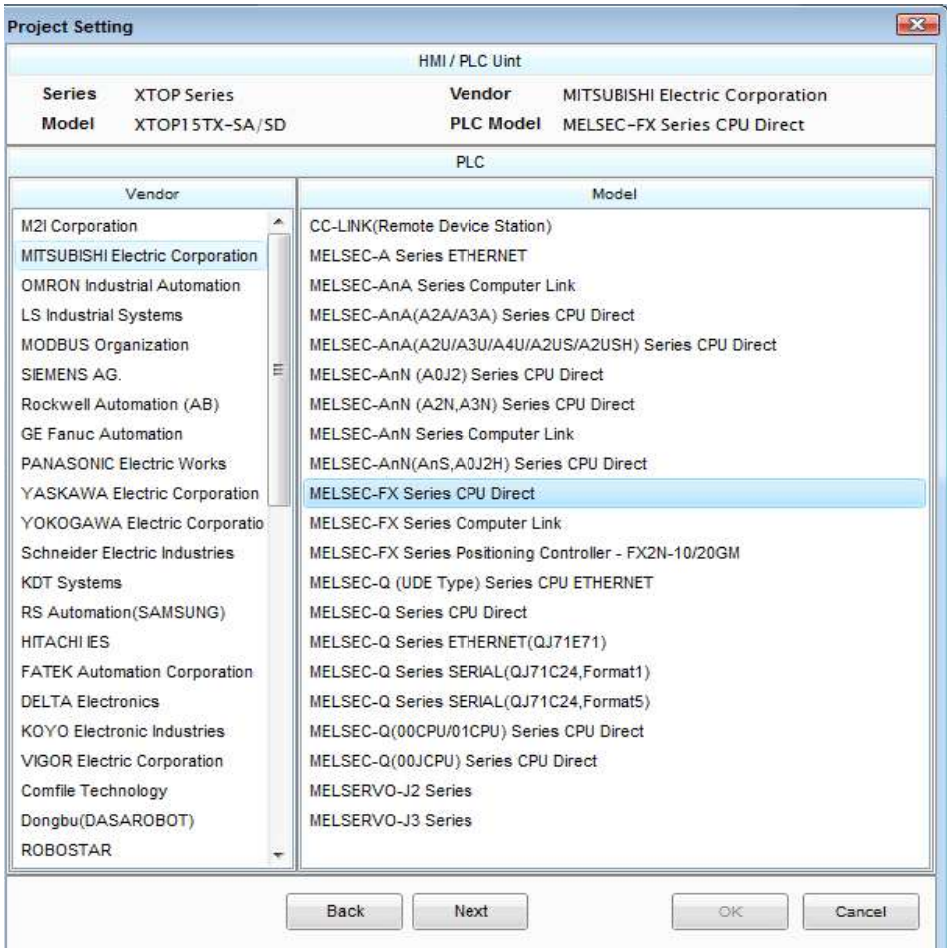
Series	CPU	Link I/F	Method	System settings	Cable
MELSEC FX	FX3G FX3U FX3UC FX2N FX2NC FX1NC FX1N FX1S FX0N	CPU Port	RS-422 (4 wire)	3.1 설정 예제 13.1 Configuration Exercise 1 (4 page)	5.1 Cable Table 1 (8 page)

■ Connection configuration

・1:1 connection (TOP 1 vs. external device)

2. Selecting TOP model and external devices

Select the external devices to connect to TOP.



Setting details		Contents
TOP	Series	Select the name of a TOP series that is to be connected to PLC. Before downloading the settings, install the OS version specified in the table below according to TOP series. Series: XTOP / HTOP — Version name: V4.0
	Name	Select the model name of TOP product.
Communication Device	Manufacturer	Select the manufacturer of external devices to be connected to TOP. Please select "MITSUBISHI".
	PLC	Select the model series of external devices to be connected to TOP. Please select "MELSEC-FX Series CPU Direct". Please check, in the "1. System configuration", if the relevant external device is available to set a system configuration.

3. Example of system settings

Regarding of communication interface settings in TOP and external devices, we suggest as below.

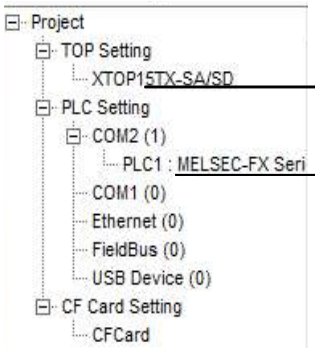
3.1 Example of settings 1

The system is set as below.

Details		TOP	MELSEC-FX Series	Remark
Serial level (port/channel)		RS-422 (4 wire, COM2)	RS-422 (CPU port)	Fixed
Serial baud rate	[BPS]	9600		Fixed
Serial data bit	[Bit]	8		Fixed
Serial stop bit	[Bit]	1		Fixed
Serial parity bit	[Bit]	EVEN		Fixed

(1) XDesignerPlus setup

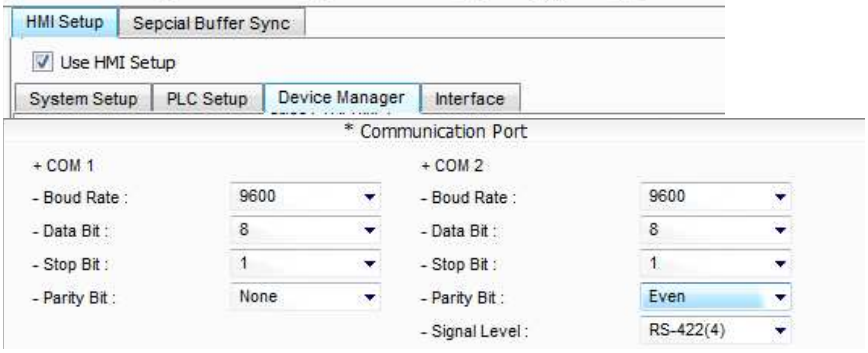
After setting the below details in [Project > Project Settings], download the detailed settings using TOP tool.



■ [Project > Project Property > Project > Settings > TOP Name]

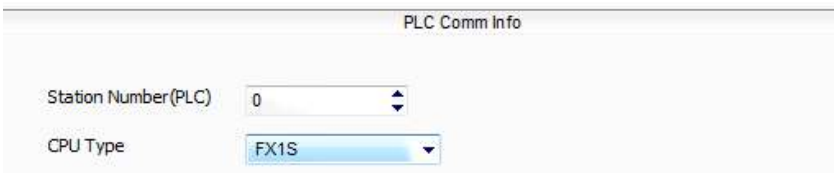
Set the communication interface of TOP tool.

- From right window [HMI Setting > check "Use HMI Setup" > Device Manager]



■ External device settings

" This sets the option of "MELSEC-FX Series CPU Direct" communication driver.



- PLC Address : Setting External Device Address
- CPU Type: Setting a type of CPU

(2) External device settings

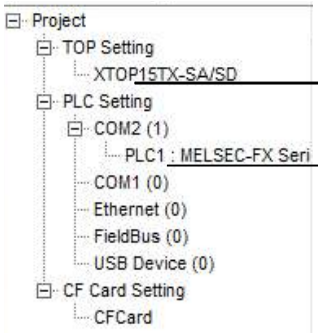
A user does not need the communication interface setting of "MELSEC-FX Series CPU Direct" because it is fixed as the object of interface set-up. That is why the user does not need to set up.

4. Communication settings details

Communication settings are available at XDesignerPlus or TOP main menu. Communication settings must be identical with the external devices.

4.1 XDesignerPlus settings details

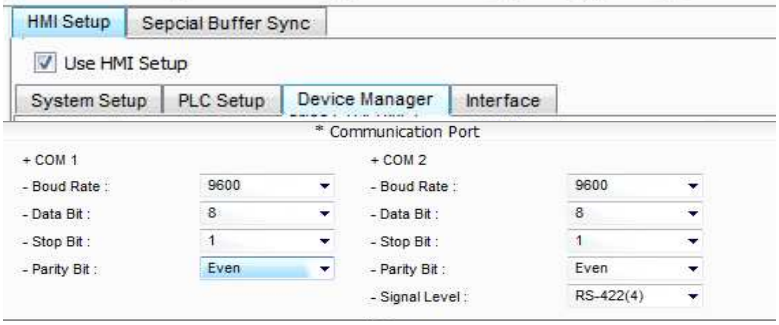
Select [Project > Project Property] to show the below window.



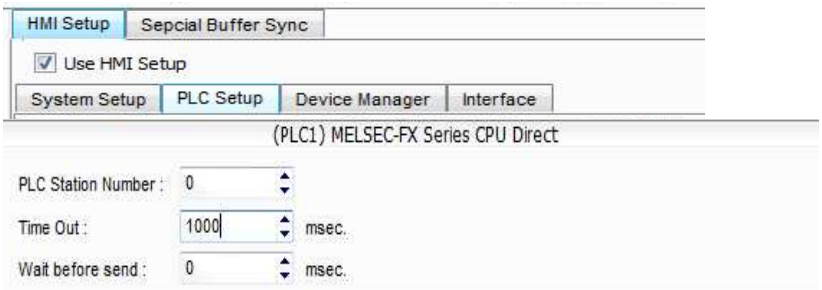
■ [Project > Project Property > Project > Settings > TOP Name]

Set the communication interface of TOP tool.

- From right window, [HMI setting > check "Use HMI setup" > Device Manager]

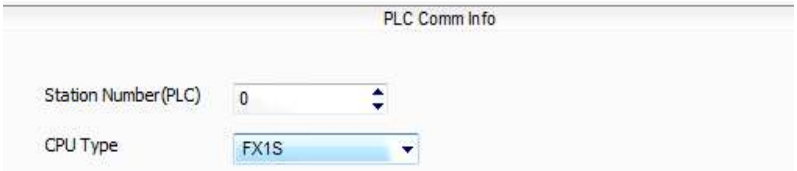


- From right window [HMI Setting > Check "Use HMI Setup" > PLC Setting]



■ External device settings

Sets the option of "MELSEC-FX Series CPU Direct" communication driver.



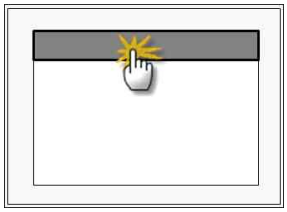
■ Communication Interface Settings

Details	Contents
Signal level	External device – select serial communication method between TOPs. (COM1 supplies RS-232C only)
Baud rate	External device – select serial communication speed between TOPs.
Data bit	External device – select serial communication data bit between TOPs.
Stop bit	External device – select serial communication stop bit between TOPs.
Parity bit	External device – select serial communication parity bit check method between TOPs.
Time out [x100 mSec]	Set up TOP's waiting time from external device at [0 - 5000] x 1mSec.
Transmitting Delay Time [x10 mSec] Receiving Wait Time [x10	Set up TOP's waiting time between response receiving – next command request transmission from external device at [0 – 5000] x 1 mSec.

mSec]	
PLC address [0~65535]	Address of other device. Select between [0 - 65535].

4.2 TOP main menu setup item

- When a buzzer is on during the power reset, touch 1 spot at the upper LCD to move to "TOP Management Main" display.
- Set up driver interface at TOP according to **Step1** → **Step2** below.
  (Press "TOP COM 2/1 setup" in **Step1** to change setup at **Step2**.)



Step 1. [PLC setup] - Setup driver interface.

PLC setup	
PLC Address : 00 Timeout : 1000 [mSec] Delay time of transmission : 0 [mSec] TOP COM 2/1 : RS - 422 , 9600 , 8 , 1 , EVEN TOP COM 2/1 setup communication test	Communication Interface Settings

Step 1–Reference.

Details	Contents
PLC address [0~65535]	Address of other device. Select between [0 - 65535].
Timeout [x1 mSec]	Set up TOP's waiting time from external device at [0 - 5000] x 1mSec.
Delay time of transmission [x1 mSec]	Set up TOP's waiting time between response receiving – next command request transmission from external device at [0 – 5000] x 1 mSec.
TOP COM 2/1	TOP's Interface setup to external device.

Step 2. [PLC setup] >[TOP COM2/COM1 setup] – Setup relevant port's serial parameter.

Port Settings	
* Serial communication + COM-1 Port - Baud rate : 9600 [BPS] - Data bit : 8 [BIT] - Stop bit : 1 [BIT] - Parity bit : EVEN [BIT] - Signal level : RS – 232C	COM 1 Port Communication Interface Settings
+ COM-2 Port - Baud rate : 9600 [BPS] - Data bit : 8 [BIT] - Stop bit : 1 [BIT] - Parity bit : EVEN [BIT] - Signal Level : RS – 422	COM-2 Port Communication Interface Settings

Step 2–Reference.

Details	Contents
Baud rate	External device – select serial communication speed between TOPs.
Data bit	External device – select serial communication data bit between TOPs.
Stop bit	External device – select serial communication stop bit between TOPs.
Parity bit	External device – select serial communication parity bit check method between TOPs.
Signal level	External device – select serial communication method between TOPs.

4.3 Communication diagnosis

■ TOP - Confirming interface setting condition between external devices

- Move to Menu by clicking the top side of LCD screen as resetting the power of TOP.
- Confirms if Port [COM 2 or COM 1] setting that is willing to use in [Communication Settings] matches with the setting of external devices.

■ Diagnosis whether the port communication is normal or not

- PLC Setting > TOP [COM 2 or COM 1] click "Communication Diagnosis" button.
- Diagnosis dialog box will pop up on the screen, you can judge by following information that is shown on box no. 3 section.

OK!	**Communication set-up normal**
Time Out Error!	abnormal Communication setting - Error in the setting situation of Cable and TOP / External device **(reference : Communication Diagnosis sheet)**

■ Communication Diagnosis Sheet

- Please refer to the information below if you have a problem between external devices and communication connection.

Designer Version		O.S Version				
Details	Contents				Confirm	
System configuration	Name of CPU				OK	NG
	Name of confront port that is communicating				OK	NG
	System Connection Method	1:1	1:N	N:1	OK	NG
Connection Cable	Name of Cable				OK	NG
PLC setup	Setup address				OK	NG
	Serial baud rate	[BPS]			OK	NG
	Serial data bit	[BIT]			OK	NG
	Serial Stop bit	[BIT]			OK	NG
	Serial parity bit	[BIT]			OK	NG
	Assigned Address Limit				OK	NG
TOP setup	Setup port	COM 1	COM 2		OK	NG
	Name of Driver				OK	NG
	Confront Address	Project Property Setup			OK	NG
		When Diagnosing Communication			OK	NG
	Serial baud rate	[BPS]			OK	NG
	Serial data bit	[BIT]			OK	NG
	Serial Stop bit	[BIT]			OK	NG
	Serial parity bit	[BIT]			OK	NG

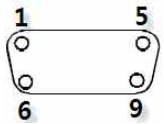
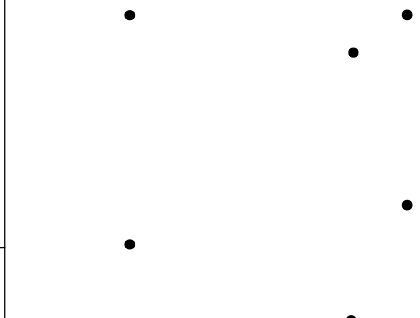
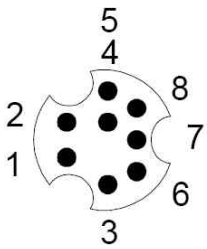
5. Cable diagram

This Chapter is to introduce the Cable diagram for regular communication between TOP and relative devices. (Cable diagram that is being introduced in this chapter might differ from the suggestions of "Mitsubishi Electric Corporation".)

5.1 Cable diagram 1

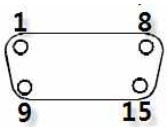
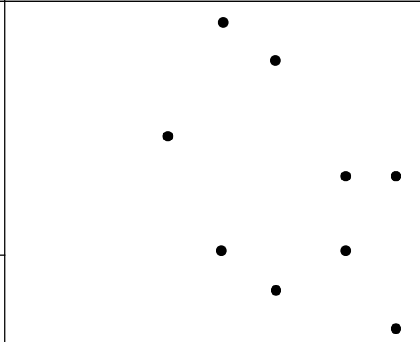
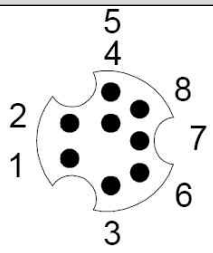
■ 1 : 1 Connection

(A) XTOP COM 2 Port (9 pin)

XTOP COM2			Cable Connection	PLC	
pin arrangement * caution 1)	Signal	Pin Number		Pin Number	**pin arrangement * caution 1)**
 Front view of D-SUB 9 Pin (male, convex)	RDA	1		1	 Front view of Communication cable connecter MINI-DIN 8 Pin (male, convex)
		2		2	
		3		3	
	RDB	4		4	
	SG	5		5	
	SDA	6		6	
		7		7	
		8		8	
	SDB	9			

*Caution1) Pin arrangement is shown from connecting face in cable connection connecter.

(B) XTOP/ATOP COM 2 Port (15 Pin)

XTOP/ATOP COM 2 포트			Cable Connection	PLC	
pin arrangement * caution 1)	Signal	Pin Number		Pin Number	**pin arrangement * caution 1)**
 Front view of D-SUB 15 Pin (male, convex)	-	1		1	 Front view of Communication cable connecter MINI-DIN 8 Pin (male, convex)
				2	
				3	

	(Pass)				
	-	10		4	
	RDA	11		5	
	RDB	12		6	
	SDA	13		7	
	SDB	14		8	
	SG	15			

*Caution1) Pin arrangement is shown from connecting face in cable connection connecter.

6. Support address

Devices that are usable with TOP are as below.

There might be difference in the range of device (address) by type / series of CPU module TOP series supports the maximum address range that external device series use. Please refer each CPU module user manual carefully for devices that you desired to use to prevent not getting out of range.

Type	Remark	Bit designated address	Word designated address	32 bit	Property
Input	Bit	X0000 – X0337	X0000 – X0320	L/H *caution1)	*Cautoin2) Caution3)
Output	Bit	Y0000 – Y0337	Y0000 – Y0320		* Caution 3)
STEP Relay	Bit	S0000 – S0999	————		
Internal Relay	Bit	M0000 – M3071	M0000 – M0192		
Special Relay	Bit	M8000 – M8255	————		* Caution 4)
Data Register	Word	D0000.00 – D7999.15	D0000 – D7999		
Special Register	Word	————	D8000 – D8255		* Caution 4)
Timer-Current	Word	————	TN000 – TN255		
Timer-Point	Bit	TS000 – TS255	————		
Counter-Point	Bit	CS000 – CS199 CS200 – CS255	————		
Counter-Current	Word	————	CN000 – CN199		
Counter-Current	Word	————	CN200 – CN255		* Caution 5)

*Caution1) The address will be saved where the 16BIT data which is subordinate to 32BIT data monitor registered and super ordinate 16BIT data will be saved right after the address that is monitor registered.

(예) If 32BIT data, 16 hexadecimal data 12345678 is saved to the address number D00100, it shall be saved with 16BIT device address as below.

Details	32BIT	16BIT	
Address	D00100	D00100	D00101
Input data (Hexadecimal Number)	12345678	5678	1234

*Caution2) Following data includes a section that cannot be written. Please use it with caution.

*Caution3) If used as Word address, 20 (octal number) unit will be used. (ex. : X0, X20, X40, ..., X160)

*Caution4) Due to the usage of system followed by address as a special section, it might not be able to execute writing data. Please refer to the manual of external devices.

*Caution5) 32 BIT device