YOKOGAWA Electric Corporation FA–M3 Series

Computer Link Driver

Supported version TOP Design Studio V1.0 or higher



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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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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
F3SP N FA-M3 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	52 Cable table 2	
		F3LC11-2F	RS-422/485	3. TOP communication setting 4.3 External device setting 3	<u>5.5. Capie table 5</u>

*Note 1) \Box 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.



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









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2. External device selection

■ Select a TOP model and a port, and then select an external device.

PLC select [COM1] Fite: [M] Model Search: Model VacAdv VacAdv Schedde Electric Corporation VGCGAWA Electric Corporation Schedde Electric Industries KDT Systems R5 Automation COMPLE TECHNOLOGY Inc. DET A Electronic FATEC Automation COMPLE TECHNOLOGY Inc. DET ROBOT BACnet IS MFC APION	elect Device						
Pitter: [All Vendor Vendor Vendor Vendor Vendor <	PLC select [CO)M1]					
@ Model Vendor Model VASKAWA Electric Corporation Scheider Electric Industries KOT Systems SS Automation HITACHI IES FATEX Automation Corporation ELTA Electronics KOYO Electronic Industries VIGOR Electric Corporation ELTA Electronics KOYO Electronic Industries VIGOR Electric Corporation COMPTLE TECHNOLOGY Inc. DST ROBOT BAChet Is MFCAPION VEC Setting [FA-M3 Series] Alles Name: PIC Setting [FA-M3 Series] Alles Name: PIC Setting [FA-M3 Series] Comm Manual String Save Mode: FITU HIL Change Comm Manual String Save Mode: FITU HIL Change Electric Computer Link Porate Condition: Timeout 200 © Insec Stabion Num 1 © Image Condition: Alles Num 1 © Image Condition: Electronic Series Stabion Num 1 © Image Condition: I @ Image Condition: I @ Image Condition: I Image Con	Filter : [All]			\sim	:	Search :	
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Use Redundancy Operate Condition: Image Condition:	String Save Mode	First LH HL	C	hange			
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Station Num 1 💽 Cpu No 1 💽	Petry	5	•				
Cpu No 1	ICCU Y						
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	Station Num Cpu No	1	× ×				
	Station Num Cpu No	1					

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.			
		Model Interface Protocol			
		PC Link			
Please check the system configuration in Chapter 1 to see if the electron connect is a model whose system can be configured.			the external device you want to		



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]



Items	ТОР			External device	Remarks
Signal Level (port)				RS-232C	
	KS-232C	KS-422	KS-485	RS-422/485	
Baud Rate	19200				
Data Bit					
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.

Project Option			×
Change HMI[H] Add PI	LC [A] TTT Change Pl	C Delete PLCD	
 TOP Setting SYS : RD1520X Option Module Setting Fieldbus (0) RFID (0) Device Setting COM1 (1) PC1 : FA-M3 Series [1] COM2 (0) Ethernet (0) Wireless (0) USBDevice (0) 	PLC Setting[FA-M3 Alias Name : Interface : Protocol : String Save Mode : Use Redundancy Operate Condition : AN Change Condition : Primary Option Timeout Send Wait Retry Station Num Cpu No	Series] ACI Computer Link 2 CLink inst LH HL Change imeOut 5 (Second) condition Edit 300 msec 5 * msec 5 * 1 1 * 1	Comm Manual
			Apply Close

Items	Settings	Remarks
Interface	Select "Computer Link".	Refer to "2. External
Protocol	Select the serial communication protocol between the TOP and an external device.	device selection".
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		ТОР	External device	Remarks		
Signal Level (port)				RS-232C		
	KS-232C	K2-422	KS-400	RS-422/485		
Baud Rate		19200				
Data Bit						
Stop Bit						
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]

	ŏ	100	PLC		×
	🔯 System	Driver(COM1)	PLC1(FA-M3 Series) 🔻		
Run		Interface	Computer Link 💌		
		Protocol	PC Link 💌		
	PLC Set	Timeout	300 🖨 msec		
		Send Wait	n msec		
VNC Viewer	~ -	Retry	5		
	[IIIIII] 🔍	Station N			
	Ethernet S				
	_	Upu No			
Screen	e and				
shot	mill				
	Diagnostic I Ma				
	[0]	Diagnostic	:	Apply	Cancel
	[System]				
Items	Settings				Remarks
Interface	Select "Comr	outer Link".			Refer to "2. Extern
Protocol	Protocol Select the serial communication protocol between the TOP and an external device.			device selection	
TimeOut (ms)	imeOut (ms) Set the time for the TOP to wait for a response from an external device.				
SendWait (ms) Set the waitin		ng time between TO	P's receiving a response from an exter	nal device	
	and sending	the next command	request.		
Station Num	Enter the pre	fix of an external de	evice.		
Cpu No	Enter the CP	U no. of the externa	l 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.

ОК	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	How to connect the sy	stem	OK	NG	1 Cretem configuration		
configuration	Connection cable name	5	OK	NG	1. System configuration		
TOP	Version information		OK	NG			
	Port in use		OK	NG			
	Driver name		OK	NG			
	Other detailed settings		OK	NG			
	Relative prefix	Project setting	OK	NG			
		Communication		NC	2. External device selection		
		diagnostics	ŬK	NG	3. Communication setting		
	Serial Parameter	Transmission	OK	NC			
		Speed	OK	NG			
		Data Bit	OK	NG			
		Stop Bit	OK	NG			
		Parity Bit	OK	NG			
External device	CPU name		OK	NG			
	Communication port n	port name (module name)		NG			
	Protocol (mode)	OK	NG				
	Setup Prefix	OK	NG				
	Other detailed settings	OK	NG	4 Estemplishes estimat			
	Serial Parameter	Transmission	OK	NC	4. External device setting		
		Speed	ŬK	NG			
		Data Bit	OK	NG			
		Stop Bit	OK	NG			
		Parity Bit	OK	NG			
	Check address range				6. Supported addresses		
			ОК	NG	(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].

Project Settings/Configuration					
Project Settings CPU Type Settings CPU Type Settings Execution Block Components Common Tag Name Definition Protection Settings CPU Properties	PROGRAMMER/SID Port Setup Communication Mode Personal Computer Link Function	19200bps No Parity Vuse V Checks V End Ch Protect] sum aracter lion		
User Log Message	Settings for Keeping Register Data Resident in F C Data Register data resident in F C Data Register(D) C File	rident in ROM Pack	-		
Configuration Configuration Run Operation Setup Inpub/Output Setup Device Setup Latch Range Setup at Power Script Setup United Data Setup Inited Data Setup Inited Data Setup Initer-CPU Shared Memory Setup E Fe In the Setup	Deletion Setup for Built-in Functions Functions Remote Programming Service Higher-level Link Service FTP Server Function Rotary Switch Function Virtual Directory Function Card Batch File Function	Operation Settings Use • Use • Use • Use • Use • Use • Use •	* If "Do Not Use" is selected for remote programming service, connection to FA-M3 tools (such as WideFreid3 and ToolBox) will no longer function.		
Sampling Trace Setup				OK Cancel Default	Help

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

Step 2. Send the settings to CPU and resut 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. (x 1)	1	Station No.: I	

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		None	Yes	Off	
SW3	Parity	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	Chatian Na 1	
Station NO. (x 1)	1	Station No.: 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	Devite	None	Yes	Off	
SW3	Parity	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 "<u>KM11-2T, KM11-3T, KM11-4T dedicated cable</u>" 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 "<u>KM11–</u> 2T, KM11–3T, KM11–4T dedicated cable" directly.





5.2. Cable table 2

■ RS-232C (1:1 connection)

COM1 ,	COM2				Externa	l device
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)
1 5	CD	1		1	CD	15
$\left(\circ \circ \right)$	RD	2		2	RD	$\left(\circ \circ \right)$
	SD	3		3	SD	
6 9	DTR	4	•	4	DTR	6 9
Based on	SG	5		5	SG	Based on
	DSR	6	•	6	DSR	
front	RTS	7	e	7	RTS	front
D-SUB 9 Pin male	CTS	8		8	CTS	D-SUB 9 Pin male
(male, convex)		9		9	FG	(male, convex)

*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				External device		
Pin	Signal	Pin	Cable connection	Signal	Din arrangement	
arrangement*Note 1)	name	number		name	Pin anangement	
1 5	RDA	1		· SDB(+)		
$(\circ \circ)$		2	ę.	· SDA(–)		
		3	•	RDB(+)		
6 9 Pacad an	RDB	4	<mark>├ •</mark>	RDA (-)		
	SG	5		SG		
cable connector	SDA	6	└── ◀			
front		7				
D-SUB 9 Pin male		8				
(male, convex)	SDB	9				

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

■ **RS-485** (1:1 connection)



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

■ **RS-485** (1:1 connection)

COM3				External device	
Pin arrangement*Note 1)	Signal name	Cable connection	Signal name	Pin arrangement	
	+		SDB (+)		
			SDA (-)		
	SG	•	RDB (+)		
Cont SG		•	RDA (-)		
(C + -			SG		
				_SG	



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

TOP	Cable connection and signal	External device	Cable connection and signal	External device
Signal name	direction	Signal name	direction	Signal name
RDA		SDB (+)		SDB (+)
RDB		SDA (-)		SDA (-)
SDA		RDB (+)		RDB (+)
SDB		RDA (-)		RDA (-)
SG		SG		SG

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

TOP	Cable connection and signal	External device	Cable connection and signal	External device
Signal name	direction	Signal name	direction	Signal name
RDA	} •	SDB (+)	• •	SDB(+)
RDB	├ ╄	SDA (-)	├ ╞	SDA()
SDA	┝━┥│	RDB (+)	╞━┥│ │ ┥──	RDB(+)
SDB -	├ ─�	RDA (-)	├ ──�	RDA()
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.

"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		Bit Address	Word Address	32 Bit	Remarks
Input Relay		1X00201 – 4X71664	1X00201 – 4X71649		*Note 1) Note 2)
Output Relay		1Y00201 – 4Y71664	1Y00201 – 4Y71649		*Note 1)
Internal Re	lay	1100001 – 4165535	1100001 – 4165535		
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	L/H	
Counter	Contact	1C0001 – 4C3072			
	Current		1CP0001 – 4CP3072		
	Setup		1CS0001 – 4CS3072		
Data Regis	ter	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)
+Nista 1)las		having Insut/Output Dalay are as fallows			

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