# RS Automation, Inc. Modbus Modicon F50

Supported version TOP Design Studio

v V1.4.3 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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Describes the devices required for connection, the setting of each device, cables, and configurable systems.

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#### **3.** TOP communication setting Page 4

Describes how to set the TOP communication.

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Describes how to set up communication for external devices.

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Describes the cable specifications required for connection.

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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 "RS Automation, Inc. – Modbus Modicon F50" is as follows:

Series	СРИ	Link I/F	Communication method	System setting	Cable	
				3. TOP communication		
			RS-232C	setting	5.1. Cable table 1	
				4. External device setting		
				3. TOP communication		
DC Automation	Madhuc Madican	FEO	RS-422(4 wire)	setting	5.2. Cable table 2	
KS Automation	Modbus Modicon F50			4. External device setting		
			RS-485 (2 wire)	3. TOP communication		
				setting	E.2. Cable table 2	
				4. External device		
				setting		

#### 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.

THE COLOR MENT					
PLC select [CC	DM1]				
Filter : [All]			$\sim$	Search :	
Vendor		Model		011000	. Ovendor
Rockwell Automation		^ 🌮	NX Series		
GE Fanuc Automation			NX Plus Series		
PANASONIC Electric Wor	rks		X8 Series		
YASKAWA Electric Corpo	ration		SPC Series		
YOKOGAWA Electric Corp	poration		Medlue Mediane 550		
Schneider Electric Indust	ries		Modbus Modicon F50		
KDT Systems					
RS Automation					
HITACHI IES					
FATEK Automation Corpo	oration				
DELTA Electronics					
KOYO Electronic Industri	es				
VIGOR Electric Corporati	on				
COMETLE TECHNOLOGY	Inc.	¥			
PLC Setting[ Modb	us Modico	on F50 ]			
Alias Name :	PLC1 Serial				
Alias Name : Interface : Protocol :	PLC1 Serial MODBUS R	τυ	~	Cc	mm Manual
Alias Name : Interface : Protocol : String Save Mode :	PLC1 Serial MODBUS R First LH HL	TU	v v inge	Co	mm Manual
Alias Name : Interface : Protocol : String Save Mode :	PLC1 Serial MODBUS R' First LH HL	TU Cha	∽ ∽	Cc	mm Manual
Alias Name : Interface : Protocol : String Save Mode : Use Redundanc Operate Condition :	PLC1 Serial MODBUS R' First LH HL Y	TU Che	∼ ∼	Co	mm Manual
Alias Name : Interface : Protocol : String Save Mode : Use Redundanco Operate Condition : Al Change Condition : —	PLC1 Serial MODBUS R First LH HL Y TimeOut	TU Cha	v v (Second)		mm Manual
Alias Name : Interface : Protocol : String Save Mode : Use Redundanc Operate Condition :	PLC1 Serial MODBUS R First LH HL V VD ~ TimeOut Condition	TU Cha	v v v (Second)		mm Manual
Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition : Primary Option	PLC1 Serial MODBUS R First LH HL V ND Condition	TU Che	v inge (Second)	C (	mm Manual
Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : AP Change Condition : C Primary Opton Timeout	PLC1 Serial MODBUS R First LH HL V VD Condition 300	TU Cha	(Second)		mm Manual
Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition : Primary Option Timeout Send Wait	PLC1 Serial MODBUS R First LH HL Y TimeOut Condition	TU Cha	(Second)	CC	Edit
Alias Name : Interface : Protocol : String Save Mode : Use Redundanc Operate Condition : A Change Condition : A Primary Option Timeout Send Wait Retry	PLC1 Serial MODBUS R First LH HL V VD TimeOut Condition 300 5	TU Che	v v inge (Second)		mm Manual
Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry Slave ID	PLC1     Serial     MODBUS R     First LH HL     y     10     300     0     5     1	TU Cha	(Second)	C (	mm Manual
Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : A Change Condition : A Change Condition : A Change Condition : A Change Condition : A Primary Option Timeout Send Wait Retry Slave ID	PLC1     Serial     MODBUS R:     First LH HL     Y     ND     TimeOut     Condition     300     5     1	TU Cha 5 msec \$ msec \$ msec \$	(Second)		emm Manual
Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : A Change Condition : C Primary Option Timeout Send Wait Retry Slave ID	PLC1     Serial     MODBUS R:     First LH HL     Y     ND     TimeOut     Condition     0     5     1	TU Cha 5 meec • meec • meec •	(Second)		Edit
Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition : Change Condition : Primary Option Timeout Send Wait Retry Slave ID	PLC1     Serial     MODBUS R     First LH HL     Y     ND     TimeOut     Condition     0     5     1	TU Cha 5 msec • msec • msec • msec	(Second)		Edit
Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry Slave ID	PLC1     Serial     MODBUS R     First LH HL     Y     XD     TimeOut     Condition     300     0     5     1	TU Cha	(Second)		mm Manual

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 "RS Automation".		
	PLC	Select an external device to connect to TOP.		
		Model	Interface	Protocol
		Modbus Modicon F50	Serial	MODBUS RTU
		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]



Items	ТОР	External device	Remarks
	RS-232C	RS-232C	
Signal Level (port)	RS-422	RS-422	
	RS-485	RS-485	
Baud Rate	384	400	
Data Bit	1	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: Modbus modicon F50"]
  - Set the options of the Modbus modicon F50 communication driver in TOP Design Studio.

Project Option		×
Change HMI[H] Kadd PLC [A] THE Change PLC[C] Change PLC[C]		
Pic Setting Pic Setting[Modbus Modicon F50]   Alas Name: Pic I:   Pic Setting[Modbus Modicon F50] Alas Name:   Pic Setting[Modbus Modicon F50] String Save Mode:   PirstLHHL Change   Operate Condition: ImmeOut   Solor Condition   Primary Option Timeout   Solor Solor   Save ID Solor   Save ID Solor	Co	omm Manual
	Apply	Close

Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External
Protocol	Select "MODBUS RTU".	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.	
Slave ID	Enter the prefix of an 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	RS-232C	
	RS-422	RS-422	
	RS-485	RS-485	
Baud Rate	384	400	
Data Bit	~	3	
Stop Bit	1		
Parity Bit	None.		

\* The above settings are setting <u>examples</u> 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]

		õ	1001	PLC	×
		🔯 System	Driver(COM1)	PLC1(Modbus Modicon F50) 🗸	
	Kun		Interface	Serial 🔻	
			Protocol	MODBUS RTU -	
	VNC	PLC S	Timeout	300 🖨 msec	
	VNC		Send Wait	0 🖨 msec	
	Viewer	പ	Retry	5	
		Ethernet	Slave ID	1	
		Linemer			
	Screen				
	shot	Infli			
		Diagnostic			
		[System]	Diagnostic		Apply Cancel
		Logaroni			
Items		Settings			Remarks
Interfac	ce	Select "Serial".			Refer to "2. External

rtems	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External
Protocol	Select "MODBUS RTU".	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.	
Slave ID	Enter the prefix of an 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.

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 system		OK	NG	1 Cretem configuration	
configuration	Connection cable name		OK	NG	<u>1. System computation</u>	
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	<u></u>	NC	2. External device selection	
		diagnostics	ŬK	NG	3. Communication setting	
	Serial Parameter	Transmission	OK	NG		
		Speed	ÜK			
		Data Bit	OK	NG		
		Stop Bit	OK	NG		
		Parity Bit	OK	NG		
External device	External device CPU name Communication port name (module name) Protocol (mode) Setup Prefix Other detailed settings		OK	NG		
			OK	NG		
			OK	NG		
			OK	NG		
			OK	NG	4 External device setting	
	Serial Parameter	Transmission	OK	NG	4. External device setting	
		Speed	OK			
		Data Bit	OK	NG		
		Stop Bit	OK	NG		
		Parity Bit	OK	NG		
Check address range				6. Supported addresses		
			OK	NG	(For details, please refer to the PLC	
					vendor's manual.)	



## 4. External device setting

Configure the communication settings of the external device by referring to the vendor's user manual.



## 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 "RS Automation.")

#### 5.1 Cable table 1

■ 1:1 connection (RS-232C) TOP COM Port (9 pin) COM PLC Pin Signal Pin Cable connection Signal arrangement\*Note 1) name number name CD 1 5 1 6 0 RD 2 SD 9 6 SD 3 RD 9 6 DTR DTR 4 Based on SG 5 SG communication DSR 6 DSR cable connector RTS 7 RTS front, CTS 8 CTS D-SUB 9 Pin male 9 (male, convex) \*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.



#### 5.2. Cable table 2

#### ■ 1:1 connection (RS-422)

#### TOP COM Port (9 pin)

CC	M			PLC
Pin	Signal	Pin	Cable connection	Signal
arrangement*Note 1)	name	number		name
15	RDA	1		SDA
		2		SDB
		3	•	RDA
6 9 Paced on	RDB	4	└─┘ │         •──	RDB
	SG	5		SG
	SDA	6		
front		7		
D-SLIB 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.

■ 1:N connection – Refer to 1:1 connection to connect in the following way.

TOP	Cable connection and signal	PLC	Cable connection and signal	PLC
Signal name	direction	Signal name	direction	Signal name
RDA		SDA		SDA
RDB		SDB		SDB
SDA		RDA		RDA
SDB		RDB		RDB
SG		SG		SG



#### 5.3 Cable table 3

#### ■ 1:1 connection (RS-485)

	-			
CC	M			PLC
Pin	Signal	Pin	Cable connection	Signal
arrangement*Note 1)	name	number		name
1 5	RDA	1		SDA
$(\circ \circ)$		2	<del> </del>	SDB
		3	•	RDA
6 9 Pacad on	RDB	4		RDB
based on	SG	5		SG
	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.

■ 1:N 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.

	Bit Address	Word Address	R/W	Remarks
U0	0001.00 ~ 0017.15	0001 ~ 0017	R	Inverter operation status
U1	0101 .00~ 0115.15	0101 ~ 0115	R	Operation status in case of abnormality
U2	9920, 9922, 9924, 9926	9920, 9922, 9924, 9926	R/W	Abnormality history
U3	N/A	N/A		Constant test record, communication does not allow R/W
B0	1001 .00~ 1014.15	1001 ~ 1014	R/W	Operation basic settings
B1	1101.00 ~ 1103.15	1101 ~ 1103	R/W	System initialization
B2	1201 .00~ 1203.15	1201 ~ 1203	R/W	Capacity, control mode setting
F0	2001 .00~ 2009.15	2001 ~ 2009	R/W	Frequency Command
F1	2101 .00~ 2110.15	2101 ~ 2110	R/W	Frequency Command Range Limit
F2	2201 .00~ 2206.15	2201 ~ 2206	R/W	Acceleration/deceleration time
F3	2301.00 ~ 2304.15	2301 ~ 2304	R/W	S Acceleration/deceleration time
F4	2401 .00~ 2016.15	2401 ~ 2016	R/W	Pattern operation setting
S0	3001 .00~ 3004.15	3001 ~ 3004	R/W	Direct brake function
S1	3101 .00~ 3104.15	3101 ~ 3104	R/W	Speed search function
S2	3201.00 ~ 3204.15	3201 ~ 3204	R/W	Dwell operation
S3	3301 .00~ 3304.15	3301 ~ 3304	R/W	Energy saving operation
S4	3401.00 ~ 3403.15	3401 ~ 3403	R/W	Slip correction
S5	3501.00 ~ 3502.15	3501 ~ 3502	R/W	Torque correction
S6	3601.00 ~ 3603.15	3601 ~ 3603	R/W	System error correction
S7	3701.00 ~ 3721.15	3701 ~ 3721	R/W	PID operation settings
C0	4001.00 ~ 4008.15	4001 ~ 4008	R/W	V/F settings
C1	4101.00 ~ 4105.15	4101 ~ 4105	R/W	Modification method
C2	4201.00 ~ 4208.15	4201 ~ 4208	R/W	Motor constant
C3	4301.00 ~ 4310.15	4301 ~ 4310	R/W	H/W adjustment constant
H0	5001.00 ~ 5007.15	5001 ~ 5007	R/W	Multifunction Input Contact
H1	5101 .00~ 5106.15	5101 ~ 5106	R/W	Multifunction Output Contact
H2	5201.00 ~ 5213.15	5201 ~ 5213	R/W	Multifunction Analog, pulse train input
H3	5301 .00~ 5306.15	5301 ~ 5306	R/W	Multifunction Analog, pulse train output
H4	5401.00 ~ 5406.15	5401 ~ 5406	R/W	Digital Operator settings
P0	6001.00 ~ 6003.15	6001 ~ 6003	R/W	Motor protection function
P1	6101.00 ~ 6106.15	6101 ~ 6106	R/W	Immediate power outage function
P2	6201 .00~ 6206.15	6201 ~ 6206	R/W	Stall prevention
P3	6301.00 ~ 6303.15	6301 ~ 6303	R/W	Excess torque detection
P4	6401.00 ~ 6402.15	6401 ~ 6402	R/W	Abnormal retry setting
P5	6501.15	6501	R/W	Fan Inspection Status
P6	6601.15	6601	R/W	PID constant
EU	9900.00 ~ 9901.15	9900 ~ 9901	R	Show error notation
SU	9500.15	9500	R/W	Device function status notation
FreQ	9501.15	9501	R/W	Communication frequency command
Reset	9910.15	9910	W	Clear fault