M2I Corporation

V1.0 or higher

TOP Master

Serial Driver

Supported version TOP Design Studio



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We want to thank our customers who use the Touch Operation Panel.

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

Appendix. M2I Protocol

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Describes the M2I protocol.



1. System configuration

The system configuration of TOP and external devices is as follows:

Series	CPU	Link I/F	Communication method	System setting	Cable
All devices su	pporting TOP Slave	Serial port	RS–232C RS-422 (4wire) RS-485 (2wire)	3. TOP communication setting 4. External device setting	5. Cable table

Connectable configuration

• 1:1 connection



• 1:N connection





2. External device selection

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

Select Device					x
PLC select [C	ОМ1]				
Filter : [All]			\sim	Search :	
				Model	() Vendor
Vendor		Model			
M2I Corporation			TOP Master		
MITSUBISHI Electric Co	rporation	8	TOP Slave		
OMRON Industrial Auto	omation	8	User Define Protocol		
LS Industrial Systems		1			
MODBUS Organization					
SIEMENS AG.					
Rockwell Automation					
GE Fanuc Automation					
PANASONIC Electric W	orks				
YASKAWA Electric Corp	oration				
YOKOGAWA Electric Co	orporation				
Schneider Electric Indu	stries				
KDT Systems					
RS Automation	~				
			A Parts	al Mart	The Council
Salact Davica					
DIC Cottin - [TOD					^
Cert Serfind 10P	Master I				
Alias Name	PLC1				
Alias Name	PLC1 : Serial		~		
Alias Name Interface Protocol	Master J : PLC1 : Serial : M2I protocol		× ×	Col	mm Manual
Alias Name Alias Name Interface Protocol String Save Mode	Master J : PLC1 :: Serial : M2I protocol : First LH HL	Cha	↓ ↓ nge	Co	mm Manual
Alias Name Alias Name Interface Protocol String Save Mode	Master J : PLC1 : Serial : M2I protocol : First LH HL Cy	Cha	v v	Co	mm Manual
Alias Name Interface Protocol String Save Mode	Master J :: PLC1 :: Serial :: M2I protocol :: First LH HL Cy AND	Cha	nge	Co	mm Manual
Alias Name Alias Name Interface Protocol String Save Mode Operate Condition : Change Condition :	Master J : PLC1 : Serial : M2I protocol : First LH HL CY AND TimeOut Condition	Cha 5	v nge (Second)	Con	mm Manual
PLC Secting [10P Alias Name Interface Protocol String Save Mode	Master J : PLC1 : Serial : M2I protocol : First LH HL Cy TimeOut Condition	Cha 5	v v (Second)	Co	mm Manual
PLC SECOND 10P Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option	Master J : PLC1 : Serial : M2I protocol : First LH HL Cy AND Condition	Cha 5	v v (Second)	Co	mm Manual
Alias Name Interface Protocol String Save Mode Operate Condition : Primary Option Timeout	Master J : PLC1 : Serial : M2I protocol : First LH HL CY AND Condition 300	Cha 5	(Second)	Co	mm Manual
Alias Name Interface Protocol String Save Mode Operate Condition : Primary Option Timeout Send Wait	Master J : PLC1 : Serial : Matter J protocol : First LH HL Cy NND TimeOut Condition 300 0	Cha 5] msec] msec	(Second)		mm Manual
Primary Option Timeout Send Wait Retry	Master J : PLC1 : Serial : M2I protocol : First LH HL Cy NND Condition 300 5 5 •	5 (msec	(Second)	Co	mm Manual
Price Secting 100P Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry Station No.	Master J : PLC1 : Serial : M2I protocol : First LH HL Cy TimeOut Condition 300 5 5 0 ()	Cha 5 () msec) msec	nge (Second)	Cor	mm Manual
Price Secting 100P Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry Station No.	Master J : PLC1 : Serial : M2I protocol : First LH HL CY NND ImmeOut Condition 300 5 5 0 5 0 5 0 1 1 1 1 1 1 1 1 1 1 1 1 1	Cha 5 () msec] msec]	v nge (Second)	Co:	mm Manual
Pice Secting 100P Alias Name Interface Protocol String Save Mode String Save Mode Change Condition : Primary Option Timeout Send Wait Retry Station No.	Master J : [PLC1 : Serial : M2I protocol : First LH HL CY TimeOut Condition 300 5 0 5	Cha 5 () msec) msec	v nge (Second)	Co 	mm Manual
Pice Secting 1 toP Alias Name Interface Protocol String Save Mode String Save Mode Change Condition : Primary Option Timeout Send Wait Retry Station No.	Master J : [PLC1 : Serial : M2I protocol : First LH HL CY TimeOut Condition 300 5 0 5 0 •	Cha 5 () msec] msec	(Second)	Co 2010	mm Manual
Primary Option Timeout Send Wait Retry Station No.	Master J : PLC1 : Serial : M21 protocol : First LH HL CY AND Condition 300 5 5 0 2 0 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	5 1] msec]]]	Second)		mm Manual
Price Secting 100P Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry Station No.	Master J : PLC1 : Serial : MIL protocol : First LH HL Cy NND : TimeOut Condition 300 : 5 0 : : 0 : : : : 0 : : : : : : : : : : : : :	Cha 5 () msec) msec	(Second)		mm Manual

Settings			Contents		
ТОР	Model	Select the TOP model.			
External device	Vendor	Select the vendor of the	e external device to be connect	ed to the TOP.	
		Select "M2I Corporation			
	PLC	Select the external device	ce to be connected to the TOP.		
		Model	Interface	Protocol	
		TOP Master	TOP Master Serial M2I Protocol		
		Please check the system configuration in Chapter 1 to see if the external device y 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

- $\blacksquare [Project] \rightarrow [Property] \rightarrow [TOP Setting] \rightarrow [HMI Setup] \rightarrow [Use HMI Setup Check] \rightarrow [Edit] \rightarrow [Serial]$
- Set the TOP communication interface in TOP Design Studio.



Items	ТОР	External device	Remarks
Signal Level	RS-232C / RS-422 / RS-485	RS-232C / RS-422 / RS-485	
Baud Rate	115		
Data Bit	8		
Stop Bit			
Parity Bit	No	ne.	

* 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. (COM3 supports only RS-485.)
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 > COM1 > PLC1: TOP Master]
 - Set the options of the communication driver option in TOP Design Studio.

Project Option		×
Change HMI[H] Add PLC [A] TI Change PLC[C] Z Delete PLC[D]		
PLC Setting[TOP Master] Statistical String String Save Model : First LH HL Change PLC Setting[TOP Master] Alas Name : [LC1] Alas Name : [LC1] Interface : Serial I I Interface : Serial I Interface : Ser		mm Manual
	Apply	Close

Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External
Protocol	Select the communication protocol between the TOP and an external device.	device selection".
String Save Mode	Set the byte order of data when entering the string data.	
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.	
Retry	Set the number of request retries when the data request result is no response/negative response.	
Station No.	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

■ [Control Panel] → [Serial]



Items	ТОР	External device	Remarks
Signal Level	RS-232C / RS-422 / RS-485	RS-232C / RS-422 / RS-485	
Baud Rate	1152		
Data Bit	8		
Stop Bit	1		
Parity Bit	Nor		

* 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. (COM3 supports only RS-485.)
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

■ [Control Panel] → [PLC]

	Ö		PLC	×
Run	🔯 System	Driver(COM1)	PLC1(TOP Master) 🗸	
		Interface Protocol	Serial 🔹	
MNC	PLC Se	Timeout	300 🗣 msec	
VNC Viewer	(ଲ) ¤	Send Wait Retry	0 🗣 msec	
0.	Ethernet S	Station N	0	
Screen shot	Infi			
	Diagnostic Ma			
	[System]	Diagnostic		Apply Cancel

Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External
Protocol	Select the communication protocol between the TOP and an external device.	device selection".
String Save Mode	Set the byte order of data when entering the string data.	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SandWait (ms)	Set the waiting time between TOP's receiving a response from an external device	
Senuvvait (IIIS)	and sending the next command request.	
Potru	Set the number of request retries when the data request result is no	
Retry	response/negative response.	
Station No.	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 that the settings of the connected ports in [Control Panel] \rightarrow [Serial] are the same as the settings of the external device.

Diagnosis of whether the port communication is normal or not

- Touch "Communication diagnostics" in [Control Panel] \rightarrow [PLC].
- Check whether communication is connected or not.

Communication	Communication setting normal
diagnostics succeeded	
Error message	Communication setting abnormal
	- Check the cable, TOP, and external device settings. (Refer to 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	Ch	eck	Remarks
System	How to connect	t the system	OK	NG	1 Custom configuration
configuration	Cable	OK	NG	1. System configuration	
ТОР	Version	OK	NG		
	Communication	port	OK	NG	
	Communication	driver and protocol	OK	NG	
	Other detailed	settings	OK	NG	
	Relative prefix	Project setting	OK	NG	2. External device selection
		Communication diagnostics	OK	NG	3. Communication setting
	Serial	Transmission Speed	OK	NG	
	Parameter	Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
External	CPU		OK	NG	
device	Communication	port	OK	NG	
	Protocol		OK	NG	
	Setup Prefix	Setup Prefix			
	Other detailed	OK	NG		
	Serial	Transmission Speed	OK	NG	
	Parameter	Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
	Check address range				5. Supported addresses
			ОК	NG	(For details, please refer to the PLC
					vendor's manual.)



4. External device setting

Refer to the vendor's user manual to identically configure the communication settings of the external device to that of the TOP.



5. Cable table

■ RS-232C (1:1 connection)

COM1 / COM2				External device		
Pin	Signal	Pin	Cable connection	Cincol norma	Dia amangana ant	
arrangement ^{*Note 1)}	name	number		Signal name	Pin arrangement	
1 5						
(° °)	RD	2		RD		
	SD	3		SD		
6 9						
Based on	SG	5		SG		
communication						
cable connector						
front,						
D-SUB 9 Pin male						
(male, convex)						

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

■ **RS-422** (1:1 connection)

COM1 ,	/ COM2				External device
Pin	Signal	Pin	Cable connection	Signal	
arrangement ^{*Note 1)}	name	number		name	
1 5	RDA(+)	1		SDA(+)	
(° °)		2	•	SDB(-)	
		3	•	RDA(+)	
Based on	RDB(-)	4		RDB(-)	
communication	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.

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

■ **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
Din arrangement	Signal	Cable connection	Signal	
	name		name	
	+		+	
	-		-	
	SG		SG	

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

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

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

TOP	Cable connection and signal	External device	Cable connection and signal	External device
Signal name	direction	Signal name	direction	Signal name
RDA(+)	├ • •	SDA(+)	• •	SDA(+)
RDB(-)	<u>├ ┡ </u>	SDB(-)		SDB(-)
SDA(+)	╞╼╽╶──│┕──	RDA(+)	┝━┥│	RDA(+)
SDB(-)	├──�	RDB(-)	⊢ • • • • • • • • • • • • • • • • • • •	RDB(-)
SG		SG		SG



6. Supported addresses

The devices available in TOP are as follows:

Address	Bit	Word
D	D0000.00 ~ D9999.15	D0000 ~ D9999



Appendix. M2I Protocol

This chapter describes the M2I protocol.

There are two types of M2I protocol commands: READ/WRITE, which use ASCII code.

	Frame	Contents	Direction
Read	Read request	System buffer request to read data.	Master 🔶 Slave
	Read response	Response to read request	Master ← Slave
Write	Write request	Request to write data on system buffer	Master 🔶 Slave
	Write response	Response to write request	Master ← Slave

1. Read request

	Size (Byte)	ASCII	HEX	Contents
Start code	1	ENQ	0x05	Start code of requested frame
Prefix	2	01 (Dec)	0x3031	SLAVE device prefix
Command	1	R	0x52	Read data command
Address	4	0100 (Dec)	0x3031, 0x3030	System buffer address of SLAVE device
Quantity	2	0x10 (Hex)	0x3130	Amount of data
End code	1	EOT	0x04	Code that denotes the end of a frame
BCC	2	0xD9 (Hex)	0x4439	The last byte of the summed value from prefix to
				end code

The example in the table above depicts a read request frame of 16 word data from system buffer number 100.

2. Read request

	Size (Byte)	ASCII	HEX	Contents
Start code	1	ACK	0x06	Start code of response frame
Prefix	2	01 (Dec)	0x30, 0x31	Device prefix
Command	1	R	0x52	Read data command
Data	4 x n	0x1234 (Hex)	0x3132, 0x3334	Data
		0x5678 (Hex)	0x3536, 0x3738	
		0xFFFF (Hex)	0x4646, 0x4646	
End code	1	EOT	0x04	Code that denotes the end of a frame
BCC	2	0xB7 (Hex)	0x4237	The last byte of the summed value from prefix to
				end code

The example in the table above depicts a response frame of n data from the system buffer address that received the read request.

3. Write request

	Size (Byte)	ASCII	HEX	Contents
Start code	1	ENQ	0x05	Start code of requested frame
Prefix	2	01 (Dec)	0x3031	SLAVE device prefix
Command	1	W	0x57	Data write command
Address	4	0100 (Dec)	0x3031, 0x3030	System buffer address of SLAVE device
Quantity	2	0x01 (Hex)	0x3031	Amount of data
Data	4 x n	0x1234 (Hex)	0x3132, 0x3334	Data
End code	1	EOT	0x04	Code that denotes the end of a frame
BCC	2	0xAB (Hex)	0x4439	The last byte of the summed value from prefix to
				end code

The example in the table above depicts a frame that requests writing the data 1234 onto 1 address from system buffer 100.



4. Write request

	Size (Byte)	ASCII	HEX	Contents
Start code	1	ACK	0x06	Start code of response frame
Prefix	2	01 (Dec)	0x30, 0x31	Device prefix
Command	1	W	0x57	Data write command
End code	1	EOT	0x04	Code that denotes the end of a frame
BCC	2	0xBC (Hex)	0x4243	The last byte of the summed value from prefix to
				end code

5. BCC error response

	Size (Byte)	ASCII	HEX	Contents
Start code	1	NAK	0x15	Start code of negative response frame
Prefix	2	01 (Dec)	0x30, 0x31	Device prefix
Command	1	2	0x32	BCC error
End code	1	EOT	0x04	Code that denotes the end of a frame
BCC	2	0xAC (Hex)	0x4143	The last byte of the summed value from prefix to
				end code