Rockwell Automation, Inc. MicroLogix, SLC500 Series DF1 Driver

Supported version TOP Design Studio

gn 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".

1. System configuration

Page 2

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

2. External device selection Page 3

Select a TOP model and an external device.

3. TOP communication setting Page 4

Describes how to set the TOP communication.

4. External device setting Page 10

Describes how to set up communication for external devices.

5. Cable table

Page 11

Describes the cable specifications required for connection.

6. Supported addresses

Page 13

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



1. System configuration

The system configuration of the driver "Rockwell Automation – MicroLogix/SLC500 Series" is as follows:

Series	СРИ	Link I/F	Communication method	System setting	Cable
MicroLogix	MicroLogix1500 (1764-LRP)	Channel 1	RS-232C	3.1 Settings example 1 (Page 4)	<u>5.1. Cable table 1</u> (Page 9-(A))
	MicroLogix 1000 MicroLogix 1200	Channel 0	RS-232C	<u>3.1 Settings</u> example <u>1</u> (<u>Page 4)</u>	<u>5.2. Cable table 2</u> (Page 9-(B))
	MicroLogix 1500 (1764-LSP, 1764-LRP)	AIC + 1761-NET- AIC (Advanced Interface Converter)	RS-232C	3.1 Settings example 1 (Page 4)	5.3. Cable table 3 (Page 9-(C))
SLC500	SLC 5/03 SLC 5/04 SLC 5/05	Channel 0	RS-232C	<u>3.1 Settings</u> example <u>1</u> (<u>Page 4)</u>	<u>5.1. Cable table 1</u> (Page 9-(A))
		1770-KF3 2760-RB 1775-KA 5130-RM	RS-232C	3.1 Settings example 1 (Page 4)	<u>5.3. Cable table 3</u> (Page 9-(D))
		1771-KGM	RS-232C	3.1 Settings example 1 (Page 4)	<u>5.3. Cable table 3</u> (Page 9-(E))

■ Connection configuration

• 1:1 (one TOP and one external device) connection





2. External device selection

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

Select Device					x
-PLC Setting[Micro	Logix Series]				
Alias Name :	PLC1				
Interface :	Serial	\sim			
Protocol :	DF1	\sim		Co	mm Manual
String Save Mode :	First HL HL	Change			
Use Redundanc	y				
Operate Condition :	ND ~				
Change Condition : 🔳	TimeOut	5 🗘 (Seco	ond)		
	Condition				Edit
Primary Option					
Timeout	300 📄 ms	sec			
Send Wait	0 🚔 m:	sec			
DF1 Mode	Full Duplex 🗸 🗸	·			
Error Detection	BCC 🗸				
Source ID	0				
Destination ID (Remote)	1				
NAK Retries	3				
ENQ Retries	3				
			🖕 Back	🗸 ОК	X Cancel

Settings		Contents
ТОР	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 " Rockwell Automation, Inc ".
	PLC	Select the model series of the external device that connects to the TOP. Select "MicroLogix/SLC500 Series DF1". 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]

- Set the TOP communication interface in TOP Design Studio).
Project Option	X
Date / Time Sync. Screen Option	Unit Convert HmiSetup Global Lock & Touch Project Style Splash PLC Buffer Sync.
■ FieldBus (0) ■ RFID (0)	
Wing Device Setting Hmi Setup Option	Initialization Edit
COM2 (1) Project Setting HMDIpsable=0 HMDIpsable=0 HMDIpsable=0	^
Ethernet (0) Start Mode = Menu Start Screen No.=1	
USBDevice (0) Latch Set=0~0 Communication Error Message=0	
USBErrorMessage=0 StorageErrorMessage=1 DatabaseMessage=1	-
Control Band	
Control Panel	
System Douison	Service Intion
	Serial X
	Regist Depty CONT
	Serial Port: CUMI
PLC Security Date/Time	Signal Level
	● RS-232C ○ RS-422(4) ○ RS-485(2)
	Baud Rate: 38400 🔻
Ethernet Serial HDMI	Stop Bit: 1
	Parity Bit: None 🔻
	Flow: Utt
Ping	Auto Search Loopback Test
Diagnostic File Ping Manager	
	Apply Cancel

Items	TOP E			External device	Remarks
Signal Level (port)	RS-232C RS-422 RS-485		RS-232C		
		KS-422	KS-405	RS-422/485	
Baud Rate	38400				
Data Bit	8				
Stop Bit	1				
Parity Bit	None.				

* The above settings are examples recommended by the company.

ltems	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 : Control/Compact Logix Series"]

- Set the options of the DF1 communication driver in TOP Design Studio.

Project Option		×
Change HMI[H] Add Pl	C [A] TITA Change PLC[C] X Delete PLC[D]	
 TOP Setting SYS : RD1520X Option Module Setting FieldBus (0) RFID (0) COM1 (0) COM2 (1) Ethernet (0) Wireless (0) USBDevice (0) 	PLC Setting[Microlys Series] Alas Name : PLC1 Interface : Serial Protocol : DF1 String Save Mode : Prist HL HL Change Operate Condition : ImmeOut Condition Condition Immeout 300 Immeout BCC Source ID 0 Immeout Immeout Immeout Immeout Immeout Immeout Immeout Immeout Immeo	Comm Manual
		Apply Close



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]

	*	Control Panel	×
	🔯 System 🗖 De	🚥 Serial 🗙	
Run		Serial Port: COM1 -	
MNC		Signal Level ● RS-232C ○ RS-422(4) ○ RS-485(2)	
		Baud Rate: 38400 💌	
VNC Viewer		Data Bit: 8	
	Ethernet Serial	Stop Bit: 1	
\bigcirc		Parity Bit: None 🔻	
Screen	with I	Flow: Off 🚽	
shot	Diagnostic File Manager	Auto Search Loopback Test	
		Apply Cancel	
	[System]	CIO	bse

	ТОР		External device	Remarks
			RS-232C	
KS-232C	KS-422	KS-485	RS-422/485	
38400				
8				
1				
None.				
	RS-232C	TOP RS-232C RS-422	TOP RS-232C RS-422 RS-485 38400 38400 1 None.	TOP External device RS-232C RS-422 RS-485 RS-232C RS-485 RS-485 RS-422/485 38400 38400 1 Image: Second se

* 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]

	¢۵		PLC	×
	🔯 System	Driver(COM1)	PLC1(MicroLogix Series) 🗸	
Run		Interface	Serial 💌	
		Protocol	DF1 💌	
WNC	PLC Se	Timeout	300 🖨 msec	
VNC		Send Wait	0 🖨 msec	
Viewer	[6ώ] ⊑	DF1 Mode	Full Dur 🔻	
	Ethernet S	Error Det	BCC -	
		Source IE	0	
Screen	m	Destinati		
SHUT		NAK Retri	3	
	M	: ENQ Retri	3	
	[System]	Diagnostic		Apply Cancel



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 port (COM1/COM2/COM3) 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	Conte	ents	Ch	eck	Remarks
System	How to connect the sy	stem	OK	NG	1 System configuration
configuration	Connection cable name	e	OK	NG	1. System computation
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	OK	NG	2. External device selection
		diagnostics	ŬK	NG	3. Communication setting
	Serial Parameter	Transmission	OK NG	NC	
		Speed		NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
External device	CPU name	OK	NG		
	Communication port n	OK	NG		
	Protocol (mode)	OK	NG		
	Setup Prefix	OK	NG		
	Other detailed settings	OK	NG	4 External device setting	
	Serial Parameter	Transmission	OK	NG	4. External device setting
		Speed	ÖK	NO	
		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

Set as below using "MicroLogix/SLC500 Series" Ladder Software "RSLogix 500". For more detailed setting method than that described in this example, refer to the PLC user manual.



Do not configure a duplicate Source ID (prefix) for the external device connected to the same unit network

1. From the "RSLogix 500" window, double-click [Channel Configuration] to open the "Channel Configuration" window.

2. From the "Channel Configuration" window, select the [Chan. 0 –System] tab, and configure as shown below.

Setup Items		Setup Description	Remarks
Driver		DF1 Full Duplex Slave	Fixed
Baud Rate		19200	
Parity		NONE	
Stop Bits		1	
Source ID (Station Add	ress)	0	
Protocol Control	Control	No Handshaking	Fixed
	Error Detection	ВСС	Fixed
	Embedded	Enabled	Fixed
	Duplicate Packet Detect	No Check	Fixed
	ACK Timeout	50	
	NAK Retries	3	
	ENQ Retries	3	

3. Download configurations to PLC.



5. Cable table

This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device. (The cable diagrams described in this section may differ from the external device vendor's recommendations.)

■ RS-232C (1:1 connection)

(A) TOP COM Port (9 pin)

TOP COM				PLC			
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin	
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)	
1 5	CD	1	•	1	CD	5 1	
0 0 0 0 6 9	RD	2 .		2	RD	$(\circ \circ)$	
	SD	3 .		3	SD	9 6	
	DTR	4] • · · · ·	4	DTR		
communication	SG	5 -		5	SG	communication	
cable connector	DSR	6	•	6	DSR	cable connector	
front.	RTS	7	•	7	RTS	front.	
D-SUB 9 Pin male	CTS	8	•	8	CTS	D-SUB 9 Pin female	
(male, convex)		9		9		(female, concave)	

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

(B) TOP CO	(B) TOP COM Port (9 pin)							
TOP COM				PLC				
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin		
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)		
15	CD	1		1		5 1		
$(\circ \circ)$	RD	2		2	TXD	$\left(\circ \circ \right)$		
	SD	3		3	RXD			
6 9 Bacad on	DTR	4		4		9 b		
communication	SG	5		5	SG			
cable connector	DSR	6		6				
front	RTS	7		7		front		
D-SUB 9 Pin male	CTS	8		8		D-SUB 9 Pin female		
(male, convex)		9		9		(female, concave)		

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

(() TOP	COM	Port	(15)	nin)
(~	,	00111	1010	(12	

тор сом				PLC			
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin	
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)	
1 8	CD	1		1		5 1	
(° °)	RD	2		2	RXD	$(\circ \circ)$	
	SD	3		3	TXD		
9 15	DTR	4		4		9 6	
Based on	SG	5		5	SG	Based on	
communication	DSR	6		6		communication	
cable connector		7		7		cable connector	
front,	RIS	1		1		front,	
D-SUB 15 Pin male	CTS	8		8		D-SUB 9 Pin female	
(male, convex)		9		9		(female, concave)	

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



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tion Panel	

(D) TOP CO	(D) TOP COM Port (9 pin)								
TOP	СОМ				PLC				
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin			
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)			
1 5	CD	1		1	GND	13 1			
00)	RD	2		2	TXD				
	SD	3		3	RXD	25 14			
6 9	DTR	4	۹	4	RTS	Based on			
Based on	SG	5		5	CTS	communication			
communication	DSR	6	•	6	DSR	cable connector			
cable connector	tor RTS 7		7	COM	front,				
front,	CTS	8	•	8	DCD	D-SUB 25 Pin			
D-SUB 9 Pin male		9		20	DTR	female (female,			
(male, convex)						concave)			
(E) TOP CC	OM Port (9	pin)							
TOP	СОМ		PLC		LC				
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin			
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)			
1 5	CD	1		1	GND	8 1			
00)	0) RD 2		O) RD 2			2	TXD		
	SD	3		3	RXD	15 9			
6 9	DTR	4	•	4	RTS	Based on			
Racod on									
	SG	5	• •	5	CTS	communication			
communication	SG DSR	5		5	CTS DSR	communication cable connector			
communication cable connector	SG DSR RTS	5 6 7		5 6 7	CTS DSR COM	communication cable connector front,			
communication cable connector front,	SG DSR RTS CTS	5 6 7 8		5 6 7 8	CTS DSR COM DCD	communication cable connector front, D-SUB 15 Pin			
communication cable connector front, D-SUB 9 Pin male	SG DSR RTS CTS	5 6 7 8 9		5 6 7 8 20	CTS DSR COM DCD DTR	communication cable connector front, D-SUB 15 Pin female (female,			

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



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.



Device notation → De

→ Device Name File Number : Element

6.1 MicroLogix Series

Device			Bit Address	Word Address	32 bits	Remarks
Output File		O000	:000.00 – 0008:255.15	O000:000 – O008:255		
Input File		1000	:000.00 – 1008:255.15	1000:000 - 1008:255		
Bit File		B003	:000.00 - B003:255.15	B003:000 - B003:255		
		B009	:000.00 – B255:255.15	B009:000 - B255:255		
Timer File	Coil	Done	TC004:000.13 - TC004:255.13			
			TC009:000.13 - TC255:255.13			
		Timing	TC004:000.14 - TC004:255.14			
			TC009:000.14 - TC255:255.14	-		
		Enable	TC004:000.15 - TC004:999.15			
			TC009:000.15 - TC099:999.15			
	Preset		_	TP004:000 - TP004:255		
				TP009:000 – TP255:255		
	Accumulated		_	TA004:000 - TA004:255		
				TA009:000 – TA255:255		
Counter	Coil	Update Acc	CC005:000.10 - CC005:255.10			
File			CC009:000.10 - CC255:255.10		L/H	
		Underflow	CC005:000.11 - CC005:255.11			
			CC009:000.11 - CC255:255.11			
		Overflow	CC005:000.12 - CC005:255.12			
			CC009:000.12 - CC255:255.12			
		Done	CC005:000.13 - CC005:255.13	-		
			CC009:000.13 - CC255:255.13			
		Down Enable	CC005:000.14 – CC005:255.14			
			CC009:000.14 – CC255:255.14			
		Up Enable	CC005:000.15 – CC005:255.15			
			CC009:000.15 - CC255:255.15			
	Preset			CP005:000 – CP005:255		
			-	CP009:000 - CP255:255		
	Accumulated			CA005:000 – CA005:255		
			-	CA009:000 – CA255:255		
Integer File		N007	:000.00 - N007:255.15	N007:000 - N007:255		
		N009	:000.00 – N255:255.15	N009:000 – N255:255		
Floating Poi	nt File		-	F008:000 – F255:255	H/L	
String File			-	ST9:0 – ST255:255	1/4	
Long Word	File	L9):0/0 – L255:255/31	L9:0 – L255:255	ЧП	



Device			Bit Address	Word Address	32 bits	Remarks
Output File		0000	:000.00 – 0063:255.15	O000:000 – O063:255		
Input File		1000	:000.00 – 1063:255.15	1000:000 - 1063:255		
Bit File		B003	:000.00 – B003:255.15	B003:000 - B003:255		
		B009	:000.00 – B255:255.15	B009:000 – B255:255		
Timer File	Coil	Done	TC004:000.13 - TC004:255.13			
			TC009:000.13 - TC255:255.13			
		Timing	TC004:000.14 - TC004:255.14			
			TC009:000.14 - TC255:255.14	-		
		Enable	TC004:000.15 - TC004:999.15			
			TC009:000.15 - TC099:999.15			
	Preset		-	TP004:000 - TP004:255		
				TP009:000 – TP255:255		
	Accumulated		-	TA004:000 - TA004:255		
				TA009:000 – TA255:255		
Counter	Coil	Update Acc	CC005:000.10 - CC005:255.10			
File			CC009:000.10 - CC255:255.10		1.41	
		Underflow	CC005:000.11 – CC005:255.11		ЦП	
			CC009:000.11 – CC255:255.11			
		Overflow	CC005:000.12 – CC005:255.12			
			CC009:000.12 – CC255:255.12			
		Done	CC005:000.13 - CC005:255.13	_		
			CC009:000.13 - CC255:255.13			
		Down Enable	CC005:000.14 - CC005:255.14			
			CC009:000.14 – CC255:255.14			
		Up Enable	CC005:000.15 - CC005:255.15			
			CC009:000.15 - CC255:255.15			
	Preset			CP005:000 - CP005:255		
	_		-	CP009:000 – CP255:255		
	Accumulated			CA005:000 – CA005:255		
			-	CA009:000 - CA255:255		
Integer File		N007	:000.00 – N007:255.15	N007:000 - N007:255		
		N009	:000.00 – N255:255.15	N009:000 - N255:255		
Floating Po	int File		_	F008:000 - F255:255	H/L	