# Rockwell Automation, Inc. Control/Compact Logix Series DF1 Driver

Supported version TOP Design Studio

lio 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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Select a TOP model and an external device.

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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.

#### **6.** Supported addresses

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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 the driver "Rockwell Automation – Control/CompactLogix Series DF1" is as follows:						
Series	СРИ	Link I/F	Communication method	System setting	Cable	
ControlLogix	Logix5550	CPU Direct	RS-232C	<u>3.1 Settings example 1</u> (Page 4)	<u>5.1. Cable table 1</u> (Page 9)	
CompactLogix	1769-L20 1769-L30 1769-L31 1769-L32E 1769-L35E	Channel 0	RS-232C	<u>3.1 Settings example 1</u> (Page 4)	<u>5.1. Cable table 1</u> (Page 9)	

■ Connectable configuration

TOP – External device (1:1)





### 2. External device selection

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

Select Device					x
PLC select [CO	M11				
Filter Fall				Conveh , lean	
Filter : [All]		V		Mode	el 🔿 Vendor
Vendor		Model			
Rockwell Automation		🔗 Cont	rol/CompactLogix Se	ries	
RS Automation		-			
HANYOUNG NUX					
SAMWONTECH					
IAI Corporation					
KOLVER Srl					
				_	
			Back	Next	X Cancel
			Back	Next 🗼	X Cancel
Select Device			Back	Next	X Cancel
Select Device PLC Setting[ Contr	ol/Compact	Logix Series	Back	Next	× Cancel
Select Device PLC Setting[ Contr Alias Name :	ol/Compact	Logix Series	Back	Next	X Cancel
Select Device PLC Setting[ Contr Alias Name : Interface :	ol/Compact PLC1 Serial	Logix Series	Back	Next	X Cancel
Select Device PLC Setting[ Contr Alias Name : Interface : Protocol :	ol/Compact PLC1 Serial DF1 Eirct 1 ki kill	Logix Series	Back	Next	X Cancel
Select Device PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode :	ol/Compact PLC1 Serial DF1 First LH HL	Logix Series	Back	Next	X Cancel
Select Device PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode : Use Redunance	ol/Compact PLC1 Serial DF1 First LH HL	Logix Series	Back	Next	x Cancel
Select Device PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode : Operate Condition :	ol/Compact PLC1 Serial DF1 First LH HL V ID V	Logix Series	Back	Next	X Cancel
Select Device PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : An Change Condition :	ol/Compact PLC1 Serial DF1 First LH HL y ID v TimeOut Condition	Logix Series	Back	Next	x Cancel
Select Device PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : An Change Condition :	ol/ Compact PLC1 Serial DF1 First LH HL V DD Condition	Logix Series	Back  cond)	Next	mm Manual
Select Device PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition :	ol/ Compact PLC1 Serial DF1 First LH HL y D TimeOut Condition	Logix Series	Back	Next	mm Manual
Select Device  PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode : Operate Condition : Alian Change Condition : Alian Primary Option Timeout	ol/Compact PLC1 Serial DF1 FrstLHHL y TimeOut Condition	Logix Series	Back	Co	mm Manual
Select Device  PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode :  Use Redundanc Operate Condition : A Change Condition : C Primary Option Timeout Send Wait	ol/Compact PLC1 Serial DF1 FrstLHHL Y DD V TimeOut Condition	Logix Series	Back	Next Ca	x Cancel
Select Device  PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode :  Use Redundanc Operate Condition :  Primary Option Timeout Send Wait DF1 Mode	ol/ Compact PLC1 Serial DF1 First LH HL Y D Condition 300 Full Duplex	Logix Series	Back	Co	x Cancel
Select Device  PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Primary Option Timeout Send Wait DF1 Mode Error Detection	ol/ Compact PLC1 Serial DF1 First LH HL V DD Solution Solution Solution Solution Solution Full Duplex BCC V	Logix Series	Back	Next Ca	x Cancel
Select Device  PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Primary Option Timeout Send Wait DF1 Mode Error Detection Source ID	ol/ Compact PLC1 Serial DF1 FirstLHHL V DD Solution Solution Solution Solution Full Duplex BCC V Solution Soluti	Logix Series	Back	Next	x Cancel
Select Device  PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Primary Option Timeout Send Wait DF1 Mode Error Detection Source ID Destination ID (Remote)	ol/ Compact PLC1 Serial DF1 First LH HL V DF1 DF1 Condition 300 Full Duplex BCC 0 0 0 0 0 0 0 0 0 0 0 0 0	Logix Series	Back	Ca	x Cancel
Select Device  PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode :  Use Redundanc Operate Condition : Primary Option Timeout Send Wait DF1 Mode Error Detection Source ID Destination ID (Remote) NAK Retries	ol/ Compact PLC1 Serial DF1 First LH HL V V Condition 300 Full Duplex BCC V 0 0 0 0 0 0 0 0 0 0 0 0 0	Logix Series	Back	Co	x Cancel
Select Device PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode : Use Redundanc Operate Conditon : An Change Conditon : An Change Conditon : Primary Option Timeout Send Wait DF1 Mode Error Detection Source ID Destination ID (Remote) NAK Retries ENO Betries	ol/ Compact PLC1 Serial DF1 First LH HL V V Condition 300 Full Duplex BCC V 0 1 3 0 0 0 0 0 0 0 0 0 0 0 0 0	Logix Series	Back	Co	Manual
Select Device  PLC Setting[ Contr Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Conditor : A Change Conditor : C Primary Option Timeout Send Wait DF1 Mode Error Detection Source ID Destination ID (Remote) NAK Retries ENQ Retries ENQ Retries	ol/ Compact PLC1 Serial DF1 First UH HL V V Condition 300 Full Duplex BCC V 0 1 3 5 5 0	Logix Series	Cond)	Co	x Cancel

Sett	tings	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 " <b>Rockwell Automation, Inc</b> ".					
	PLC	Select an external device to connect to TOP.	Select an external device to connect to TOP.				
		Model Interface Protocol					
		Control/Compact Logix Series Serial DF1 Driver					
		Please check the system configuration in Chapter 1 to see if the external device you wa 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.



Items	TOP External device				Remarks	
Signal Level (port)				RS-232C		
	R3-232C	K3-422	K3-405	RS-422/485		
Baud Rate		38400				
Data Bit	8					
Stop Bit	1					
Parity Bit			None.			

\* The above settings are examples recommended by the company.

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 : Control/Compact Logix Series"]
  - Set the options of the DF1 communication driver in TOP Design Studio.

Project Option		×
Change HMI[H] Add PLC [A]	TT Change PLC[C] Delete PLC[D]	
	etting[ Control/CompactLogix Series ]   Alas Name : PLC1   Interface : Serial   Protocol : DF1   Protocol : DF1   Protocol : DF1   Condition : InneOut   Secundian   Condition : InneOut   Condit	omm 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]

	Ō	Control Pane	il	×	
	🔞 System	Se Se	erial	×	
Run		Serial Port:	COM1		
		Signal Level	-422(4) () RS-485(2	2)	
-12	PLC Secur	Baud Rate:	38400		
VNC Viewer		Data Bit:	8	-	
		Stop Bit:	1		
	Ethernet	Parity Bit:	None		
Screen	Land E	Flow:	Off		
shot	Diagnostic Fil	e Auto Search	Loopback Tes	it i	-
	Mana	ger	Apply Canc	el	
	[System]	L		Close	
TOPRX - TOPRXC	)800S			A 2021-08-31 05	:18:57 PW
Items		ТОР		External device	Remarks
Signal Level (port)	RS-232C	RS-422	RS-485	RS-232C RS-422/485	
Baud Rate		38400		•	
Data Bit		8			

\* The above settings are setting examples recommended by the company.

Stop Bit Parity Bit

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.

8 1

None.



#### (2) Communication option setting

■ [ Main Screen > Control Panel > PLC ]

	TUI	PLC	×
Run Run VNC Viewer Viewer Screen shot	vstem Driver(COM1) Interface Protocol Timeout Send Wait DF1 Mode Error Det Source IC Destinati NAK Retri ENQ Retri	PLC1(Control/CompactLogix Series) Serial DF1 300 msec 0 msec Full Dur BCC 1 m 3 3 m 3	•
[Sys	tem] Diagnostic	App	ly Cancel
TOPRX - TOPRX0800S		A 2021-0	8-31 05:19:09 PM



#### **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	Check		Remarks
System	How to connect the sy	stem	OK	NG	1 System configuration
configuration	Connection cable name	e	OK	NG	1. System computation
ТОР	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	NC	2. External device selection
		diagnostics	ŬK	NG	3. Communication setting
	Serial Parameter	Transmission	OK	NC	
		Speed	ÜK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
External device	CPU name		OK	NG	
	Communication port name (module name)		OK	NG	
	Protocol (mode)		ОК	NG	
	Setup Prefix		OK	NG	
	Other detailed settings		OK	NG	4 Eutomal device setting
	Serial Parameter	Transmission	OK	NC	4. External device setting
		Speed	ÜK	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

Set as below using "Control/CompactLogix Series" Ladder Software "RSLogix5000". For more detailed setting method than that described in this example, refer to the PLC user manual.



- Take caution when selecting RTU/ASCII mode in Protocol Frame format.

- Check the contents of the address map on the external device side and use the communication address according to its contents.

1. In "RSLogix5000" project window, bring up the [Controller Properties] pop-up window.

2. Configure the [Serial Port] tab settings as shown below.

Setup Items	Setup Description	Remarks
Mode	System	
BaudRate	38400	
Data Bits	8	
Parity Bits	None	
Stop Bits	1	
Control Line	No Handshake	
RTS Send Delay	0	
TRS Off Delay	0	
3. Configure the [System Protoco	l] tab settings as shown below.	
Setup Items	Setup Description	Remarks
Protocol	DF1 Slave	
Station Address	0	
Transmit	3	
Slave Poll	3000	
EOT Suppression	No Check	
Error Detection	BCC	
Enable Duplicate Detection	No Check	

4. 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)

СОМ				PLC		
Pin	Signal	Pin	Cable connection	Signal		
arrangement*Note 1)	name	number		name		
1 5	CD	1		CD		
	RD	2		SD	5 1	
6 9	SD	3		RD		
Based on	DTR	4	•	DTR	9 6	
communication	SG	5		SG	Based on communication	
cable connector	DSR	6	•	DSR	cable connector front,	
front,	RTS	7	P	RTS	D-SUB 9 Pin male (female,	
D-SUB 9 Pin male	CTS	8	<b>↓</b>	CTS	convex)	
(male, convex)		9				

\*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.

- [New Tag] : Create tag (Tag Name, Data Type Setting)
- 1. Run [Controller Tags] > [New Tag].

2. In [New Tag] dialog box, set Tag Name, Data Type					
Items	Contents	Remarks			
Tag Name	The name of the tag used in RSLogix5000 (User Define).				
	You must map the File Number to the appropriate tag to communicate with the TOP.				
	■ [Map PLC/SLC Messages] Reference				
Data type	BOOL : 32bit Data				
	DINT : Double Word Data				
	INT : Word Data				
	REAL : Float Data				

New Tag			New Tag		
<u>N</u> ame:	N7	ОК	<u>N</u> ame:	F8	OK
Description:		Cancel	Description:		Cancel
		Help			Help
Typ <u>e</u> :	Base Connection		Тур <u>е</u> :	Base Connection	
Alias <u>F</u> or:	v v		Alias <u>F</u> or:	<b></b>	
Data <u>T</u> ype:	INT[1000]		Data <u>T</u> ype:	REAL[1000]	
Scope:	TEST 💽		<u>S</u> cope:		
Style:	Decimal		Style:	Float	
🗖 Open Cor	figuration		🗖 Open Cor	ifiguration	

■ [Map PLC/SLC Messages] : File Number mapping in tag

3. In "RSLogix5000" menu, run [Logic] > [Map PLC/SLC Messages...].

4. In [PLC 2,3,5 / SLC Mapping] dialog box [New Tag]dialog box created Tag Name, map File Number.

File	e Number	∆ Name	 		Cano	<u>`e</u>
7		N7				
3		B3			Hel	P
8		F8				
				-		

The supported address ranges by the "Tag File Number Setting" described above are as follows:

DEVICE	Bit Adrress	Word Address	32bit	Remarks
BOOL	B000:000.00~B999:999.00	B000:000~B999:999	L/H	
DINT	B000:000.00~B999:999.00	B000:000~B999:999		
INT	N000:000.00~B999:999.00	N000:000~B999:999		
REAL	-	F000:000~B999:999		