SERVOMEX

DF Series

Serial Driver

V1.4.11.33 or higher

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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4. External device setting Page 10

Describes how to set up communication for external devices.

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Describe the cable specifications required for connection.

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

1. System configuration

The system configuration of TOP and "SERVOMEX – DF Series" is as follows:

Series	СРИ	Link I/F	Communicati on method	System setting	Cable
DF	DF-3□□E DF-7□□	J15 connector	RS-232C RS-485	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					×
PLC select [C0	DM1]				
Filter : [AI]		~		Search :	
				Mode	I O Vendor
Vendor		Model			
FANUC Co., Ltd.	^	🔗 DF Ser	ies		
MINEBEA Co., Ltd.		~			
Azbil Corporation					
KORO TECHNOLOGY					
ROBOSTAR					
Ebmpapst					
CoDeSys Automation All	liance				
Ophir Optronics Solution	is Ltd.				
SERVOMEX					
Tiger Optics LLC					
B & P Automation					
Decisional Decision					
Peripheral Device					
OTHERS Manufacture					
	•	1			
			Back	🔷 Next	X Cancel
Colore Devices					
Select Device					x
Select Device PLC Setting[DF Se	eries]				×
Select Device PLC Setting[DF Se Alias Name	PLC1				x
Select Device PLC Setting[DF Se Alias Name Interface Protocol	eries] : PLC1 : Serial				×
Select Device PLC Setting[DF Se Alias Name Interface Protocol String Save Mode	eries] : PLC1 : Serial : Digital Commun : First LH HL	nication v		Co	x mm Manual
Select Device PLC Setting[DF Set Alias Name Interface Protocol String Save Mode	PLC1 : PLC1 : Serial : Digital Commun : First LH HL	nication v Change		Co	mm Manual
Select Device PLC Setting[DF Se Alias Name: Interface: Protocol String Save Mode Operate Condition: a	eries] : PLC1 : Serial : Digital Commu : First LH HL : Y	rication ∨ Change		_ Co	mm Manual
Select Device PLC Setting[DF Se Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : Change Condition :	eries] : PLC1 : Serial : Digital Commun : First LH HL : From the second se	nication V Change	nnd)	co	mm Manual
Select Device PLC Setting[DF Se Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : Alian Change Condition :	eries] : PLC1 : Serial : Digital Commun : First LH HL : Y ND - TimeOut : Condition	Change	nd)	Co	mm Manual
Select Device PLC Setting[DF Se Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : Change Condition : Primary Option	eries] : PLC1 : Serial : Digital Communi : First LH HL Y ND - TimeOut 1 Condition	Change	ind)		× mm Manual
Select Device PLC Setting[DF Se Alias Name Interface Protocol String Save Mode Use Redundant Operate Condition : Primary Option Temport	eries] : PLC1 : Serial : Digital Commu : First LH HL : Y ND : TimeOut : Condition	Change S (Secc	ind)	Co	× mm Manual
Select Device PLC Setting[DF Se Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : Primary Option Timeout Condition	eries] : PLC1 : Serial : Digital Commu : First LH HL 	nication V Change	nd)	Co	mm Manual
Select Device PLC Setting[DF Se Alias Name Interface String Save Mode Use Redundanc Operate Condition : Primary Option Timeout Send Wait	eries] : PLC1 : Serial : Digital Communi : First LH HL : Y ND : TimeOut 1 Condition 2000 : 300 : 300 : Serial : Digital Communi : Serial : Digital Communi : Digital Communi : First LH HL : Serial : Serial : Digital Communi : First LH HL : Serial : Serial : Digital Communi : First LH HL : Serial : Serial : Serial : Serial : Digital Communi : First LH HL : Serial : Serial	mication Change	nd)	co	mm Manual
Select Device PLC Setting[DF Se Alias Name Interface String Save Mode Coperate Condition : Primary Option Timeout Send Wait Retry	eries] : PLC1 : Serial : Digital Commu : First LH HL :Y ND : TimeOut 1 Condition 2000 : 300 : S : C : C : C : C : C : C : C : C	mication Change S (Secc msec	nd)	Co	mm Manual
Select Device PLC Setting[DF Se Alias Name: Interface: Protocol String Save Mode Operate Condition : Anage Condition : Primary Option Timeout Send Wait Retry ID Number	eries] : PLC1 : Serial : Digital Commun : First LH HL :Y ND : TimeOut 1 Condition 2000 : 300 : 1 : 1 : : 1 : : : : : : : : : : : : :	mication V Change	ind)	Co	mm Manual
Select Device PLC Setting[DF Se Alias Name Interface Protocol String Save Mode Operate Conditon : Primary Option Timeout Send Wait Retry ID Number Series	eries] : PLC1 : Serial : Digital Commun : First LH HL Y ND V 1 TimeOut 1 Condition 2000 5 1 1 DF-700 V	mication V Change	ond)	co 	mm Manual
Select Device PLC Setting[DF Se Alias Name Interface: Protocol String Save Mode Operate Condition : Primary Option Timeout Send Wait Retry ID Number Series	eries] : PLC1 : Serial : Digital Commun : First LH HL Y ND V 1 TimeOut Condition 2000 © 300 © 5 © 1 © DF-700 ~	mication v Change	und)	50 	mm Manual
Select Device PLC Setting[DF Se Alias Name Interface Protocol String Save Mode Operate Condition : Primary Option Timeout Send Wait Retry ID Number Series	eries] : PLC1 : Serial : Digital Communi- : First LH HL Y ND ~ TimeOut Condition 2000 © 5 © 1 © DF-700 ~	mication v Change	and)	Co	mm Manual
Select Device PLC Setting[DF Se Alias Name Interface Protocol String Save Mode Use Redundance Operate Condition : Primary Option Timeout Send Wait Retry ID Number Series	eries] : PLC1 : Serial : Digital Commu : First LH HL Y ND V 2000 2000 5 5 1 © DF-700 V	mication v Change	and)	Co	mm Manual
Select Device PLC Setting[DF Se Alias Name: Interface: Protocol String Save Mode Use Redundanc Operate Condition : Primary Option Timeout Send Wait Retry ID Number Series	aries] : PLC1 : Serial : Digital Communication : First LH HL Y ND ∨ 1 TimeOut 2000 ♥ 300 ♥ 5 ♥ 1 ♥ DF-700 ∨	nication V Change	ind)	Co	× mm Manual

Settings		Contents				
ТОР	Model	Check the display and process of TOP to select the touch model.				
		Select the vendor of the extern	al device to be connected to TOF	2.		
	Vendor	Select "SERVOMEX".				
	PLC	Select an external device to connect to TOP.				
External device		Model	Interface	Protocol		
		DF Series	Serial	Digital Communication		
		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

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



Items	ТОР	External device	Remarks		
Signal Level	RS-232C	RS-232C			
	RS-485	RS-485			
Baud Rate	9600				
Data Bit	8				
Stop Bit	1				
Parity Bit	Nc	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.
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

- $\blacksquare [Project] \rightarrow [Project Property] \rightarrow [PLC Setting > COM1 > DF Series]$
 - Set the options of the DF Series communication driver in TOP Design Studio.

Project Option		×
Change HMI[H]	Add PLC [A] TIL Change PLC[C] 🔀 Delete PLC[D]	
 TOP Setting SYS : RD1520X Option Module Setting Fieldbus (0) Fieldbus (0) COM1 (1) PC1 : DF Series COM2 (0) Ethernet (0) Wireless (0) USBDevice (0) 	PLC Setting[DF Series] Alias Name : PLC1 Interface : Serial Protocol : Digital Communication String Save Mode : Frist LH HL Change Operate Condition : Primary Option Timeout 2000 Imsec Send Wait 300 Imsec Series DF-700 V	Comm Manual
		Apply Close
Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External
Protocol	Select "Digital Communication".	device selection".
Timeout	Set the time to wait for a response from an external device.	

Set the waiting time before sending a data request to an external device.

*Note 1

Series Select the series of the external device.

Enter ID for external device.

*Note 1)Setting it to 300ms or higher is recommended.

Send Wait

ID Number

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

 $\blacksquare [Control Panel] \rightarrow [Serial]$



Items	ТОР	External device	Remarks		
Signal Level	RS-232C	RS-232C			
	RS-485	RS-485			
Baud Rate	9600				
Data Bit	8	3			
Stop Bit		1			
Parity Bit	No	ne.			

* 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

■ [Control Panel] → [PLC]



Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External
Protocol	Select "Digital Communication".	device selection".
Timeout	Set the time to wait for a response from an external device.	
Send Wait	Set the waiting time before sending a data request to an external device.	*Note 1
ID Number	Enter ID for external device.	
Series	Select the series of the external device.	

*Note 1)Setting it to 300ms or higher is recommended.

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.
- \blacksquare 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		Check		Remarks	
System	How to connect the system		OK	NG	1 Custom configuration	
configuration	Connection cable name		ОК	NG	1. System configuration	
ТОР	Version information		OK	NG		
	Port in use		OK	NG		
	Driver name		OK	NG		
	Other detailed setting	S	ОК	NG		
	Relative prefix	Project setting	OK	NG		
		Communication	ОК	NG	2. External device selection	
	Serial Parameter	Transmission Speed	ОК	NG	<u>5. communication setting</u>	
		Data Bit	ОК	NG		
		Stop Bit	OK	NG		
		Parity Bit	OK	NG		
External device	CPU name	ОК	NG			
	Communication port	OK	NG			
	Protocol (mode)	ОК	NG			
	Setup Prefix	OK	NG			
	Other detailed settings		OK	NG	4. External device setting	
	Serial Parameter	Transmission Speed	ОК	NG	4. External device setting	
		Data Bit	OK	NG		
		Stop Bit	OK	NG		
		Parity Bit	ОК	NG		
	Check address range		OK	NG	6. Supported addresses	

- Refer to the user manual of the external device and configure the communication options.

5. Cable table

This chapter introduces a cable diagram for communication between the TOP and the external device.

(The cable diagrams in this section may differ from the vendor's recommendations.)

■ RS-232C

TOP				External device		
Pin	Signal	Pin	Cable connection	Pin	Signal	Din arrangement
arrangement ^{*Note 1)}	name	number		number	name	Pin anangement
1 5		1		1	RXD	
	RD	2		2	TXD	
6 9	SD 3	3	RTS			
Based on		4		4	CTS	
communication	SG	5		5	RXD-	
cable connector		6		6		
front,		7		7	TXD-	
D-SUB 9 Pin male		8		8	SG	
(male, convex)		9		9		

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

■ RS-485

TOP				External device		
Pin	Signal	Pin	Cable connection	Pin	Signal	Din arrangement
arrangement ^{*Note 1)}	name	number		number	name	Pin analigement
1 5	RDA	1	• •	- 1	RXD	
		2		2	TXD	
		3		3	RTS	
Based on	RDB	4		4	CTS	
communication	SG	5] +	5	RXD-	
cable connector	SDA	6		6		
front,		7		7	TXD-	
D-SUB 9 Pin male		8		8	SG	
(male, convex)	SDB	9		9		

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

■ RS-485

TOP			External device		
Pin arrangement	Signal	Cable connection	Pin	Signal	Pin arrangement
· ··· a.r.agement	name		number	name	r in analysement
	+ '	•	1	RXD	
	- '		2	TXD	
0	SG		3	RTS	
)@ ,] sg			4	CTS	
)@] -		•	5	RXD-	
)@1 +			6		
0			7	TXD-	
			8	SG	
			9		

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

TOP		External device	Cable connection and signal	External device
Signal name		Signal name	direction	Signal name
RDA		RXD	• •	RXD
RDB		RXD-	} • • • •	RXD-
SDA	┟╼╷╷╺╴	TXD	┟╼╸╎╴	TXD
SDB	<u>}_</u> •	TXD-	├ ──�	TXD-
SG		SG		SG

6. Supported addresses

The addresses available in TOP are as follows:

Depending on the external device model, the supported address range may vary. Be careful not to use an address that deviates from the supported range by referring to the user manual of the external device.

■ DF-300E Series

Address		Bit	Word	Remarks
STATUS		STATUS0.0 ~ STATUS2.7	STATUS0 ~ STATUS2	*Note 1
РРВ		-	РРВ	*Note 2
CALIBRATION *Note 3	EXE	CALIBRATION.EXE	CALIBRATION.EXE	*Note 4
	ТҮРЕ	CALIBRATION.TYPE	CALIBRATION.TYPE	
	MODE	CALIBRATION.MODE	CALIBRATION.MODE	
	VALUE	-	CALIBRATION.VALUE	*Note 2

*Note1) Status per bit

0.0	Over Range	1.0	Reserve	2.0	Reserve
0.1	Under Range	1.1	Reserve	2.1	Reserve
0.2	Invalid Data	1.2	Reserve	2.2	ROM Checksum Error
0.3	Memory Error	1.3	Command Error	2.3	Reserve
0.4	Alarm 1 On	1.4	Alarm 5 On	2.4	Reserve
0.5	Alarm 2 On	1.5	Alarm 6 On	2.5	In Calibration
0.6	Alarm 3 On	1.6	Alarm 7 On	2.6	NU
0.7	Alarm 4 On	1.7	Alarm 8 On	2.7	NU

*Note 2) Float type data

*Note 3) When entering any values in CALIBRATION.EXE, refer to the values in MODE, TYPE, VALUE and transmit commands.

CALIBRATION.TYPE : 0=Span, 1=Zero

CALIBRATION.MODE : 0=Manual, 1=Auto

*Note 4)Transmit the command to an external device when entering any value.

DF-700 Series

Address		Bit	Word	Remarks
STATUS		STATUS0.0 ~ STATUS2.8	STATUSO ~ STATUS2	*Note 1
PPB		-	PPB	*Note 2
PCELL		- PCELL		*Note 2
ROOM_TEMPERATURE		-	ROOM_TEMPERATURE	*Note 2
SENSOR_ISOLATE		SENSOR_ISOLATE	SENSOR_ISOLATE	*Note 4
SENSOR_RESTORE		SENSOR_RESTORE	SENSOR_RESTORE	*Note 4
SYSTEM_ISOLATE		SYSTEM_ISOLATE	SYSTEM_ISOLATE	*Note 4
SYSTEM_RESTORE		SYSTEM_RESTORE	SYSTEM_RESTORE	*Note 4
O2_SENSOR_OFF		O2_SENSOR_OFF	O2_SENSOR_OFF	*Note 4
O2_SENSOR_ON		O2_SENSOR_ON	O2_SENSOR_ON	*Note 4
CALIBRATION *Note 3	EXE	CALIBRATION.EXE	CALIBRATION.EXE	*Note 4
	ТҮРЕ	CALIBRATION.TYPE	CALIBRATION.TYPE	
	MODE	CALIBRATION.MODE	CALIBRATION.MODE	
	VALUE	-	CALIBRATION.VALUE	*Note 2

*Note1) Status per bit

0.0	Over Range	1.0	NU	2.0	Unit Isolated
0.1	NU	1.1	NU	2.1	Unreasonable Room Temp
0.2	Invalid Data	1.2	NU	2.2	Warm up
0.3	NU	1.3	Command Error	2.3	H2O Error/O2 Sensor Off
0.4	Alarm 1 On	1.4	Temperature Alarm	2.4	Pres. not in range/No O2 sensor
0.5	Alarm 2 On	1.5	O2 Electrolyte/H2O Pres. Alarm	2.5	In Calibration
0.6	Alarm 3 On	1.6	O2 Flow Alarm/H2O Sys. Alarm	2.6	NU
0.7	Alarm 4 On	1.7	O2 Sensor Off/H2O NU Alarm	2.7	NU

*Note 2) *Note 3) *4) Same explanation as DF-300E above.