Robostar Co., Ltd

RCS-8000 Series

Serial Driver

V1.4.11.23 or higher

Supported version TOP Design Studio

CONTENTS

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

1. System configuration Page 2 Describes connectable devices and network configurations. 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 12

Describes the addresses which can communicate with an external device.



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1. System configuration

The system configuration of TOP and ROBOSTAR – RCS-8000 Series is as follows:

Series	Link I/F	Communication method	System setting	Cable
RCS-8000	CN3	RS-232C	3. TOP communication setting	5. Cable table
	(Serial Port for PC/Teach Pendant)	RS-422	4. External device <u>setting</u>	

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.

PLC select [C	ОМ1]				
Filter : [All]		\sim		Search :	
				۲	Model 🔿 Vendor
Vendor		Model			
BONGSHIN LOADCELL	^	🜮 RCS-800	0		
FANUC Co., Ltd.		~			
MINEBEA Co., Ltd.					
Azbil Corporation					
KORO TECHNOLOGY					
ROBOSTAR					
Ehmoanst					
CoDeSys Automation A	lliance				
Ophir Optronics Solutio	ns Ltd.				
SERVOMEX					
Tiger Optics, LLC					
B & R Automation					
Peripheral Device					
OTHERS Manufacture	~				
PLC Setting[RCS	-8000]				
	-				
Alias Name	PLCI				
Alias Name Interface	: PLC1 : Serial	~			
Alias Name Interface Protocol	: Serial : ROBOSTAR Pro	tocol V		(Comm Manual
Alias Name Interface Protocol String Save Mode	: FLC1 : Serial : ROBOSTAR Pro : First LH HL	tocol v Change		(Comm Manual
Alias Name Interface Protocol String Save Mode	: PLC1 : Serial : ROBOSTAR Pro : First LH HL	tocol V Change		(Comm Manual
Alias Name Interface Protocol String Save Mode	Serial ROBOSTAR Pro First LH HL CY AND V	tocol V Change		(Comm Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition :	Serial Serial ROBOSTAR Pro First LH HL Cy TimeOut	tocol v Change	4)	(Comm Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : [Change Condition :]	Serial ROBOSTAR Pro First LH HL CY TimeOut Condition	tocol v Change	d)		Comm Manual
Alias Name Interface Protocol String Save Mode	PICT Serial ROBOSTAR Pro Trist LH HL O	tocol v Change	đ)		Comm Manual
Alias Name Interface Protocol String Save Mode	Serial Serial ROBOSTAR Pro First LH HL CY NND Condition 300	tocol v Change	J)		Comm Manual
Alias Name Interface Protocol String Save Mode	I PICI I Serial ROBOSTAR Pro First LH HL Cy TimeOut Condition 300	tocol v Change	J)		Comm Manual
Alias Name Interface Protocol String Save Mode	Serial Serial ROBOSTAR Pro ROBOSTAR Pro First LH HL Cy TimeOut Condition	tocol v Change	4)		Comm Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Change Condition : Primary Option Timeout Send Wait Retry Station No.	Serial Serial Serial Source Provide And Serial Source Provide And Source Provida	tocol v Change	1)		Comm Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Ch	Serial : Serial : ROBOSTAR Pro :: First LH HL CY AND TimeOut Condition 300 5 1	tocol v Change	-1) 		Comm Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : I Change Condition : I Primary Option Timeout Send Wait Retry Station No.	Serial : Serial : ROBOSTAR Pro :: First LH HL CY AND TimeOut Condition 300 5 1	tocol v Change	J)		Comm Manual
Alias Name Interface Protocol String Save Mode	Serial I: ROBOSTAR Pro I: ROBOSTAR Pro I: First LH HL CY NND TimeOut Condition 300 5 1	tocol v Change	-f) 		Comm Manual
Alias Name Interface Protocol String Save Mode	Serial ROBOSTAR Pro First LH HL CY TimeOut Soo 5 1 *	tocol v Change	d)		Comm Manual
Allas Name Interface Protocol String Save Mode	Serial ROBOSTAR Pro First LH HL CY TimeOut Condition 300 5 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	tocol v Change	J)		Comm Manual

Settings			Contents	
ТОР	Model	Check the display and process of TOP to select the touch model.		
Vendor External device PLC	Select the vendor of the external device to be connected to TOP. Select "ROBOSTAR".			
		Select an external device to connect to TOP.		
		Model	Interface	Protocol
	PLC	RCS-8000	Serial	ROBOSTAR Protocol
		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] → [Property] → [TOP Setting] → [HMI Setup] → [Use HMI Setup Check] → [Edit] → [Serial]



Items	ТОР	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
	RS-422	RS-422	
Baud Rate	96	00	
Data Bit		3	
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

- $\blacksquare [Project] \rightarrow [Project Property] \rightarrow [Device Setting > COM > RCS-8000]$
 - Set the options of the RCS-8000 communication driver in TOP Design Studio.

Project Option		\times
Change HMI[H] Kald PLC [A] The Change PLC [C] Change PLC [D]		
PLC Setting RCS-8000] PLC Setting RCS-8000] Plc Setting Fieldbus (0) Plc Seting Fieldbus (0)	Comm Manual	
	Apply Close	

Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External
Protocol	Select "ROBOSTAR Protocol".	device selection".
TimeOut (ms)	Set the time to wait for a response from an external device.	
SendWait (ms)	Set the waiting time before sending a data request to an external device.	
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 (port)	RS-232C	RS-232C	
	RS-422	RS-422	
Baud Rate	96	00	
Data Bit	8		
Stop Bit	1		
Parity Bit	Nc	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] \rightarrow [PLC]

	ö	:001	PLC	×
Bun	🚳 System	Driver(COM1)	PLC1(RCS-8000) -	
		Interface	Serial 🔻	
		Protocol	ROBOSTAR Protocol 💌	
WNC	PLC	Timeout	300 🖨 msec	
ANC		Send Wait	0 🚔 msec	
Viewer	പപ	Retry	5	
	Ethernet	Station N	1	
Screen	mit			
shot	inii *			
	Diagnostic			
	[System]	Diagnostic		Cancel
Items	Settings			Remarks
Interface	Select "Seri	al".		Refer to "2. External
Protocol	Select "ROE	BOSTAR Protocol".		device selection".

Interface	Select "Serial".	Refer to "2. External
Protocol	Select "ROBOSTAR Protocol".	device selection".
TimeOut (ms)	Set the time to wait for a response from an external device.	
SendWait (ms)	Set the waiting time before sending a data request to an external device.	
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		Check		Remarks	
System	How to connect the system		OK	NG	1 Custom configuration	
configuration	Connection cable name		OK	NG	1. System configuration	
TOP	Version information		OK	NG		
	Port in use		OK	NG		
	Driver name		OK	NG		
	Other detailed setting	JS	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	NG		
		Speed	ŬK			
		Data Bit	OK	NG		
		Stop Bit	OK	NG		
		Parity Bit	OK	NG		
External device	CPU name		OK	NG		
Communication port na		name (module name)	OK	NG		
	Protocol (mode)	OK	NG			
	Setup Prefix	OK	NG			
	Other detailed setting	OK	NG	4 External device setting		
	Serial Parameter	Transmission	ОК	NG	4. External device setting	
		Speed	-	_		
		Data Bit	OK	NG		
		Stop Bit	OK	NG		
		Parity Bit	OK	NG		
	Check address range		OK	NG	6. Supported addresses	



4. External device setting

- Refer to the user manual of the vendor and configure the communication channel options.

Step 1. Turn on the [F1] controller and select Teach Pendant.

Step 2. Press [ENT].

Step 3. Select [F3] PARA.

Step 4. Select [F3] OPER.

Step 5. Select [F4] SET.

Step 6. Select [F1] COM.

Step 7. Select a port to use and configure the communication speed.

Setting	Speed
Value	
0	9600 bps
1	19200 bps
2	38400 bps
3	115200 bps



5. Cable table

This chapter introduces a cable diagram for normal communication between the TOP and the external device. (The cable diagram described in this section may differ from the recommendations of "ROBOSTAR")

■ RS-232C (CN3 COM1)

TOP				External device			
Pin	Signal	Pin	Cable connection	Pin	Signal	Din arrangement	
arrangement ^{*Note 1)}	name	number		number	name	Pin arrangement	
1 5		1					
(° °)	RD	2		2	RD		
6 9	SD	3		3	SD		
		4					
Based on	SG	5		5	SG		
communication		6				D-SUB SOLD 15Pin	
cable connector		7					
front,		8					
D-SUB 9 Pin		9					

■ RS-232C (CN3 COM2)

ТОР				External device		
Pin	Signal	Pin	Cable connection	Pin	Signal	Din orrangement
arrangement ^{*Note 1)}	name	number		number	name	Pin anangement
1 5		1				
(° °)	RD	2		9	RD	
6 9	SD	3		10	SD	
		4				
Based on	SG	5		5	SG	
communication		6				D-SUB SOLD 15Pin
cable connector		7				
front,		8				
D-SUB 9 Pin		9				

■ RS-422 (CN3 RS-422)

TOP				External device			
Pin	Signal	Pin	Cable connection	Pin	Signal	Din arrangement	
arrangement ^{*Note 1)}	name	number		number	name	Pin arrangement	
1 5	RDA	1	/				
(° °)		2					
		3					
6 9	RDB	4				0	
Based on		5					
communication	SDA	6		12	RX+	D-SUB SOLD 15Pin	
cable connector		7		13	RX-	000000000000000000000000000000000000000	
front,		8		14	TX+		
D-SUB 9 Pin	SDB	9		15	TX-		



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.

Address	Description	Bit	Word	Authorization	Remarks
BBB	I/O	BBB00.00 ~ BBB41.07	BBB00 ~ BBB40	R/W	
INT	Integer type variable	INT000.00 ~ INT255.15	INT000 ~ INT255	R/W	
POS	Position type variable	POS0000.00 ~ POS1023.31	POS0000 ~ POS1023	R/W	
ERR	Robot status	ERR0.00 ~ ERR0.15	ERRO	R	*Note 1)
MSG	Ongoing alarm code	MSG0.00 ~ MSG0.15	MSG0	R	
SPD	Controller speed	SPD0.00 ~ SPD0.31	SPD0	R/W	
JOB	Operating job number	JOB0.00 ~ JOB0.31	JOB0	R/W	
CRP	Location coordinates of robot	CRP0.00 ~ CRP1.31	CRP0 ~ CRP1	R	*Note 2)
JOG	Incremental movement by data input	JOG0.00 ~ JOG0.31	JOG0	W	
EMG	Emergency stop	EMG0.00 ~ EMG0.15	EMG0	W	
FUN	Other commands	FUM0.00 ~ FUN7.15	FUN0 ~ FUN7	W	*Note 3)

*Note 1)

Bit	0	1	2	3	4	5	6	7
Status	RUN	INPOS	1	ALARM	1	1	None.	None.
Bit	8	9	10	11	12	13	14	15
Status	ORIGIN	SERVO ON	None.	None.	1	1	None.	None.

*Note 2)

CRP0: Pulse, CRP1: Joint

*Note 3)

Address	Description
FUN0	Run robot JOB
FUN1	Stop robot JOB
FUN2	Reset robot JOB
FUN3	Return-to-origin execution
FUN4	JOG move execution -
FUN5	JOG move execution +
FUN6	Continuous JOB move execution
FUN7	JOB move stop