SIEMENS AG. SIMETIC S7-300/400 Series

Serial Driver

Supported version TOP Desi

TOP Design Studio V1.0 or higher



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

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Select a TOP model and an external device.

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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 "SIEMENS AG. - S7-300/400 Series RK512" is as follows:

Series	СРИ	Link I/F	Communication method	System setting	Cable	
SIMETIC S7-300	CPU312 IFM CPU313 CPU314 CPU314 IFM CPU315 CPU315(F)-2 DP CPU315(F)-2 PN/DP CPU316	CP341	RS-232C			
	CPU316-2 DP CPU317-2 DP CPU317F-2 CPU318-2 CPU319-3 PN/DP CPU319-3 PN/DP CPU614 CPU388	CP341	RS-422 (4 wire) / RS-485	<u>3. TOP</u> communication <u>setting</u> <u>4. External device</u> <u>setting</u>	5. Cable table	
SIMETIC	CPU412-1 CPU412-2 DP CPU413-1 CPU413-2 DP CPU414-1 CPU414-2 DP CPU414-3 DP CPU416 1	CD441 2	RS-232C			
S7-400	CPU416-2 DP CPU416-3 DP CPU417-4 CPU414-3PN/DP CPU416-3PN/DP CPU417 CPU486	Cr 44 1-2	RS-422(4 wire) / RS-485			

Connection configuration

• 1:1 connection





2. External device selection

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

CICCL DEVICE							
PLC select [C	OM1]						
Filter : [All]			\sim		Search :		
					۲	Model	○ Vendor
Vendor		Model					
M2I Corporation		î 💋	S7-300/4	00 Series			
MITSUBISHI Electric Co	rporation						
OMRON Industrial Auto	mation						
LS Industrial Systems							
MODBUS Organization							
SIEMENS AG.							
Rockwell Automation							
GE Fanuc Automation							
PANASONIC Electric We	orks						
YASKAWA Electric Corp	oration						
YOKOGAWA Electric Co	rooration						
Schneider Electric Indus	stries						
VDT Systems	10100						
RDT Systems		,					
RS Automation							
PLC Setting[S7-3 Alias Name	00/400 Se	ries]					
Interface	: Computer lin	k	\sim				
Protocol	: RK512		\sim			Com	im Manual
String Save Mode	: First LH HL	Ch	ange				
Use Redundan	cy						
Operate Condition :	ND ~]					
Change Condition :	1 TimeOut	5	CSecond (Second)			
	Condition						m
Primary Option							
Timeout	300	msec					
Send Wait	0	msec					
Retry	5						

Settings		Contents				
ТОР	Model	Check the display and process of TOP to select the touch model.				
External device	Vendor	Select the vendor of the external device to be connected to TOP.				
		Select "SIEMENS AG."				
	PLC	Select an external device to connect to TOP.				
		Model	Interface	Protocol		
		S7-300/400 Series	Computer Link	RK512		
				<u> </u>		
		Please check the system config	guration 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] → [HMI Setup > "Use HMI Setup" Check > Edit > Serial]
 - Set the TOP communication interface in TOP Design Studio.

Project Option			×
Change HMI[H] Add P	LC [A] TITI Change PLC[C] X Delete PLC[D]		
TOP Setting	Date / Time Sync. Screen Option Unit Convert		
Option Module Setting	Project Option Screen Change HmiSetup Global Lock & Touch Project Style	Splash PL	C Buffer Sync.
Fieldbus (0) → RFID (0) ✓ → Device Setting ✓ → COM1 (1)	- Use HMI Setup	Initialization	Edit
← ■ PLC1: \$7-300/400 Series ← © COM2 (0) ← © COM3 (0) ← ■ Ethernet (0) ← ■ UseDevice (0)	Project Setting HMD(balde =0 Project Name =New project Start Korde =Nexu Start Screen No.=1 Latch Use=0 Latch Set=0-0 Communication Error Message=0 USBETOrMessage=1 DatabaseMessage=1 DatabaseMessage=1		~

Control Panel	
🔯 System 🛛 🔤 Devices	Service 🚰 Option
	- Serial X
	Serial Port: COM1 -
PLC Security Date/Time	Signal Level ● RS-232C ○ RS-422(4) ○ RS-485(2)
	Baud Rate: 9600 🔻
	Data Bit: 8 🔹
Ethernet Serial HDMI	Stop Bit: 1 🔻
	Parity Bit: Even 🔹
	Flow: Off 🗸
Diagnostic File Ping Manager	Auto Search Loopback Test
	Apply Cancel

Items	ТОР	External device	Remarks
Signal Level	RS-23	32C	
Baud Rate	960	0	
Data Bit	8		
Stop Bit	1		
Parity Bit	Eve	n	

* 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 Settings > COM > "PLC1 : S7-300/400 Series"]
 - Set the options of the S7-300/400 Series RK512 communication driver in TOP Design Studio.

Change HMI[H] Add PLC [A] THE Change PLC[C] C Delete PLC[D]		
V TOP Setting		
Condition String Sr-Sub/VetU Series Condition Condition	Cor	mm Manual
	Apply	Close

Items	Settings	Remarks
Interface	Select "Computer link".	Refer to "2. External
Protocol	Select "RK512".	device selection".
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	Configure the amount of redelivery attempts from TOP to 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

■ [Main Screen > Control Panel > Serial]



Items	ТОР	External device	Remarks
Signal Level	RS-23	2C	
Baud Rate	960	0	
Data Bit	8		
Stop Bit	1		
Parity Bit	Eve	n	

* 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]

					_
	õ	1001	PLC		×
	🔯 System	Driver(COM1)	PLC1(S7-300/400 Series) -		
Run		Interface	Computer link 💌		
		Protocol	RK512 💌		
VNC	PLC	Timeout	300 🔶 msec		
VNC		Send Wait	0 🔷 msec		
Viewer	പ	Retry	5		
	LIIIIIIIJ Et bernet				
	cillerner				
Caraan					
shot	inti ^{***}				
	Diagnostic				
	[[[]]]	Diagnostic	.]		Cancel
	Laysteill	Bragnostre			
ums	Settings				Remarks
erface	Select "Comp	outer link".			Refer to "2.
tocol	Select "RK51	2".			device sele
neOut (ms)	Set the time	for the TOP to wait	for a response from an external device.		
ndWait (ms)	Set the waiting	ng time between TC	DP's receiving a response from an externa	l device	
	and sending	the next command	request.		
try	Configure the	e amount of redeliv	ery attempts from TOP to 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 if the COM port 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	Cont	ents	Check		Remarks
System	How to connect the system		OK	NG	1 Custom configuration
configuration	Connection cable nam	OK	NG	1. System configuration	
ТОР	Version information		OK	NG	
	Port in use		OK	NG	
	Driver name		OK	NG	
	Other detailed setting	S	OK	NG	
	Relative prefix	Project setting	OK	NG	2. Estempli device coloction
		Communication diagnostics	ОК	NG	3. Communication setting
	Serial port setting	Baud Rate	OK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
External device	CPU name		OK	NG	
	Communication port r	munication port name (module name)		NG	
	Protocol (mode)	Protocol (mode)			
	Setup Prefix	Setup Prefix			
	Other detailed setting	S	OK	NG	4. External device setting
	Serial port setting	Baud Rate	OK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
	Check address range		OK	NG	6. Supported addresses



4. External device setting

For more detailed setting method than that described in this example, refer to the PLC user manual. Set as below using SIEMTIC S7 Ladder Software.

Step 1. Create a new project with [New Project] in the top bar of the main menu of [SIMATIC Manager].

Step 2. Choose Menu [Insert] > [Station] > [1 SIMATIC 400 Station] or [2 SIMATIC 300 Station]. → CPU add

Step 3. Double-click the added "[SIMATIC 400(1)]" or [SIMATIC 300(1)] CPU > Double-click [Hardware] on that CPU.. → [HW Config] window newly appears

Step 4. In the left tree panel of the [HW Config] window, open "[SIMATIC 400] > [RACK-400]" or "[SIMATIC 300] > [RACK-300]" to select the Base unit model that you use and register by dragging & dropping it to the bottom right of the window.

Step 5. Select [SIMATIC 400] > [PS-400] or [PS-300] to select the power unit used to drag & drop on the current rack.

Step 6. Select [SIMATIC 400] > [CPU-400] or [CPU-300] to select the CPU unit, then drag & drop on the current rack. (If the Properties – PROFIBUS interface DP window is new, press the [Cancel] key to exit the window.)

HW Config - [SIMATIC 300 Station(1) (Configur	uration) 20150810]	
👊 Station Edit Insert PLC View Options	Window Help	
Eind: Mt Mi		
Brofile: Stendard		
	2 CPU 315-2 PN/DP	
	$\chi_2 = \frac{NP_1 DP_2}{PN-IO}$	
	X2 P1 Port 1	
	3	
In Internet 300	4 H CP 341-RS232C	
SIMATIC PC Based Control 300/400		
E SIMATIC PC Station		
	8	
	9	
	S I Module Order number Firmw MPI address I address Q address Comment	
	2 1 MD//DD 2 2047+	
	X2 PN-IO 2045*	
	X2 Port 1 2045*	
	3	
	4 HE CP 341-HS232C 6ES7 341-1AHU1-0AEU 256271 256271	
	8	
	9	



Step 7. Double-click on the registered CPU Name. →A new [Properties] window for that CPU appears..

Properties -	CP 341-RS23	2C - (R0/S4)		
General Add	resses Basic Pa	arameters		
Inputs				
<u>S</u> tart:	256	Process image:		
End:	271	v		
⊠ S <u>v</u> stem	Default			
– Outputs –				
Start:	256	Process image:		
End:	271			
🔽 Syst <u>e</u> m	Default			
ок	Parameter		Cancel	Help

Step 8. On the [General] tab of the [Properties] window, select [Interface] > [Properties] to launch the [Properties – protocol] popup window.

🔯 Assigr	ing Paramete	rs to Point-To-Point	Connections - [CP 341-RS232C	(R0/S4)	💶 🗖 📈
<u>F</u> ile <u>E</u> dit	<u>V</u> iew <u>O</u> ptions	<u>H</u> elp				
Protocol:	RK512	•				
						_
					1	
					ļ	
		Pro	ocol			
			<u></u>			
		2				
Press F1 for	r help,				1	NUM //

Step 9. Double-click the [Protocol] box in the middle of the screen to enter the [RK512] protocol detailed settings as shown below.

Protocol	
RK 512 Receiving Data	
Protocol	Protocol Parameters
🔽 With Block Check	Character Delay Time: 220 ms
🔽 Use Default Values	Acknowledgement Delay Time: 2000 ms
	Setup Attempts: 6 🚊
	Transmission Attempts: 6
-Speed	Character Frame
Transmission	Data Bits: Stop Bits: Parity: Priority:
9600 <u>▼</u> bps	8 - 1 - Even - Low -
확인	취소 도움말

Step 10. In the Project Tree of the [SIMATIC Manager] window, select Registered CPU Name from [HW Config], select [Blocks], and double-click **[OB1]**. (If the [Properties] window pops up, click [ok].) → Run Ladder software [LAD/STL/FBD]



Step 11. Set parameters in Ladder software [LAD/STL/FBD]. Set one of the examples below according to [Language for Selected Blocks] > [STL] or [LAD].

[Language for selected Blocks] > [STL]	[Language for selected Blocks] > [LAD]
$\begin{tabular}{lllllllllllllllllllllllllllllllllll$	DB7 Image: Status sta

Items	Contents
DB7	The DB number that P_RCV_RK will use to receive communication
EN_R	"EN-R" must be ON to communicate.
R	Reset input
LADDR	Input Start Address Number confirmed in order 12.
DB_NO	Input DB you will use. Only the areas you assign can be read and written through communication.



5. Cable table

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

■ RS-232C

TOP				Externa	l device
Pin	Signal	Pin	Pin	Signal	Pin
arrangement*Note 1)	name	number	number	name	arrangement*Note 1)
1 5					1 5
(° °)	RD	2	2	RD	0 0
	SD	3	3	SD	
6 9 Record on					b 9
	SG	5	5	SG	communication
front					front
D-SLIB 9 Pin male					D-SLIB 9 Pin male
(male, convex)					(male, convex)

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

■ RS-485

TOP				Externa	l device
	Signal		Pin	Signal	Pin
Pin andngement*Note I)	name		number	name	arrangement*Note 1)
	+				1 5
	-				(° °)
0	SG		3	TRX+	
SG SG					Based on
01 -		L	5	SG	communication
01+					cable connector
0					front,
			8	TRX–	D-SUB 9 Pin male
					(male, convex)

*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	Bit address	Word address	Double word address*Note 1)Note 2)	R/W	Remarks
Input relay	100000.0 – 116383.7	IW00000 – IW16382	ID00000 – ID16382	R/W	Cannot be written
Output relay	Q00000.0 – Q16383.7	QW00000 – QW16382	QD00000 – QD16382	R/W	Cannot be written
Data block	DB00001.DBX00000.0 – DB00255.DBX00511.7	DB00001.DBW00000 – DB00255.DBW00510	DB00001.DBD00000 – DB00254.DBD00510	R/W	
Internal memory	M00000.0 – M08191.7	MW00000 – MW08190	MD00000 – MD08190	R/W	Cannot be written
Timer	T00000.0 - T00255.15	T00000 – T00255	T00000 – T00254	R	
Counter	C00000.0 – C00255.15	C00000 – C00255	C00000 – C00254	R	

*Note 1) 32 bits of data are stored in 16 bits in the order of high/low for word addresses.

(Example) MW00000 (32bit data, 0x12345678) → MW00000(16bit, 0x1234) MW00002(16bit, 0x5678)

*Note 2) For 32 bit address, style \rightarrow notation form \rightarrow check "word swap" function.

IIII Numeric Property		×
PREVIEW	Data Shape Style Input Case Effect & Action	
12345	Font Consolas ✓ 73 ✓ Image: Imag	
	Format Data Length[1]: 5 Cut Length[1]: 0	
ID: 4 SEQ: 3 X: 634 ♥ Y: 117 ♥ Width: 266 ♥ Height: 114 ♥	Decimal point Setting Dec point length [D]: 0 Use Address D PLC1 CONNECTION	
Security Level : 0 💌 Create Security Log Ignore GlobalLock	Fill in the blanks with '0' M Password (with '*')[P] Initialize Input Data [1] No display input data [K] Enter the number of digits fixed	
Hide Object	Use Format Mask[S] (Unavailable when 'Key Input' is used.)	
Visible Permission Icon	Format[<u>r</u>]: #,##U	
	OK Can	el