SIEMENS AG.

SIMATIC S7-1200/1500 Series

Ethernet Driver

Supported version TOP Design Studio V1.0 or higher



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 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. Supported addresses Page 13

Describes data address available in the external device.



1. System configuration

The system configuration of TOP and "SIEMENS AG. - S7-1200/1500 Series Ethernet" is as follows.

Series	CPU	Link I/F	Communication method	System setting	Cable
SIMATIC	S7-1200 S7-1500	PROFINET Interface on CPU	Ethernet (TCP)	<u>3. TOP</u> <u>communication</u> <u>setting</u> <u>4. External device</u> <u>setting</u>	Twisted pair cable ^{*Note 1)}

*Note 1) Twisted pair cable

- Refer to STP (Shielded Twisted Pair Cable) or UTP (Unshielded Twisted Pair Cable) Category 3, 4, 5.

- Depending on the network configuration, you can connect to components such as the hub and transceiver, and in this case, use a direct cable.

■ 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.

elect Device							x
PLC select [Ethernet	1						
Filter · [All]	-		\sim		Search		
					Searci	 Model 	() Vendor
Vendor		Model					
M2I Corporation	^	8	S7-300/	400 Series			
MITSUBISHI Electric Corporation			\$7-200	Series			
OMRON Industrial Automation			57 200				
LS Industrial Systems			S7-1200	/1500 Series			
MODBUS Organization		\$	LOGO! S	Series			
SIEMENS AG.							
Rockwell Automation							
GE Fanuc Automation							
PANASONIC Electric Works							
YASKAWA Electric Corporation							
YOKOGAWA Electric Corporation							
Schneider Electric Industries							
KDT Systems							
RS Automation	~						
elect Device PLC Setting[S7-1200/150	D Se	eries]					×
Alias Name : PLC1		-		Bind IP : Aut	• •		
Interface : Ethernet			\sim				
Protocol : OP Comm	unica	tion(COTP)	\sim			Cor	mm Manual
String Save Mode : First LH H	-	Chan	ge				
Use Redundancy	_						
Operate Condition : AND	\sim		-				
Change Condition : TimeOut		5	(Secon	ıd)			alt.
Condition							
Primary Option							
IP 192 🗬	1	68 🚖 (0 🜲	1			
Ethernet Protocol TCP	\sim						
Port 102	¢						
	-	msec					
Timeout 1000							
Timeout 1000 Send Wait 0		msec					
Timeout 1000 Send Wait 0 Device name notation English	×	msec					
Timeout 1000 Send Wait 0 Device name notation English PLC Series \$7-1500	 	msec					
Timeout 1000 Send Wait 0 Device name notation English PLC Series \$7-1500 Do not display the error for a monomeration	✓	msec kistent data	block				

Settings			Contents				
ТОР	Model	Check the display and process of TOP to select the touch model.					
	Vendor	Select the vendor of the extern Select "SIEMENS AG."	ect the vendor of the external device to be connected to TOP. ect "SIEMENS AG."				
	PLC	Select the external device to be connected to the TOP.					
External device		Model	Interface	Protocol			
		S7-1200/1500 Series	Ethernet	OP Communication(COTP)			
		Please check the system config connect is a model whose syste	guration in Chapter 1 to see if em can be configured.	the external device you want to			



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

 $\blacksquare [Project] \rightarrow [Property] \rightarrow [TOP Setting] \rightarrow [HMI Setup] \rightarrow [Use HMI Setup Check] \rightarrow [Edit] \rightarrow [Ethernet]$



Items	ТОР	External device	Remarks
IP Address	192.168.0.100	192.168.0.51	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

% The above setting is an example.

Items	Description
IP Address	Set the IP address of the TOP.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.



(2) Communication option setting

-

_

- [Project] → [Project properties] → [PLC settings > Ethernet > S7-1200/1500 Series]
 - Set the options of the communication driver of S7-1200/1500 Series Ethernet in TOP Design Studio.

Project Option	·········		×
Change HMI[H]	Add PLC [A] TI Change PLC[C] X Delete PLC[D]		
 TOP Setting SYS : RD 1520X Option Module Setting Fieldbus (0) Fieldbus (0) Device Setting COM1 (0) COM2 (0) 	PLC Setting[S7-1200/1500 Series] Alias Name : PLC1 Interface : Ethernet Protocol : OP Communication(COTP) v String Save Mode : First LH HL	Co	mm Manual
Ethernet (1) Ethernet (1) Wireless (0) USBDevice (0)	Seri Use Redundancy Operate Condition : AND Change Condition : TimeOut 5 (Second) Condition Edit Primary Option		
<	IP 192 (a) 168 (c) 51 (c) Ethernet Protocol TCP I Port 102 (c) Image: Compared to the compared to		
		Apply	Close
Items	Settings	Remarks	
Interface	Select "Ethernet".	Refer to "	2. External
Protocol	Select the communication protocol between the TOP and an external device.	device sele	ection".
IP	Enter the IP address of the external device.		
Ethernet Protocol Select the Ethernet protocol between the TOP and an external device.			
Port	Enter the Ethernet communication port number of the external device.		
Timeout	Set the time for the TOP to wait for a response from an external device.		
Send Wait	Set the waiting time between TOP's receiving a response from an external		
	device and sending the next command request.		
Device name notation	Select an address entry notation.		
PLC Series	Select the CPU series of the external device.		
Do not display Negative response received when requesting to read/write DB that is not registered in PLC is not displayed as an error.		*Note 1)	

*Note 1) It can be used in the following cases. After PLC power is turned on, if TOP requests data while loading, the PLC responds negatively that it is an incorrect memory access. Check this option not to display this response as a communication error. Remark) In this situation, other normal data may not be displayed as well.



3.2. Communication setting in TOP

****** This is a setting method when "Use HMI settings" in "3.1 Communication setting in 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] → [Ethernet]

	6	Ethernet ×	×
Run	🔯 System	PortEthernet Port : ETH1 • 0 •	Option
	PLC Se	Link Speed : Auto MAC Address : 00:15:1D:05:38:C5 IP Address : 192.168.0.100	Sound
VNC Viewer	<u>م</u>	Subnet Mask : 255.255.255.0 Gateway : 192.168.0.1 E Default Gateway	(((.
	Ethernet	DNS (1) : DNS (2) :	Wi-Fi
Screen shot	Diagnostic M	Primary IP : 192.168.0.100 Cable Status : ETH1 Connected	MRAM Analysis
	[System]	Bridge Mode : Use Bridge Check duplicate Apply Cancel	Close

 $\ensuremath{\mathbb{X}}$ The above setting is an example.

Items	ТОР	External device	Remarks
IP Address	192.168.0.100	192.168.0.51	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

% The above setting is an example.

Items	Description
IP Address	Set the IP address of the TOP.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.



(2) Communication option setting

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

	õ	1001	PLC	×
\smile	🔯 System	Driver(ETH)	PLC1(S7-1200/1500 Series) -	
Run		Interface	Ethernet -	.
		Protocol	OP Communication(CC •	
WNC	PLC	Bind IP	Auto	
VNC		IP	192 🗘 168 🗘 🛈 🗘 51 🗘	
Viewer		Ethernet	TCP -	
	Ethernet	Port	102	
		Timeout	1000 🜩 msec	
Screen	word	Send Wait	0 🖨 msec	
shot	Imil .	Device name no	t Engli 🗸	
	Diagnostic	PLC Series	S7-15 -	
		🗆 Do not displ	ay the error for a non-existent data 📃 🗖	
	[System]	Diagnostic	Ping Test Apply Cance	1

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External
Protocol	Select the communication protocol between the TOP and an external device.	device selection".
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	
Port	Enter the Ethernet communication port number of the external device.	
Timeout	Set the time for the TOP to wait for a response from an external device.	
Send Wait	Set the waiting time between TOP's receiving a response from an external	
	device and sending the next command request.	
Device name notation	Select an address entry notation.	
PLC Series	Select the CPU series of the external device.	
Do not display Negative response received when requesting to read/write DB that is not registered in PLC is not displayed as an error.		*Note 1)

*Note 1) It can be used in the following cases. After PLC power is turned on, if TOP requests data while loading, the PLC responds negatively that it is an incorrect memory access. Check this option not to display this response as a communication error. Remark) In this situation, other normal data may not be displayed as well.



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 [Ethernet] 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 device, please check the settings in the sheet below.

Items	Contents		Check		Remarks		
System	How to connect the sy	OK	NG	1 System configuration			
configuration	Connection cable name		OK	NG	T. System configuration		
ТОР	Version information		ОК	NG			
	Port in use	Port in use		NG			
	Driver name Other detailed settings		OK	NG			
			ОК	NG			
	Relative prefix	Project setting	ОК	NG	2. External device selection		
		Communication diagnostics	ОК	NG	3. TOP communication setting		
	Ethernet port setting	IP Address	OK	NG			
		Subnet Mask	OK	NG			
		Gateway	OK	NG			
External device	CPU name	OK	NG				
	Communication port n	OK	NG				
	Protocol (mode)	OK	NG				
	Setup Prefix	OK	NG	4. External device setting			
	Other detailed settings		OK	NG	4. External device setting		
	Ethernet port setting	IP Address	OK	NG			
		Subnet Mask	OK	NG			
		Gateway	OK	NG			
	Check address range		OK	NG	5. Supported addresses		



4. External device setting

Set as follows in TIA Portal.

For more details than the followings, refer to the manufacturer's user manual.

Step 1. Create a new project.







Step 3. Set the IP address.

Project tree		Project7 ► I	PLC_1 [CPU 1	511-1 P	'N]										
Devices															
M 0 0	7	+ PLC_1		•		60	€ ±	100%		•					
						_									
	^			0											
💕 Add new device				6 ~								_			
📥 Devices & networks											-	▼	▼		
- C_1 (CPU 1511 1-PN)			0	1	2	3	4	5	6	7	15	23	31		
Device configuration			Rell O					-							
Online & diagnostics			Kall_U	S BREAK											
Program blocks															
Technology objects	=										8	16	24		
External source files															
PLC tags											15		31		
Le PLC data types															
Watch and force tables						_									
Maraces									_		_				
Program info		<													
		PROFINET in	torfaco 1 [M	odulol											
E Text lists				ouulej			Y		1		_	_			
local modules		General	IO tags	Syste	em cons	stants	Te	exts							
	~	General								Add new	subn	et			
✓ Details view		Ethernet add	dresses												
		Time synchro	onization	IP p	orotoco	1									
Name		Operating m	node												
		Advanced op	ptions					(Set	IP addr	ess in	the p	roject		
		Web server a	access					L		IP ad	dress:	19	92.1	68.0.	51
		Hardware id	entifier					L		Subnet	mack	20		EE 265	•
			•							sabriet		:			<u> </u>
									Jose	outer		_			
			•						Ro	outerad	dress:	0		.0.	0
									O IP a	ddress	is set	direct	tly at t	he device	



Step 4. Change the Protection & Security setting.

Check Device Configuration \rightarrow General \rightarrow Protection \rightarrow Permit access with PUT/GET communication from remote partner.



(S7-1200 Firmware v3.0 or lower Protection setting)

	Rack_0	
Log PLC data types Log PLC data types Log Watch and force tables Program info	PLC_1 [CPU 1214C AC/DC/Rly] General IO tags Sy] Second
	General Project information Catalog information PROFINET interface DI14/D010 Al2 High speed counters (HSC) Pulse generators (PTO/PWM)	Protection No protection Write protection Write/Read protection Password for read/write access
	FIO IFWM1 FTO 2/PWM2 Startup Cycle Communication load System and clock memory Web server	Password: Confirm password:
Details view Name	Time of day Protection Connection resources Overview of addresses	2



Step 5. Change the Data Block property.

Click the right of DB \rightarrow Properties \rightarrow Attributes \rightarrow Uncheck Optimized block access

(TIA Portal v10 or lower. Symbolic access only unchecked)

Information	Attributes	
Time stamps Compilation Protection Attributes Download with	Only store in load memory Data block write-protected in the device Optimized block access	



5. Supported addresses

The addresses available in TOP are as follows:

Depending on the external device model, there are differences in the address range, presence, and access restrictions. Refer to the manufacturer's user manual for correct use.

Address	Bit	Word	Double word	Remarks
Input	100000.0 ~ 132767.7	IW00000 ~ IW32766	ID00000 ~ ID32764	*Note 1)
Output	Q00000.0 ~ Q32767.7	QW00000 ~ QW32766	QD00000 ~ QD32764	*Note 2)
Marker	M00000.0 ~ M16383.7	MW00000 ~ MW16382	MD00000 ~ MD16380	
Data Block	DB00001.DBX00000.0 ~	DB00001.DBW00000 ~	DB00001.DBD00000 ~	*Note 3)
	DB65535.DBX65527.7	DB65535.DBW65526	DB65535.DBD65524	

*Note 1) Input is subordinated the embedded I/O depending on the CPU type, so there may be areas where Write input is not possible.

*Note 2) Output can enable Write values only during Run. In case of Stop, the output value is reset.

*Note 3) Offset address is used by unchecking the Optimized block access (TIA Portal v10 or lower Symbolic access only)among DB properties.

 \cdot Changes when address notation is in German

Input : E, EW, ED

Output : A, AW, AD

※ Precautions when registering variables in DB

TOP accesses DB in units of minimum words (16 bits).

To monitor a byte-unit variable with DBW, you need to register an arbitrary variable as many as 1 byte after the corresponding variable.