

Siemens – S7 300 – 400 TCP

Driver Documentation

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Document description

This document is dedicated to the programming and functionality of the Siemens driver for PLC of the S7 300 - 400 series.

Driver Selection

Kreo - Select device	×
OFC OA Client SoftMotion protocol (TCP)	^
Fatek FB series	
Mitsubishi "SLMP" type protocol (FX5)	
Modbus Master protocol (TCP) Slave protocol (TCP)	
Omron Ethernet/IP (NJ-NX series) FINS protocol (TCP) FINS protocol (UDP)	
Panasonic FP / SIGMA protocol (TCP)	
Schneider M series PLC Codesys based Modbus Master protocol (TCP)	
Siemens Industrial ethernet protocol (LOGO cpu 0AB7) Industrial ethernet protocol (LOGO cpu 0AB8) Industrial ethernet protocol (S7-1200/1500 cpu) Industrial ethernet protocol (S7-1200/1500 symbolic/optimized) Industrial ethernet protocol (S7-200 Smart cpu) Industrial ethernet protocol (S7-3/400 cpu)	Ĵ
[Ok

In the Kreo HMI driver portfolio, select Siemens – Industrial ethernet protocol (S7-300/400).



Communication parameters

Double-clicking on the HMI model displays the following page:

				×
Info	ETH 1	ETH 2		
Ethernet pa	arameters			
IP address	192.168.0.1			
Subnet mas	255.255.0.0			
Ping timeou	t 500 ms	~		
Industrial et	thernet proto	col (S7-3/40() cpu)	
Name		Value		Format
🔗 General	port parameters	ę.		
Protocol tim	eout (msec.)	500		(50 - 10000) Step:50
No. of retry		0		number: 0 - 3
<				D
				Ok

IP address	IP address of HMI port connected to Siemens S7 PLC 300 - 400
Subnet mask	Subnet mask of the HMI port connected to the Siemens S7 PLC 300 - 400
Ping timeout	The PING command is sent to the PLC to test the stability of the connection
Protocol	The PLC must respond to requests within the defined timeout .
Timeout	
No. of retry	Number of requests to the PLC failed to force the product into error mode



Double-clicking on the communication driver displays the communication parameters of the Siemens S7 driver 3 00 - 400.

Info		Parameters			
De	vice properti	ies			
	🗌 Is offscan] Disable Optimizati	on	
	User Address Fi	ield Format D	Default	`	*
De	vice paramet	ters			
	Name	Ň	Value	For	ormat
	Tcp/IP setting	s 177			
	IP address	c	0.0.0	IP .	address: 0.0.0.0 - 255.255.255.255
	IP port	1	102	nui	ımber: 0 - 65535
	Siemens speci	ific parameters			
	Expansion slot	2	2	0 -	- 255

Is offscan	The defined driver in the project is not scheduled.
	To re-enable driver scheduling, you must use the functions available at the ST
	script level:
	TAG_SETOFFSCANDEV (device, state)
	TAG_SETOFFSCAN (Tag, state)
Disable	Disables data request optimization.
optimization	Each variable is requested with a dedicated message
User Address	Format of the tag address.
Format	the default format is default at the driver configuration level but the user can
	select the preferred format (decimal or hexadecimal)
IP address	PLC IP address
IP port	Connection port.
	The default value
Expansion slot	ID of the PLC rack slot in which the CPU is inserted



Offscan

Offscan management can be used if a machine module is part of the Kreo HMI application but is not physically connected.



A device NOT CONNECTED but in ONSCAN state heavily reduces the performance of the product since the continuous communication timeouts slow down the execution of the functions of requests that follow.

Disable optimization:

This option can be used to identify what data displayed on a specific page is causing the communication error.

This value will not be displayed but a series of ????? allows the user to easily identify this Tag.



Programming a Tag

				×
Тад		Database	Events	
Name	Tag1			
Address type	e Devic	e	~	
Туре	Boole	ean	 Array size 	1
Device	Industria	l ethernet protocol (S7-3	3/400 × Dynamic	
Data Area	Data blo	ck	✓ Data Type	Bit ~
DB	0		🖉 DBW	0
Bit	0		0	
	. — -			
Defreeb (me			pdate Use in scripts	
Kerresn (ms) U	- Onscan mod	e Never V Networ	
		e		
	via OPC			

The variables have a fixed address mapped to the memory areas made available by the PLC.



Memory areas

AREA	GUY	DIM.	R/W	DESCRIPTION
Data Block	BitByteWordDwordRealString String (Plc)	1 816323288	R/W	Reads/writes multiple optimized 8bit DBWs together on the page in a single message. There is a data type "String (PLC)" that is used for the specific string data of the Siemens software.
Data block (Simatic Time)	TimeBase 1/100sTimeBase 1/10sTimeBase 1sTimeBase 10s TimeBase AUTO String Format	32 32 32 32 32 32 32	R/W	Reads / writes DBW type data with SimaticTime format representation (see below for operation)
Hours	TimeBase 1/100sTimeBase 1/10sTimeBase 1sTimeBase 10s TimeBase AUTO String Format	32 32 32 32 32 32 32	R/W	Reads / writes Timer- type data with SimaticTime format representation (see below for operation)
Counter	Value (Word)	16	R/W	Reads/writes the current value Counter
Select	BitByteWordDwordReal	18163232	R/W	Reads / writes Merker-type data
Input	BitByteWordDwordReal	18163232	R/W	Reads / writes Input type data



Output	BitByteWordDwordReal	18163232	R/W	Reads / writes data type
				Output



Counter e Timer

Data such as COUNTER and TIMER are now in <u>binary format</u>, and you no longer need to specify BCD because the driver takes care of the conversion.

COUNTER data counts for a range of 0..999 fixed. The TIMER (or SIMATIC TIME) type data counts according to the following rules:

- Oms . . 9S990ms (with time base = 0, i.e. 1/100s base.)
- Oms . . 1M30S990ms (with time base = 1, i.e. 1/10s base.)
- 0s . . 16m39s (with base times = 2, i.e. base 1s.)
- Os . . 2h46m30s (with base times = 2, i.e. base 10s.)

There are two areas that work differently from the standard of a simple TAG:

- area Timer
- area Data Block (Simatic Time)

in which the following types of data are present:

- 1. TimeBase = 1/100s.
- 2. TimeBase = 1/10s.
- 3. TimeBase = 1s.
- 4. TimeBase = 10s.
- 5. TimeBase = AUTO (1ms.)
- 6. String Format

Representation / Setting of *Timer, Data Block (SimaticTime)* types

- READ: fixed time base, LONG numerical format, representation 0..999000 (x10ms.)
 WRITE: fixed time base (x10ms), LONG numeric format, allowed values 0..999
- READ: fixed time base, LONG numerical format, representation 0..99900 (x100ms.)
 WRITE: fixed time base (x100ms), LONG numeric format, allowed values 0..999
- 3. READ: fixed time base, LONG numerical format, representation 0..9990 (x1s.) WRITE: fixed time base (x1s.), LONG numeric format, permissible values 0..999
- 4. READ: fixed time base, LONG numerical format, representation 0..999 (x10s.) WRITE: fixed time base (x10s.), LONG numeric format, permissible values 0..999
- READ: automatic time base (x1ms), format num. LONG, representation
 0..9990000
 WRITE: automatic time base (x1ms), format num. LONG, allowed values
 0..9990000
 (the driver automatically adapts the write time base)



6. READ: automatic time base (x1ms), STRING format, rappr. ##h##m##s###ms WRITE: **automatic**

time base (x1ms), STRING format, allowed values:

- ###ms(es: 100ms 450ms 30ms)
- ##s###ms(es: 4s100ms 6s450ms 15s30ms)
- ##m##s(is: 2m4 s 1m40s 15m30s)
- ##h##m(es: 2m4 s 1m40s 15m30s)
- ##h##m##s###ms(es: 1m25s300ms 3m1s250ms)
- ####### (es: 100 4000 567000)

Only numeric characters and values 'm' 's' 'h' 'ms' are allowed; no spaces are allowed, and the format must be consistent. If the time indication is omitted (i.e. only the numerical value is present) the data is considered in <u>milliseconds</u>.

Error codes

CODE	DESCRIPTION
DRIVER ERROR	Unable to send prompt message, possible ethernet adapter problem
PROTOCOL ERROR	Generic error of receiving data from the PLC
PROTOCOL TIMEOUT	Timeout error, there was no response to a data request
PROTOCOL OFFLINE	Device offline, there is no response from the device during ethernet connection
FORMAT DATA ERR	the value (or string) entered in the field during writing is not consistent with the allowed format rules
TRANSMISSION ERROR	Driver TCP packet transmission error
ERROR	Unmanaged Driver Socket Error Reporting



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