Siemens – S7 300 – 400
TCP

Driver Documentation

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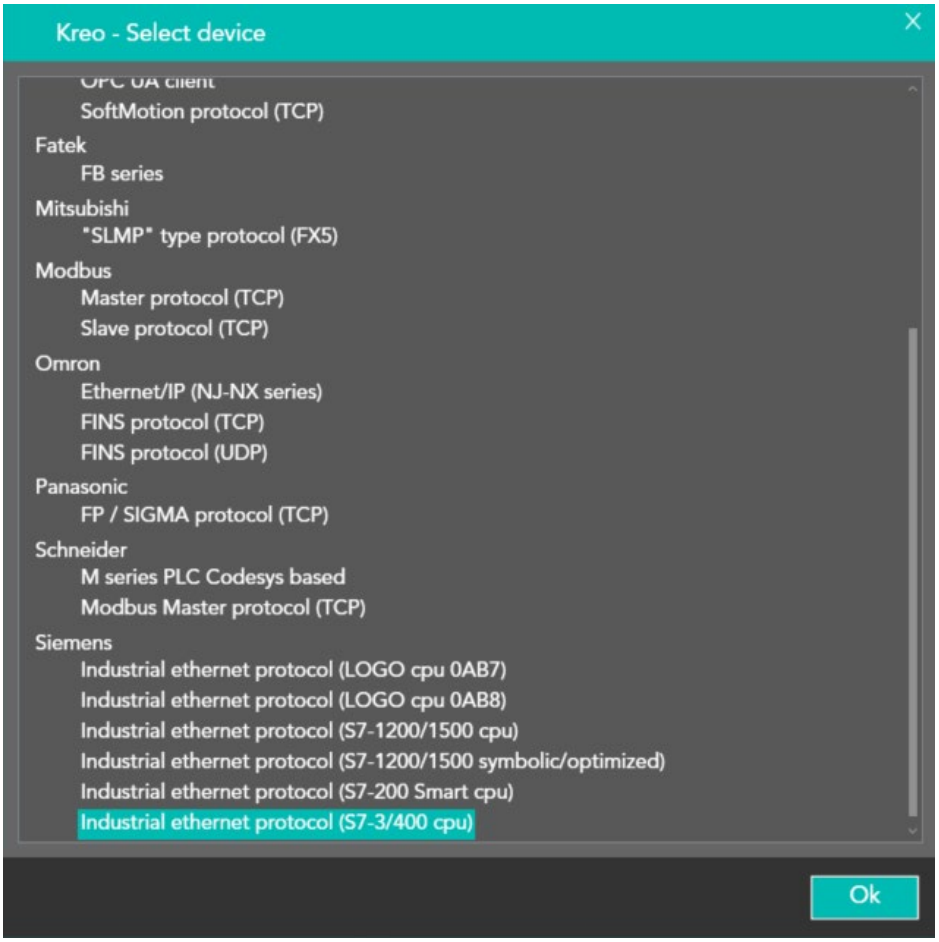
Document description

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

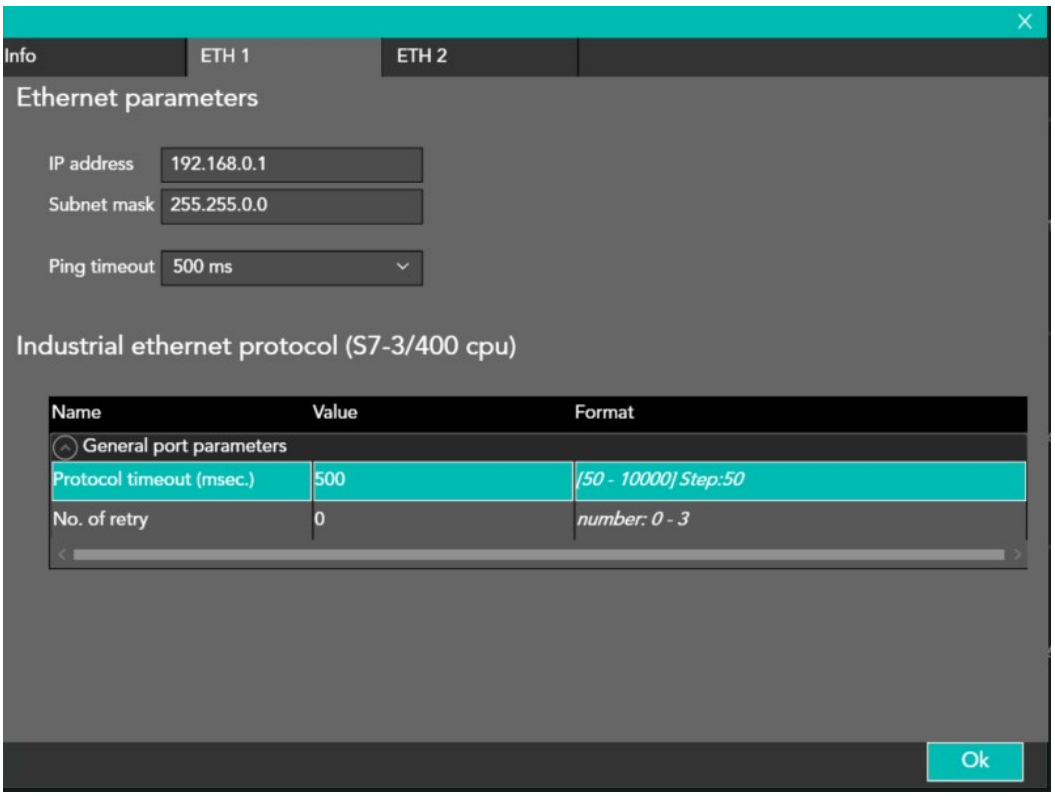
Driver Selection



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

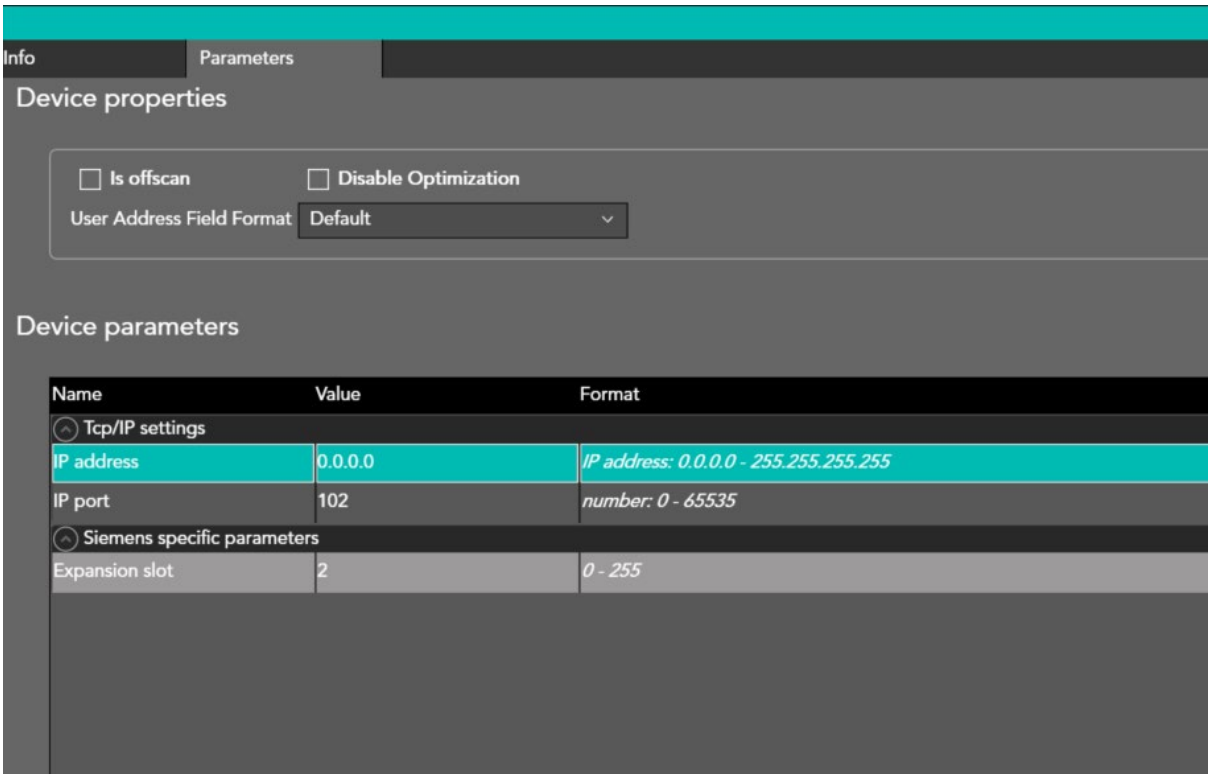
Communication parameters

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



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 Timeout	The PLC must respond to requests within the defined 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.



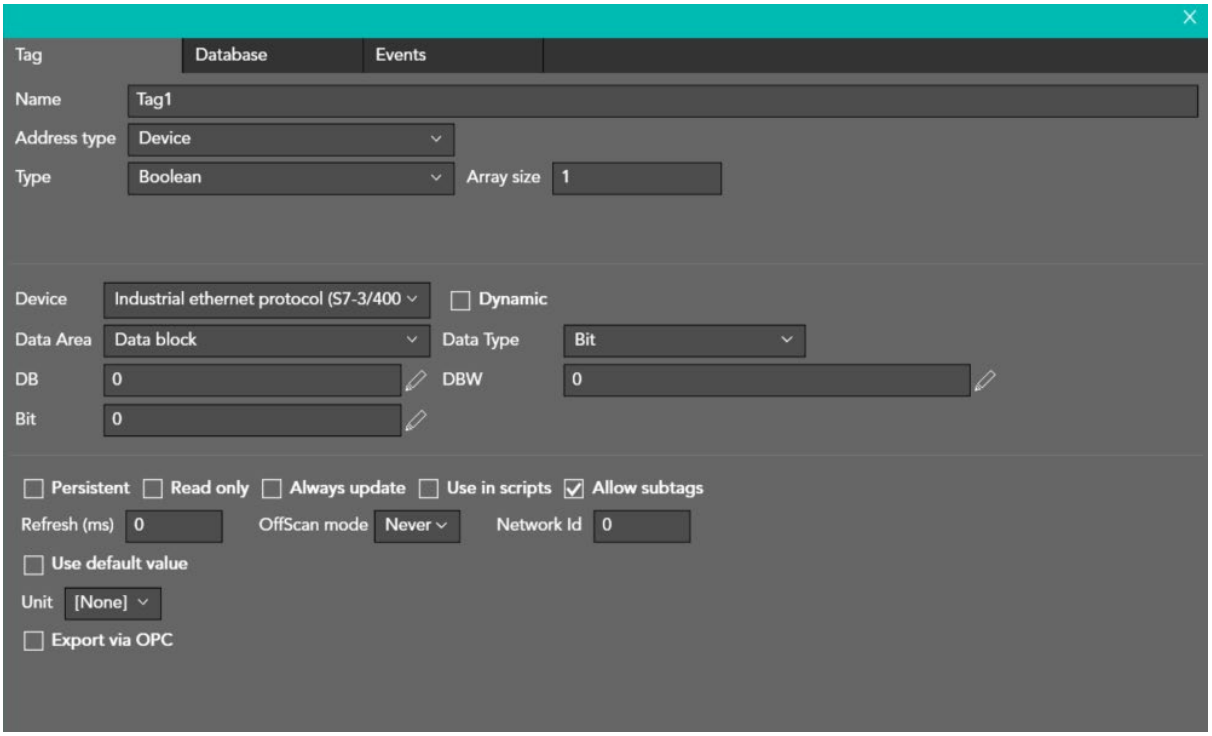
Is offscan	The defined driver in the project is not scheduled. To re-enable driver scheduling, you must use the functions available at the ST script level: TAG_SETOFFSCANDEV (device, state) TAG_SETOFFSCAN (Tag, state)
Disable optimization	Disables data request optimization. Each variable is requested with a dedicated message
User Address Format	Format of the tag address. 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



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	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	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 binary format, 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:

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

1. READ: fixed time base, LONG numerical format, representation 0..999000 (x10ms.)
   WRITE: fixed time base (x10ms), LONG numeric format, allowed values 0..999

2. 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

5. 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 milliseconds.

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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