Siemens – S7 1200 - 1500

Driver Documentation

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Document description

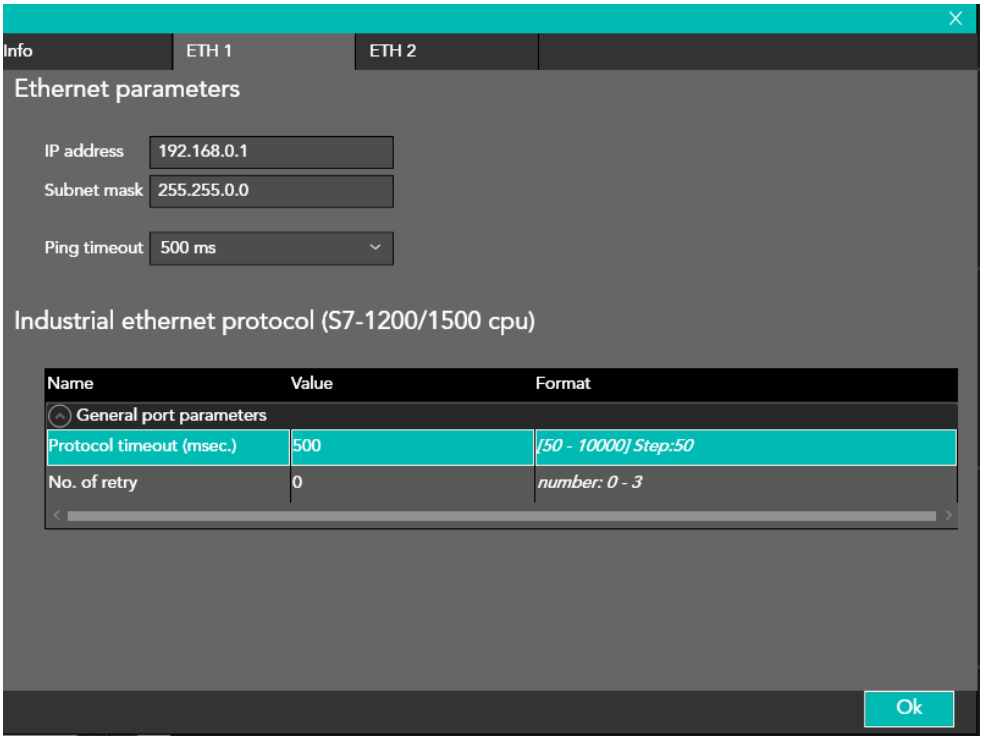
This document is dedicated to the programming and functionalities of the Siemens S7 1200 – 1500 PLC communication driver.

Driver selection

Select Siemens – Industrial ethernet protocol (S7 – 1200/1500) in the Kreo HMI driver portfolio.

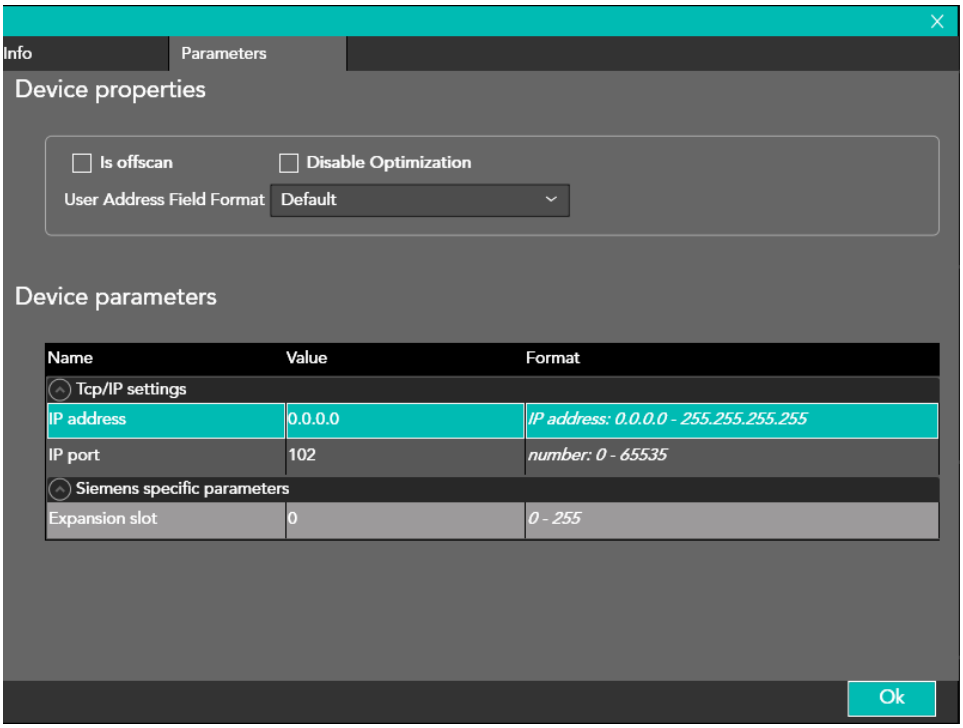
Communication parameters

The page below is displayed by double clicking over the HMI configuration.



IP address	Ip address of the HMI port
Subnet mask	Subnet mask of the HMI port
Ping timeout	The PING command is sent in order to test the connection stability
Protocol Timeout	The PLC has to reply before this time out window will expire in order not to have communication error
No. of retry	Number of retry before having the communication error

The page below is displayed by double clicking over the Siemens communication driver:



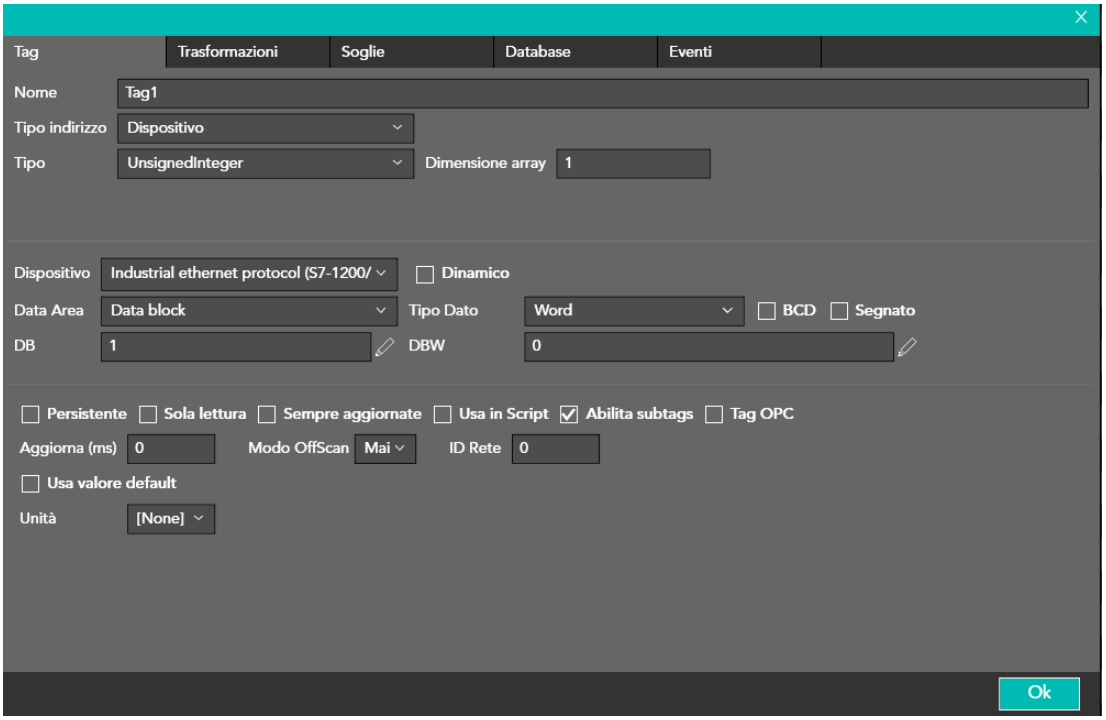
Is Offscan	The driver is defined in the project but will not be scheduled. In order to enable the driver it is mandatory to use the ST script function: TAG_SETOFFSCANDEV (device, state) TAG_SETOFFSCAN (Tag, state)
Disable the optimization	Disable the data optimization. Each tag will be refreshed with a separate communication message.
User address field format	Tag address format. The default format is defined in the driver description but the user can select the desired format (DECIMAL or HEXADECIMAL)
IP address	Ip address of the PLC port
IP port	Communication port The default value is 502
Expansion slot	Id of the Rack slot where the CPU is inserted

IsOffscan
Is offscan management can be used in case a specific machine module will be part of the Kreo HMI project but will not be physically connected.

A NOT CONNECTED and ONSCAN device will reduce dramatically the performance of the page refresh due to the communication timeout.

Disable Optimization:
This option can be used in order to identify wich of the data displayed on a specific page is causing the communication error.
The value will not be displayed but a series of ????? will let the user identify the faulty tag to be fixed.

Tag definition



The memory mapping is based on the area that can be accessed in the PLC memory structure.

Memory areas

AREA	TYPE	DIM.	R/W	DESCRIPTION
Data Block	Bit Byte Word Dword Real String String (Plc)	1 8 16 32 32 8 8	R/W	Read/Write of optimized data block area.
Data block (Simatic Time)	TimeBase 1/100s TimeBase 1/10s TimeBase 1s TimeBase 10s TimeBase AUTO String Format	32 32 32 32 32 32	R/W	Read/Write of data block registers formatted as SimaticTime
Timer	TimeBase 1/100s TimeBase 1/10s TimeBase 1s TimeBase 10s TimeBase AUTO String Format	32 32 32 32 32 32	R/W	Read/Write of Timer formatted as SimaticTime
Counter	Value (Word)	16	R/W	Read/Write of the Counter value
Merker	Bit Byte Word Dword Real	1 8 16 32 32	R/W	Read/Write of the Merker area
Input	Bit Byte Word Dword Real	1 8 16 32 32	R/W	Read/Write of the Input area

Output	Bit Byte Word Dword Real	1 8 16 32 32	R/W	Read/Write of the Output area

Counter and Timer

The Counter and Timer are based on fully binary format.
Not necessary to define them as BCD.

The Counter address range is from 0 to 999.
The Timer (Simatic Time) range is listed below:

- 0ms .. 9s990ms (time base = 0, 1/100s.)
- 0ms .. 1m30s990ms (time base = 1, 1/10s.)
- 0s .. 16m39s (time base = 2, 1s.)
- 0s .. 2h46m30s (time base = 2, 10s.)

The two areas below are dedicated to the timer objects:

- Timer area
- Data Block area (Simatic Time)

Embedding the below data type:

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

Setting and visualization of the *Timer and Data Block (SimaticTime)*

1. READ: fixed time base, data type LONG, range 0..999000 (x10ms.)
   WRITE: fixed time base (x10ms), data type LONG, rannge 0..999

2. READ: fixed time base, data type LONG, range 0..99900 (x100ms.)
   WRITE: fixed time base (x100ms), data type LONG, range 0..999

3. READ: fixed time base, data type LONG, range 0..9990 (x1s.)
   WRITE: fixed time base (x1s.), data type LONG, range 0..999

4. READ: fixed time base, data type LONG, range 0..999 (x10s.)
   WRITE: fixed time base (x10s.), data type LONG, range 0..999

5. READ: automatic time base (x1ms), data type LONG, range 0..9990000
   WRITE: automatic time base (x1ms), data type LONG, range 0..9990000
   (il driver adatta automaticamente la base tempi in scrittura)

6. READ: automatic time base (x1ms), STRING format, rappr. ##h##m##s###ms
   WRITE: **automatic time base** (x1ms), STRING format, value range:
   - ###ms (es: 100ms - 450ms - 30ms)
   - ##s###ms (es: 4s100ms - 6s450ms - 15s30ms)
   - ##m##s (es: 2m4s - 1m40s - 15m30s)

- ##h##m (es: 2m4s - 1m40s - 15m30s)
- ##h##m##s###ms (es: 1m25s300ms - 3m1s250ms)
- ####### (es: 100 - 4000 - 567000)

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

Error code

CODICE	***DESCRIZIONE***
DRIVER ERROR	Unable to send request message, possible ethernet card problem
PROTOCOL ERROR	PLC receiving message generic error
PROTOCOL TIMEOUT	Timeout error, there was no response to a data request
PROTOCOL OFFLINE	Device offline, there is no response from the device during the ethernet connection
SOCKET ERROR	Error while creating the ethernet socket, the device does not respond
PING FAIL	The device does not respond to the standard ethernet PING request
FORMAT DATA ERR	The value (or string) inserted in the field during writing is not consistent with the allowed format rules
TRANSMISSION ERROR	Driver TCP packet transmission error
ERROR	Unmanaged Socket Driver Error Report

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