

Siemens SIMATIC RK512

Siemens SIMATIC RK512 communication protocol

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Supported device types and versions

The protocol allows reading and writing data from control PLC automats of Siemens Simatic of the S5 and S7 series. PLC Simatic must be equipped with the following serial communication point-to-point modules:

- SIMATIC S5 series: CP524, CP525 or CP544
- SIMATIC S7-300 series: CP341
- SIMATIC S7-400 series: CP441-2

The protocol RK512 is a transport superstructure of [protocol 3964\(R\)](#). It allows universal reading and writing values of PLC Simatic objects - minimal intervention into the PLC application software (using the STEPS5/7 programming language).

The 3964 protocol, which is the line layer of the RK512 protocol, has two variants - 3964 a 3964R. The 3964R allows extra data security using the BCC checksum.

Communication line configuration

- Communication line category: [Serial](#), [SerialOverUDP Device Redundant](#).
- Serial line parameters according to the setting of the SIMATIC communication module.

Communication station configuration

- Communication protocol: **Siemens SIMATIC RK512**.
- No address parameter is required, one communication line allows communication with one SIMATIC PLC.

Station protocol parameters

The [Communication station configuration dialog box](#) - tab **Protocol parameters**.

Parameters defined in the input field have an effect on some optional protocol parameters. The following station protocol parameters can be defined:

Table 1

Parameter	Meaning	Unit / size	Default value
Retry Count	Maximum count of request retries. If no response returns after a request had been sent, the station's status will change to a communication error.	-	2
Retry Timeout	Timeout before resending a request if no response has been received.	ms	100 ms
Wait First Timeout	The delay after sending the request and before reading the response.	ms	100 ms
Wait Timeout	The delay between the response readings.	ms	50 ms
Max Wait Retry	The maximum number of retries of the response reading.	-	40
3964 (without BCC)	Enable the 3964 link protocol, i.e. version with no transmission security. By default, the 3964R protocol is used, which implements the BCC checksum.	YES/NO	NO
CPU id	CPU identification (1 up to 4), not used by default (value = 0).	0,1,2,3,4	0

I/O tag configuration

Possible I/O tag value types: **Ai, Ao, Ci, Co, Di, Do**.

I/O tag address is a character string as follows:

- the letter L denotes the left byte (higher) of the element
- the letter R denotes the right byte of the (lower) element
- the letter W denotes the interpretation of the element value as a 16-bit unsigned word (signed if KF suffix is used - see [Note 1](#))
- the letter D denotes the interpretation of values of 2 elements (address n and n + 1) as a 32-bit unsigned double word (signed if KF suffix is used, or float if suffix KG is used - see [Note 1](#))
- m - a data block number is a number from interval 1..255
- n - offset in a data block as well as byte offsets are numbers from interval 0..255
- k - bit position is a number from the interval 0..15 (for elements in Data block/Extended data block) resp. 0..7 (for Memory/Input/Output data)

Table 2

Data	Format	Description	Access	I/O tag type
Data block/Extended data block elements	D{B X}mD{L R W D}n[x]	m = "data block" number n = word offset in the data block x = suffix KF, KG (as necessary - see Note 1)	R/W	Ai, Ao, Ci, Co
Data block bits	D{B X}mDn.k	m = "data block" number n = word offset in the data block k = bit position [0..15]	R/W	Di, Do
Memory elements	F{Y W D}n[x] or M{B W D}n[x]	n = byte offset in "memory area" x = suffix KF, KG (as necessary - see Note 1)	R	Ai, Ci
Memory bits	Fn.k or Mn.k	n = byte offset in "memory area" k = bit position [0..7]	R	Di
Input elements	I{B W D}n[x] or E{B W D}n[x]	n = byte offset in "input area" x = suffix KF, KG (as necessary - see Note 1)	R	Ai, Ci
Input bits	In.k or En.k	n = byte offset in "input area" k = bit position [0..7]	R	Di
Output elements	Q{B W D}n[x] or A{B W D}n[x]	n = byte offset in "output area" x = suffix KF, KG (as necessary - see Note 1)	R	Ai, Ci
Output bits	Qn.k or An.k	n = byte offset in "output area" k = bit position [0..7]	R	Di

Table 2 contains the address format used in SIMATIC S5, i.e. use of word offset in DB and DX elements. Therefore you can use addresses in the S7 format according to table 3 for DB and DX elements:

Table 3

Data	Format	Description	Access	I/O tag type
Data block/Extended data block elements	D{B X}m.DB{B W D}n[x]	m = "data block" number n = byte offset in the data block x = suffix KF, KG (as necessary - see Note 1)	R/W	Ai, Ao, Ci, Co
Data block bits	D{B X}m.DBXn.k	m = "data block" number n = byte offset in the data block k = bit position [0..7]	R/W	Di, Do

Explanatory text:

- R/W = read and write access
- R = read-only access

Note 1:

The suffix is optional as follows:

- KF - the number (of word W type or dword D type) will be interpreted as a signed number.
- KG - the number will be interpreted as a float (for dword D type) in the IEE754 format.

Literature

- SIEMENS SIMATIC CP341 Point-to-Point Communication Installation and Parameter Assignment, Manual 6ES7 341-1AH00-8BA0

Changes and modifications

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Document revisions

- Ver. 1.0 - January 24th, 2002 - document creation.
- Ver. 1.1 - November 3rd, 2010 - document update.



Related pages:

[Communication protocols](#)