

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 transport superstructure of the [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, that 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**.
- There is not required any address parameter, one communication line allows to communicate with one PLC SIMATIC.

Station protocol parameters

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

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

Table 1

Parameter	Meaning	Unit / size	Default value
Retry Count	Poll repetition count in case of a communication error.	-	2
Retry Timeout	Delay between poll repetition in case of a communication error.	ms	100 ms
Wait First Timeout	First waiting for response after sending the poll.	ms	100 ms
Wait Timeout	Delay between response readings till its finalization.	ms	50 ms
Max Wait Retry	Repetition count of response readings till its finalization.	-	40
3964 (without BCC)	Enable the 3964 link protocol, i.e. version with no transmission security. By default, there is used the 3964R protocol using 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 - data block number is a number from interval 1..255
- n - offset in 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 v "output area" k = bit position [0..7]	R	Di

The 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 the 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 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 data block k = bit position [0..7]	R/W	Di,Do

Explanatory text:

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

Note 1:

Suffix is optional as follows:

- KF - number (of word W type or dword D type) will be interpreted along with a sign.
- KG - number will be interpreted as float (for dword D type) in the IEEE754 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](#)

