(https://sieportal.siemens.com/en-vn/home)

SiePortal

The integrated platform for your product selection, buying, and support workflow – bringing together Industry Mall and Online Support.

> Home (https://sieportal.siemens.com/en-vn/home) > Support > Knowledge base

Entry type: **FAQ** Entry ID: **26483647**, Entry date: **11/26/2019**

★★★★☆ **(12)**
> **Rate**

What properties, advantages and special features does the S7 protocol offer?

| Entry | Associated product(s) |

All SIMATIC S7 CPUs and C7 CPUs have integrated S7 communication services with which the user program can read and write data.

The following functions are available to you for the S7 CPUs and C7 CPUs regardless of the bus system used, so that you can use S7 communication via Industrial Ethernet, PROFIBUS or MPI:

System function blocks (SFBs): in STEP 7 V5.x for S7-400 CPUs
Function blocks (FBs): in STEP 7 V5.x for S7-300 CPUs and C7-CPUs
Instructions: in TIA Portal for S7-300 CPUs, S7-400 CPUs, S7-1200 CPUs and S7-1500 CPUs

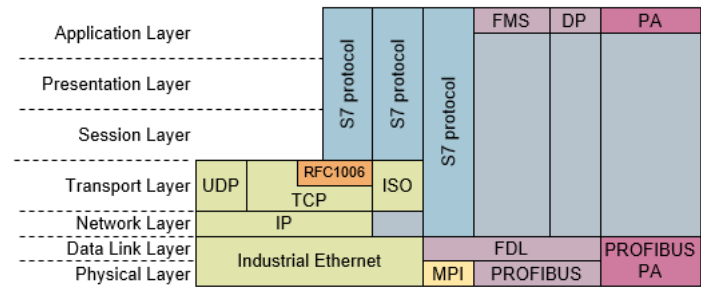Position of the S7 protocol in the ISO-OSI reference model.

Fig. 1

Services of the S7 protocol
Overview of the S7 protocol services.

Service	Description
PUT / GET	This service is a unidirectional read/write service for transferring small volumes of data to and from a station.
BSEND / BRCV	This service is a bidirectional and block-oriented service for transferring large volumes of data between two stations.
USEND / URCV	This service is a bidirectional and uncoordinated service for transferring small volumes of data between two stations.

Table 1

User data size
The S7 protocol permits transfer of data from 1 byte to 64 Kbytes. The maximum data size depends on the service used and the S7 CPU used.

Service	S7-300 CPU	S7-400 CPU	S7-1200 CPU	S7-1500 CPU
PUT / GET	160 bytes	400 bytes	160 bytes	880 bytes
BSEND / BRCV	32768 bytes / 65534 bytes	65534 bytes	-	65534 bytes with standard access 65535 bytes with optimized access
USEND / URCV	160 bytes	440 bytes	-	920 bytes

Table 2

Properties of the S7 protocol
The following table shows the properties of the S7 protocol.

Properties	PUT / GET	BSEND / BRCV	USEND / URCV
Memory areas	M, D, E, A, T, Z	M, D, E, A, T, Z	M, D, E, A, T, Z
Data consistency	8 to 32 bytes 32 bytes to total length[1)2)]	Total length per job[2)]	Total length per job[2)]
Communication principle	Client / Server	Client / Client	Client / Client
Maximum number of connections	See CPU specification	See CPU specification	See CPU specification
Functions	FB15 / SFB15 "PUT" FB14 / SFB14 "GET"	FB12 / SFB12 "BSEND" FB13 / SFB13 "BRCV"	FB8 / SFB8 "USEND" FB9 / SFB9 "URCV"

Table 3

2) In the user program you must make sure that the data block is not modified during data transfer.

Advantages of the S7 protocol

Independent of the bus medium (PROFIBUS, Industrial Ethernet, MPI).

Can be used on all S7 data areas.

Transfer of up to 64 Kbytes in one job.

The S7 protocol ensures automatic acknowledgment of the data records.

Low processor and bus load during transfer of large volumes of data.

Note

The S7 protocol is supported by all available S7 CPUs and communication processors. Furthermore, PC systems with appropriate hardware and software support communication via the S7 protocol.

Further Information

Entry ID ❯ 20987358 (/cs/document/20987358?lc=en-vn) provides a complete example of S7 communication with BSEND/BRCV via PROFIBUS.

General information about communication via SIMATIC S7 is available in Entry ID: ❯ 20982954 (/cs/document/20982954/cpu-cpu-communication-with-simatic-controllers-(compendium)?lc=en-vn) .

Examples of S7 communication with PUT / GET are available in the following Entry IDs:

❯ 92269951 (/cs/document/92269951/how-do-you-configure-and-program-an-s7-connection-and-the-fb15-put-and-fb14-get-function-blocks-for-data-transfer-between-an-s7-1200-cpu-and-an-s7-300-cpu-?lc=en-vn) : Data transfer between an S7-300 CPU and an S7-1200 CPU

❯ 82212115 (/cs/document/82212115/how-do-you-configure-and-program-an-s7-connection-and-the-%e2%80%9cput%e2%80%9d-and-%e2%80%9cget%e2%80%9d-instructions-for-data-transfer-between-two-s7-cpus-?lc=en-vn) : Data transfer between an S7-1200 CPU and an S7-1500 CPU

❯ 18610307 (/cs/document/18610307/how-do-you-program-communication-blocks-fb14-get-and-fb15-put-for-data-exchange-in-the-s7-program-of-an-s7-300-cpu-?lc=en-vn) : PUT / GET in the user program of the S7-300 CPU (STEP 7 V5.x)

Security information

In order to protect technical infrastructures, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art IT security concept. Siemens' products and solutions constitute one element of such a concept. For more information about cyber security, please visit

https://www.siemens.com/cybersecurity#Ouraspiration. (https://www.siemens.com/cybersecurity#Ouraspiration)

....

Also available in the following languages:
❯ German
❯ French
❯ Italian
❯ Spanish
❯ Chinese

Entry belongs to product tree folder(s):

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Basic Controller ❯ S7-1200 ❯ Central processing units ❯ Standard CPUs (products?pnid=13685)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Basic Controller ❯ S7-1200 ❯ Central processing units ❯ Fail-safe CPUs (products?pnid=13686)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Advanced Controller ❯ S7-1500 ❯ CPUs ❯ Standard-CPUs (products?pnid=13718)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Advanced Controller ❯ S7-1500 ❯ CPUs ❯ Failsafe CPUs (products?pnid=13719)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Advanced Controller ❯ S7-300 ❯ CPUs ❯ Standard CPUs (products?pnid=13753)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Advanced Controller ❯ S7-300 ❯ CPUs ❯ Compact CPUs (products?pnid=13754)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Advanced Controller ❯ S7-300 ❯ CPUs ❯ Failsafe CPUs (products?pnid=13755)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Advanced Controller ❯ S7-300 ❯ CPUs ❯ Technology CPUs (products?pnid=13756)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Advanced Controller ❯ S7-400 ❯ CPUs ❯ Standard CPUs (products?pnid=13830)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Advanced Controller ❯ S7-400 ❯ CPUs ❯ Failsafe CPUs (products?pnid=13831)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Distributed Controller ❯ based on ET 200SP ❯ Central processing units ❯ Standard CPUs (products?pnid=13889)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Distributed Controller ❯ based on ET 200SP ❯ Central processing units ❯ Fail-safe CPUs (products?pnid=13890)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Distributed Controller ❯ based on ET 200SP ❯ Central processing units ❯ ET 200SP Open Controller (products?pnid=13891)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Distributed Controller ❯ Based on ET 200S ❯ Central processing units ❯ Standard CPUs ❯ IM151-7 CPU (products?pnid=13896)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Distributed Controller ❯ Based on ET 200S ❯ Central processing units ❯ Standard CPUs ❯ IM151-8 PN/DP CPU (products?pnid=13897)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Distributed Controller ❯ Based on ET 200S ❯ Central processing units ❯ Failsafe CPU ❯ IM151-7 F-CPU (products?pnid=13901)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Distributed Controller ❯ Based on ET 200S ❯ Central processing units ❯ Failsafe CPU ❯ IM151-8 F PN/DP CPU (products?pnid=13902)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Distributed Controller ❯ based on ET200Pro ❯ Central processing units ❯ Standard CPUs (products?pnid=13908)

❯ Automation Technology ❯ Automation Systems ❯ Industrial Automation Systems SIMATIC ❯ PLC ❯ Software Controller ❯ S7-1500 Software Controller ❯ Standard CPUs (products?pnid=13913)

❯ Automation Technology ❯ Industrial Communication ❯ Industrial Ethernet ❯ System interfaces ❯ SIMATIC S7 ❯ Communication for SIMATIC S7-1500 ❯ CP 1543-1 (products?pnid=15340)

❯ Automation Technology ❯ Industrial Communication ❯ Industrial Ethernet ❯ System interfaces ❯ SIMATIC S7 ❯ Communication for SIMATIC S7-1500 ❯ CM 1542-1 (products?pnid=15341)

❯ Automation Technology ❯ Industrial Communication ❯ Industrial Ethernet ❯ System interfaces ❯ SIMATIC S7 ❯ Communication for SIMATIC S7-300 ❯ CP 343-1 Lean (products?pnid=15344)

❯ Automation Technology ❯ Industrial Communication ❯ Industrial Ethernet ❯ System interfaces ❯ SIMATIC S7 ❯ Communication for SIMATIC S7-300 ❯ CP 343-1 (products?pnid=15345)

Rate entry

☆ ☆ ☆ ☆ ☆ no rating   Submit rating

Requests and feedback

What do you want to do?

- You want to discuss in our forum and exchange experiences with other users
  > Go to the Forum (/forum/vn/en)

- You have a technical question / problem: Ask the Technical Support
  > Create support request

  Note: Depending on the effort involved, support may be subject to a charge. In this case, please have a Siemens Industry Service Card (https://support.industry.siemens.com/cs/vn/en/sc/4869) ready.
- You want to create CAx data for one or more products
  > Go to the CAx download manager

© Siemens AG 2009-2025   Imprint (https://www.siemens.com/corporate-information) | Privacy policy (https://www.siemens.com/privacy-notice) | Cookie policy (https://www.siemens.com/cookie-notice) |

- You would like to send us feedback on this Entry.

> Provide feedback

Note: The feedback always relates to the current entry. Your message will be forwarded to our technical editors working in the Online Support. In a few days, you will receive a response if your feedback requires one.