SIEMENS
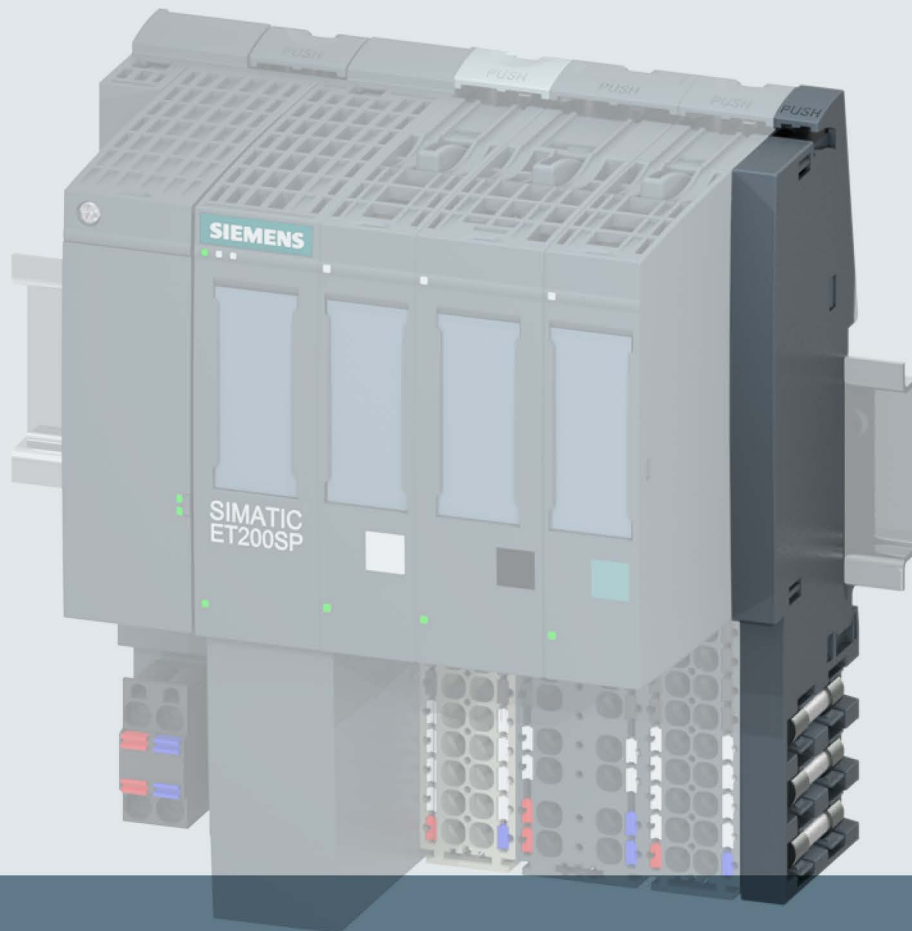

SIMATIC

ET 200SP

Server module (6ES7193-6PA00-0AA0)

Manual

Answers for industry.

SIEMENS

SIMATIC

ET 200SP
Server module
(6ES7193-6PA00-0AA0)

Manual

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Preface

Purpose of the documentation

This manual supplements the ET 200SP distributed I/O system (http://support.automation.siemens.com/WW/view/en/58649293) system manual.

Functions that generally relate to the system are described in this manual.

The information provided in this manual and in the system/function manuals supports you in commissioning the ET 200SP distributed I/O system.

Conventions

Please also observe notes labeled as follows:

Note

A note contains important information on the product described in the documentation, on the handling of the product, or on the section of the documentation to which particular attention should be paid.

Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. You can find more information about industrial security on the Internet (http://www.siemens.com/industrialsecurity).

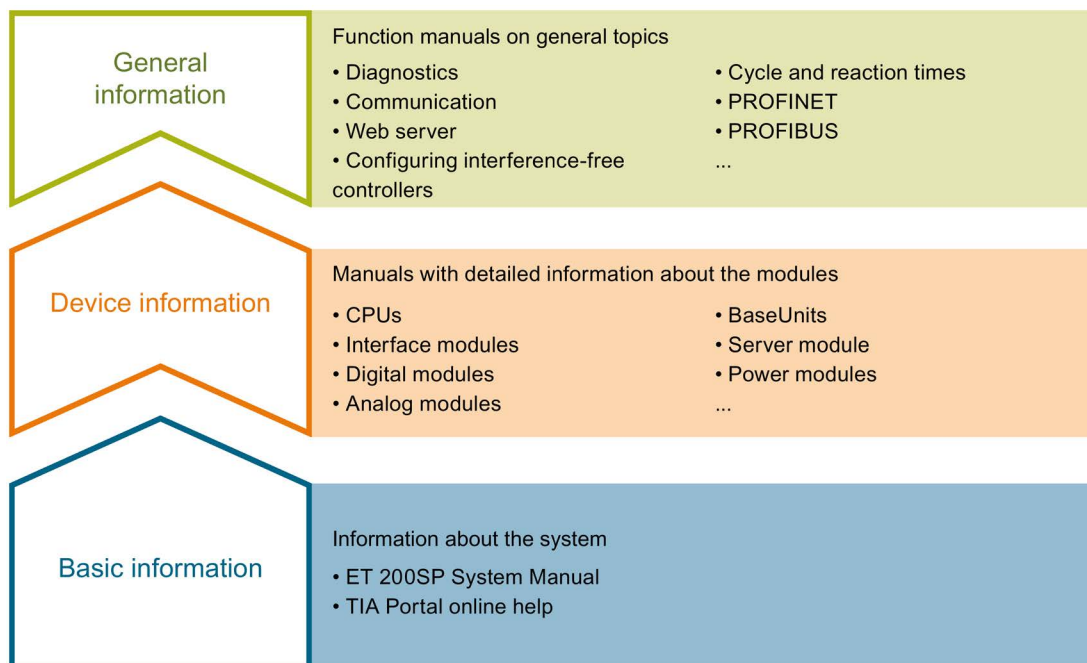To stay informed about product updates as they occur, sign up for a product-specific newsletter. You can find more information on the Internet (http://support.automation.siemens.com).

Table of contents

Documentation guide 1

The documentation for the SIMATIC ET 200SP distributed I/O system is arranged into three areas.
This arrangement enables you to access the specific content you require.

General information

Function manuals on general topics

- Diagnostics
- Communication
- Web server
- Configuring interference-free controllers
- Cycle and reaction times
- PROFINET
- PROFIBUS
- ...

Device information

Manuals with detailed information about the modules

- CPUs
- Interface modules
- Digital modules
- Analog modules
- BaseUnits
- Server module
- Power modules
- ...

Basic information

Information about the system

- ET 200SP System Manual
- TIA Portal online help

Basic information

The system manual describes in detail the configuration, installation, wiring and commissioning of the SIMATIC ET 200SP. distributed I/O system. The STEP 7 online help supports you in the configuration and programming.

Device information

Product manuals contain a compact description of the module-specific information, such as properties, terminal diagrams, characteristics and technical specifications.

General information

The function manuals contain detailed descriptions on general topics regarding the SIMATIC ET 200SP distributed I/O system, e.g. diagnostics, communication, Web server, designing interference-free controllers.

You can download the documentation free of charge from the Internet (http://w3.siemens.com/mcms/industrial-automation-systems-simatic/en/manual-overview/tech-doc-et200/Pages/Default.aspx).

Changes and supplements to the manuals are documented in a Product Information.

Manual Collection ET 200SP

The Manual Collection contains the complete documentation on the SIMATIC ET 200SP distributed I/O system gathered together in one file.

You can find the Manual Collection on the Internet (http://support.automation.siemens.com/WW/view/en/84133942).

My Documentation Manager

The My Documentation Manager is used to combine entire manuals or only parts of these to your own manual.
You can export the manual as PDF file or in a format that can be edited later.

You can find the My Documentation Manager on the Internet (http://support.industry.siemens.com/My/ww/en/documentation).

Application examples

Applications examples support you with various tools and examples for solving your automation tasks. Solutions are shown in interplay with multiple components in the system - separated from the focus in individual products.

You can find application examples on the Internet (https://support.industry.siemens.com/sc/ww/en/sc/2054).

CAx Download Manager

The CAx Download Manager is used to access the current product data for your CAx or CAe systems.

You configure your own download package with a few clicks.

In doing so you can select:

- Product images, 2D dimension drawings, 3D models, internal circuit diagrams, EPLAN macro files

- Manuals, characteristics, operating manuals, certificates

- Product master data

You can find the CAx Download Manager on the Internet (http://support.industry.siemens.com/my/ww/en/CAxOnline).

TIA Selection Tool

With the TIA Selection Tool, you can select, configure and order devices for Totally Integrated Automation (TIA).
This tool is the successor of the SIMATIC Selection Tool and combines the known configurators for automation technology into one tool.
With the TIA Selection Tool, you can generate a complete order list from your product selection or product configuration.

You can find the TIA Selection Tool on the Internet (http://w3.siemens.com/mcms/topics/en/simatic/tia-selection-tool).

Product overview

<div style="text-align: right; font-size: 2em;">2</div>

2.1 Properties

Article number

6ES7193-6PA00-0AA0

View of the module

Figure 2-1   View of the server module

Properties

The module has the following technical properties:

- Closes off the backplane bus of the ET 200SP
- Contains a support for 3 spare fuses (5 × 20 mm)

The module supports the following functions:

- Firmware update
- I&M identification data
- Reconfiguration in RUN
- Representation of the statuses of supply voltage L+ and the feedback voltage (Page 15) per slot.
- Retentive storage of device name for device replacement without topological configuration of the IM 155-6 PN BA.

You can configure the module with STEP 7 (TIA Portal) and with a GSD file.

Function and properties	Product version of the module as of	Firmware version of the module as of
Support of the IM 155-6 PN BA	1	V1.1.1

Parameters/address space

<div align="right">3</div>

3.1 Parameters

Parameters for the server module

The effective range of the configurable parameter depends on the type of configuration. Possible configuration: Distributed operation on PROFINET IO in an ET 200SP system.

When assigning parameters in the user program, use the "WRREC" instruction to transfer the parameter to the module by means of data records, see section Parameter assignment and structure of parameter data record (Page 19).

The following parameter settings are possible:

Table 3- 1   Configurable parameter and its default (GSD file)

Parameters	Range of values	Default	Reconfiguration in RUN	Effective range with configuration software, e.g., STEP 7 (TIA Portal)	
				GSD file PROFINET IO	GSD file PROFIBUS DP
Group diagnostics: No supply voltage L+	• Disable • Enable	No	Yes	ET 200SP	---

3.2 Explanation of the parameters

Group diagnostics: No supply voltage L+

When you enable this parameter, the ET 200SP generates one diagnostic per potential group (as group information) when the supply voltage L+ fails.

This function does not depend on enabling the parameter "Diagnostics: No supply voltage L+" of the I/O modules.

The diagnostics is formed from the states of the supply voltage of the installed I/O modules within the potential group.

Requirements

- All I/O modules must be inserted, i.e. the current configuration must not have any empty slots.

- If no I/O modules are inserted on light-colored BaseUnits BU..D, the beginning of this potential group is not recognized. The I/O modules of this potential group are therefore part of the previous potential group.
  If the I/O module is installed on the light-colored BaseUnit, the potential group is detected, the diagnostics is reevaluated according to the potential group arrangement and new diagnostics may be reported. The position of the light-colored BaseUnit remains stored in the structure until the supply voltage 1L+ of the CPU/interface module is turned off.

3.3 Address space

Introduction

You can read out the status of the supply voltage L+ and the feedback voltage of I/O modules via the address space of the server module:

- All I/O modules:
  No supply voltage L+ or no I/O module available

- Additional digital output module HF:
  feedback voltage present

Requirements

- The I/O module used must support monitoring of the supply voltage.
- The I/O module used must support monitoring of a feedback voltage.

Length of input data

The length of the input data depends on the CPU/interface module:

- Interface module with 12 I/O modules maximum configuration: 2/4 bytes
- Interface module with 32 I/O modules maximum configuration: 4/8 bytes
- CPU/interface module with 64 I/O modules maximum configuration: 8/16 bytes

Configurations

In the configuration software, you can select 3 configurations for the server module for operation on the CPU/interface module:

- Configuration with disabled "Status of the supply voltage L+" and disabled "Status of the feedback voltage":
    - The server module only has one diagnostics address.
- Configuration with enabled "Status of the supply voltage L+" and disabled "Status of the feedback voltage":
    - The server module has 2/4/8 bytes of input data for the display of the status of the supply voltage L+ of the inserted I/O modules.
    - Display in the input data of the server module:

      Supply voltage L+ present/missing or I/O module available/not available
- Configuration with enabled "Status of the supply voltage L+" and enabled "Status of the feedback voltage":
    - The server module has 4/8/16 bytes of input data for the display of the status of the supply voltage L+ and the status of the feedback voltage of the inserted I/O modules.
    - Display in the input data of the server module:

      Supply voltage L+ present/missing or I/O module available/not available

      Feedback voltage present/missing

Table 3- 2   Data length depending on configuration and maximum configuration

Maximum configuration	"Status supply voltage" deactivated	Activated	Activated
	"Status feedback voltage" deactivated	Deactivated	Activated
12 slots	0	2	4
32 slots	0	4	8
64 slots	0	8	16

3.3.1   Input data for interface modules with maximum 12 I/O modules

Configuration with enabled status detection of the supply voltage L+ (2 bytes of input data)

You can read out the following status for each I/O module of the ET 200SP in the input data (byte 0 to 1):

- Supply voltage L+ present/missing or I/O module available/not available (2 bytes)

	7	6	5	4	3	2	1	0
Byte 0	8	7	6	5	4	3	2	1
Byte 1	x	x	x	x	12	11	10	9

Slots of the I/O modules
Bit = 1:
Supply voltage L+ available and I/O module available
Bit = 0:
Missing supply voltage L+ or no I/O module available
X = 0

Figure 3-1   Configuration with enabled status detection of the supply voltage L+ (2 bytes)

Configuration with enabled status detection of the supply voltage L+ and enabled status detection of the feedback voltage (4 bytes of input data)

You can read out the following status for each I/O module of the ET 200SP in the input data (byte 0 to 3).

- Supply voltage L+ present/missing or I/O module available/not available (2 bytes)
- Feedback voltage present/missing (2 bytes)

	7	6	5	4	3	2	1	0
Byte 0	8	7	6	5	4	3	2	1
Byte 1	x	x	x	x	12	11	10	9

Slots of the I/O modules
Bit = 1:
Supply voltage L+ available and I/O module available
Bit = 0:
Missing supply voltage L+ or I/O module not available
x = 0

	7	6	5	4	3	2	1	0
Byte 2	8	7	6	5	4	3	2	1
Byte 3	x	x	x	x	12	11	10	9

Bit = 1:
Feedback voltage present
Bit = 0:
Feedback voltage missing
x = 0

Figure 3-2   Configuration with enabled status detection of the supply voltage L+ and enabled status detection of the feedback voltage (4 bytes of input data)

Note

- An inserted or missing server module always signals bit=0 for the slot.
- If the server module is missing, the input data is invalid.
- For I/O modules without feedback voltage monitoring, the bit for the feedback voltage is the same as the bit for the missing supply voltage L+.

3.3.2 Input data for interface modules with maximum 32 I/O modules

Configuration with enabled status detection of the supply voltage L+ (4 bytes of input data)

You can read out the following status for each I/O module of the ET 200SP in the input data (byte 0 to 3):

- Supply voltage L+ present/missing or I/O module available/not available (4 bytes)

	7	6	5	4	3	2	1	0
Byte 0	8	7	6	5	4	3	2	1
Byte 1	16	15	14	13	12	11	10	9
Byte 2	24	23	22	21	20	19	18	17
Byte 3	32	31	30	29	28	27	26	25

Slots of the I/O modules
Bit = 1:
Supply voltage L+ available and I/O module available
Bit = 0:
Missing supply voltage L+ or no I/O module available

Figure 3-3   Supply voltage L+ missing or I/O module not available (4 bytes); feedback voltage not available

Configuration with enabled status detection of the supply voltage L+ and enabled status detection of the feedback voltage (8 bytes of input data)

You can read out the following status for each I/O module of the ET 200SP in the input data (byte 0 to 7).

- Supply voltage L+ present/missing or I/O module available/not available (4 bytes)

- Feedback voltage present/missing (4 bytes)

	7	6	5	4	3	2	1	0
Byte 0	8	7	6	5	4	3	2	1
Byte 1	16	15	14	13	12	11	10	9
Byte 2	24	23	22	21	20	19	18	17
Byte 3	32	31	30	29	28	27	26	25

Slots of the I/O modules
Bit = 1:
Supply voltage L+ available and I/O module available
Bit = 0:
Missing supply voltage L+ or I/O module not available

	7	6	5	4	3	2	1	0
Byte 4	8	7	6	5	4	3	2	1
Byte 5	16	15	14	13	12	11	10	9
Byte 6	24	23	22	21	20	19	18	17
Byte 7	32	31	30	29	28	27	26	25

Bit = 1:
Feedback voltage present
Bit = 0:
Feedback voltage missing

Figure 3-4   Configuration with enabled status detection of the supply voltage L+ and enabled status detection of the feedback voltage (8 bytes of input data)

Note

- An inserted or missing server module always signals bit=0 for the slot.
- If the server module is missing, the input data is invalid.
- For I/O modules without feedback voltage monitoring, the bit for the feedback voltage is the same as the bit for the missing supply voltage L+.

3.3.3 Input data for CPU/interface modules with maximum 64 I/O modules

Configuration with enabled status detection of the supply voltage L+ (8 bytes of input data)

You can read out the following status for each I/O module of the ET 200SP in the input data (byte 0 to 7):

● Supply voltage L+ present/missing or I/O module available/not available (8 bytes)

	7	6	5	4	3	2	1	0	Slots of I/O modules
Byte 0	8	7	6	5	4	3	2	1	Bit = 1:
Byte 1	16	15	14	13	12	11	10	9	Supply voltage L+ present and I/O module available
Byte 2	24	23	22	21	20	19	18	17	Bit = 0:
Byte 3	32	31	30	29	28	27	26	25	Missing supply voltage L+ or no I/O module available
Byte 4	40	39	38	37	36	35	34	33	
Byte 5	48	47	46	45	44	43	42	41	
Byte 6	56	55	54	53	52	51	50	49	
Byte 7	64	63	62	61	60	59	58	57	

Figure 3-5   Configuration with enabled status detection of the supply voltage L+ (8 bytes)

Configuration with enabled status detection of the supply voltage L+ and enabled status detection of the feedback voltage (16 bytes of input data)

You can read out the following status for each I/O module of the ET 200SP in the input data (byte 0 to 15):

● Supply voltage L+ present/missing or I/O module available/not available (8 bytes)

● Feedback voltage present/missing (8 bytes)

	7	6	5	4	3	2	1	0	Slots of I/O modules
Byte 0	8	7	6	5	4	3	2	1	Bit = 1:
Byte 1	16	15	14	13	12	11	10	9	Supply voltage L+ present and I/O module available
Byte 2	24	23	22	21	20	19	18	17	Bit = 0:
Byte 3	32	31	30	29	28	27	26	25	Missing supply voltage L+ or no I/O module available
Byte 4	40	39	38	37	36	35	34	33	
Byte 5	48	47	46	45	44	43	42	41	
Byte 6	56	55	54	53	52	51	50	49	
Byte 7	64	63	62	61	60	59	58	57	

	7	6	5	4	3	2	1	0	
Byte 8	8	7	6	5	4	3	2	1	Bit = 1:
Byte 9	16	15	14	13	12	11	10	9	Feedback voltage available
Byte 10	24	23	22	21	20	19	18	17	Bit = 0:
Byte 11	32	31	30	29	28	27	26	25	Feedback voltage not available
Byte 12	40	39	38	37	36	35	34	33	
Byte 13	48	47	46	45	44	43	42	41	
Byte 14	56	55	54	53	52	51	50	49	
Byte 15	64	63	62	61	60	59	58	57	

Figure 3-6   Configuration with enabled status detection of the supply voltage L+ and enabled status detection of the feedback voltage (16 bytes of input data)

Note

- An inserted or missing server module always signals bit=0 for the slot.
- If the server module is missing, the input data is invalid.
- For I/O modules without feedback voltage monitoring, the bit for the feedback voltage is the same as the bit for the missing supply voltage L+.

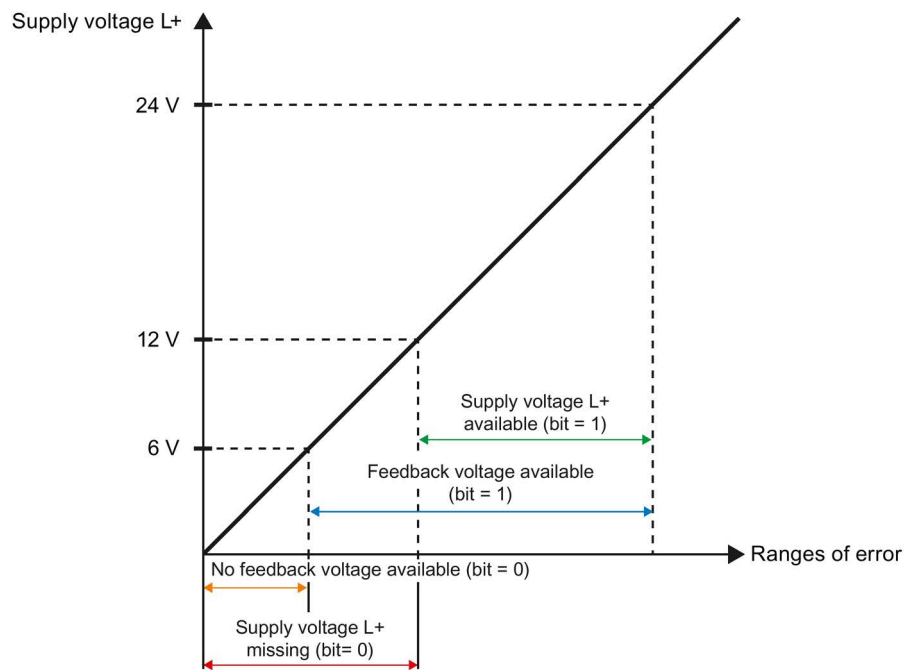## 3.3.4 Evaluating feedback voltage

Ranges of error

Figure 3-7   Ranges of error of the supply voltage L+ and the feedback voltage

Feedback voltage

A feedback may occur, for example, due to a crossover in a cable of a digital output module and depends on the target status of the supply voltage L+:

If the supply voltage L+ of the I/O module is greater than 6 V, this is entered in the input data in the respective bit.

- Byte 2 and 3 (for 12 I/O modules and 4 bytes of input data)
- Byte 4 to 7 (for 32 I/O modules and 8 bytes of input data)
- Byte 8 to 15 (for 64 I/O modules and 16 bytes of input data)

The feedback voltage can be evaluated via the user program in the following cases:

Table 3- 3   Under what circumstances can the feedback voltage be evaluated via the user program?

Supply voltage L+ safely disconnected[1]	Status detection of supply voltage L+ (input data)	Status detection of feed-back voltage (input data)	Explanation
Yes	Not available: Bit = 0	Available: Bit = 1	The feedback voltage detected is in the range 6 to 12 V (e.g. in the event of a fault in the system)
Yes	Available: Bit = 1	Available: Bit = 1	The feedback voltage detected is > 12 V (e.g. in the event of a fault in the system)

[1]   This does not refer to the supply voltage applied to the BaseUnit, but, for example, to the status information of a safety relay.

Diagnostics alarms

4

A diagnostics alarm is output for each diagnostics event. The diagnostics alarms can, for example, be read out in the diagnostics buffer of the CPU. You can evaluate the error codes with the user program.

Table 4- 1   Diagnostics alarms, their meanings and corrective measures

Diagnostics alarm	Error code	Meaning	Solution
Server module with invalid firmware version (< V1.1.1)	$1B_H$	General error	- Replace the server module. - Firmware update of the server module.

Technical specifications

<div style="text-align: right">5</div>

5.1 Technical specifications

Technical specifications of the server module

	6ES7193-6PA00-0AA0
Dimensions	
Width	7 mm
Height	117 mm
Depth	36 mm
Weights	
Weight, approx.	19 g

Parameter data record

<div style="text-align: right; font-size: 2em;">6</div>

6.1 Parameter assignment and structure of parameter data record

Parameter assignment in the user program

You can change the parameters of the module in RUN.

Changing parameters in RUN

The WRREC instruction is used to transfer the parameters to the module using data record 128. The parameters set in STEP 7 are not changed in the CPU, which means the parameters set in STEP 7 are valid again after a restart.

STATUS output parameter

The module ignores errors that occurred during the transfer of parameters with the WRREC instruction and continues operation with the previous parameter assignment. However, a corresponding error code is written to the STATUS output parameter.

The description of the WRREC instruction and the error codes is available in the STEP 7 online help.

Structure of data record 128

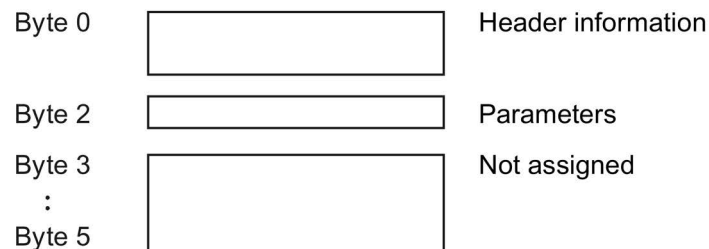| Byte 0		Header information
Byte 2		Parameters
Byte 3 : Byte 5		Not assigned

Figure 6-1   Structure of data record 128

Header information

The following diagram shows the structure of the header information.
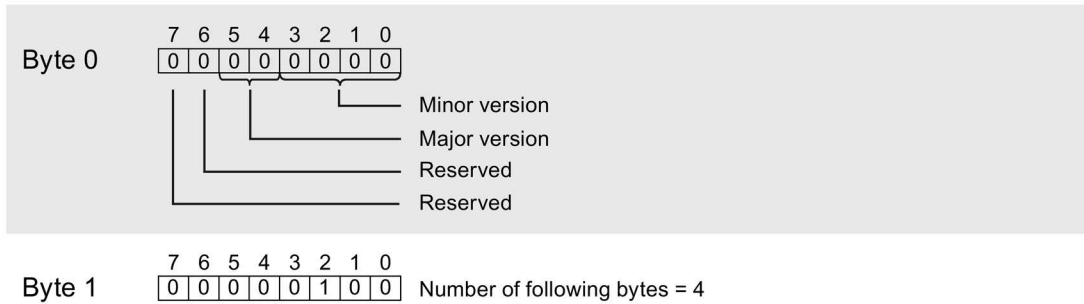

Figure 6-2   Header information

Parameters

The following diagram shows the structure of the parameter in byte 2.

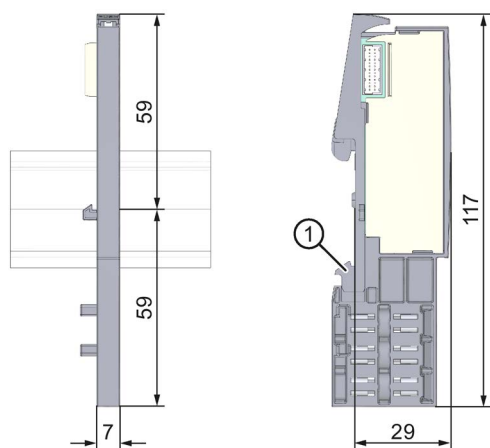Enable the parameter by setting the corresponding bit to "1".

Figure 6-3   Structure of byte 2

Dimensional drawing

<div align="right">

A
</div>

A.1 Server module

Dimensional drawing of the server module

① Contact plating of mounting rail

Figure A-1   Dimensional drawing of the server module