

Edition

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EQUIPMENT MANUAL

SIMATIC

S7-1500 / S7-1500H / ET 200MP

Active backplane bus ST 1+12 slot

Active backplane bus ST 1+8 slot

Active backplane bus ST 1+4 slot

6ES7590-0BX00-0AA0

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SIMATIC

S7-1500, S7-1500R/H, ET 200MP
Active backplane bus ST 1+12 slot,
active backplane bus ST 1+8 slot,
active backplane bus ST 1+4 slot




Equipment Manual

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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.

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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.

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Introduction

Purpose of the documentation

This documentation provides important information on assembling and commissioning the active backplane bus.

Basic knowledge required

A basic knowledge of automation engineering is required to understand the documentation.

Scope of the documentation

This documentation applies to all products from the following product families:

- S7-1500H/HF
- SIMATIC ET 200MP

Conventions

- S7-1500H: This term refers to the CPU1517H and CPU1518HF. If a piece of information only affects one of the CPU versions, it is explicitly named.
- STEP 7: In this documentation, "STEP 7" is used as a synonym for all versions of the configuration and programming software "STEP 7 (TIA Portal)".
- The figures in this manual show the active backplane bus ST 1+12 slot. The figures also apply accordingly for the active backplane bus ST 1+8 slot and the active backplane bus ST 1+4 slot.

Recycling and disposal

The products are low in pollutants and can be recycled. For ecologically compatible recycling and disposal of your old device, contact a certificated waste disposal service for electronic scrap.

Industry Mall

The Industry Mall is the catalog and ordering system of Siemens AG for automation and drive solutions on the basis of Totally Integrated Automation (TIA) and Totally Integrated Power (TIP).

You can find catalogs for all automation and drive technology products on the Internet (<https://mall.industry.siemens.com>).

1.1 S7-1500/ET 200MP documentation guide

1.1.1 Information classes S7-1500/ET 200MP



The documentation for the SIMATIC S7-1500 automation system and the ET 200MP distributed I/O system is arranged into three areas.

This arrangement enables you to access the specific content you require. Changes and supplements to the manuals are documented in a Product Information.

You can download the documentation free of charge from the Internet

(<https://support.industry.siemens.com/cs/ww/en/view/109742691>).

Basic information



The System Manual and Getting Started describe in detail the configuration, installation, wiring and commissioning of the SIMATIC S7-1500 and ET 200MP systems.

The STEP 7 online help supports you in the configuration and programming.

Examples:

- Getting Started S7-1500
- S7-1500/ET 200MP System Manual
- Online help TIA Portal

Device information



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

Examples:

- Equipment Manuals CPUs
- Equipment Manuals Interface Modules
- Equipment Manuals Digital Modules
- Equipment Manuals Analog Modules
- Equipment Manuals Communications Modules
- Equipment Manuals Technology Modules
- Equipment Manuals Power Supply Modules

General information



The function manuals contain detailed descriptions on general topics relating to the SIMATIC S7-1500 and ET 200MP systems.

Examples:

- Function Manual Diagnostics
- Function Manual Communication
- Function Manual Motion Control
- Function Manual Web Server
- Function Manual Cycle and Response Times
- PROFINET Function Manual
- PROFIBUS Function Manual

Product Information

Changes and supplements to the manuals are documented in a Product Information. The Product Information takes precedence over the device and system manuals. You can find the latest Product Information on the S7-1500 and ET 200MP systems on the Internet (<https://support.industry.siemens.com/cs/de/en/view/68052815>).

Manual Collection S7-1500/ET 200MP

The Manual Collection contains the complete documentation on the SIMATIC S7-1500 automation system and the ET 200MP distributed I/O system gathered together in one file. You can find the Manual Collection on the Internet. (<https://support.industry.siemens.com/cs/ww/en/view/86140384>)

Manual Collection fail-safe modules

The Manual Collection contains the complete documentation on the fail-safe SIMATIC modules, gathered together in one file. You can find the Manual Collection on the Internet. (<https://support.industry.siemens.com/cs/de/en/view/109806400>)

SIMATIC S7-1500 comparison list for programming languages

The comparison list contains an overview of which instructions and functions you can use for which controller families. You can find the comparison list on the Internet (<https://support.industry.siemens.com/cs/ww/en/view/86630375>).

1.1.2 SIMATIC Technical Documentation

Additional SIMATIC documents will complete your information. You can find these documents and their use at the following links and QR codes.

The Industry Online Support gives you the option to get information on all topics. Application examples support you in solving your automation tasks.

Overview of the SIMATIC Technical Documentation

Here you will find an overview of the SIMATIC documentation available in Siemens Industry Online Support:



Industry Online Support International

<https://support.industry.siemens.com/cs/ww/en/view/109742705>

Watch this short video to find out where you can find the overview directly in Siemens Industry Online Support and how to use Siemens Industry Online Support on your mobile device:



Quick introduction to the technical documentation of automation products per video <https://support.industry.siemens.com/cs/us/en/view/109780491>



YouTube video: Siemens Automation Products - Technical Documentation at a Glance <https://youtu.be/TwLSxxRQqSA>

Retention of the documentation

Retain the documentation for later use.

For documentation provided in digital form:

1. Download the associated documentation after receiving your product and before initial installation/commissioning. Use the following download options:
 - Industry Online Support International: <https://support.industry.siemens.com>
The article number is used to assign the documentation to the product. The article number is specified on the product and on the packaging label. Products with new, non-compatible functions are provided with a new article number and documentation.
 - ID link:
Your product may have an ID link. The ID link is a QR code with a frame and a black frame corner at the bottom right. The ID link takes you to the digital nameplate of your product. Scan the QR code on the product or on the packaging label with a smartphone camera, barcode scanner, or reader app. Call up the ID link.
2. Retain this version of the documentation.

Updating the documentation

The documentation of the product is updated in digital form. In particular in the case of function extensions, the new performance features are provided in an updated version.

1. Download the current version as described above via the Industry Online Support or the ID link.
2. Also retain this version of the documentation.

mySupport

With "mySupport" you can get the most out of your Industry Online Support.

Registration	You must register once to use the full functionality of "mySupport". After registration, you can create filters, favorites and tabs in your personal workspace.
Support requests	Your data is already filled out in support requests, and you can get an overview of your current requests at any time.
Documentation	In the Documentation area you can build your personal library.
Favorites	You can use the "Add to mySupport favorites" to flag especially interesting or frequently needed content. Under "Favorites", you will find a list of your flagged entries.
Recently viewed articles	The most recently viewed pages in mySupport are available under "Recently viewed articles".
CAX data	The CAX data area gives you access to the latest product data for your CAX or CAe system. You configure your own download package with a few clicks: <ul style="list-style-type: none"> • Product images, 2D dimension drawings, 3D models, internal circuit diagrams, EPLAN macro files • Manuals, characteristics, operating manuals, certificates • Product master data

You can find "mySupport" on the Internet. (<https://support.industry.siemens.com/My/ww/en>)

Application examples

The application 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 on individual products.

You can find the application examples on the Internet.
(<https://support.industry.siemens.com/cs/ww/en/ps/ae>)

Safety instructions

2.1 Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines, and networks.

In order to protect plants, systems, machines, and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For more information on protective industrial cybersecurity measures for implementation, please visit (<https://www.siemens.com/global/en/products/automation/topic-areas/industrial-cybersecurity.html>).

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customers' exposure to cyber threats.

To stay informed about product updates at all times, subscribe to the Siemens Industrial Cybersecurity RSS Feed under (<https://new.siemens.com/global/en/products/services/cert.html>).

Product overview

3.1 New functions

Changes compared to the previous version

Compared to the previous version, this manual contains the following change:
The active backplane bus can be used for S7-1500H.

3.2 Application area and function

Introduction

The active backplane bus serves to increase the system availability. It is designed for occasional pulling and plugging of I/O modules for expansion or in case of faults.

Benefits

The benefits of the active backplane bus are:

- Reaction-free replacement of a defective module:
 - Without the CPU reporting a station failure
 - Without disturbing modules in the station
- Startup with one or more module gaps. You have the option of plugging in additional modules later.
- Startup with configuration control is possible. You have the possibility to re-configure your plant.

Application

The area of application is everywhere where plant downtimes are not desired. The availability of the plant has the highest priority.

The areas of application are, for example:

- Logistics
 - High-bay storage facilities
 - Baggage conveyors at airports
 - Letter and paper sorting systems in postal logistics
- Infrastructure
 - Water/waste water
 - Tunnels

3.3 Properties

- Continuous processes that must not be interrupted due to the technical process management
 - Semiconductor industry
 - Chemical
 - Pharmaceutical
 - Battery manufacturing
- Applications in which plant operation must be maintained as long as possible, for example, when a service technician is not immediately available.
 - Offshore installations (oil platforms)
 - Compressors along gas pipelines that maintain the working pressure
- Other applications
 - Signal boxes in railway engineering
 - Shipbuilding

3.3 Properties

Article numbers

For ET 200MP:

- 6ES7590-0BL00-0AA0 (Active backplane bus ST 1+12)

For ET 200MP and S7-1500H:

- 6ES7590-0BH00-0AA0 (active backplane bus ST 1+8)
- 6ES7590-0BD00-0AA0 (active backplane bus ST 1+4)

NOTE

Required firmware version for S7-1500H

To use the active backplane bus with the S7-1500 H-CPU, the active backplane bus requires firmware version \geq V1.1.0.

View of the active backplane bus

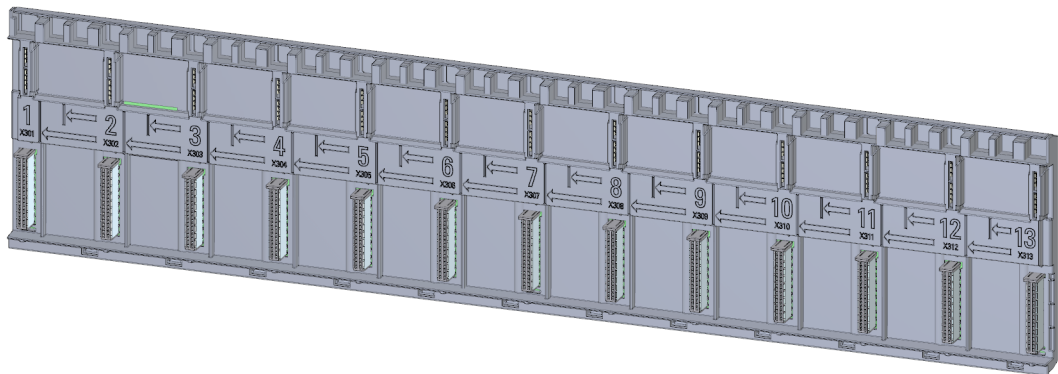


Figure 3-1 Active backplane bus ST 1+12

The active backplane bus is placed in an S7-1500 mounting rail. The mounting rail must be longer than the active backplane bus. There must be enough space for the fixing screws of the mounting rail. Information on the length of the active backplane bus can be found in the section "Required mounting rail ([Page 15](#))".

Properties

The active backplane bus can be used for ET 200MP with:

Designation	Article number	As of hardware functional status	As of firmware version
IM 155-5 PN HF	6ES7155-5AA00-0AC0	FS01	V4.4
Digital input modules DI and F-DI	See List of I/O modules ET 200MP (Page 34)		
Digital output modules DQ and F-DQ			
Analog input modules AI			
Analog output modules AQ			
System power supply			
Technology modules			
Communications modules			

The active backplane bus can be used for S7-1500H with:

Designation	Article number	As of hardware functional status	As of firmware version
CPU 1517H-3 PN	6ES7517-3HP00-0AB0	FS01	V3.1
CPU 1518HF-4 PN	6ES7518-4JP00-0AB0	FS01	V3.1
CP 1543-1 communications module	6GK7543-1AX00-0XE0		V3.0
System power supply	See List of I/O modules S7-1500H (Page 33)		

The active backplane bus supports:

- Identification data I&M0 to 3
- Firmware update
- Prioritized startup (only applies for ET 200MP)

The following restriction applies for operating the ET 200MP with the active backplane bus

Pulling and plugging during operation (hotswap) cannot be performed in isochronous mode. If any I/O module is plugged or unplugged in a station configured for isochronous mode, the connection to the controller is re-established and the I/O modules are temporarily inaccessible.

Maximum configuration

In addition to the CPU or interface module, the active backplane bus can be equipped with a maximum of:

- 12 modules for the active backplane bus ST 1+12 (applies only for ET 200MP)
- 8 modules for the active backplane bus ST 1+8
- 4 modules for the active backplane bus ST 1+4

Accessories

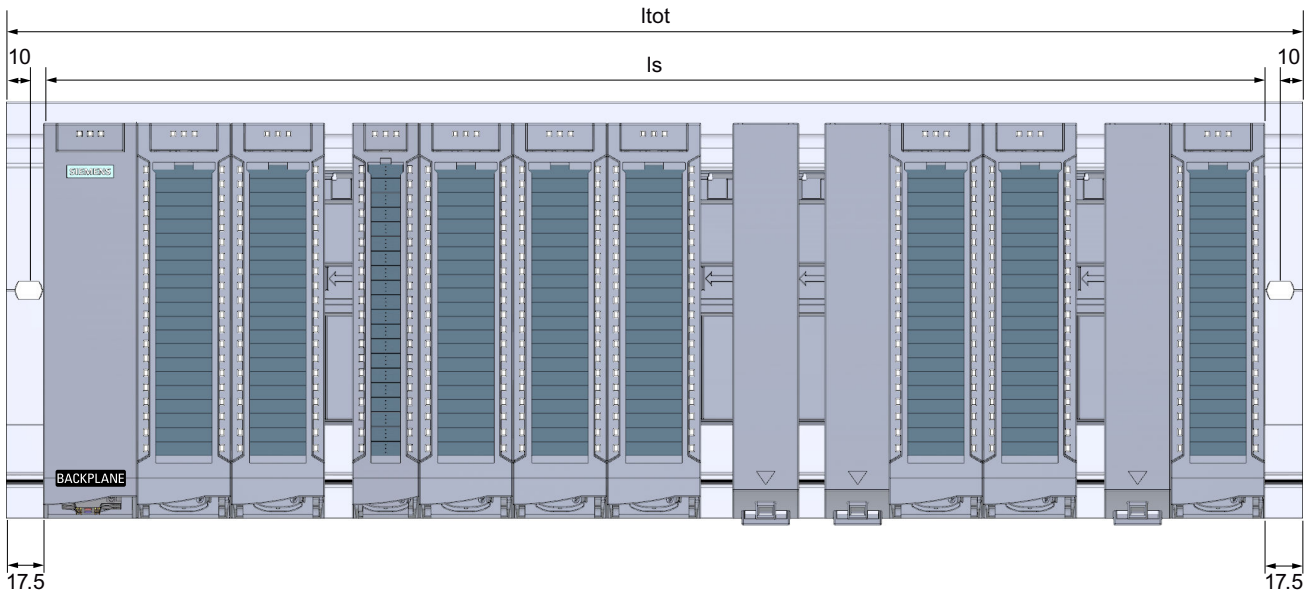
You order the following accessories separately:

- Slot protection
- Mounting rail

See also Spare parts/accessories [\(Page 32\)](#)

Mounting

4.1 Required mounting rail



Required mounting rail for ET 200MP

The following table and diagram help you to select the matching mounting rails for the active backplane bus used.

Active backplane bus	Length of station l_s	Minimum length of mounting rail l_{tot} (2 m rail for cutting to length)	Pre-assembled mounting rail
Active backplane bus ST 1+4 slot	175 mm	210 mm for pre-mounted modules 192.5 mm with left-alignment	245 mm (9.6") 6ES7590-1AC40-0AA0
Active backplane bus ST 1+8 slot	315 mm	350 mm for pre-mounted modules 332.5 mm with left-alignment	482 mm (19") 6ES7590-1AE80-0AA0
Active backplane bus ST 1+12 slot	455 mm	490 mm for pre-mounted modules 472.5 mm with left-alignment	

4.1 Required mounting rail

Required mounting rail for S7-1500H

The following table and diagram help you to select the matching mounting rails for the active backplane bus used.

Active backplane bus	Length of station l_s	Minimum length of mounting rail l_{tot} (2 m rail for cutting to length)	Pre-assembled mounting rail
Active backplane bus ST 1+4 slot	350 mm	385 mm for pre-mounted modules 367.5 mm with left-alignment	482 mm (19") 6ES7590-1AE80-0AA0
Active backplane bus ST 1+8 slot	490 mm	525 mm for pre-mounted modules 507.5 mm with left-alignment	530 mm (20.9") 6ES7590-1AF30-0AA0

Mounting the mounting rail

NOTE

No screws behind the active backplane bus

Note that behind the active backplane bus, no screws are available for mounting the mounting rail. Otherwise, the active backplane bus cannot be mounted.

System power supply

With active backplane bus, a system power supply supplies power to the entire station. Which means also to the I/O modules plugged in to the left of the bus. You can plug the system power supply into any slot to the right of the interface module/CPU.

Place the active backplane bus in the mounting rail and mount the modules

Below we will show you how to mount the active backplane bus.

1. Tilt the active backplane bus forward and insert it diagonally into the mounting rail.
2. Push the active backplane bus backwards.

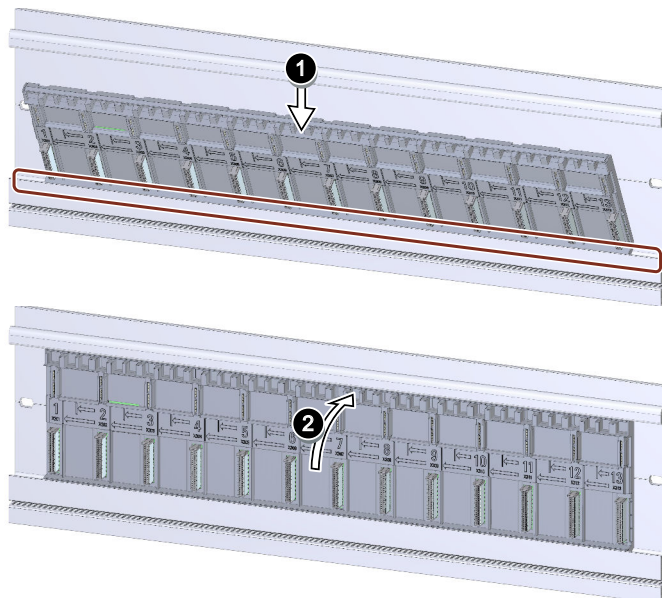


Figure 4-1 Insert the active backplane bus into the mounting rail

3. Hook the interface module/CPU into the mounting rail. You can only plug in one interface module/one CPU. The interface module/CPU must be plugged into the first slot.
4. Swivel the interface module/CPU downward so that the contacts are connected to the active backplane bus.
5. Align the active backplane bus with the interface module/CPU.
6. Tighten the screws for the interface module/CPU (tightening torque 1.5 Nm).

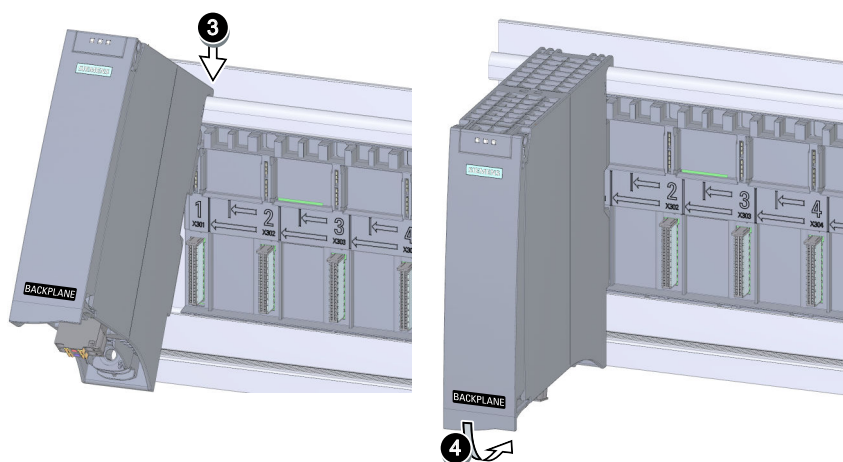


Figure 4-2 Mounting the interface module/CPU on the active backplane bus

7. Install the I/O module on the mounting rail. Align a 25 mm or 35 mm wide I/O module with the arrows. A 70 mm wide I/O module covers 2 slots.

8. Swing the I/O module downwards so that the contacts are connected to the active backplane bus.

NOTE

CP type does not match the configuration

If the plugged CP type does not match the configured type, maintenance diagnostics will be triggered after the first program load and OB 83 will be called.

9. Tighten the screw for the I/O module (tightening torque 1.5 Nm).
10. Repeat the process for all I/O modules that you want to mount.

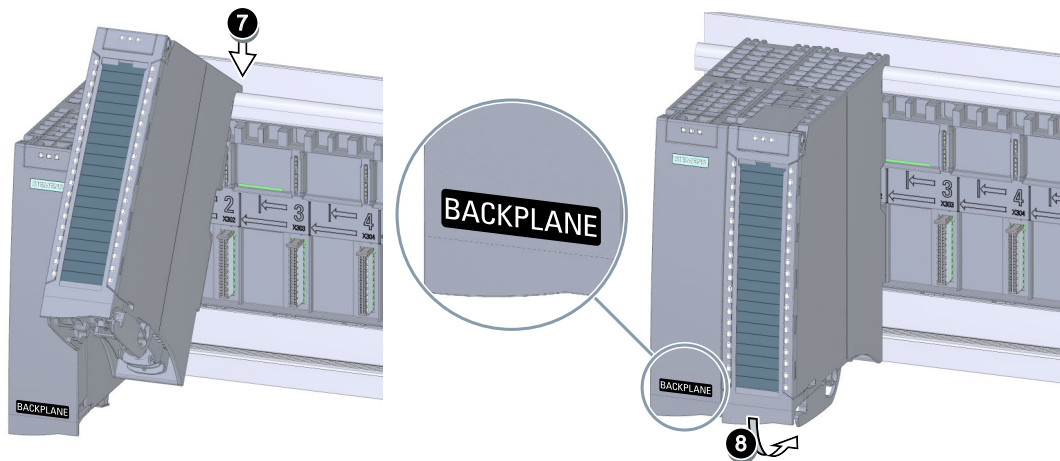


Figure 4-3 Mounting the I/O module on the active backplane bus

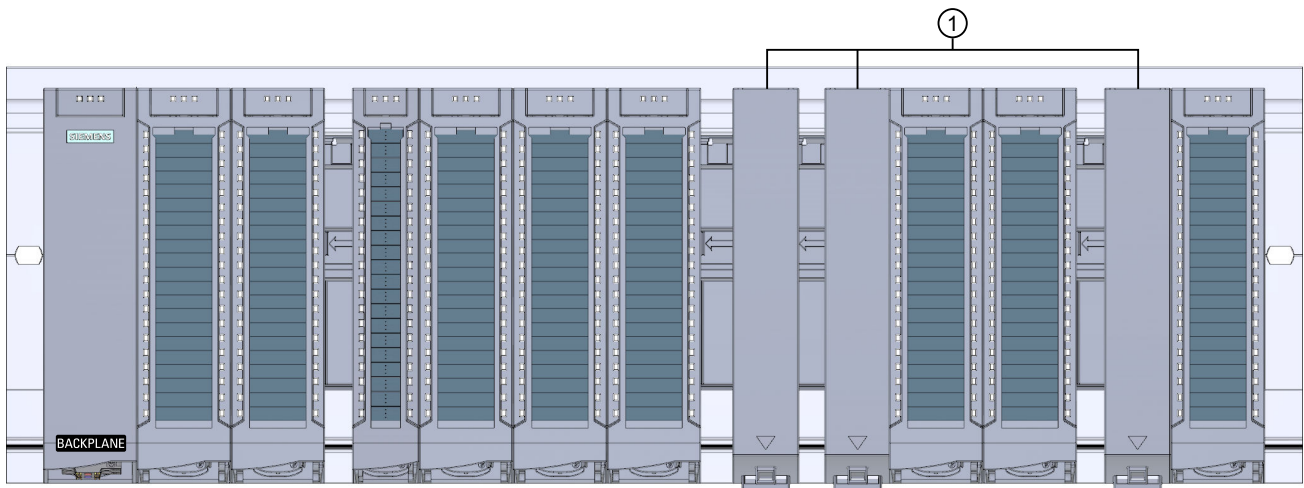
11. If you have empty slots on the active backplane bus, then you must provide these slots with a slot protection (see Operation (Page 20)).
12. A "BACKPLANE" sticker is enclosed for the active backplane bus. Use this sticker to label the interface module/CPU. In this way, you can see even with a fully equipped active backplane bus that the I/O modules can be pulled without any reaction.

Slots

NOTE

Slots

The empty slots need to be provided with a slot protection. The slot protection is used to secure mechanically and to protect the contacts.



① Slot protection

Figure 4-4 Active backplane bus equipped with modules and slot protection

Operation

With the active backplane bus, you can cover the following scenarios during operation:

- Plugging and unplugging I/O modules without reaction on the station or the CPU goes into STOP.
- Plugging I/O modules into slots previously left free without the CPU going into STOP.

Pulling and plugging with S7-1500H

The following tables show the responses of the H-system depending on the system state and scenario.

Table 5-1 RUN-Redundant system state

Scenario	Response
Pulling and plugging an I/O module from the rack	The H-system remains in the RUN-Redundant state.
Pulling and plugging a CPU from the rack	The H-system remains in the RUN-Redundant state. With direct supply of the CPU with 24 DC V. The communication to the CPs is interrupted.
Plugging an unconfigured CP	The H-system remains in the RUN-Redundant state. The CP can be used for online access to the system.

Table 5-2 RUN Solo system state

Scenario	Response
Pulling and plugging an I/O module from the rack on the primary CPU	The H-system remains in the RUN Solo state.
Pulling and plugging the primary CPU from the rack	The H-system remains in the RUN Solo state. With direct supply of the CPU with 24 DC V. The communication to the CPs is interrupted.
Plugging an unconfigured CP	The H-system remains in the RUN Solo state. The CP can be used for online access to the system.

Pulling and plugging interface modules

You cannot pull and plug the interface module without any reaction.
Do not pull or plug the interface module under load.

Removing and inserting I/O modules

You can pull and plug I/O modules without any reaction.

1. Only pull or plug the front connector of the I/O modules when it is de-energized.
2. With I/O modules, pull the front connector out of the I/O module using the unlocking strap. Swivel the front connector downward and remove it from the grooves.
3. Then you may pull the I/O module.
4. When plugging in, proceed in reverse order (see also S7-1500 Automation System system manual (<https://support.industry.siemens.com/cs/ww/en/view/59191792>)).

Pulling and plugging power supply module

You can pull and plug the power supply module without any reaction if the power balance of the power supply remains positive.

NOTE

Diagnostic message in case of failure of both system power supplies on the identical slots of the respective H-CPU


A diagnostic message is issued in case of failure of both system power supplies on the identical slots of the H-CPU. The ERROR LEDs on both H-CPU flash red. However, the S7-1500H redundant system remains in the RUN-Redundant system state.

Example: In an H-system, the system power supplies on slot 2 on mounting rail 0 and mounting rail 1 have failed.

You can find more information in the S7-1500R/H System Manual (<https://support.industry.siemens.com/cs/us/en/view/109754833>).

Only pull or plug the power supply module when it is de-energized.

Use in explosive area Zone 2

 WARNING
<p>Pulling or plugging a module is prohibited in a potentially explosive atmosphere</p> <p>If you pull or plug a module or connector during operation, there is a risk of sparking. Sparks can cause an explosion in the hazardous area; death or serious physical injury as well as damage to property can result.</p> <p>Do not pull or plug the module or the connectors until one of the following two conditions is met: The area is no longer hazardous or the device and its plug connectors are de-energized.</p>

See product information Deployment of the modules in zone 2 hazardous atmospheres (<https://support.industry.siemens.com/cs/ww/de/view/19692172>).

Slots of I/O modules

They have an installation with empty slots.

You can plug in additional I/O modules during operation.

Configure

6.1 Configuring S7-1500H with active backplane bus

6.1.1 Configure

Requirement

You need TIA Portal as of V19.

Configure

You configure the SIMATIC S7-1500H with STEP 7 (TIA Portal).

1. Insert the S7-1500H on slot 1.
2. Insert the I/O modules onto slots 2 to 9.
 - maximum two power supply module to the right of the CPU
 - maximum 6 communications modules

6.1.2 Configuration of the active backplane bus in the TIA Portal

The illustrations and descriptions in this section show the configuration of the active backplane bus.

Requirement

- You have configured the H-CPU
- You are in the device view

Replacing a rack

To replace the U-connector rack for an active backplane bus, you use the "Change device" function.

Changing a device using the shortcut menu

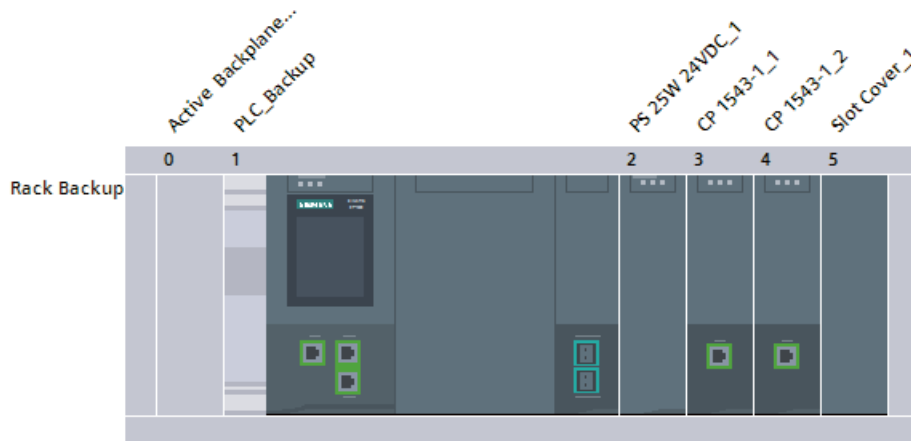
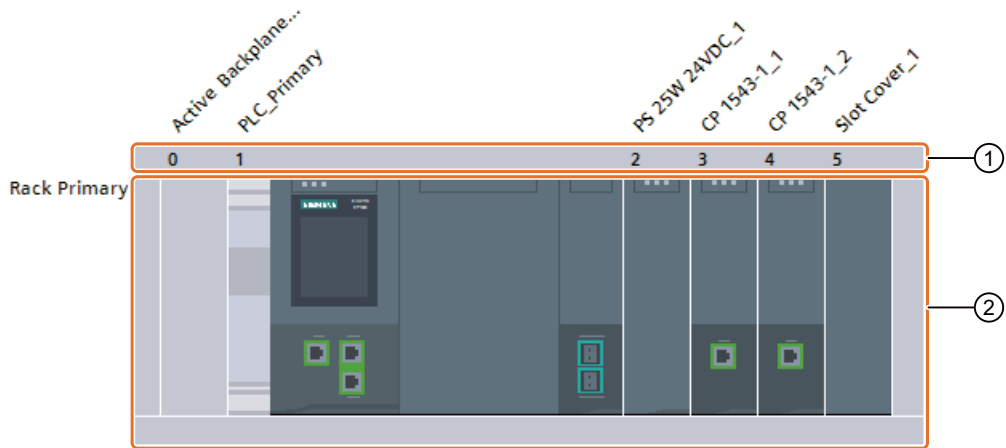
1. Right-click in the rack area ① or on the name of the rack.
2. Select "Change device" from the shortcut menu.
A dialog window opens.
3. Select another rack and click "OK".
The replacement of the rack starts.

Changing a device using drag-and-drop

1. Open the hardware catalog.
2. Select the "Rack" folder and navigate through the subfolders to the desired rack.
3. Select the desired rack.
4. Drag the rack into the rack area ① and place it there.

NOTE**Negative power balance**

If the power balance is negative, you must additionally drag a power supply module to the primary rack.



- ① Rack area
- ② Module area (slots)

NOTE

Customizing modules

When you change modules in the primary rack, these changes are automatically adopted in the backup rack.

NOTE

Parameter "Comparison preset to actual module"

You can configure the "Comparison preset to actual module" parameter for both the CPU and the active backplane bus in STEP 7. You can find the parameter for the active backplane bus in the general properties under "Module parameters > General". With the active backplane bus, you can take over the set parameter for the startup from the CPU:

- From CPU (recommended setting)
- Startup of CPU only if compatible
- Startup of CPU even if mismatch

Note

Contrary to plugging modules, the replacement of a rack cannot be started by double-clicking on the catalog entry. The reason for this is that a double-click only works if there is slot free and permitted available. However, only one permissible area is available for a rack, which is always automatically occupied by the standard rack type when a device is plugged in the network view.

Additional information

You can find more information in the STEP 7.

6.2 Configuring ET 200MP with active backplane bus**6.2.1 Configure****Configure**

You configure the IM 155-5 PN HF interface module with STEP 7 or the configuration software of another manufacturer.

Configuration software	
STEP 7 (TIA Portal)	GSD file
<ul style="list-style-type: none"> as of TIA Portal V16 with HSP0318 for the active backplane bus ST 1+12 as of TIA Portal V16 with HSP0334 for the active backplane bus ST 1+8 and the active backplane bus ST 1+4 	<ul style="list-style-type: none"> GSDML V2.34 and higher for the active backplane bus ST 1+12 GSDML V2.35 and higher for the active backplane bus ST 1+8 and the active backplane bus ST 1+4
-	"Insert" the active backplane bus on slot 0.
Insert the interface module IM 155-5 PN HF in slot 1.	
Insert the I/O modules on slots 2 to 13.	

NOTE**GSD file**

When configuring using a GSD file, more I/O modules can be configured than can be physically inserted. If you configure more I/O modules than can be inserted, the IM 155-5 PN HF sends the message "Module cannot be reached".

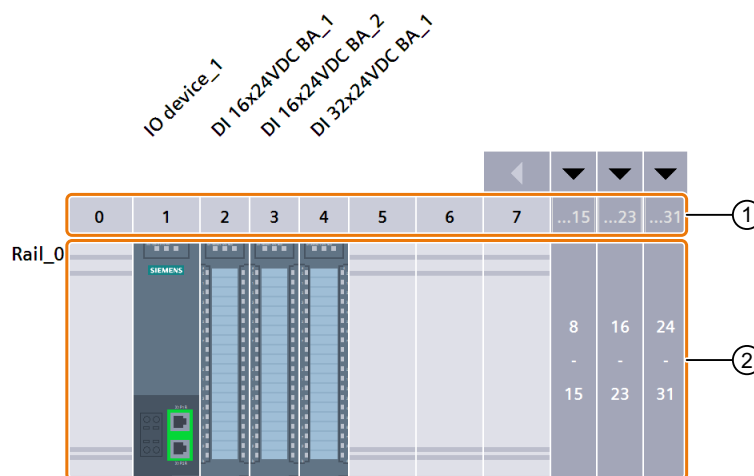
NOTE**GSD file and 70 mm wide system power supply**

When you are plugging a 70 mm wide system power supply, note that this system power supply physically occupies two slots. When configuring using the GSD file, you must then leave an empty slot after the system power supply in the configuration. Otherwise, the IM 155-5 PN HF interface module reports the setpoint/actual difference as a "Configuration error".

6.2.2 Configuration of the active backplane bus in the TIA Portal

The illustrations and descriptions in this section show the configuration of the active backplane bus.

The representation of a station in the device view consists of two main areas:



- ① Rack area
- ② Module area (slots)

Replacing a rack

To replace the U-connector rack for an active backplane bus, you use the "Change device" function.

Switch to the device view.

Changing a device using the shortcut menu

1. Right-click in the rack area ① or on the name of the rack (in the figure above e.g. "Rail_0").
2. Select "Change device" from the shortcut menu.
A dialog window opens.
3. Select another rack and click "OK".
The replacement of the rack starts.

Changing a device using drag-and-drop

1. Open the hardware catalog.
2. Select the "Rack" folder and navigate through the subfolders to the desired rack.
3. Select the desired rack.
4. Drag the rack into the rack area ① and place it there.



- ① Rack area
- ② Module area (slots)

Note

Contrary to plugging modules, the replacement of a rack cannot be started by double-clicking on the catalog entry. The reason for this is that a double-click only works if there is slot free and permitted available. However, only one permissible area is available for a rack, which is always automatically occupied by the standard rack type when a device is plugged in the network view.

With ET 200MP, a representative module is automatically created in slot 0 when replacing into the active backplane rack. This module reflects the diagnostics and parameters of the active backplane bus according to the characteristics of the selected rack.

Additional information

You can find more information in the STEP 7.

Alarm and system messages

Pull/plug interrupt

Each pulling and plugging action of a configured module results in a pull/plug interrupt. OB 83 is started when a configured module is pulled in RUN mode. If OB 83 is not programmed, the CPU switches to STOP.

When plugging a module into a configured slot in the RUN state, OB 83 is started and the parameter assignment is made if the module matches.

You can find additional information in the STEP 7 online help.

Firmware update

The firmware update is possible:

- Firmware update of the S7-1500H, of the IM 155-5 PN HF or the active backplane bus leads to a restart of the station.
Pull/plug interrupts of the plugged modules can be reported during a firmware update of the active backplane bus.
- Firmware update of a module leads to a restart of this module only. Other modules are not affected.
- Firmware update of a I/O module in isochronous mode results in a restart of the station. The isochronous mode only applies for a configuration with the IM 155-5 PN HF.

Technical specifications

Technical specifications of the active backplane bus

The following table shows the technical specifications as of 07/2020. On the Internet, you will find a data sheet with technical specifications that are updated daily for the active backplane bus ST 1+12

(<https://support.industry.siemens.com/cs/de/en/pv/6ES7590-0BL00-0AA0/td?dl=en>), active backplane bus ST 1+8

(<https://support.industry.siemens.com/cs/de/en/pv/6ES7590-0BH00-0AA0/td?dl=en>) and active backplane bus ST 1+4

(<https://support.industry.siemens.com/cs/de/en/pv/6ES7590-0BD00-0AA0/td?dl=en>).

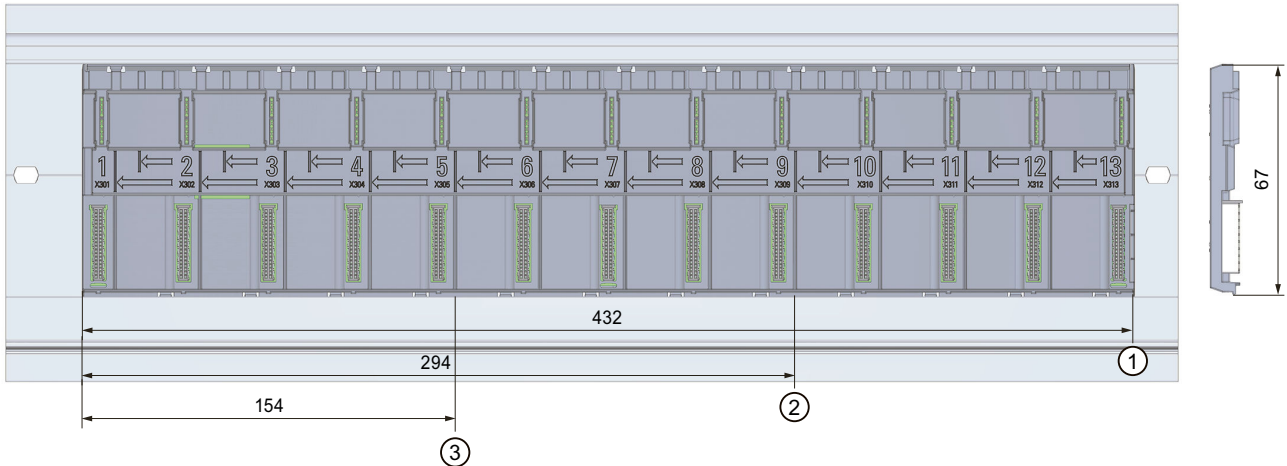
Article number	6ES7590-0BL00-0AA0	6ES7590-0BH00-0AA0	6ES7590-0BD00-0AA0
General information			
Product type designation	Active backplane ST 1+12 slot	Active Backplane ST 1+8 Slot	Active Backplane ST 1+4 Slot
HW functional status	FS01	From FS01	
Firmware version	V1.0.0	from V1.0.0	
<ul style="list-style-type: none"> FW update possible 	Yes		
Product function			
<ul style="list-style-type: none"> I&M data 	Yes; I&M0 to I&M3		
<ul style="list-style-type: none"> Isochronous mode 	Yes		
<ul style="list-style-type: none"> Prioritized startup 	Yes		
Engineering with			
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V16	V16 / V17	
<ul style="list-style-type: none"> STEP 7 configurable/integrated from version 	V5.6 and higher		
<ul style="list-style-type: none"> PROFINET from GSD version/GSD revision 	V2.34 / -	V2.35 / -	
Power			
Power available from the backplane bus	2 W		
Power loss			
Power loss, typ.	2 W		

Article number	6ES7590-0BL00-0A-A0	6ES7590-0BH00-0-AA0	6ES7590-0BD00-0-AA0
Hardware configuration			
Slots			
• Grid size	35 mm; Utilization of 25 mm-wide modules possible		
• Number of slots	13	5	
– of which for CPU, max.	0	1; for S7-1500H CPU with CPU firmware V3.1 or higher; 0 to V1.1.0	
– of which for IM, max.	1		
– of which for PS, max.	12; Max. 2 PS per station	2; Max. 2 PS per station	
– of which for IO/CM/CP/TM, max.	12	8	4
– of which for F-IO, max.	12	8	4
• Number of single-width slots, max.	12	8	4
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-30 °C		
• horizontal installation, max.	60 °C		
• vertical installation, min.	-30 °C		
• vertical installation, max.	40 °C		
Ambient temperature during storage/transportation			
• min.	-40 °C		
• max.	70 °C		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual		
Dimensions			
Width	434 mm	294 mm	154 mm
Height	99 mm		
Depth	14 mm		
Weights			
Weight, approx.	352 g		

Dimension drawings

Dimension drawing of active backplane bus

This section contains a dimension drawing of the active backplane bus mounted on a mounting rail.



- ① Length of active backplane bus ST 1+12
- ② Length of active backplane bus ST 1+8
- ③ Length of active backplane bus ST 1+4

Figure 9-1 Dimension drawing of active backplane bus front and side view

Spare parts/accessories

Spare part compatibility

If spare parts are required, you can replace the active backplane bus ST 1+8 slot with:

- Active backplane bus ST 1+12 slot

If spare parts are required, you can replace the active backplane bus ST 1+4 slot with:

- Active backplane bus ST 1+8 slot
- Active backplane bus ST 1+12 slot

Accessories for the active backplane bus

Table 10-1 Accessories

Designation	Article number
Slot protection, 5 units	6ES7590-0CA00-0AA0
Mounting rail	
• Mounting rail, 245 mm (with drill holes)	6ES7590-1AC40-0AA0
• Mounting rail, 482 mm (with drill holes)	6ES7590-1AE80-0AA0
• Mounting rail, 530 mm (with drill holes)	6ES7590-1AF30-0AA0
• Mounting rail, 830 mm (with drill holes)	6ES7590-1AJ30-0AA0
• Mounting rail, 2000 mm (without drill holes) for cutting to length	6ES7590-1BC00-0AA0

The active backplane bus is placed in an S7-1500 mounting rail. The mounting rail must be longer than the active backplane bus to provide enough space for the IM 155-5 PN HF / S7-1500H and the fixing screws.

List of I/O modules

A.1 List of I/O modules S7-1500H

List of H-CPUs

The following table contains the H-CPUs and the HW and FW version as of which they can be used for the active backplane bus.

Designation	Article number	as of hardware functional status	as of firmware version
CPU 1517H-3 PN	6ES7517-3HP00-0AB0	FS01	V3.1
CPU 1518HF-4 PN	6ES7518-4JP00-0AB0	FS01	V3.1

List of the modules

The following table contains the modules of the S7-1500H for the active backplane bus and the HW and FW version as of which they can be used.

The I/O modules as of delivery date 05/2020 can be used without restrictions.

Designation	Article number	as of hardware functional status	as of firmware version
PS 25W 24VDC	6ES7505-0KA00-0AB0	FS02	V1.0.1
PS 60W 24/48/60VDC	6ES7505-0RA00-0AB0	FS03	V1.0.1
PS 60 W 120/230V AC/DC	6ES7507-0RA00-0AB0	FS03	V1.0.1
CP 1543-1	6GK7543-1AX00-0XE0	FS01	V3.0

A.2 List of I/O modules ET 200MP

List of interface modules

The following table contains the IM 155-5 PN and the HW and FW versions starting at which it can be used.

Designation	Article number	as of hardware functional status	as of firmware version
IM 155-5 PN HF	6ES7155-5AA00-0AC0	FS01	V4.4

List of the modules

The following table contains the modules of the S7-1500 for the active backplane bus and as of which HW and FW version they can be used.

The I/O modules as of delivery date 03/2020 can be used without restrictions.

Designation	Article number	as of hardware functional status	as of firmware version
DI 16x24VDC HF	6ES7521-1BH00-0AB0	FS02	V2.0.1
DI 16x24VDC BA	6ES7521-1BH10-0AA0	FS01	V1.0.0
DI 32x24VDC HF	6ES7521-1BL00-0AB0	FS02	V2.0.1
DI 32x24VDC BA	6ES7521-1BL10-0AA0	FS01	V1.0.0
DI 16x24...125VUC HF	6ES7521-7EH00-0AB0	FS01	V1.0.0
DI 16x24VDC SRC BA	6ES7521-1BH50-0AA0	FS02	V2.0.0
DI 16x230VAC BA	6ES7521-1FH00-0AA0	FS02	V2.0.0
DQ 16x24VDC/0.5A ST	6ES7522-1BH00-0AB0	FS02	V2.0.2
DQ 16x24VDC/0.5A HF	6ES7522-1BH01-0AB0	FS01	V1.0.0
DQ 16x24VDC/0.5A BA	6ES7522-1BH10-0AA0	FS01	V1.0.0
DQ 32x24VDC/0.5A ST	6ES7522-1BL00-0AB0	FS02	V2.0.2
DQ 32x24VDC/0.5A HF	6ES7522-1BL01-0AB0	FS01	V1.0.0
DQ 32x24VDC/0.5A BA	6ES7522-1BL10-0AA0	FS01	V1.0.0
DQ 8x24VDC/2A HF	6ES7522-1BF00-0AB0	FS02	V2.0.0
DQ 16x24...48VUC/125VDV/0.5A ST	6ES7522-5EH00-0AB0	FS01	V1.0.0
DQ 8x230V/5A ST Relay	6ES7522-5HF00-0AB0	FS02	V2.0.0
DQ 8x230VAC/2A ST Triac	6ES7522-5FF00-0AB0	FS02	V2.0.0
DQ 16x230VAC/2A ST relay	6ES7522-5HH00-0AB0	FS01	V1.0.0
DQ 16Vx230VAC/1A ST Triac	6ES7522-5FH00-0AB0	FS01	V1.0.0
DI 16x24VDC/ DQ 16xDC24VDC/0.5A BA	6ES7523-1BL00-0AA0	FS01	V1.0.0
F-DI 16x24VDC	6ES7526-1BH00-0AB0	FS01	V1.0.2
F-DQ 8x24VDC/2A PPM	6ES7526-2BF00-0AB0	FS03	V1.0.2
AI 8xU/I/RTD/TC ST	6ES7531-7KF00-0AB0	FS02	V2.0.1
AI 8xU/I/R/RTD BA	6ES7531-7QF00-0AB0	FS01	V1.0.0

Designation	Article number	as of hardware functional status	as of firmware version
AI 8xU//R/RTD/TC HF	6ES7531-7PF00-0AB0	FS01	V1.0.0
AI 4xU//RTD/TC ST	6ES7531-7QD00-0AB0	FS01	V1.0.0
AI 8xU// HS	6ES7531-7NF10-0AB0	FS01	V1.0.1
AI 8xU// HF	6ES7531-7NF00-0AB0	FS01	V1.0.0
AQ 2xU// ST	6ES7532-5NB00-0AB0	FS01	V1.0.0
AQ 4xU// ST	6ES7532-5HD00-0AB0	FS02	V2.0.0
AQ 4xU// HF	6ES7532-5ND00-0AB0	FS01	V1.0.0
AQ 8xU// HS	6ES7532-5HF00-0AB0	FS01	V1.0.0
AI 4xU//RTD/TC/AQ 2xU// ST	6ES7534-7QE00-0AB0	FS01	V1.0.0
PS 25W 24VDC	6ES7505-0KA00-0AB0	FS02	V1.0.1
PS 60W 24/48/60VDC	6ES7505-0RA00-0AB0	FS03	V1.0.1
PS 60 W 120/230V AC/DC	6ES7507-0RA00-0AB0	FS03	V1.0.1
TM Count 2x24V	6ES7550-1AA00-0AB0	FS01	V1.0.0
TM PosInput 2	6ES7551-1AB00-0AB0	FS01	V1.0.0
TM Timer DIDQ 16x24V	6ES7552-1AA00-0AB0	FS01	V1.0.0
TM PTO 4	6ES7553-1AA00-0AB0	FS01	V1.0.0
TM SIWAREX WP521 ST	7MH4980-1AA01	FS01	V1.1.0
TM SIWAREX WP522 ST	7MH4980-2AA01	FS01	V1.1.0
TM NPU	6ES7556-1AA00-0AB0	FS01	V1.0.0
CM PtP RS232 BA	6ES7540-1AD00-0AA0	FS01	V1.0.3
CM PtP RS232 HF	6ES7541-1AD00-0AB0	FS01	V1.0.3
CM PtP RS422/485 BA	6ES7540-1AB00-0AA0	FS01	V1.0.3
CM PtP RS422/485 HF	6ES7541-1AB00-0AB0	FS01	V1.0.3
CM 8xIO-Link	6ES7547-1JF00-0AB0	FS01	V1.0.0