AMIKON TECHNICAL DOCUMENTATION

Installation Instructions

Siemens 6ES7590-1AC40-0AA0

245 mm aluminum mounting rail

LENGTH	MATERIAL	HOLE PITCH	FAMILY
245 mm	**Aluminum**	**225 mm**	**S7-1500 / ET 200MP**

For qualified personnel only. Isolate the equipment and follow the complete manufacturer and site safety procedures. This reference does not replace the approved project design or the full installation manual.

01 PREPARATION AND WIRING CHECKS

- Qualified personnel only: isolate the electrical equipment before mounting work; use the required cabinet or restricted-access enclosure.
- Use the 245 mm rail row: fixing-hole pitch 225 mm and end offsets 10 mm. Do not apply the adjacent 2000 mm cutting procedure to this predrilled rail.
- Select M6 fixing screws and washers for the mounting surface. Preserve module access, heat dissipation and the full manual's cabinet clearances.
- For the documented PE bolt connection, use a grounding conductor of at least 10 mm2, an M6 ring terminal and the specified 4 Nm tightening torque.
- Follow the original grounding hardware order. An equivalent permanent protective connection may replace the bolt method only as permitted by the system manual.
- Inspect the rail fixing and protective connection before installing modules. These pages cover the rail only; module wiring and commissioning require their own manuals.

02 ORIGINAL WIRING REFERENCE

Original source PDF pages 3, 37, 39, 40, 42, 224. The following pages retain the original Siemens drawings and printed page numbers.

Siemens original installation documentation

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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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.

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Installation 4

4.1 Basics

Introduction

All modules of the S7-1500 automation system/ET 200MP distributed I/O system are open equipment. This means that you may only install this system in housings, cabinets or electrical operating rooms. These housings, cabinets or electrical operating rooms must only be accessible with a key or tool. Access may only be possible for instructed or authorized personnel.

Installation position

The S7-1500 automation system/ET 200MP distributed I/O system can be used in a horizontal installation for ambient temperatures up to 60 °C and in vertical installation for ambient temperatures up to 40 °C. Additional information can be found in the chapter Mechanical and climatic ambient conditions (Page 214).

Mounting rail

In addition to the S7-1500/ET 200MP modules, other components can be mounted on the mounting rail; for example, modules from the S7-1200 and ET 200SP portfolio, terminals, circuit breakers, small contactors or similar components.

These components can influence the installation dimensions for the cable duct.

Modules can be mounted up to the outer edge of the mounting rail (marginless assembly).

The mounting rails are available in various lengths. You can order the mounting rails using the online catalog or the online ordering system. The available lengths and part numbers can be found in the Accessories/spare parts (Page 224) section.

4.2 Installing the mounting rail

Lengths and drill holes

The mounting rails are delivered in five lengths:

- 160 mm
- 245 mm
- 482.6 mm (19 inches)
- 530 mm
- 830 mm
- 2000 mm

The part numbers can be found in the Accessories/spare parts (Page 224) section.

The mounting rails (from 160 to 830 mm) come with two drill holes for fixing screws. A set of screws for grounding the mounting rail is provided.

The 2000 mm mounting rail is provided for assemblies with special lengths and does not have holes for fixing screws. No set of screws for grounding is enclosed with the mounting rail (can be ordered as an accessory (Page 224)).

The specifications of the maximum offsets between two drill holes can be found in the table, "Dimensions for the drill holes".

Tools required

- Commercially available hacksaw
- Drill ∅ 6.5 mm
- Screwdriver
- Size 10 adjustable screw-wrench or socket wrench for grounding cable connection
- Adjustable screw-wrench, matching the selected fixing screws
- Stripping tool and crimp tool for the grounding cable

Required accessories

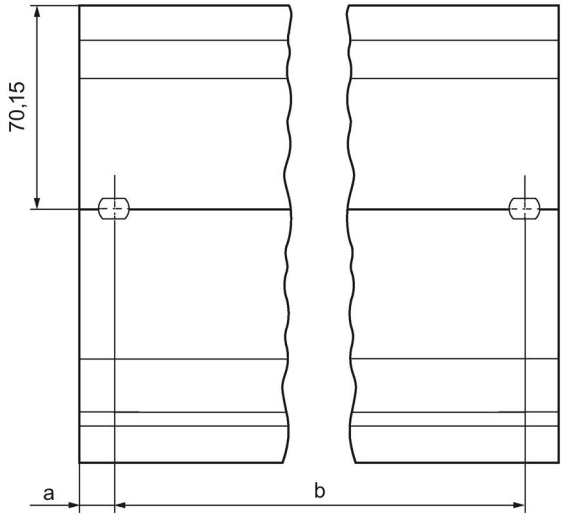
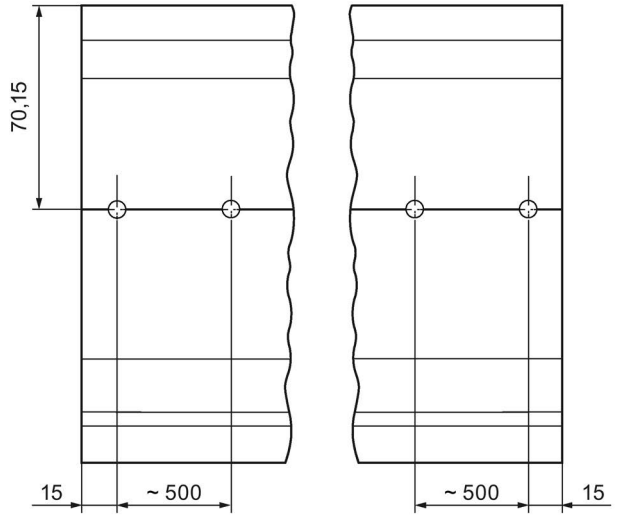
You can use the following screw types for fastening of the mounting rails:

Table 4- 1 Required accessories

For ...	you can use ...	Explanation
• outer fixing screws • additional fixing screws (for mounting rails > 482.6 mm)	M6 fillister head screws according to ISO 1207/ISO 1580 (DIN 84/DIN 85)	Choose a suitable screw length for your assembly.
	M6 hexagon head screws according to ISO 4017 (DIN 4017)	You also need washers for cylinder head screws with an internal diameter of 6.4 mm and an external diameter of 11 mm in accordance with ISO 7092 (DIN 433).

Dimensions for the drill holes

Table 4- 2 Dimensions for the drill holes

"Standard" mounting rails	"Longer" mounting rails
	

Length of the mounting rail	Distance a	Distance b
160 mm	10 mm	140 mm
245 mm	10 mm	225 mm
482.6 mm	8.3 mm	466 mm
530 mm	15 mm	500 mm
830 mm	15 mm	800 mm

Additional fixing screws (for mounting rails > 530 mm)

For mounting rails > 530 mm, we recommend using additional fixing screws at intervals of ≤ 500 mm on the identification groove.

Attaching the protective conductor

The S7-1500 automation system/ ET 200MP distributed I/O system has to be connected to the protective conductor system of the electrical system to ensure electrical safety.

To connect the protective conductor, follow these steps:

1. Strip the grounding conductor with a minimum diameter of 10 mm^2 and attach a ring terminal for size M6 bolts with the crimping pliers.
2. Slide the enclosed bolt into the T profile groove.
3. Insert the spacer, ring terminal with the grounding connector, flat washer, and lock washer onto the bolt (in that order). Thread the hexagon head nut, and fasten the components in place with the nut (torque 4 Nm).
4. Connect the opposite end of the grounding cable to the central grounding point/protective conductor busbar (PE).

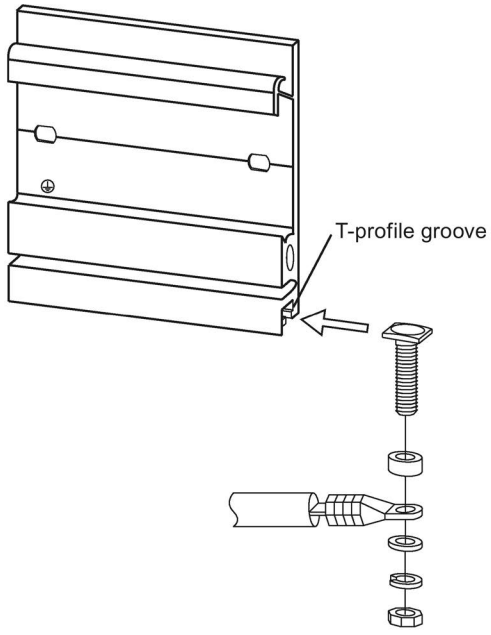


Figure 4-3 Attaching the protective conductor

Note

Alternative grounding of the mounting rail

If it is ensured that the mounting rail is permanently connected to the protective conductor system using an equivalent installation that complies with standards, for example, by permanent attachment to a grounded control cabinet wall, grounding via the grounding screw can be omitted.

Reference

Additional information on the precise dimensions of the mounting rails can be found in the Dimension drawings of the mounting rails (Page 217) section.

Accessories/spare parts

B

Accessories for the S7-1500 automation system/ET 200MP distributed I/O system

Table B- 1 General accessories

Description	Part number
Mounting rail	
• Mounting rail, 160 mm (with drill holes)	6ES7590-1AB60-0AA0
• 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
PE connection element for mounting rail, 2000 mm (spare part), 20 units	6ES7590-5AA00-0AA0
Front connector (incl. four potential bridges, cable tie, and individual labeling strip) for 35 mm modules	
• Screw-type terminals, 40-pin	6ES7592-1AM00-0XB0
Front connector (incl. four potential bridges, cable tie, and individual labeling strip) for 35 mm modules	
• Push-in terminal (40-pin)	6ES7592-1BM00-0XB0
Front connector (incl. cable tie and individual labeling strip) for 25 mm modules	
• Push-in terminal (40-pin)	6ES7592-1BM00-0XA0
4-pole connection plug for supply voltage (spare part), 10 units	6ES7193-4JB00-0AA0
DIN A4 labeling sheet (10 x for labeling the 35 mm I/O modules)	
• Pre-perforated, AI gray	6ES7592-2AX00-0AA0
DIN A4 labeling sheet (10 x for labeling the 25 mm I/O modules)	
• Pre-perforated, AI gray	6ES7592-1AX00-0AA0
U connector (spare part), 5 units	6ES7590-0AA00-0AA0
I/O shielding set for 35 mm modules (consists of: power supply element, shielding bracket, and shield clamp), (spare part), 5 units	6ES7590-5CA00-0AA0
I/O shielding set for 25 mm modules (consists of: power supply element, shielding bracket, and shield clamp), (spare part), 4 units	6ES7590-5CA10-0XA0
Shield clamp (spare part), 10 units	6ES7590-5BA00-0AA0
70 mm display for CPU (spare part)	6ES7591-1BA00-0AA0
35 mm display for CPU (spare part)	6ES7591-1AA00-0AA0