

SIEMENS

SIMATIC

Industrial PC Client SIMATIC IPC RC-545A

Operating Instructions

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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.

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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.

Preface

Technical knowledge required for using these operating instructions

These operating instructions contain all the information you need to install, electrically connect, commission, expand, and maintain and repair the SIMATIC IPC RC-545A.

The information in these operating instructions is intended for personnel with qualified expertise in the following areas:

- Mounting of industrial PCs and accessories
- Electrical installation
- Commissioning of industrial PCs
- Microsoft operating systems
- IT administration and network engineering
- Service and maintenance of industrial PCs

General knowledge in the field automation control engineering is recommended.

Range of validity of these operating instructions

These operating instructions are valid for all order variants of the SIMATIC IPC RC-545A.

History

Currently released versions of these operating instructions:

Version	Comments
03/2024	First edition

Security information

Siemens provides products and solutions with industrial security 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 security concept. Siemens' products and solutions constitute one element of such a concept.

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To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed visit (<https://www.siemens.com/cert>).

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Product description

1.1 Important instructions and manuals for operating the device

Documentation	Contents	Source
Operating instructions	<ul style="list-style-type: none"> • Product description • Technical specifications • Installation of the device • Operation of the device • Installing and removing hardware • Dimension drawings 	<ul style="list-style-type: none"> • Supplied data storage medium • Online in the "Rack PC" section in: Documentation for SIMATIC Industrial PC (http://www.siemens.com/simatic-ipc-doku-portal)
Quick Install Guide	<p>Information on:</p> <ul style="list-style-type: none"> • Link and QR code to the online form for the quality control notification in the SIEMENS After Sales Information System (ASIS) • Operating instructions of the device • Installation of the device • Connecting the device to the power supply unit • Connecting I/O devices • Switching the device on 	<ul style="list-style-type: none"> • Supplied in printed form with the device • Supplied data storage medium
User Manual (UM) for the motherboard	<p>Information on:</p> <ul style="list-style-type: none"> • Firmware description • Description of the motherboard • Description of the interfaces on the motherboard 	<ul style="list-style-type: none"> • Online at: User Manual Motherboard SMS-610-A2 (https://support.industry.siemens.com/cs/ww/en/view/109826687) <p>Name of file: Mainboard_SMS-610-A2_UM.pdf</p>
Windows® operating system	<p>Information on:</p> <ul style="list-style-type: none"> • Commissioning the operating system • Restoring the operating system • Configuration of the operating system 	<ul style="list-style-type: none"> • Supplied data storage medium • Online at: Microsoft® Windows® 10 (https://support.industry.siemens.com/cs/ww/en/view/109749498)

1.1 Important instructions and manuals for operating the device

Documentation	Contents	Source
SIMATIC IPC Creating a bootable USB flash drive	Information on: <ul style="list-style-type: none">• Creating a bootable USB flash drive for recovery of operating system, software and drivers	<ul style="list-style-type: none">• Online at: SIMATIC IPC Creating a bootable USB flash drive (https://support.industry.siemens.com/cs/ww/en/view/109811224)
SIMATIC NET	Industrial communication	<ul style="list-style-type: none">• Online at: SIMATIC NET (http://w3.siemens.com/mcms/automation/en/industrielle-kommunikation/Seiten/Default.aspx)

1.2 Product highlights

The SIMATIC IPC RC-545A is a client-class industrial PC in 19" rack format (4 U). It is perfectly suited for high-performance industrial PC applications.

SIMATIC IPC RC-545A is available with two enclosure variants: Standard enclosure or short enclosure.

Device view



Note

Depending on the configuration ordered the features and illustrations described in this manual may differ from the features of your device.

Maximum industrial compatibility for 24-hour continuous use in industrial environments

- Independent product design with a user-friendly enclosure concept and front design
- Rugged all-metal enclosure, coated over its entire surface (blue chromated) and/or enameled on the outside to protect against corrosion and dirt
- High EM compatibility for use in industrial, business and commercial areas
- Maximum processor performance (in full configuration) without loss of performance (throttling) at up to 40 °C ambient temperature
- Dust protection through overpressure venting concept with front-side fan and dust filter
- Low noise impact thanks to closed-loop fan
- Protection against vibration and shock through corresponding drive cage (type B) and card retainer

High productivity through fast data processing

- 12th generation Intel® processors: Core i7, Core i5, or Core i3 up to 12 cores/20 threads
- Graphics controller (770) integrated in processor up to 4 K Ultra HD resolution
- Maximum performance, e.g. through Intel H610E chipset, DDR5 memory with support of dual-channel technology
- High data transfer rates, e.g. with PCI Express technology Gen 4, USB 3.1 Gen 1 SuperSpeed (5 Gbps)
- Modern hard drives with a capacity of up to 2 TB for storing larger data volumes and greater reliability
- Solid-state drive with up to 960 GB as a fast replacement for hard disk drives for increased data security

Reduction in standstill times thanks to high system availability and security

- Secure 24h operation (high MTBF, speed-controlled fans)
- Self-diagnostics for temperature, fan, program sequence (watchdog), battery, drives
- Access protection for the front removable trays, control elements (power, reset), USB interfaces, dust filter and front fan by means of locked fan cover and lockable front door
- The enclosure cover can only be opened when the front door is open
- A secured internal USB slot in the device, for a software dongle, for example
- Service-friendly device configuration (modifications, service), e.g. installation of drives, replacement of filter or front fan without tools

Time savings due to high flexibility in commissioning, use and service

- High expandability through integrated interfaces:
 - 2 x Intel® Gbit Ethernet
 - 2 x USB 3.1 Gen 1 (Front)
 - COM 1 RS232/422/485 (rear of the device)
 - 2 x USB 3.1 Gen 2 Type A (rear of the device)
 - 4 x USB 2.0 Type A
 - 1 x USB 2.0 (internal)
 - 3 x graphics interfaces
 - Audio
 - 7 x slots for PCI and PCI-Express
- Multi-monitoring: Up to 5 x DisplayPort or 6 x DVI-D via onboard graphics and optional graphics card (via adapter in some cases) or 5 x VGA via adapter
- Optional graphics card for multi-monitoring
- Suitable for installation in space-saving control cabinets with a depth of only 400 mm (devices with short enclosure)
- Can be used in different positions with telescopic rails or as an industrial tower PC (Tower Kit optional)
- Pre-installed and activated operating systems:
 - Windows 10 IoT Enterprise 2021 LTSC (64-bit)
- Fast restoration of the delivery state by restoring from USB stick

1.3 Area of application

The SIMATIC IPC RC-545A offers system integrators, control cabinet builders, plant constructors, and machine manufacturers a 19" rack PC platform for high-performance applications and IT applications at the control and cell level for:

- Process and visualization applications
- Measurement, control, and rule-based tasks
- Data acquisition and management

The SIMATIC IPC has CE certification for use in the industrial sector as well as in residential, business, and commercial environments. In addition to industrial applications, therefore, it can also be used in building automation or public facilities.

1.4 External design of the device

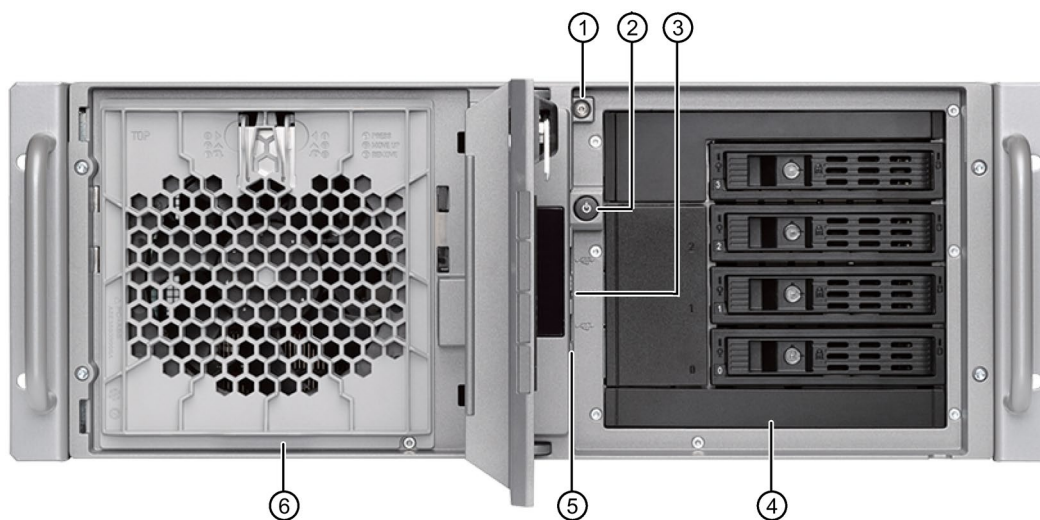
1.4.1 Front panel

Front: Front door is closed



- ① 19" mounting bracket with handle
- ② Fan cover on front fan with openings to ventilate the device (locked with front door)
- ③ System status displays (Page 28)
- ④ Front door: lockable, protection against unauthorized access
- ⑤ Lock
 - Key vertical: open
 - Key horizontal: closed

Front: Front door is open



- ① Locking screw of the enclosure cover
- ② On-off button, see Operator controls (Page 26)
- ③ Reset pushbutton, see Operator controls (Page 26)
- ④ Drive cage (in this case type A); depending on the expansion variant, see:
 - Drive cage (Page 17)
- ⑤ Interfaces on the front of the device, see Device ports (Page 23)
- ⑥ Front fan support

1.4.2 Drive cage

1.4.2.1 Drive cage type A

Drives and mounting locations in the drive cage type A

The drive cage type A is located behind the front door.

You can install drives in removable trays, in which the drives are easily accessible from the outside without opening the device.

The removable trays can be locked, thus protecting the drives from unauthorized access.

You can also install 5.25" drives or 5.25" components in the slot ③.



(0)	Slot 0 for: <ul style="list-style-type: none"> • 2.5" drive in removable tray • 3.5" drive in removable tray
(1)	Slot 1 for: <ul style="list-style-type: none"> • 2.5" drive in removable tray • 3.5" drive in removable tray
(2)	Slot 2 for: <ul style="list-style-type: none"> • 2.5" drive in removable tray • 3.5" drive in removable tray
(3)	Slot 3 (5.25" slot) for: <ul style="list-style-type: none"> • 2.5" drive or 3.5" drive in the 5.25" mounting frame with removable tray • 5.25" drive or 5.25" component
(A)	5.25" mounting frame with removable tray
(B)	Cover
(C)	Cover

Components of the removable tray



(1)	Status display (Page 31)
(2)	Status display (Page 31)
(3)	Number of the mounting location (here: Mounting location 0)
(4)	Lock

1.4.2.2 Drive cage type B

Drives and mounting locations in the drive cage type B

The drive cage type B is located behind the front door.

In drive cage type B, drives are fixed-mounted internally and provided with a drive cover on the outside to prevent access.

The drives are particularly well protected against vibration and oscillation ("vibration-dampened drive cage").



(0)	Slot 0 (5.25" tray) for: <ul style="list-style-type: none"> • 2.5" drive in the assembly kit for 5.25" tray • 3.5" drive in the assembly kit for 5.25" tray • 5.25" drive or 5.25" component
(1)	Slot 1 (5.25" tray) for: <ul style="list-style-type: none"> • 2.5" drive in the assembly kit for 5.25" tray • 3.5" drive in the assembly kit for 5.25" tray • 5.25" drive or 5.25" component
(2)	Slot 2 (5.25" tray) for: <ul style="list-style-type: none"> • 2.5" drive in the assembly kit for 5.25" tray • 3.5" drive in the assembly kit for 5.25" tray • 5.25" drive or 5.25" component
(A)	Cover (if no drive is installed) or drive cover (if drive is installed)
(B)	Cover

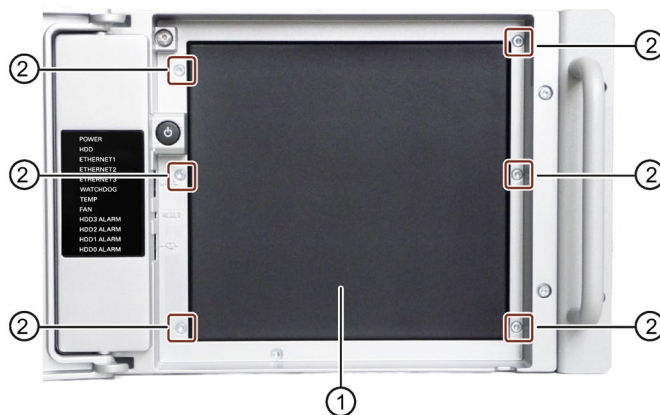
1.4.2.3 Drive cage type C

Drives and mounting locations in the drive cage type C

For devices with a short enclosure, only the drive cage type C can be installed.

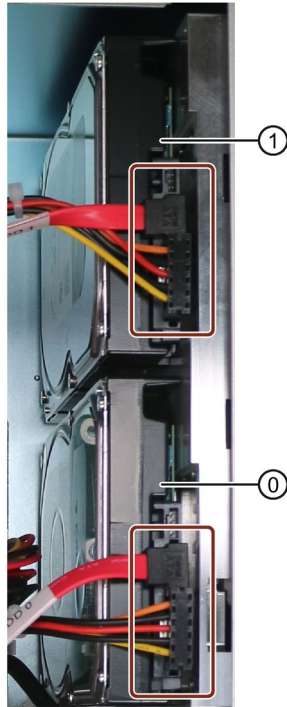
The drive cage type C consists of a design cover and a drive bay plate.

The drive bay plate is accessible after the design cover has been removed. You can mount 2.5" or 3.5" drives (HDD or SSD) on the drive bay plate.



①	Design cover (mounted on the drive bay plate) <ul style="list-style-type: none">• 2.5" drive on the drive bay plate• 3.5" drive on drive bay plate
②	Six screws for attaching or loosening the drive bay plate with attached design cover (with TORX T10 screwdriver)

Slot numbering on the drive bay plate

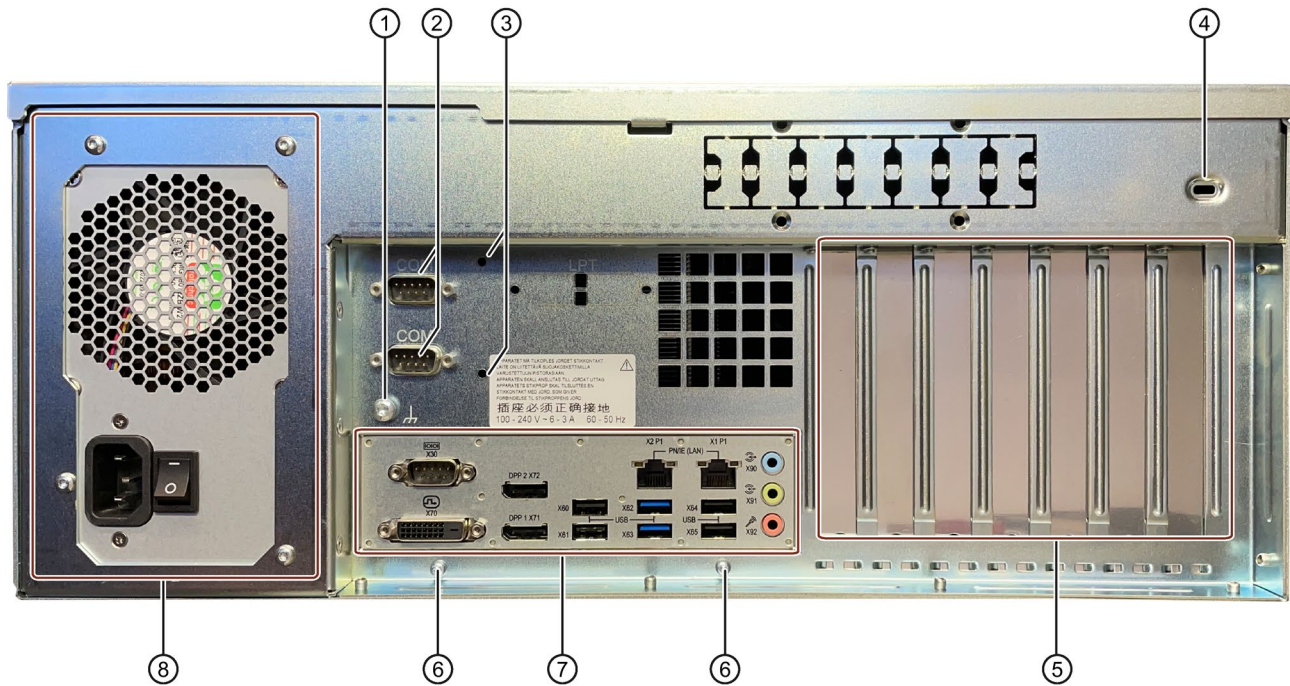


(0)	Mounting location 0
(1)	Mounting location 1

See also

Installation options for drives with drive cage type C (Page 94)

1.4.3 Rear of the device

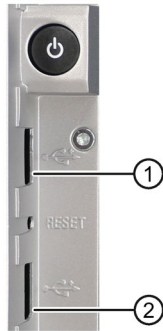


- ① Connection for functional grounding, see "Connection of equipotential bonding line (Page 63)"
- ②
 - COM 3, optional (top)
 - COM 2, optional (bottom)
- ③ Drill holes for attaching the retainer for the internal USB flash drive
- ④ Opening, prepared for Kensington lock
- ⑤ Slot brackets or connections of inserted expansion cards
- ⑥ Fixing screws for strain relief (Page 70)
- ⑦ Connections on the rear of the device (Page 24)
- ⑧ Power supply unit 550 W (Page 25)

1.4.4 Device ports

1.4.4.1 Connections on the front of the device

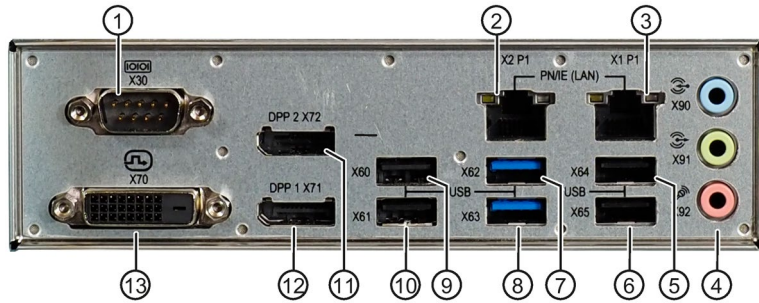
There are two USB connection sockets on the front of the device behind the front panel. Observe the technical specifications of the connections on the device (Page 137).



No.	Connection socket
①	USB 3.1 Gen 1; Type A (X66) SuperSpeed backwards compatible to USB 3.0 / 2.0 / 1.1; each 900 mA / high current ¹
②	USB 3.1 Gen 1; Type A (X67) SuperSpeed backwards compatible to USB 3.0 / 2.0 / 1.1; each 900 mA / high current ¹

¹ Sum of the currents on the USB interfaces of the device (including the internal USB interfaces) ≤ 3 A

1.4.4.2 Connections on the rear of the device



Note

Note the information in "Technical specifications of the connections on the device (Page 137)".

No.	Connection socket
①	COM1 • (X30)
②	LAN 2 (X2 P1)
③	LAN 1 (X1 P1)
④	Audio • Light blue: Line IN for audio devices (X90) • Lime green: Line OUT for headphones or speakers (X91) • Pink: Microphone IN, (X92)
⑤	USB 2.0 Type A (480 Mbps) backwards compatible to USB 1.1; 900 mA / high current ¹ • (X64)
⑥	USB 2.0 Type A (480 Mbps) backwards compatible to USB 1.1; 900 mA / high current ¹ • (X65)
⑦	USB 3.2 Gen1 Type A (5 Gbps) SuperSpeed; backwards compatible to USB 3.0 / 2.0 / 1.1; each 900 mA / high current ¹ • (X62)
⑧	USB 3.2 Gen1 Type A (5 Gbps) SuperSpeed; backwards compatible to USB 3.0 / 2.0 / 1.1; each 900 mA / high current ¹ • (X63)
⑨	USB 2.0 Type A (480 Mbps) backwards compatible to USB 1.1; 900 mA / high current ¹ • (X60)

No.	Connection socket
⑩	USB 2.0 Type A (480 Mbps) backwards compatible to USB 1.1; 1500 mA / high current ¹ <ul style="list-style-type: none"> (X61)
⑪	DisplayPort (labeling on the device: DPP), for connecting monitors <ul style="list-style-type: none"> DPP 2 (X72)
⑫	DisplayPort (labeling on the device: DPP), for connecting monitors <ul style="list-style-type: none"> DPP 1 (X71)
⑬	DVI-D, for connecting monitors <ul style="list-style-type: none"> DVI-D (X70)

¹ Sum of the currents on the USB interfaces of the device (including the internal USB interfaces) ≤ 3 A

Graphics card connections

Graphics cards are expansion cards that can be installed as an option.

After installing a graphics card, additional connections are available on the rear of the device in the vicinity of the expansion cards for connecting monitors.

You can find information on these connections and connection options for monitors with adapters under "Connecting several monitors (multi-monitoring) (Page 67)".

You can find information on the graphics cards under "Technical specifications of graphic (Page 136)".

1.4.4.3 Connection of power supply unit 550 W

Socket for power plug



1.4.5 Operator controls

1.4.5.1 On-off switch for power supply unit 550 W

⚠ WARNING

Risk of electric shock

The on-off switch does not fully disconnect the device from the line voltage.

You also need to observe the notes and information under "Switching off the device (Page 72)".

On-off switch



1.4.5.2 On-off button and reset button

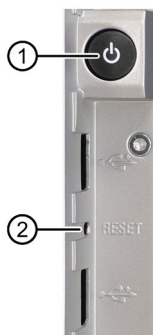
! WARNING

Risk of electric shock

The on-off button and on-off switch do not fully disconnect the device from the electricity grid.

You also need to observe the notes and information under "Switching off the device (Page 72)".

The on-off button ① and the reset button ② are located on the front of the device behind the front door.



① **On-off button**

The on-off button starts and shuts down the operating system.

You can find information on switching the device on and off under "Open the device (Page 77)" and "Switching off the device (Page 72)".

② **Reset button**

The reset button is for the emergency when the device can no longer be operated.

You can find information on the hardware reset under "Switching off the device (Page 72)"

1.4.6 Status indicators

1.4.6.1 System status displays

The status indicators for the system are located on the front of the device. They provide information on the status of the device components.



No.	Status display	Meaning	Status	Meaning of the status
①	POWER	Operating mode of the PC	OFF	Switched off or disconnected from the mains
			YELLOW	"Hibernate" or "Shut down" energy saving mode
			Flashing YELLOW	"Standby" energy saving mode
			GREEN	PC in operation
②	HDD	Access to hard disk	OFF	No access
			GREEN	Access
③ ④ ⑤	ETHERNET 1 ETHERNET 2 ETHERNET 3 (no function)	Ethernet status display (see also Status displays of the LAN ports (Page 30))	OFF	<ul style="list-style-type: none"> No connection No data traffic
⑥	WATCHDOG (function currently not available)	Watchdog status	OFF	Not activated
			GREEN	Activated
			RED	Expired

No.	Status display	Meaning	Status	Meaning of the status
⑦	TEMP	Temperature status	OFF	No error
			RED	Possible causes: <ul style="list-style-type: none"> • CPU temperature is critical • Device temperature is critical
⑧	FAN	Fan status	OFF	No error
			RED	Possible causes: <ul style="list-style-type: none"> • Front fan faulty • The fan on the processor heat sink is faulty • Fan on drive cage type A faulty
⑨ ⑩ ⑪ ⑫	HDD3 ALARM HDD2 ALARM HDD1 ALARM HDD0 ALARM	Not available with this device version		

1.4.6.2 Status displays of the LAN ports

The LAN ports are numbered on the enclosure to identify them clearly.

The numbering by the operating system may differ from this.

You can find detailed information on the position of the LAN ports under: "Connections on the rear of the device (Page 24)".

You can find technical information on LAN ports under: "Technical specifications of the connections on the device (Page 137)"

Status indicator LAN 1 and LAN 2



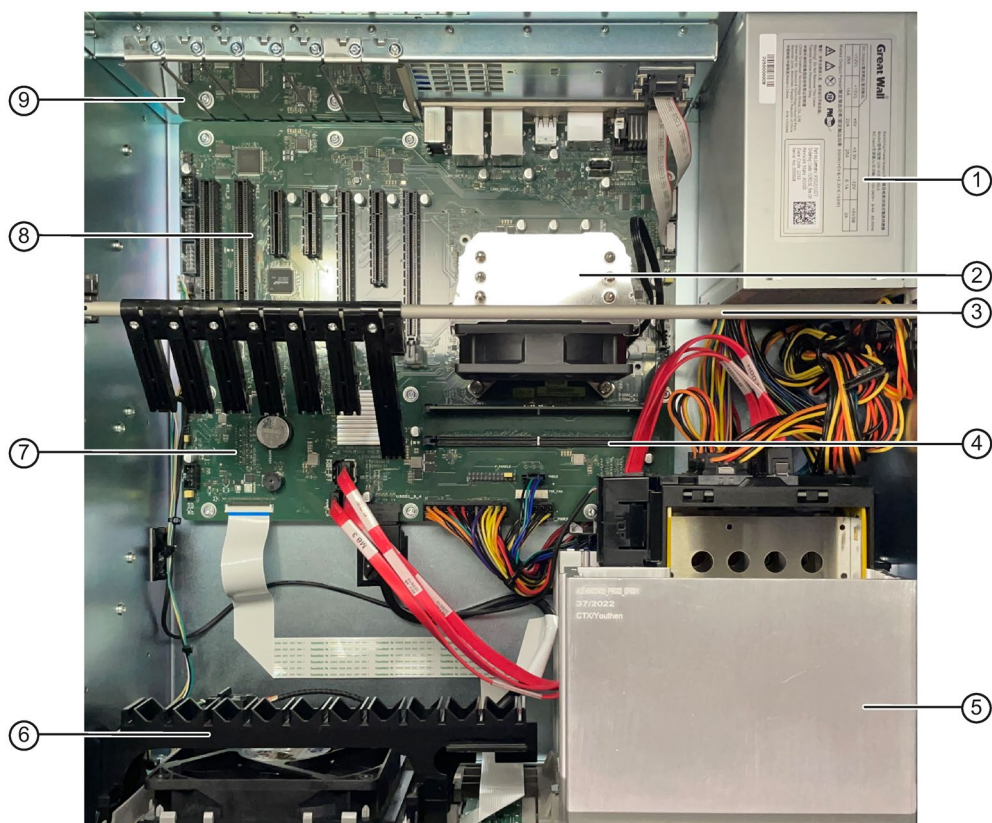
Status display	Meaning	Status	Meaning of the status
LED 1	Connection status	OFF	<ul style="list-style-type: none"> No cable connected Cable not active Interface disabled
		ORANGE	<ul style="list-style-type: none"> Active cable connected
		ORANGE flashing	<ul style="list-style-type: none"> Data transfer active
		ORANGE flashing then steady	<ul style="list-style-type: none"> Wake on LAN from S5 mode possible
LED 2	Data transmission rate	OFF	<ul style="list-style-type: none"> 10 Mbps
		ORANGE	<ul style="list-style-type: none"> 100 Mbps
		GREEN	<ul style="list-style-type: none"> 1000 Mbps

1.4.6.3 Status displays on removable tray for drives



No.	Status display	Meaning	Status	Meaning of the status
①	Power	Status of the removable tray	OFF	<ul style="list-style-type: none"> • Device switched off • Power supply not connected • No drive installed
			GREEN	<ul style="list-style-type: none"> • Device is switched on and a drive is installed
②	Activity	Status of the drive	ORANGE	<ul style="list-style-type: none"> • Drive is active
			OFF	<ul style="list-style-type: none"> • Drive is not active

1.5 Internal design of the device



The motherboard shown is an example only. Details may differ from the motherboard of your device version.

- ① Power supply unit 550 W
- ② Processor heat sink
- ③ Rod with card holders for expansion cards
- ④ Slots for memory modules
- ⑤ Drive cage (here: Drive cage type A or type B)
- ⑥ Guide rail for long expansion cards
- ⑦ Motherboard
- ⑧ Expansion card slots
- ⑨ Slot brackets (numbering of expansion card slots on the enclosure)

1.6 Accessories and replacement parts

1.6.1 Hardware accessories



Accessories from Siemens are available for your device. These are not included in the scope of supply.

Obtaining accessories from the SIEMENS Industry Mall






You can find additional information in the online ordering system Industry Mall (<https://mall.industry.siemens.com>).

First select your Region and then navigate to the desired topic area.

Accessories available for order

Name	Description	Article number
Retainer for locking the internal USB interface	The retainer is a mechanical safety device for the internal USB interface. It optimizes the protection of an internal USB memory stick against loads caused by vibration and shock during transportation or operation. This increases the reliability and operational safety of the device.	6ES7648-1AA00-0XK0 
Tower Kit for SIMATIC IPCs	You can use the Tower Kit to convert the device into an industrial Tower PC. This step expands the operating range beyond the control cabinet. Components of the Tower Kit: <ul style="list-style-type: none"> • Cover • Feet • Accessories: Screws and rubber feet 	For devices with standard enclosures: 6ES7648-1AA01-0XC0 For devices with short enclosures: 6ES7648-1AA01-0XE0 



1.6 Accessories and replacement parts

Name	Description	Article number
DisplayPort adapter Connection of monitors with the following adapters possible to: <ul style="list-style-type: none"> Integrated graphics interfaces 	<ul style="list-style-type: none"> DP to DVI-D adapter DisplayPort to DVI-D 	6ES7648-3AF00-0XA0 
	<ul style="list-style-type: none"> DP to VGA adapter DisplayPort to VGA 	6ES7648-3AG00-0XA0 
Mini-DisplayPort adapter Connection of monitors with the following adapters possible to: <ul style="list-style-type: none"> NVIDIA T400 graphics card 	<ul style="list-style-type: none"> mDP to VGA adapter Mini DisplayPort to VGA 	6ES7648-3AL00-0XA0 
	<ul style="list-style-type: none"> mDP to DVI-D adapter Mini DisplayPort to DVI-D available as single-pack or 3-pack 	1 adapter 6ES7648-3AK00-0XA0 3 adapters 6ES7648-3AK00-1XA0 
	<ul style="list-style-type: none"> mDP to DP adapter Mini DisplayPort to DisplayPort Available as single-pack or 3-pack* 	1 adapter 6ES7648-3AJ00-0XA0 3 adapters 6ES7648-3AJ00-1XA0* 

* Included in scope of supply of NVIDIA T400 graphics cards.


SIEMENS spare parts services

Information on ordering, the provision and delivery of spare parts can be found under "Industry Online Support: Spare parts services (<http://support.automation.siemens.com/WW/view/en/16611927>)".

Name	Description	Article number
Rack PC 4HM filter set	Filter mat for fan cover on front of device, pack of 10 filter mats	A5E37019277
Removable tray 3.5" drive (SATA/SAS) or 2.5" SSD (SATA), (without drive)	<p>The removable tray makes for quick and simple replacement of a 2.5" or 3.5" drive without having to open the device or remove it from the control cabinet. The result is the following advantages for service and maintenance, data backup and data transfer:</p> <ul style="list-style-type: none"> • Replacement of a failed hard disk during operation ("hot-swap") • Downloading different system states or operating systems from different hard drives during a short period of time. • Simplified data backup by copying, for example, to a backup hard drive. • Simple transportation of backup data • Separate data storage and archiving possible 	<p>6ES7648-0EH00-1BA0</p> 
Removable drive bay kit HDD / SSD for drive cage type A	Removable tray with backplane, key, data cable, screws, numbers for drive numbering on the front	A5E37754868
5.25" mounting frame for HDD/SSD removable tray	5.25" mounting frame for removable tray. You can use a 2.5" or a 3.5" drive in the removable tray.	<p>A5E35804114</p> 

Product description

1.6 Accessories and replacement parts

Name	Description	Article number
Assembly kit HDD / SSD for 5.25" tray	Assembly kit for 2.5" and 3.5" drives, Can be inserted in the 5.25" tray of the drive cage type B	A5E39679590 
Assembly kit HDD / SSD internal, standard enclosure, side panel	Assembly kit with drive bay plate for the internal installation of drives (3.5" HDD or 2.5" SSD)	A5E38368482

1.6.2 Software accessories

You can find information on software products for SIMATIC IPCs here:

- Catalog and ordering system for Automation and Drives: Industry Mall (<https://mall.industry.siemens.com>).

First select your Region and then navigate to the desired topic area.

- Industrial automation technology portfolio: Products & Services (<https://www.siemens.com/global/en/products/automation/pc-based.html>)

Area: "SIMATIC IPC software and accessories".

Safety instructions

2.1 General safety instructions

Danger if work is performed incorrectly

 **WARNING**

The installer of the system is responsible for the safety of a system in which the device is integrated.

There is a risk of malfunction if work on the device is carried out incorrectly, if the device is faulty, or if it is integrated incorrectly into a system.

Death or serious bodily injury can result.

- Make sure that only appropriately qualified personnel work on the device or on a system.

Danger to life when the control cabinet is open

 **WARNING**

Electrocution risk when control cabinet is open

When you open the control cabinet, there may be a dangerous voltage at certain areas or components.

Touching these areas or components can cause death or serious physical injury.

- Disconnect the control cabinet from the power supply before opening it.
- Ensure that the power to the control cabinet cannot be turned on accidentally.

Risk of electric shock when working on the device

WARNING

Risk of electric shock from mains voltage

The on-off button and on-off switch do not fully disconnect the device from the mains voltage.

There is also a risk of fire if the device or connecting lines are damaged.

- Always fully disconnect the device from the mains voltage before performing work on the device or when the device will not be used over an extended period of time.

Shut down the operating system.

Then pull out the power plug or operate the central AC circuit breaker if installed in a control cabinet.

Therefore, when installing the device in a control cabinet, ensure that the AC circuit breaker is easily accessible.

Risk due to strong high-frequency radiation

NOTICE

Observe immunity to RF radiation

The device has increased immunity to high-frequency radiation in accordance with the information on electromagnetic compatibility (Page 131).

Radiation exposure exceeding the specified immunity limits can impair device functions, result in malfunctions and therefore injuries or damages.

- Note the information on immunity to high-frequency radiation.

Danger in case of lightning strike

DANGER

Danger in case of lightning strike

A lightning flash may enter the mains cables and data transmission cables and jump to a person.

Death, serious injury and burns may result.

- In the event of an approaching thunderstorm, completely disconnect the device from the mains voltage in good time, see "Switching off the device (Page 72)".
- Do not touch power cables and data transmission cables during a thunderstorm.
- Keep sufficient distance from electric cables, distributors, systems, etc.

Danger when working on electrostatically sensitive components (ESD)

Electrostatic sensitive devices can be labeled with an appropriate symbol.



NOTICE

Electrostatic sensitive devices (ESD)

The device contains electrostatically sensitive components that can be destroyed by voltages that are far below human perception.

This can result in malfunctions and damage to the machine or plant.

- If you are working with electrostatically sensitive components, take appropriate precautions when opening the device and observe the ESD guidelines.

Risk due to device overheating

When setting up and installing the device, observe the important information in section:

- "Safety instructions on ambient and environmental conditions (Page 46)

Danger when changing the battery



WARNING

Risk of explosion and release of harmful substances

Improper use and handling of the backup battery can result in an explosion of the battery.

Harmful substances released by an explosion can cause serious physical injury.

Damaged batteries jeopardize the functioning of the device.

- Replace spent batteries promptly, see information under "Changing the backup battery (Page 120)".
- Replace the battery only with an identical battery or types recommended by the manufacturer.
- Do not throw the battery into a fire.
- Do not perform soldering work on the cell body of the battery.
- Do not recharge the battery.
- Do not open the battery.
- Do not short-circuit the battery.
- Do not reverse the polarity of the battery.
- Do not heat the battery over 100 °C.
- Protect the battery from direct sunlight, moisture and condensation.

Avoiding functional restrictions

NOTICE
Possible functional restrictions in case of non-validated plant operation
The device is tested and certified on the basis of the technical standards. In rare cases, functional restrictions can occur during plant operation.
Validate the correct functioning of the plant to avoid functional restrictions.

Use in industrial environments


Note

Use in an industrial environment without additional protective measures

This device was designed for use in a normal industrial environment according to IEC 60721-3-3.

2.2 Safety instructions on transport and storage


Danger when carrying and lifting the device

 CAUTION
Risk of physical injury The device is heavy and may injure persons and be damaged if it falls. <ul style="list-style-type: none">• Use the handles on the front panel of the device to carry and lift the device.

Risk during transport and storage

NOTICE
Damage to the device during transport and storage If a device is transported or stored without packaging, shocks, vibrations, pressure and moisture may impact the unprotected unit. Damaged packaging indicates that ambient conditions have already had a massive impact on the device and it may be damaged. This may cause the device, machine or plant to malfunction. <ul style="list-style-type: none">• Keep the original packaging.• Pack the device in the original packaging for transportation and storage.

Danger due to damage to the device

 WARNING
Electric shock and fire hazard due to damaged device A damaged device can be under hazardous voltage and trigger a fire in the machine or plant. A damaged device has unpredictable properties and states. Death or serious injury could occur. <ul style="list-style-type: none">• Avoid installing and commissioning a damaged device.• Label the damaged device and keep it locked away. Send off the device for immediate repair.

Risk due to condensation

NOTICE**Damage from condensation**

If the device is subjected to low temperatures or extreme fluctuations in temperature during transportation, moisture could occur on or inside the HMI device (condensation).

Moisture can cause a short-circuit in electrical circuits and damage the device.

- Store the device in a dry place.
- Allow the device to warm up to room temperature before commissioning.
- Do not expose the device to direct heat radiation from a heating device.
- If condensation develops, wait approximately 12 hours or until the device is completely dry before switching it on.

2.3 Safety instructions for assembly

Fire protection enclosure

Note

The device meets the requirements for fire protection enclosures in accordance with IEC/EN/UL/CAN/CSA-C22.2 No. 61010-2-201. It can therefore be installed without an additional fire protection cover.

Approvals expire if the instructions are not observed

 **WARNING**

Approvals expire if the instructions are not observed

If the ambient and environmental conditions are not complied with during installation and operation of the device or system, the approvals according to IEC/EN/UL/CAN/CSA-C22.2 No. 61010-2-201 are voided.

There is a risk of overheating and personal injury.

Note the following instructions and information under:


- "Climatic and mechanical environmental conditions (Page 132)"
- "Safety instructions on ambient and environmental conditions (Page 46)"

Important notes on rack assembly

Note

- **Higher operating temperature**
If installed in a closed unit or a multi-unit rack, the ambient operating temperature may be greater than the room temperature. Install the device in an environment recommended by the manufacturer, see notes under "Climatic and mechanical environmental conditions (Page 132)"
- **Reduced air flow**
When installing the device in a rack, ensure that the air flow required for safe operation of the device is guaranteed, see instructions under "Climatic and mechanical environmental conditions (Page 132)".
- **Mechanical load**
Mounting of the equipment in the rack should be such that a hazardous condition is not caused due to an uneven mechanical load, see notes under "Climatic and mechanical environmental conditions (Page 132)"
- **Circuit overload**
When connecting the device, observe the information on the power supply unit on the information label on the rear of the device.
- **Reliable grounding**
Ensure that the equipment installed in the rack is safely grounded, see the notes under "Connection of equipotential bonding line (Page 63)"

Danger to life when the control cabinet is open

 WARNING
Electrocution risk when control cabinet is open
When you open the control cabinet, there may be a dangerous voltage at certain areas or components.
Touching these areas or components can cause death or serious physical injury.
<ul style="list-style-type: none">• Disconnect the control cabinet from the power supply before opening it.• Ensure that the power to the control cabinet cannot be turned on accidentally.

2.4 Safety instructions on ambient and environmental conditions

Approvals expire if the instructions are not observed

 **WARNING**

Approvals expire if the instructions are not observed

If the ambient and environmental conditions are not complied with during installation and operation of the device or system, the approvals according to IEC/EN/UL/CAN/CSA-C22.2 No. 61010-2-201 are voided.

There is a risk of overheating and personal injury.

Danger if ambient conditions are unsuitable

NOTICE

Ambient conditions and chemical resistance

Unsuitable ambient conditions may cause faults or damage the device. Failure to comply will void the warranty and approval in accordance with IEC/EN/UL/CAN/CSA-C22.2 No. 61010-2-201.

- When the device is operated in severe environments which are subject to caustic vapors or gases, ensure sufficient clean air is provided.
- Clean the enclosure surface with a damp cloth.
- Make sure that no water gets inside the device.

Notes on the suitable location of the device

Note

When you plan your project, you should make allowances for:

- Install the device in such a way that it poses no danger, e.g. by falling over.
- Only operate the device in a suitable environment, see information under "Climatic and mechanical environmental conditions (Page 132)".
 - Avoid extreme ambient conditions such as heat.
 - Do not expose the device to direct sunlight or powerful light sources.
- Observe the permitted mounting positions of the device.
- This device was designed for use in a normal industrial environment.
- When using the device in locations with difficult operating conditions due to corrosive vapors or gases, special additional protective measures are necessary, such as the supply of clean air.
- Ensure adequate ventilation of the device:
 - Do not obstruct the venting slots of the device.
 - Always maintain a minimum clearance of 50 mm to the area of the ventilation slots.
- The device meets the requirements for fire protection enclosures in accordance with IEC/EN/UL/CAN/CSA-C22.2 No. 61010-2-201. You can therefore install it without an additional fire protection enclosure.
- The connected or built-in peripherals should not introduce a counter emf in excess of 0.5 V into the device.

High frequency radiation

CAUTION

Immunity to RF interference

The device has increased immunity to high-frequency radiation, see information under "Electromagnetic compatibility (Page 131)".


High frequency radiation above the specified immunity limits can result in malfunctioning of the device.

Persons are injured and the plant is damaged.

- Avoid high-frequency radiation.
- Remove radiation sources from the environment of the device.
- Switch off radiating devices.
- Reduce the radio output of radiating devices.
- Read the information on electromagnetic compatibility.
- Read the information in the technical specifications.

2.5 Safety instructions for I/O devices

Risk of damage to the device from connecting I/O devices

 CAUTION
Fault caused by I/O devices The connection of I/O devices can cause faults in the device. The result may be personal injury and damage to the machine or plant. <ul style="list-style-type: none">• Only connect I/O devices which are approved for industrial applications in accordance with EN 61000-6-2 and IEC 61000-6-2.• I/O devices that are not hotplug-capable may only be connected after the device has been disconnected from the power supply unit.

Danger due to regenerative feedback

NOTICE
Damage to the device due to regenerative feedback A connected or installed component can cause voltage to be fed back to ground in the device. This can damage the device. <ul style="list-style-type: none">• Do not introduce voltage into the device through connected or built-in I/O devices that are operated with their own power supply unit (e.g. a USB drive with an external power supply unit).

Note on measuring the counter voltage

Note

Note the following when measuring the counter voltage:

- Switch off the affected device and then insert the power plug.
 - Connect all cables from the system to the device and switch all components of the system to active before starting the measurement.
-

Risk of electric shock from mains voltage

 **WARNING****Risk of electric shock**

The on-off button and on-off switch do not fully disconnect the device from the mains voltage.

There is also a risk of fire if the device or connecting lines are damaged.

- Always fully disconnect the device from the mains voltage before performing work on the device or when the device will not be used over an extended period of time.
- For control cabinet mounting: Use a central, easily accessible AC circuit breaker, especially when close to the device.
- When you install the device, ensure that the power supply plug is easily accessible.

2.6 Safety instructions on device and system extensions

Contact your technical support team or the point of sale to find out which device and system expansions are suitable for installation.

Risk due to device and system expansions

NOTICE

Damage caused by device and system expansions

Device and system expansions may contain faults and affect the entire device, machine or plant.

Device and system expansions may violate safety rules and regulations regarding radio interference suppression.

If you install or replace device or system expansions and damage your device, the warranty is voided.

- Disconnect the device completely from the line voltage before opening the device. (Page 72)
- Only install device or system expansions designed for this device.
Contact your technical support team (Page 159) or the point of sale to find out which device and system expansions are suitable for installation.
- Note the Information on electromagnetic compatibility (Page 150).

Risk of electric shock when working on the device

WARNING

Risk of electric shock from mains voltage

The on-off button and on-off switch do not fully disconnect the device from the mains voltage.

There is also a risk of fire if the device or connecting lines are damaged.

- Always fully disconnect the device from the mains voltage before performing work on the device or when the device will not be used over an extended period, see information under "Switching off the device (Page 72)"
- For control cabinet mounting: Use a central, easily accessible AC circuit breaker, especially when close to the device.
- When you install the device, ensure that the power supply plug is easily accessible.

Risk when opening the device

WARNING

Risk of malfunctions and electric shock

Improper intervention in the device endangers operational reliability and may damage the device.

The results are personal injuries and damage to the plant.

Take the following precautions:

- Disconnect the power plug before you open the device.
- Close the device after every intervention.

NOTICE

Electrostatic sensitive devices (ESD)

The device contains electronic components which may be destroyed by electrostatic charge. Malfunctions and damage to the machine or system can result.

Take corresponding precautionary measures when you open the device.

WARNING

Risk due to unauthorized opening and improper repairs or expansions

Improper procedures when carrying out expansions may result in damage to equipment or endanger the users.

If you install or exchange system expansions and damage your device, the warranty becomes void.

It is therefore essential that you observe the information under "Open the device (Page 77)".

Danger from unauthorized or improperly performed repairs

WARNING

Danger due to unauthorized opening or improperly carried out repairs or extensions

Improperly carried out repairs or extensions to the device can lead to property damage or danger to the users.

If you install or exchange system expansions and damage your device, the warranty becomes void.

Risk of overheating when using expansion cards

 **CAUTION**

Fire hazard due to overheating of the device

Expansion cards generate additional heat. The device can overheat or cause a fire.

- Observe the safety and installation instructions for the expansion cards.
- Note the maximum power consumption permitted for the device, see "General technical specifications (Page 128)".

 **CAUTION**

Danger of burns from the hot blanking plates on the rear of the device

If expansion cards that generate a lot of heat are fitted, high temperatures can be present on the rear of the device in the vicinity of the perforated blanking plates.

Observe the danger symbol "Warning of hot surface" (Page 163) on the rear of the device.

Observe the Notes on the suitable location of the device (Page 46).

Limitation of liability

Note

- All technical specifications and approvals of the device only apply if you use expansion components that have a valid CE approval (CE mark).
- Observe the installation instructions for expansion components in the associated documentation.
- UL approval of the device only applies when the UL-approved components are used according to their "Conditions of Acceptability".
- We are not liable for functional limitations caused by the use of third-party devices or components.

Mounting the device

3.1 Preparing for installation

3.1.1 Scope of delivery

Device and hardware for the device

- IPC in the "Rack" device version
- Power supply cable*
- Strain relief for USB and LAN ports, 2 detachable cable ties
- Strain relief for power plug
- Key for front door: 2 keys
- For device with drive cage type A:
 - 2 keys for removable drive bay
- Self-adhesive enclosure feet: 4 pieces
- 1 USB flash drive* with:
 - Software and tools to restore the installed Microsoft® Windows® operating system
 - Device driver
 - Quick Install Guide for the device
 - Operating instructions of the device
 - Product Information
 - User Manual (UM) for the motherboard with firmware/BIOS description and hardware description of the interfaces

* (optional, if ordered)

Operating system

Depending on the ordered device configuration, the device is equipped **with** or **without** an installed operating system.

You can find information on ordering Microsoft® Windows® operating systems under: Important instructions and manuals for operating the device (Page 10) or Technical specifications of the operating systems (Page 139).

Installed software

You will find information on more software for your device under: Software accessories (Page 37).

Printed documents

- Quick Install Guide for the device with link and QR code to the online form for quality control (quality control notification) in the SIEMENS After Sales Information System (ASIS)
- Product Information "Important notes on your device"

3.1.2 Checking the delivery package

 **WARNING**

Electric shock and fire hazard due to damaged device

Improper storage or shipping can damage equipment. This may result in personal injury and/or property damage.

You must follow the instructions under "Safety instructions on transport and storage (Page 42)".

Procedure

1. Check the delivery unit for any signs of visible transport damage.
If any transport damage is present at the time of delivery, lodge a complaint at the shipping company in charge. Have the shipper confirm the transport damage immediately.
2. Unpack the device at its installation location.
3. Keep the original packaging in case you have to transport the unit again.
4. Check the scope of delivery (Page 53) and any accessories (Page 33) you may have ordered for completeness and damage.
If the contents of the package are incomplete, damaged or do not correspond to your order, you can use the After Sales Information System (ASIS) (<http://www.siemens.com/asis>) to provide feedback on product deliveries and repairs.
Complete the online form for quality control (quality control notification).
5. Please keep the documentation in a safe place. It is required for initial commissioning and is part of the device.
6. Note down the Device identification data (Page 56).

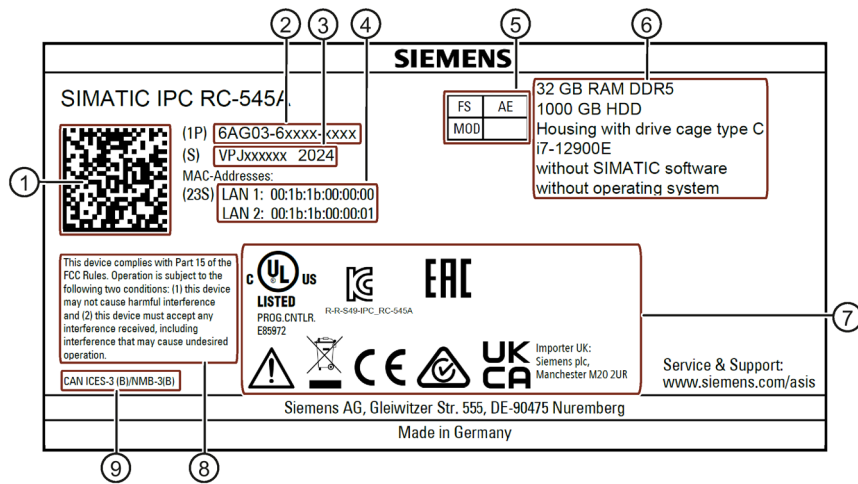
3.1.3 Device identification data

The device can be clearly identified with the help of this identification data in case of repairs or loss.

The following illustrations are examples. The data of your device may differ from the data in these examples.

Nameplate

The nameplate is located inside the front door.



Identification data of the device

①	QR code for information about the device
②	Item number of the device (device-specific)
③	Serial number of the device (device-specific)
④	MAC-Addresses (Media Access Control Addresses): MAC address of the device's LAN ports (device-specific)
⑤	FS (Functional State): Functional state of the device
⑥	Information on the device equipment (device-specific)
⑦	Symbols of certificates and approvals (Page 164) Symbols for safe use and disposal (Page 163)
⑧	FCC Rules (USA) (Page 148)
⑨	ICES Compliance (Canada) (Page 149)

COA label

The COA label (Certificate of Authenticity) is located inside the front door.

Note

The COA label is only available for devices delivered with Microsoft® Windows® operating system installed.



*Example: COA label for the Microsoft® Windows® 10 operating system
(the data of the product key are grayed out in the figure)*

3.2 Mounting the device

3.2.1 Mounting types

Note

If the device is permanently installed, mounted on telescopic rails or set up as a tower, it must not be subjected to vibration loads during operation. In these cases, use only SSDs and not HDDs as drives.

Horizontal: Mounting with cabinet brackets

The device can be installed horizontally in control cabinets and 19" rack systems.

This installation type meets the requirements in accordance with IEC60297-3-100.

Horizontal: Mounting on telescopic rails

The device can be installed horizontally in control cabinets and 19" rack systems.

When telescopic rails are used for mounting, the device can be withdrawn fully from the cabinet or rack. Note the information in "Technical specifications of the telescopic rails (Page 139)".

Installation in the control cabinet

When mounting the device in a cabinet, use a central and easily accessible mains disconnecter (if possible, near the device).

Horizontal: Mounting on device base

This installation type meets the requirements in accordance with IEC60297-3-100.

Vertical: Mounting on device base

For vertical operation, mount the device on a horizontal base made of metal and secure it against falling.

The following device bases are available from Rittal for this purpose (Rittal Type TE 7000.620, Rittal Type VR 5501.655, Rittal Type DK 5501.655). You should also observe the information of the manufacturer of the device bases.

Vertical: with Tower Kit

For the vertical operation of the device with a Tower Kit, the device has a cover and feet. The Tower Kit can be ordered as an option, see "Hardware accessories (Page 33)".

More information

More information can be found in the Quick Install Guide (QIG) that is enclosed with the device.

See also

Rittal device bases (<https://www.rittal.com/de-de/product/list.action?categoryPath=/PG0001/>)

3.2.2 Securing the device

 **WARNING**

Dangerous voltage and fire hazard

Improper actions during installation and assembly may lead to personal injury and/or damage to equipment.

It is essential that you follow the installation and mounting instructions under:

- Safety instructions for assembly (Page 44)
- Safety instructions on ambient and environmental conditions (Page 46)


 **DANGER**

Electrocution risk when control cabinet is open

When you open the control cabinet, individual areas or components may be under life-threatening voltage.

Touching these areas or components can result in death or serious injury.

- Disconnect the control cabinet from the power supply before opening it.
- Secure the control cabinet against unintentional switching on of the power.

 **CAUTION**

Risk of physical injury

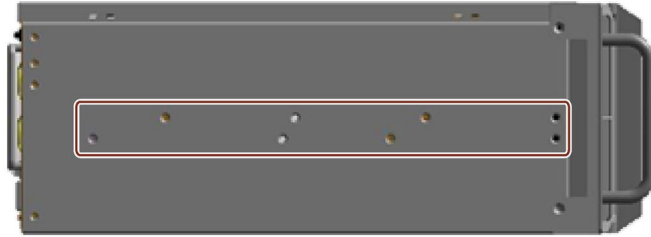
The device is too heavy to be mounted exclusively on the 19" brackets on the front.

The device may fall down, injure people, and become damaged.

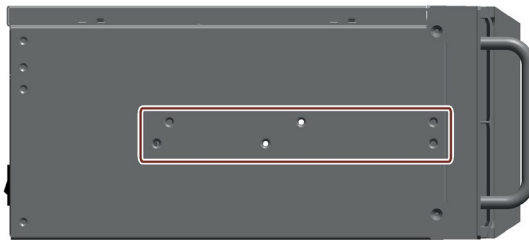
- Secure the device using additional measures. The fixing screws of the telescopic rails may not protrude more than 5 mm into the device.
- To carry and lift the device, use the handles on the front of the device.

Drill holes for telescopic rails

Drill holes for standard enclosure



Drill holes for short enclosure



The dimensions for the holes can be found here: "Dimension drawings for drill holes for telescopic rails (Page 145)".

You can find detailed information on the telescopic rails here: "Technical specifications of the telescopic rails (Page 139)".

Connecting the device

4.1 Country-specific information on supply voltage

Country-specific information on supply voltage in USA and Canada

Supply voltage 120 V / 230 V / 240 V

Ensure that the power supply cables used are rated for the maximum current consumption and maximum ambient temperature of the device and that they meet the requirements of the following standards:

- ANSI/UL 817
- CSA C22.2 No. 21

Ensure that the device connectors, connector sockets, and connection materials are rated for the maximum current consumption and maximum ambient temperature of the device and that they meet the requirements of the following standards:

- ANSI/UL 498 and CSA C22.2 No. 42
- CSA C22.2 No. 182.1
- CSA C22.2 No. 182.2
- CSA C22.2 No. 182.3

Country-specific information on supply voltage outside of USA and Canada

Supply voltage 230 V AC

This device is supplied with a safety-tested power supply cable and may only be connected to a grounded socket outlet.

If you do not use the power supply cable, use a flexible cable which is rated for the maximum current consumption and maximum ambient temperature of the device and also complies with the safety regulations of the country in which the device is installed.

Power supply cables and device plugs must bear the prescribed markings.

4.2 Connection of equipotential bonding line

A low-resistance ground connection ensures that interference signals generated by external power supply cables, signal cables or other cables to the I/O devices are safely discharged to earth.

The connection for functional earthing on a device has a large surface, makes contact over a large area and is marked with the following symbol.



You can find information on the position of the functional earthing connection under "Rear of the device (Page 22)".

Requirement

- Screwdriver TORX T20
- Equipotential bonding conductor with a minimum cross section of 2.5 mm²

Procedure

1. Make the connection for functional ground via an equipotential bonding line to the equipotential bonding rail or grounding bar of the control cabinet in which the device is installed.

4.3 Connecting the power supply unit 550 W

WARNING

Injury to persons or damage to property when operated on an incorrect power supply system

If you connect the device to an unsuitable power supply, the device receives voltages and currents that are too high or too low.

Injuries to persons, malfunctions or a damage to the device can result.

- The permissible nominal voltage of the device must match the local mains voltage.
- Operate the device only in grounded electricity grids (TN networks in accordance with VDE 0100 Part 100 or IEC 60364-1).
- Operation via non-grounded or impedance-grounded grids is prohibited.

WARNING

Risk of electric shock

The on-off button and on-off switch do not fully disconnect the device from the mains voltage.

There is also a risk of fire if the device or connecting lines are damaged.

- Always fully disconnect the device from the mains voltage before performing work on the device or when the device will not be used over an extended period of time.
- For control cabinet mounting: Use a central and easily accessible AC circuit breaker near the device.

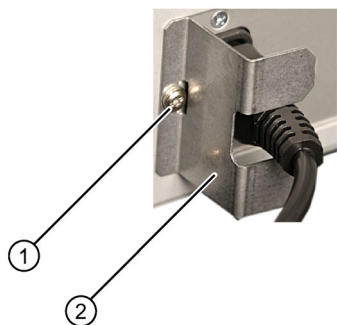
Requirement

- You have observed the information under "Country-specific information on supply voltage (Page 62)".
- Screwdriver TORX T10

Procedure

1. Ensure that the on-off switch is in position '0' (off). You can find information on the position of the on-off switch under "On-off switch for power supply unit 550 W (Page 26)".
2. Connect the power plug to the corresponding socket. Information on the position of the socket is available in "Connection of power supply unit 550 W (Page 25)".
3. Plug the power supply cable into the power outlet.
4. Switch on the device at the on-off switch (position I).
5. To prevent unintentional removal of the power plug, secure the power plug on the device.

6. Remove the retaining screw ①.



7. Screw on the power plug latch ② with the fixing screw ①.

4.4 Connecting I/O devices

4.4.1 Connecting external devices



CAUTION

Fault caused by I/O devices

The improper connection of I/O devices can cause faults in the device.

The result may be personal injury and damage to the machine or plant.

Be sure to follow the Instructions for connecting I/O devices (Page 48).

Procedure

Note

Use the original connections of the I/O to be connected without adapters or extensions.

1. Connect the I/O devices to the respective interfaces. Information on the position of the interfaces is available in "Device ports (Page 23)".
2. Secure the cables (Page 70) with a strain relief.

4.4.2 Connecting audio devices

Requirement

- You have observed the information under "Connecting external devices (Page 66)" and under "Technical specifications of the connections on the device (Page 137)"

Procedure

Note

Use the original connection technology of the audio devices to be connected without adapters and extensions.

1. Connect the I/O devices to the respective interfaces. Information on the position of the interfaces is available in "Device ports (Page 23)".
2. Secure the cables (Page 70) with a strain relief.

4.4.3 Connecting several monitors (multi-monitoring)

4.4.3.1 Connecting monitors for using the NVIDIA T400 graphics card

Power supply units

The NVIDIA T400 graphics card can be operated with the following power supply units:

- Power supply unit 550 W:

Connection sockets on the rear of the device

As standard, there are three connection sockets on the rear of the device for connecting monitors to the integrated graphics interfaces.

- 2 x DP (DisplayPort; labeling on the device: DPP1, DPP2)
- DVI-D

You will find 3 additional connection sockets on the rear of the device for connecting monitors to the optional NVIDIA T400 graphics card.

- 3 x mDP (Mini DisplayPort)

At these connection sockets, you can use adapters to connect monitors to other graphics ports.

You can find information on the connection sockets on the rear of the device under: "Connections on the rear of the device (Page 24)".

You can find information on the adapters under "Hardware accessories (Page 33)".

Connection socket on monitor		Connection socket on the integrated graphics interfaces			Connection socket on the NVIDIA T400 graphics card		
		DP (DPP1; X71) ¹	DP (DPP2; X72) ¹	DVI-D (X70) ¹	mDP1	mDP2	mDP3
Monitor 1	DP (Display-Port)	X					
	DVI	X ²⁾					
	VGA	X ²⁾					
Monitor 2	DP (Display-Port)		X				
	DVI		X ²⁾				
	VGA		X ²⁾				
Monitor 3	DP (Display-Port)						
	DVI			X			
	VGA						

Connection socket on monitor		Connection socket on the integrated graphics interfaces			Connection socket on the NVIDIA T400 graphics card		
Monitor 4	DP (Display-Port)				X ²⁾		
	DVI				X ²⁾		
	VGA				X ²⁾		
Monitor 5	DP (Display-Port)					X ²⁾	
	DVI					X ²⁾	
	VGA					X ²⁾	
Monitor 6	DP (Display-Port)						X ²⁾
	DVI						X ²⁾
	VGA						X ²⁾

1) Labeling on the device

2) via adapter, see "Hardware accessories (Page 33)"

Requirement

- You have observed the information in the following sections:
"Connecting external devices (Page 66)"

Procedure

1. Connect the monitors to the rear of the device (Page 24).

For information on connecting monitors with adapters, see "Hardware accessories (Page 33)".

2. On delivery the device is set for multi-monitoring.

If the delivery state settings have been changed, configure the multi-monitoring function in the firmware settings, see "Installing a graphics card (Page 88)".

4.5 Connecting the device to networks

The following options are available for integrating the device into existing or planned system environments and networks.

Ethernet

Wake on LAN and Remote Boot are supported.

You can use the integrated Ethernet interfaces for communication and data exchange with automation devices, e.g. SIMATIC S7.

You need the "SOFTNET S7" software package for this.

PROFINET

PROFINET can be operated via:

- All Ethernet interfaces on the device (RT)

SIMATIC NET

Use this software package to create, operate and configure an innovative network for Field & Control level. Additional information is available under SIMATIC NET (<http://w3.siemens.com/mcms/automation/en/industrielle-kommunikation/Seiten/Default.aspx>).

The software package and the documentation are not included in the scope of supply.

More information

You can find additional information on the Internet at: Technical support (<https://support.industry.siemens.com>)

4.6 Securing the cables

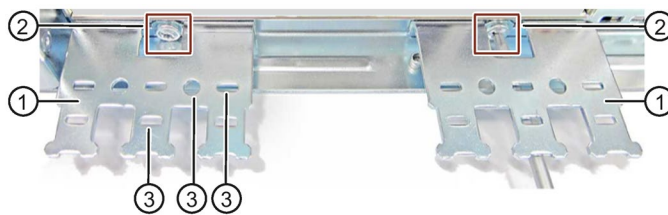
The strain relief is used to prevent accidental loosening of cables.
You can mount two strain-relief assemblies.

Requirement

- I/O devices are connected to the respective connections.
- Screwdriver TORX T10

Procedure

1. Connect I/O devices to the corresponding sockets on the rear of the device. Information on the position of the sockets is available in "Device ports (Page 23)".
2. Screw the desired strain relief ① with the fixing screw ② on the left and/or right of the device.



3. Insert the detachable cable ties in the respective openings of the strain relief ③ and fasten the cables with the cable ties.
4. Fasten the cables to the corresponding openings in the strain relief ④ using simple cable ties.



Example: Cable fastened to strain relief with cable ties

Commissioning the device

5.1 Switching on the device

Requirement

- The power supply unit is connected. (Page 64)

Procedure

1. For devices with power supply unit 550 W:
Switch on the on-off switch on the rear of the device (position |).
2. Press the on-off button on the front side of the device behind the front door.
Information on the position of the switch and the button is available under "Operator controls (Page 26)".

Commissioning the installed Windows® operating system

You can find information on switching on the device for the first time and starting up the installed Windows® operating system in the documentation for your operating system, see "Important instructions and manuals for operating the device (Page 10)".

5.2 Configuring automatic switch-on of device

In the firmware settings, you can specify that the device starts up again automatically after being disconnected from the mains voltage for up to two minutes as soon as the mains voltage is available again.

The minimum downtime required for the mains voltage depends on the configuration of the device.

Configure this function in the firmware settings:

1. Select: "Advanced > Power Management > Restore AC after Power Loss".
2. Assign the "Always on" value to the firmware setting "Restore AC after Power Loss".

See also

Important instructions and manuals for operating the device (Page 10)

5.3 Switching off the device

Shutting down the operating system

For active operating system:

- Shut down the operating system properly.

For inactive operating system

- Briefly press the on-off button. Information on the position of the button is available under "On-off button and reset button (Page 27)".

Result

The "POWER" status display on the front (Page 28) indicates the corresponding energy-saving mode ("Shut down") of the device.

The device is switched off but not fully disconnected from the mains voltage.

Fully disconnecting the device from the mains voltage

 **WARNING**

Risk of electric shock from mains voltage

The on-off button and on-off switch do not fully disconnect the device from the mains voltage.

There is also a risk of fire if the device or connecting lines are damaged.

Always fully disconnect the device from the mains voltage before performing work on the device or when the device will not be used over an extended period of time.

- Shut down the operating system.
The "POWER" status indicator on the front (Page 28) indicates the corresponding energy-saving mode ("Shut down").

- Then pull out the power plug or operate the central AC circuit breaker if installed in a control cabinet.

Therefore, when installing the device in a control cabinet, ensure that the AC circuit breaker is easily accessible.

Hardware reset

If the device does not respond to input from the keyboard or mouse, restart it with the hardware reset. A started operating system will not hereby shut down safely.

NOTICE

Data loss

With a hardware reset, the device is switched off and restarted.

- Data in the main memory is deleted.
- Data on the data storage media may be lost.
- The device may be damaged.

Perform a hardware reset only in the case of an emergency.

Hardware reset with on-off button:

- Press the on-off button for more than 4 seconds:
 - The device switches off.
 - To switch on the device again, press the on-off button again.

Hardware reset with reset button:

- Press the reset button.
 - The device switches off and on again.

Information on the position of the buttons is available under "On-off button and reset button (Page 27)".

Operating the device

6.1 Opening the front door

Procedure

1. Open the front door with the key.
2. Pull the front door to the side.



6.2 Multi-monitoring

In its delivery state, the device is equipped with integrated graphics interfaces.

You will find the various standard connection sockets on the rear of the device for connecting monitors to these graphics interfaces.

You can find information on the position of the connection sockets and the labeling on the device here: "Connections on the rear of the device (Page 24)".

To connect additional monitors to the device at the same time (multi-monitoring), you can install a graphics card.

You can find information on this here:

- Connecting several monitors (multi-monitoring) (Page 67)
- Installing a graphics card (Page 88)

6.3 Drive configurations

6.3.1 System with 2 drives

You can order the device as a system with two drives. You can find information on the capacity of the drives in the ordering documents.

In a system with 2 independently operated drives, the second drive has not yet been set up in the delivery state of the device. The drive setup can be performed with the pre-installed operating system.

You have the option of backing up your data to this drive.

You can find information on how to boot the device from the second drive in the detailed firmware/BIOS description. See "Important instructions and manuals for operating the device (Page 10)".

6.4 Monitoring of the device

6.4.1 Monitoring functions

Note

No support of monitoring functions by SIMATIC DiagBase or SIMATIC DiagMonitor

The SIMATIC DiagBase and SIMATIC DiagMonitor software do not support the monitoring functions of this device.

Monitored device functions IPC

Monitoring	Description	Status display and actions
Temperature monitoring	<ul style="list-style-type: none"> Monitoring of high and low temperature limits and cable break of the temperature sensors For this, temperature sensors record the temperature at critical points of the device, e.g. at the processor. The temperature thresholds are defined for the individual temperature sensors. 	<ul style="list-style-type: none"> Status display "TEMP" Speed control of the device fans, the fan of the power supply unit and the fan of the graphics card Temperature alarm is output.
Fan monitoring	<ul style="list-style-type: none"> Monitoring of underspeed and failure of a fan as well as cable break of the tachometer cable <p>The operation of the fan is monitored at the following positions:</p> <ul style="list-style-type: none"> Front panel Processor Drive cage type A 	<ul style="list-style-type: none"> Status display "FAN" Fan alarm is output.

Monitoring	Description	Status display and actions
Drive monitoring	<ul style="list-style-type: none"> Determination of the status of the drives (HDD and SSD) with SMART functionality (SMART: Self-Monitoring, Analysis, and Reporting Technology) 	<ul style="list-style-type: none"> SMART status of the hard drives

<p>NOTICE</p>
<p>Fan monitoring restricted</p> <p>The power supply units do not report a fan error.</p> <p>If the fan of the power supply unit fails or is defective, no fan alarm is output.</p> <p>The device switches off automatically to protect against overheating.</p>

6.5 Trusted Platform Module (TPM)

Your device has a Trusted Platform Module conforming to the TPM 2.0 standard. The Trusted Platform Module is a chip that enhances your device with security functions. This provides an improved protection from manipulation of the device.

<p>NOTICE</p>
<p>Import restrictions for the Trusted Platform Module</p> <p>Use of the Trusted Platform Module is subject to legal restrictions in some countries and is not permitted there.</p> <ul style="list-style-type: none"> Always observe the respective import restrictions of the country in which the device will be used.

Activating the Trusted Platform Module

You can find information on activating the Trusted Platform Module in the detailed firmware/BIOS description in "Important instructions and manuals for operating the device (Page 10)".

Expanding and assigning parameters to the device

7

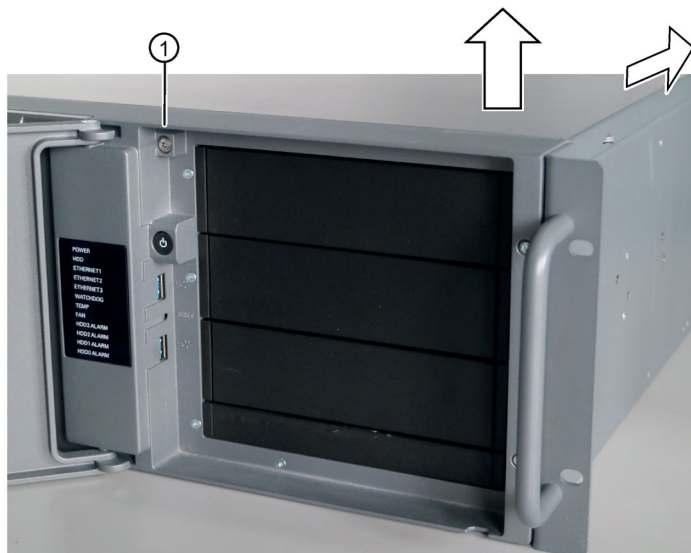
7.1 Open the device

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".
- Screwdriver TORX T10

Procedure

1. Unplug all connecting cables.
2. Open the front panel. (Page 74)
3. Unscrew the locking screw of the enclosure cover ①.



4. Push the enclosure cover back.
5. Lift up and remove the enclosure cover.

7.2 Installing and removing expansion cards

7.2.1 Information on using expansion cards

Slots for expansion cards

You can find information on which expansion card you can install in which slot under "Technical specifications of the expansion card slots (Page 134)".

Requirements for expansion cards

- You can find the permitted dimensions for expansion cards under "Dimension drawing of the expansion cards (Page 144)". To rule out contact problems and malfunctions, do not use any expansion cards that exceed the maximum permissible height.
- For expansion cards with a lower mounting height (low-profile expansion card), three long card retainers are enclosed with the device. Use these instead of the long card retainers installed in the device.
- Use an extender for long PCI/PCIe expansion cards for insertion into the guide rails.
Long expansion cards are only supported in a device with a standard enclosure.

7.2.2 Installing expansion cards

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- You are familiar with the Information on using expansion cards. (Page 78)
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Hold the bar ① with the card retainer on both ends and remove it by pulling it upwards.

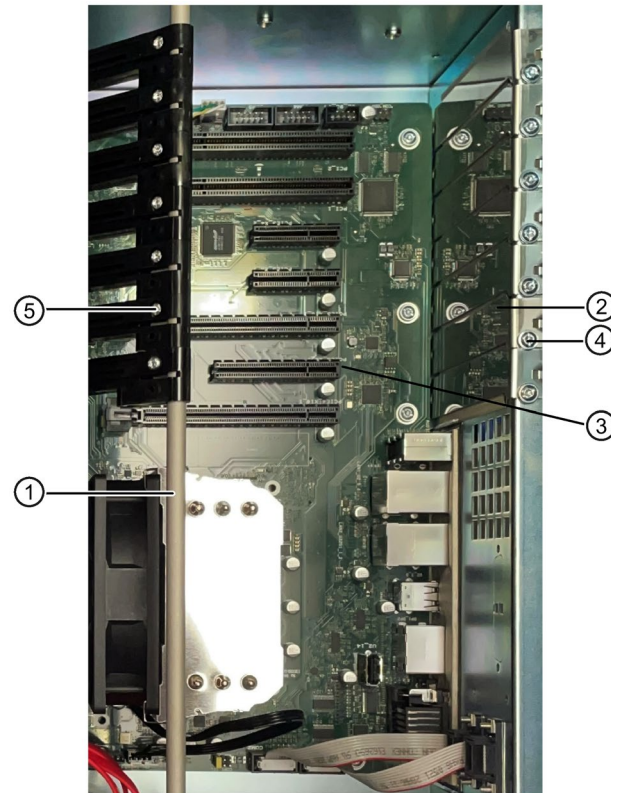
The bar is latched on both ends.

3. Remove the slot bracket ② for the required slot.
4. Insert the expansion card into the free slot ③ on the motherboard.
5. Secure the expansion card with the screw ④.
6. Re-insert the bar ① with the card retainers.
7. Detach the card retainer in question and place it on the expansion card in the slot ③.
8. Secure the card retainer with the locking screw ⑤.

If you are installing a short expansion card, remove the locking screw ⑤ from the card retainer and install it in the opposite hole.

If you are installing a low-profile expansion card, use one of the longer card holders that are shipped with the device for mounting.

9. Close the device.



7.2.3 Removing expansion cards

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- You can find Information on the components described in the procedure under "Installing expansion cards (Page 78)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Hold the bar with the card retainer at both ends and remove it by pulling it upwards.
The bar is latched on both ends.
3. Disconnect all cables and the screw of the expansion card that you wish to remove.
4. Remove the expansion card from the slot.
If you do not wish to install a new expansion card, install the corresponding slot bracket with the screw.
5. Close the device.

7.3 Installing and removing memory modules

7.3.1 Information on using memory modules

Usable memory modules

You can operate the device with the following memory modules:

- DIMM DDR5 memory modules
- Memory transaction rate 4800 MT/sec "unbuffered"
- "without ECC"

Slots for memory modules

Information on the slots of the memory modules can be found under "Layout of the motherboard (Page 151)".

Combination options for memory modules

You can equip the device with one or two memory modules, each with the same memory capacity. Mixing of memory capacities is not permitted.

You can use the modules to expand the memory capacity of your device to a maximum of 64 GB.

Depending on the number of memory modules used, these are plugged into defined slots on the motherboard.

The slots are labeled on the motherboard.

Combination option	Channel A	Channel B (external)	Maximum expansion
	DIMM_A1	DIMM_B1	
Combination 1	8 GB / 16 GB / 32 GB		32 GB
Combination 2	8 GB / 16 GB / 32 GB	8 GB / 16 GB / 32 GB	64 GB

Conditions of use of memory modules

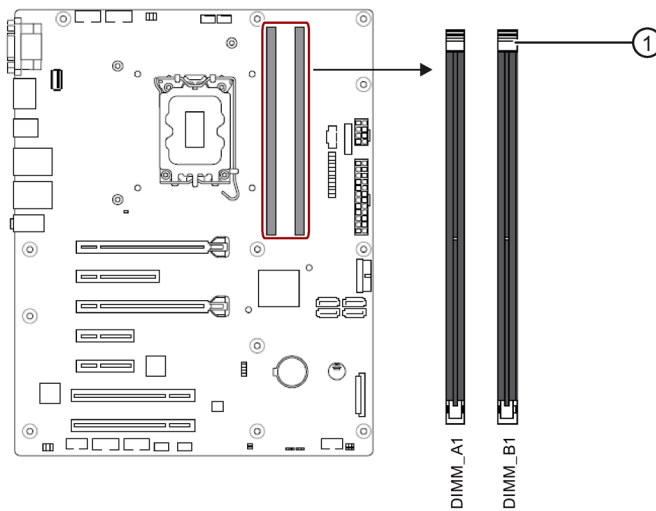
- When two identical memory modules are installed, memory is operated in dual-channel mode.
- If expansion cards with their own storage, e.g. graphics cards, with 256 MB and more are used, the memory available for an operating system or applications may be less than 64 GB.
- In case of operating errors, it may be sufficient to remove one or two memory modules or to use a memory module with lower capacity so that the physical memory expansion on the motherboard and the reserved memory of the expansion card do not overlap.

7.3.2 Installing memory modules

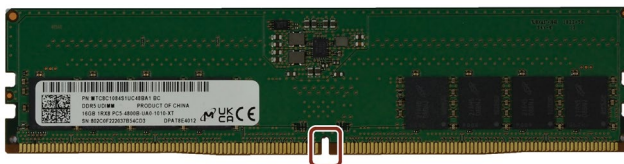
Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- You are familiar with the information under "Information on using memory modules (Page 81)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".

Location of the memory modules on the motherboard



Order when installing multiple memory modules



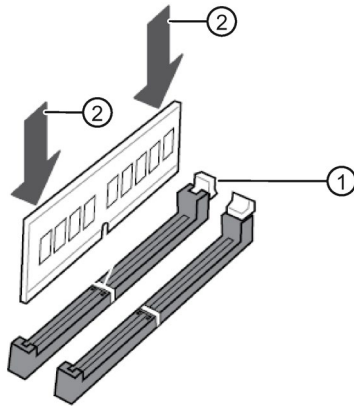
If you install several memory modules, install them one after the other in the following order:

- Memory module 1: DIMM_A1 slot
- Memory module 2: DIMM_B1 slot

The slots of the memory modules are labeled on the motherboard.

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. To obtain better access to the memory modules, remove expansion cards (Page 80) if required.
3. Open the lock ① on the slot.



4. Remove the memory module from its packaging.
Hold it by the upper edges only.
5. Insert the memory module in the slot perpendicular to the motherboard.
When inserting, pay attention to the cutout on the memory module, which must be in line with the coding of the base.
6. To prevent tilting, press evenly on both sides of the memory module ② until the lock audibly engages.
7. Close the device.

Display of a changed memory configuration

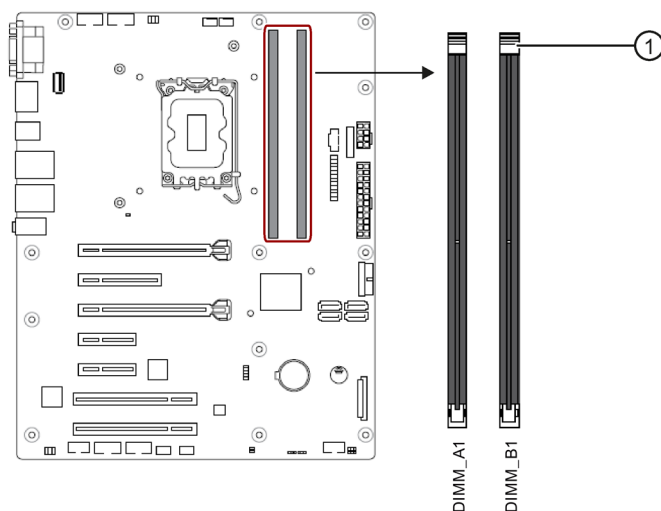
A changed memory allocation is automatically recognized when the device is switched on.

7.3.3 Removing memory modules

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".

Location of the memory modules on the motherboard



Order when removing multiple memory modules

If you remove several memory modules, remove them one after the other in the following order:

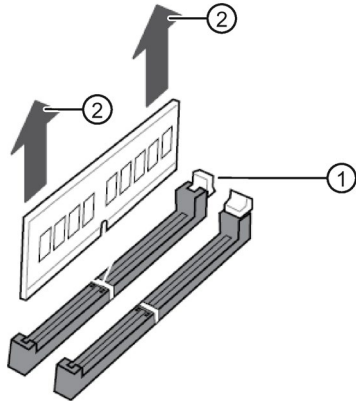
- Memory module 1: DIMM_B1 slot
- Memory module 2: DIMM_A1 slot

The slots of the memory modules are labeled on the motherboard.

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. To obtain better access to the memory modules, remove expansion cards (Page 80) if required.
3. Open the lock ① at the slot of the memory module. Remove the memory module from the slot.

To avoid tilting, pull the memory module out of the slot evenly on both sides ②.



4. Close the device.

Display of a changed memory configuration

A changed memory allocation is automatically recognized when the device is switched on.

7.4 Connecting a USB stick to the internal interface

You can connect a USB flash drive internally in the device. You can find the interfaces for this on the motherboard (Page 151) at the rear of the device.

For this process, you will need a retainer for locking the internal USB interface.

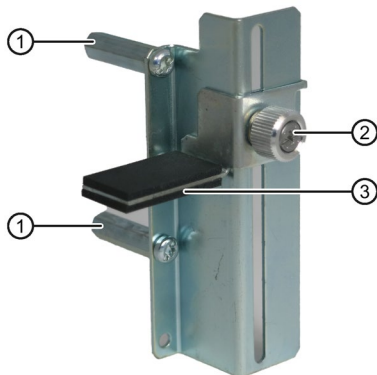
Only use original spare parts or components approved for this device. You can find information on this under "Hardware accessories (Page 33)".

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".
- Screwdriver TORX T10

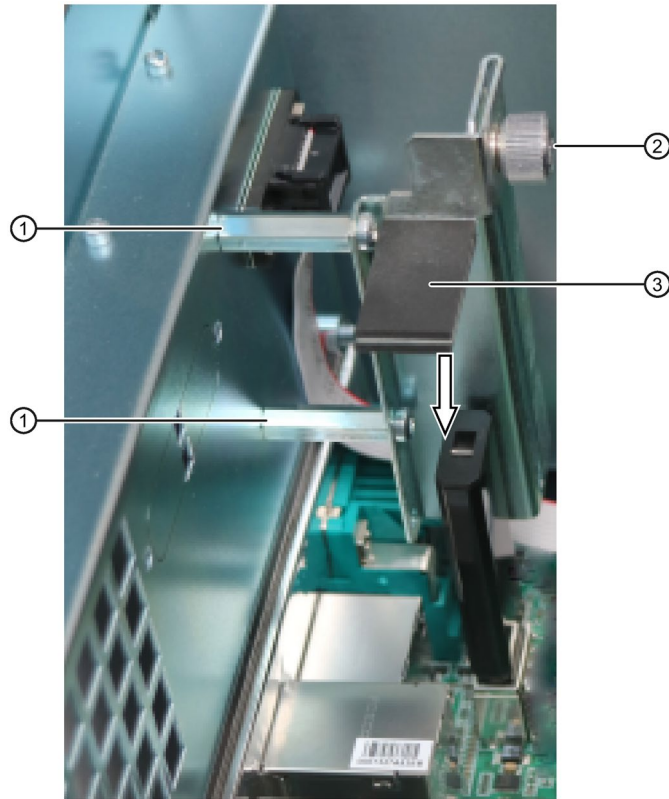
Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Insert the USB stick into the socket of the internal USB interface on the motherboard (Page 151).
3. Screw the two hexagon bolts ① with two of the enclosed screws into the first and third drill holes of the retainer.



4. Hold the retainer from the inside with the hexagon bolts on the rear panel of the device and fasten the retainer from the outside with the remaining screws on the rear panel of the device. You can find information on the position of the drill holes in section "Rear of the device (Page 22)".
5. Slide the bar of the retainer ③ onto the USB stick.

6. Fix the retainer by turning the screw ② on the guide rail.



7. Close the device.

7.5 Installing and removing a graphics card

7.5.1 Installing a graphics card

In its delivery state, the device is equipped with integrated graphics interfaces.

You will find several connection sockets on the rear of the device for connecting monitors to these graphics interfaces.

You can find information on the position of the connection sockets and the labeling on the device in section "Device ports (Page 23)".

To connect additional monitors to the device (multi-monitoring) (Page 67), you can install a graphics card.

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- A graphics card suitable for this device that supports multi-monitoring, see "Connecting several monitors (multi-monitoring) (Page 67)".
- You know the information about the power supply of the graphics card, see "Technical specifications of the connectors for the power supply of graphics cards (Page 138)".
- You have made a note of the firmware settings because the firmware settings of the device can be deleted when a graphics card is installed.

You can find information on this in the firmware description of the device, see "Important instructions and manuals for operating the device (Page 10)".

Procedure

1. The graphics card is an expansion card.

Install the graphics card. You can find notes on the specified mounting position under "Technical specifications of the expansion card slots (Page 134)".

Note the information under "Installing expansion cards (Page 78)".

Note

Graphics cards with external power supply

Connect graphics cards that require an external power supply with the 6-pin or 8-pin (6+2) plug of the power supply unit. You can find information on this in the section "Technical specifications of the connectors for the power supply of graphics cards (Page 138)".

The technical conditions of the power supply unit must be observed.

2. Check the firmware settings.
3. Configure the function "Multi-monitoring" in the firmware settings of the device.

Note the following information.

Displaying a message about opening firmware settings on the monitor of the graphics card

In delivery state the device is configured so that this message is only displayed on a monitor that is connected to a DPP connection or DVI-D connection on the rear of the device, see section "Device ports (Page 23)".

If you want to display this message on a monitor that is connected to a connection of a graphics card, follow these steps.

1. Connect a monitor to the DPP port or the DVI-D port.
2. To open the firmware settings, press the or <Esc> button during the boot phase, when a boot message appears.
3. Select "Advanced" > "Graphics Configuration".
4. Assign the "Auto" value to the firmware setting "Primary Display".

See also

Service and support (Page 159)

7.5.2 Removing a graphics card

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- You have made a note of the firmware settings because the firmware settings of the device can be deleted when the graphics card is removed.

You can find information on this in the firmware description of the device, see "Important instructions and manuals for operating the device (Page 10)".

Procedure

1. The graphics card is an expansion card.
Remove the graphics card.
Note the information under "Removing expansion cards (Page 80)".
2. Check the firmware settings.

7.6 Installing and removing drives in drive cages

7.6.1 Installation options for drives with drive cage type A

Number of drives per system and their mounting locations

You can install up to six drives at the following bays in the drive cage type A and on the side panel of the device.

Note

The 4 SATA connectors on the motherboard of the device support the use of 4 drives.

Note

Note the numbering of the mounting locations in the type A drive cage (Page 17).

Number of drives per system	Mounting location	Notes on installation options
1	Drive cage type A: <ul style="list-style-type: none"> Mounting location 0 	Drive cage; slots 0, 1, and 2: <ul style="list-style-type: none"> Drive cage type A (Page 17) 2.5" drive or 3.5" drive in removable tray (Page 95) Drive cage; slot 3: <ul style="list-style-type: none"> Drive cage type A (Page 17) 2.5" drive or 3.5" drive in the 5.25" mounting frame with removable tray (Page 102) 5.25" drive or 5.25" component (Page 108) Inside the device: <ul style="list-style-type: none"> 3.5" drive inside on the side panel of the device (Page 113)
2	Drive cage type A: <ul style="list-style-type: none"> Mounting location 0 Mounting location 1 	
3	Drive cage type A: <ul style="list-style-type: none"> Mounting location 0 Mounting location 1 Mounting location 2 	
4	Drive cage type A: <ul style="list-style-type: none"> Mounting location 0 Mounting location 1 Mounting location 2 	
	Drive cage type A: <ul style="list-style-type: none"> Mounting location 3 	

Number of drives per system	Mounting location	Notes on installation options
5 ¹	Drive cage type A: <ul style="list-style-type: none"> • Mounting location 0 • Mounting location 1 • Mounting location 2 	
	Drive cage type A: <ul style="list-style-type: none"> • Mounting location 3 	
	1 x internal in the device	
6 ¹	Drive cage type A: <ul style="list-style-type: none"> • Mounting location 0 • Mounting location 1 • Mounting location 2 	
	Drive cage type A: <ul style="list-style-type: none"> • Mounting location 3 	
	<ul style="list-style-type: none"> • 2 x internal in the device 	

¹ If more than 4 drives are used, an additional controller is required

7.6.2 Installation options for drives with drive cage type B

Note

If the device is permanently installed, mounted on telescopic rails or operated as tower, it can only be subjected to the vibration stresses during operation described in the following.

The restrictions do not apply to the use of SSD.

Number of drives per system and their mounting locations

You can install up to five drives in the drive cage type B and on the side panel of the device at the following mounting locations.

Note

Note the numbering of the mounting locations in the type B drive cage (Page 19).

Number of drives per system	Mounting location	Notes on installation options
1	Drive cage type B: • Mounting location 0	Drive cage; slots 0, 1, and 2: <ul style="list-style-type: none"> • Drive cage type B (Page 19) • 2.5" drive or 3.5" drive in assembly kit for 5.25" tray (Page 105) • 5.25" drive or 5.25" component (Page 108) Inside the device: <ul style="list-style-type: none"> • 3.5" drive inside on the side panel of the device (Page 113)
2	Drive cage type B: • Mounting location 0 • Mounting location 1	
3	Drive cage type B: • Mounting location 0 • Mounting location 1 • Mounting location 2	
4	Drive cage type B: • Mounting location 0 • Mounting location 1 • Mounting location 2	
	• 1 x internal in the device	
5 ¹	Drive cage type B: • Mounting location 0 • Mounting location 1 • Mounting location 2	
	2 x internal in the device	

¹ If more than 4 drives are used, an additional controller is required

Maximum vibration load for drives in the respective installation location

Note

If the device is permanently installed, mounted on telescopic rails or operated as a tower, it may only be exposed to the following vibration loads during operation.

The restrictions do not apply to the use of SSD.

Drives in drive cage type B

Drives in drive cage type B may be exposed to the following maximum vibration loads during operation:

- 10 ... 58 Hz: 0.015 mm
- 58 Hz to 500 Hz: 2 m/s²

Vibrations must not exceed 500 Hz.

7.6.3 Installation options for drives with drive cage type C

Installation options for drives in the drive cage type C

You can mount drives in the following combination on the drive bay plate of the drive cage type C:

- 1 x 3.5" HDD
- 2 x 3.5" HDDs
- 1 x 2.5" SSD
- 2 x 2.5" SSDs
- 1 x 3.5" HDD and 1 x 2.5" SSD

These drives are then built into the device and are not accessible from the outside.

- You can find information on the mounting locations under "Drive cage type C (Page 20)"
- You can find information on the procedure under "Installing a 2.5" drive or 3.5" drive in drive cage type C (Page 110)".

7.6.4 Drives in the removable tray

7.6.4.1 Changing a 2.5" drive or 3.5" drive in a removable tray

You can install 2.5" or 3.5" drives in the removable tray with drive cage type A.

You can find notes on the mounting locations here:

- "Drive cage type A (Page 17)"
- "Installation options for drives with drive cage type A (Page 91)"

Only use original spare parts or components approved for this device. You can find information on this under "Hardware accessories (Page 33)".

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".
- When changing a 3.5" drive (HDD): Screwdriver TORX T10
- When changing a 2.5" drive (SSD): Screwdriver TORX T8
- The device you wish to replace is inactive.

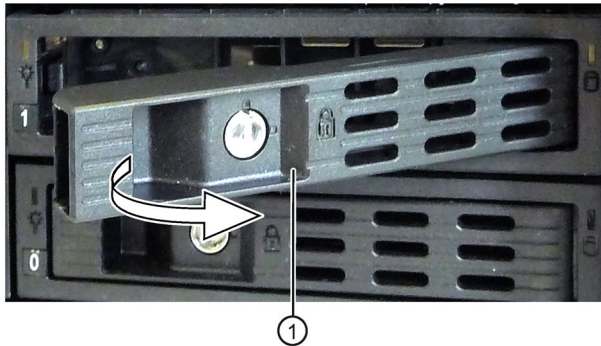
NOTICE
<p>Risk of damaging the drive and data loss</p> <p>Drives in removable trays cannot be replaced during operation (hot swap).</p> <p>When you remove the drive while data is being written to it, you may damage the drive and destroy data.</p> <ul style="list-style-type: none">• Only take out the removable tray when the device is switched off.

Procedure

1. Open the front door. (Page 74)
2. Open the lock of the removable tray with the appropriate key.



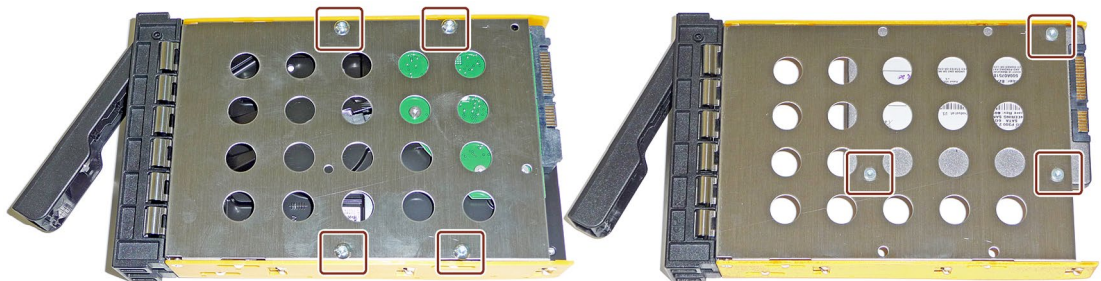
3. Reach into the notch ① in the bracket of the removable tray and pull out the bracket in the direction of the arrow up to a slight resistance.



The removable tray is pushed out of the drive cage by leverage.

4. Grip the removable tray from the front in the middle at the top and bottom and pull the removable tray completely out of the device.
5. Loosen the highlighted screws on the bottom of the removable tray and remove the drive.

The left figure shows as drive a 3.5" HDD, the right figure a 2.5" SSD.



6. Carefully insert the new drive into the removable tray.
Take care not to touch the contacts of the drive when you do this.
7. Fasten the new drive with the screws to the base of the removable tray.
Only use the original screws.
8. Carefully insert the removable tray into the drive cage of the device again.
9. Fold the tray bracket out of the removable tray as far as it will go and slide the removable tray fully into the drive cage.

Ensure that the removable tray fits tightly in the drive cage.

10. Close the tray bracket.
11. Lock the removable tray with the key.

Note

The removable tray must always be locked to ensure reliable operation of the devices with removable trays.

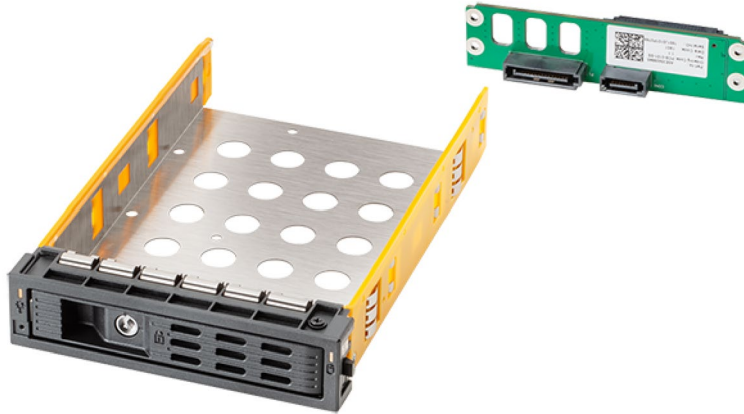
See also

Status displays on removable tray for drives (Page 31)

7.6.4.2 Removing a backplane for removable tray

The backplane of the removable tray is installed from inside at the back end of the drive cage type A and is equipped with interfaces for data cables to the motherboard.

This enables the convenient connection of the data cables from the motherboard to the drive in the removable tray at these interfaces.

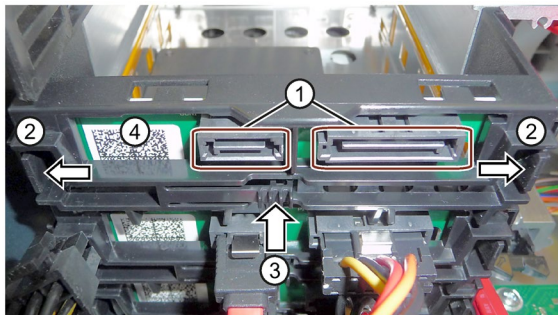


Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".

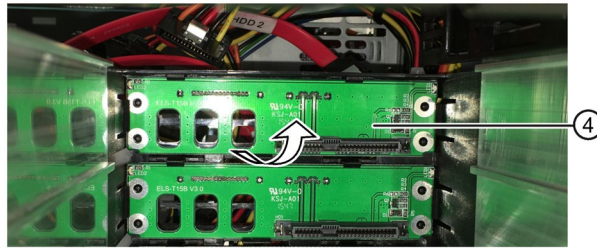
Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Pull out both plugs ①.



3. Unlatch the backplane by firmly pressing on the latches ② in the direction of the arrow and simultaneously pressing on the ejector ③.

4. Remove the unlatched backplane ④ from the brackets by turning it upwards and removing it from the drive cage.

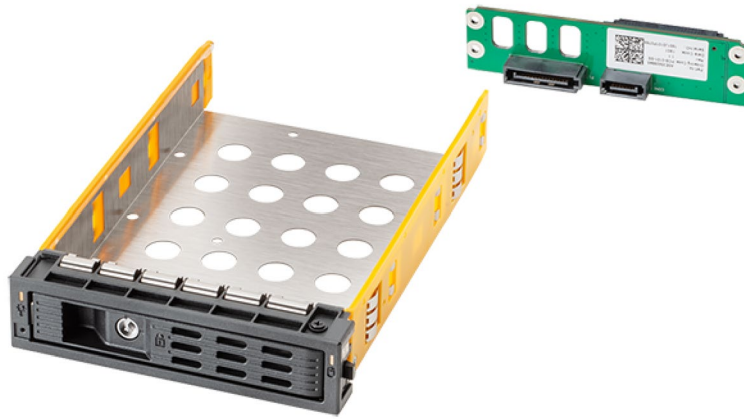


5. Close the device.

7.6.4.3 Installing a backplane for removable tray

The backplane of the removable tray is installed from inside at the back end of the drive cage type A and is equipped with interfaces for data cables to the motherboard.

This enables the convenient connection of the data cables from the motherboard to the drive in the removable tray at these interfaces.



Only use original spare parts or components approved for this device. You can find information on this under "Hardware accessories (Page 33)".

Requirement

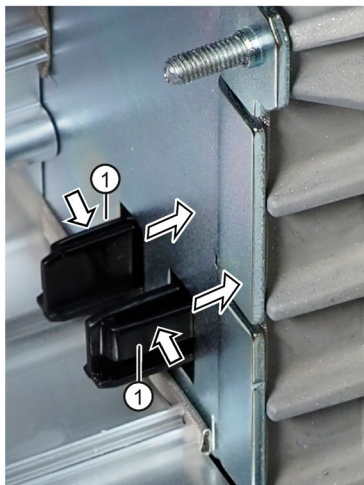
- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. First remove the cover ② located on the front of the type A drive cage to the left of the removable trays.

To do this, press the locks ① of the cover ② together inside the device and keep them pressed.

Then push the locks to the front in the direction of the arrow.

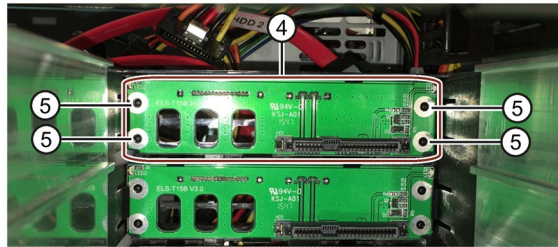


3. Remove the cover ② upwards at an angle at the front of the device.



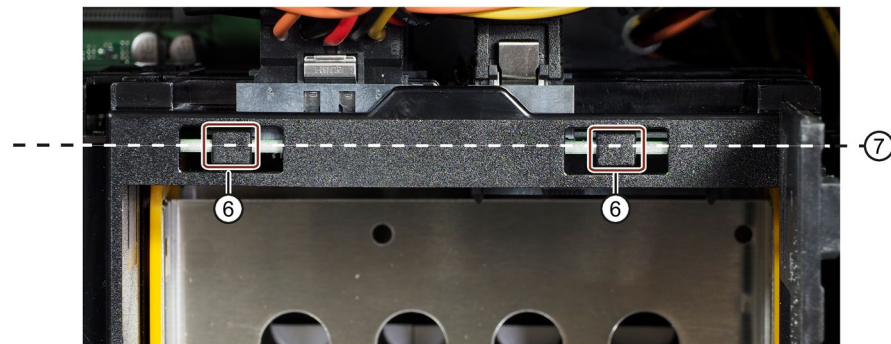
4. On the front of the drive cage, remove the cover ③, which may be located to the right of the cover ②.
5. Remove all existing removable trays until the drive cage is freely accessible.

6. At the appropriate position, insert the backplane ④ from the front into the drive cage and snap it into place at the back.



Check the following:

- The backplane lies flat at the back in the drive cage.
- All centering openings ⑤ of the backplane lie in the centering pins.
- The backplane is clipped in behind the latches ⑥.
- All backplanes lie exactly underneath each other, vertically aligned, when viewed from above ⑦.

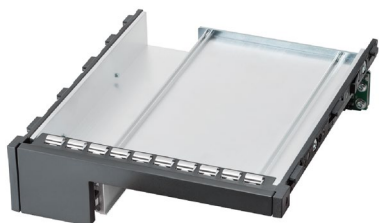


7. Replace the required covers or removable trays on the front of the type A drive cage.
8. Insert the cover ② into the front of the device.
9. At the backplane, connect the data cables with the corresponding interfaces on the motherboard.
10. Connect the power supply.
11. Close the device.

7.6.5 Drives in 5.25" slots of drive cages

7.6.5.1 2.5" drive or 3.5" drive in the 5.25" mounting frame with removable tray

You can install 2.5" or 3.5" drives in the 5.25" mounting frame for removable trays with drive cage type A.



5.25" mounting frame with removable tray

You can find information on the slot here:

- Drive cage type A (Page 17)
- Installation options for drives with drive cage type A (Page 91)

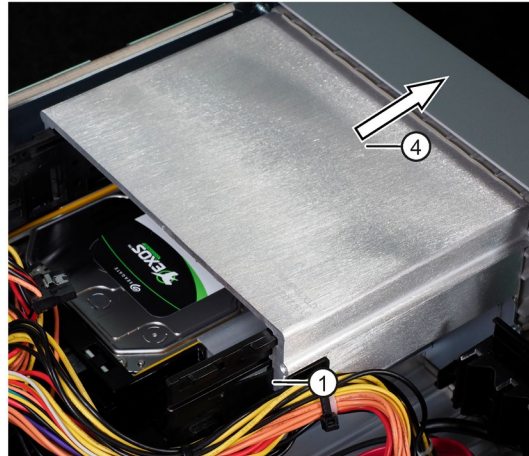
Only use original spare parts or components approved for this device. You can find information on this under "Hardware accessories (Page 33)".

Requirement

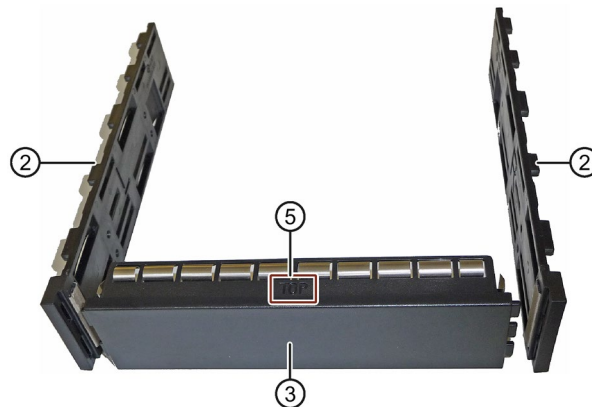
- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".
- Screwdriver TORX T10

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Remove the installed empty 5.25" component from the corresponding mounting location:
 - If available: Disconnect all data cables from the 5.25" component.
 - Press on the surfaces ① on the two side mounting bars ② of the 5.25" component.
 - Press and hold surface ① to push the 5.25" component forward out of the drive holder ④.



3. Remove the left and right mounting bars ② from the blanking plate ③.

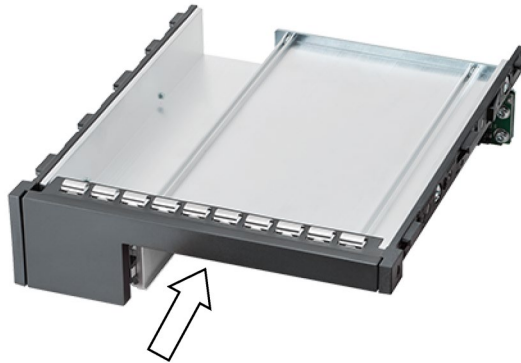


Note

Reinstalling an empty 5.25" component

The mounting rails are labeled with "L" and "R" and can be re-installed on the blanking plate in the same way if necessary. The top of the blanking plate ⑤ is also labeled.

- Slide the 5.25" mounting frame into the drive cage from the front.



- Connect the data cables to the 5.25" mounting frame.
- Carefully insert the removable tray into the 5.25" mounting frame.
- Fold the bracket out completely and slide the removable tray on the bracket completely into the 5.25" mounting frame.
- Make sure that the removable tray is firmly seated in the 5.25" mounting frame.
- Close the tray bracket.
- Lock the removable tray with the key.
- Close the device.
- Connect the power supply.

7.6.5.2 Changing a 2.5" or drive 3.5" drive in the assembly kit for a 5.25" tray

You can install 2.5" or 3.5" drives in an assembly kit for the 5.25" tray in the drive cage type A and drive cage type B.



Assembly kit HDD/SSD for 5.25" tray

In this assembly kit, the drive is shock and vibration dampened.

You can find notes on the mounting locations here:

- Drive cage type B (Page 19)
- Installation options for drives with drive cage type B (Page 93)

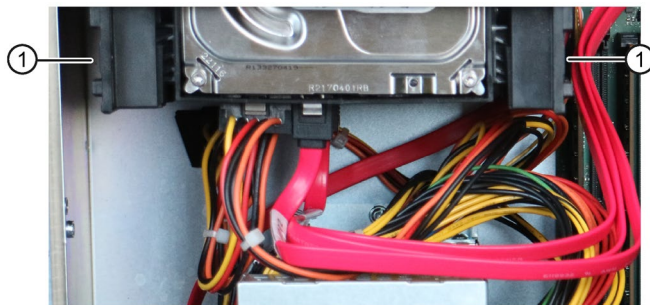
Only use original spare parts or components approved for this device. You can find information on this under "Hardware accessories (Page 33)".

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".
- When replacing a 3.5" HDD: Screwdriver TORX T10
- When replacing a 2.5" SSD: Screwdriver TORX T8

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Remove all power supply and data cables from the drive.
3. Press the sides against the surfaces ① of the drive mounting bars ②.



The assembly kit is unlocked.

4. Slide the assembly kit on the drive mounting bars ② forward out of the device and set it aside.



5. Remove the left and right drive mounting bars ② and the drive cover ③ from the drive.

Note:

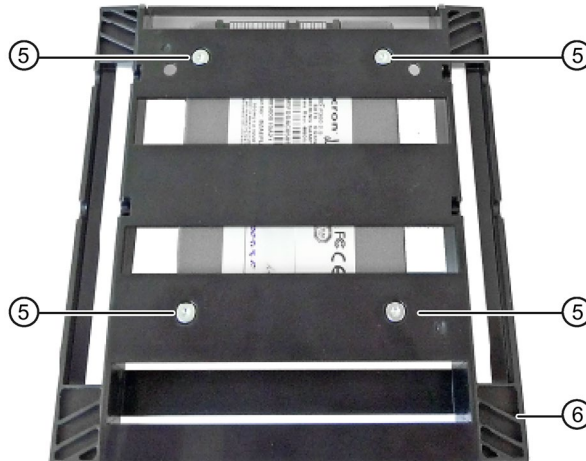
The drive cover is labeled "L" ④ and "TOP" ⑤.

The drive mounting bars are labeled "L" and "R" respectively.

6. Loosen the four screws ⑤ and remove the drive from the drive bay ⑥.



Drive cage with 3.5" HDD



Drive bay with 2.5" SSD

7. Install the new drive in the drive bay ⑥. Ensure that the new drive faces upwards.
8. Fasten the new drive using four screws ⑤.
Start at the hole marked with "1" on the drive bay.
9. Attach the left and right drive mounting bars ② on the drive bay ⑥.
10. Slide the drive bay evenly and without tilting 3/4 (not completely) into the guide rail of the drive cage.

11. Insert the drive cover ③ between the drive mounting bars ②. Ensure that the pins engage in the openings on the left and right ⑦.



12. Push the drive bay in fully and evenly until you hear it click into the drive cage.
13. Connect the power and data cables to the drive.
14. Close the device.

7.6.5.3 Installing a 5.25" drive or 5.25" component

You can install 5.25" drives or other 5.25" components in type A and type B drive cages.

You can find notes on the mounting locations here:

- Drive cage type A (Page 17)
- Installation options for drives with drive cage type A (Page 91)
- Drive cage type B (Page 19)
- Installation options for drives with drive cage type B (Page 93)

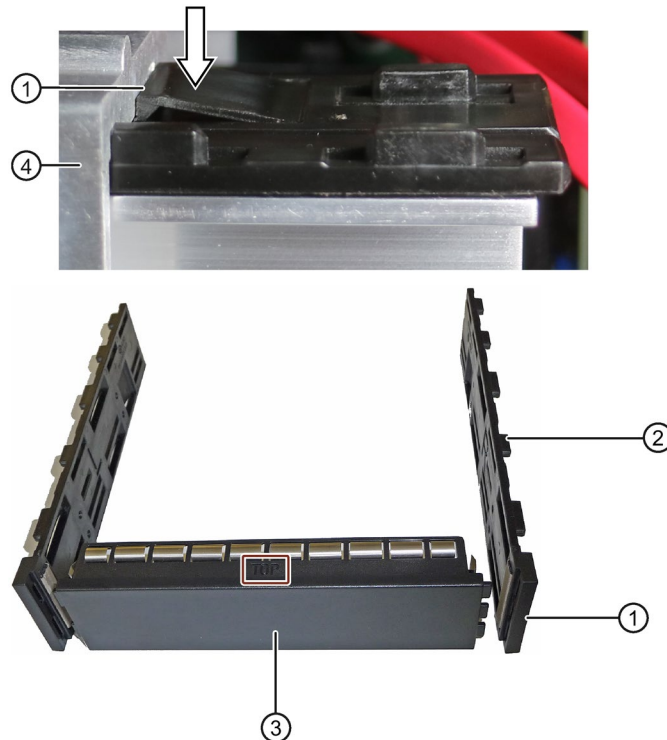
Only use original spare parts or components approved for this device. You can find information on this under "Hardware accessories (Page 33)".

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".
- Screwdriver TORX T10

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Remove the installed empty 5.25" component from the corresponding mounting location:
 - If available: Disconnect all data cables from the 5.25" component.
 - Press on the surfaces ① on the two side mounting bars ② of the 5.25" component.
 - Press and hold surface ① to push the 5.25" component forward out of the drive holder ④.



3. Remove the left and right mounting bars ② from the blanking plate ③.

Note

The mounting bars are labeled "L" and "R". The top of the blanking plate is also marked.

4. Screw the right and left drive mounting bars to the new drive.
Take care not to touch the contacts of the drive when you do this. The blanking plate is no longer required.
5. Slide the new drive with the drive mounting bars evenly backwards into the guide rails of the drive cage and without tilting, until it clicks into place.
6. Close the device.

7.6.6 Installing drives with drive cage type C

7.6.6.1 Installing a 2.5" drive or 3.5" drive in drive cage type C

You can install 2.5" or 3.5" drives on a drive bay plate for drive cage type C.

You can find information on the slot here:

- Installation options for drives with drive cage type C (Page 94)

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".
- When installing 3.5" HDDs: Screwdriver TORX T10
- When installing 2.5" SSDs: Screwdriver TORX T8

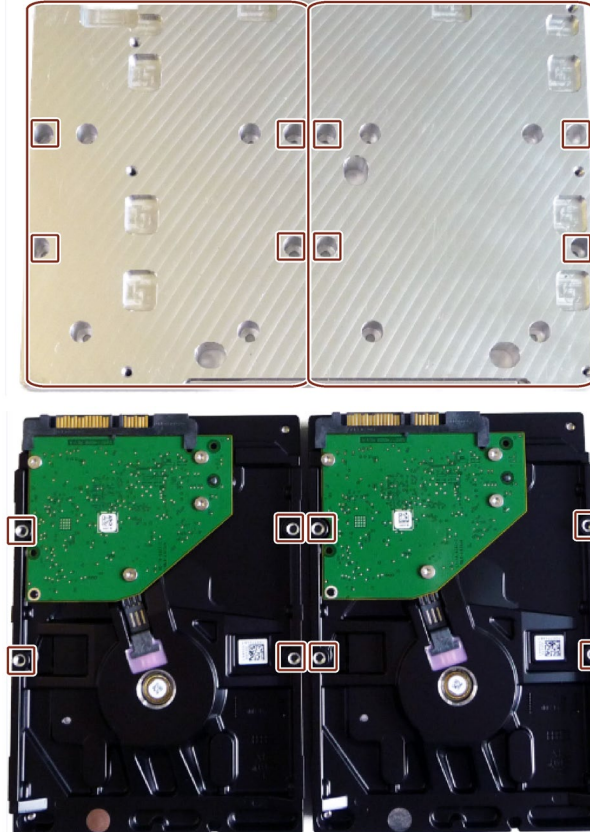
Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Remove the six screws for attaching or loosening the drive bay plate (see "Drive cage type C (Page 20)") while holding the drive bay plate from the inside so that it does not fall into the device when loosened.
3. Inside the device, remove the drive bay plate with the attached design cover.
4. Remove the design cover from the front of the drive bay plate.

5. Mount one or more drives on the rear of the drive bay plate. Note the holes:

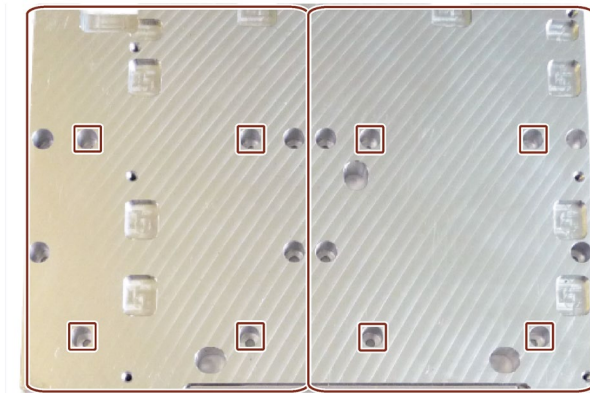
3.5" HDDs:

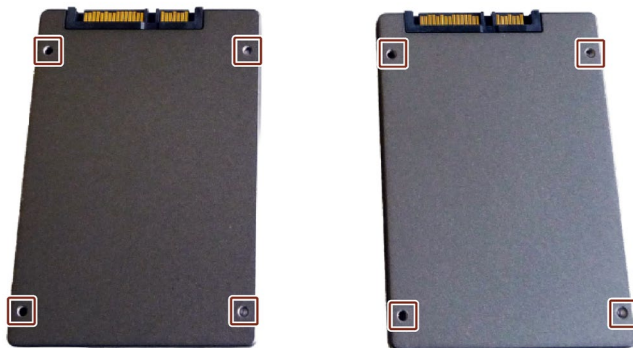
Holes on the front of the drive bay plate and on the HDDs



2.5" SSDs:

Holes on the front of the drive bay plate and on the SSDs





6. Mount the design cover back onto the drive bay plate.
7. Connect the data cables to the desired connector on the motherboard and on the drive.
8. Close the device.
9. Connect the power supply.

See also

Hardware accessories (Page 33)

7.7 Installing and removing drives in the device (only possible with standard enclosure)

7.7.1 Installing a 3.5" drive inside on the side panel of the device

On devices with a standard enclosure, you can install up to two 3.5" drives internally on the right side panel of the device (viewed from the front of the device).

You will need one drive bay plate per drive.

The drives are then built into the device and are not accessible from the outside.

Only use original spare parts or components approved for this device. You can find information on this under "Hardware accessories (Page 33)".

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".
- Screwdriver TORX T10

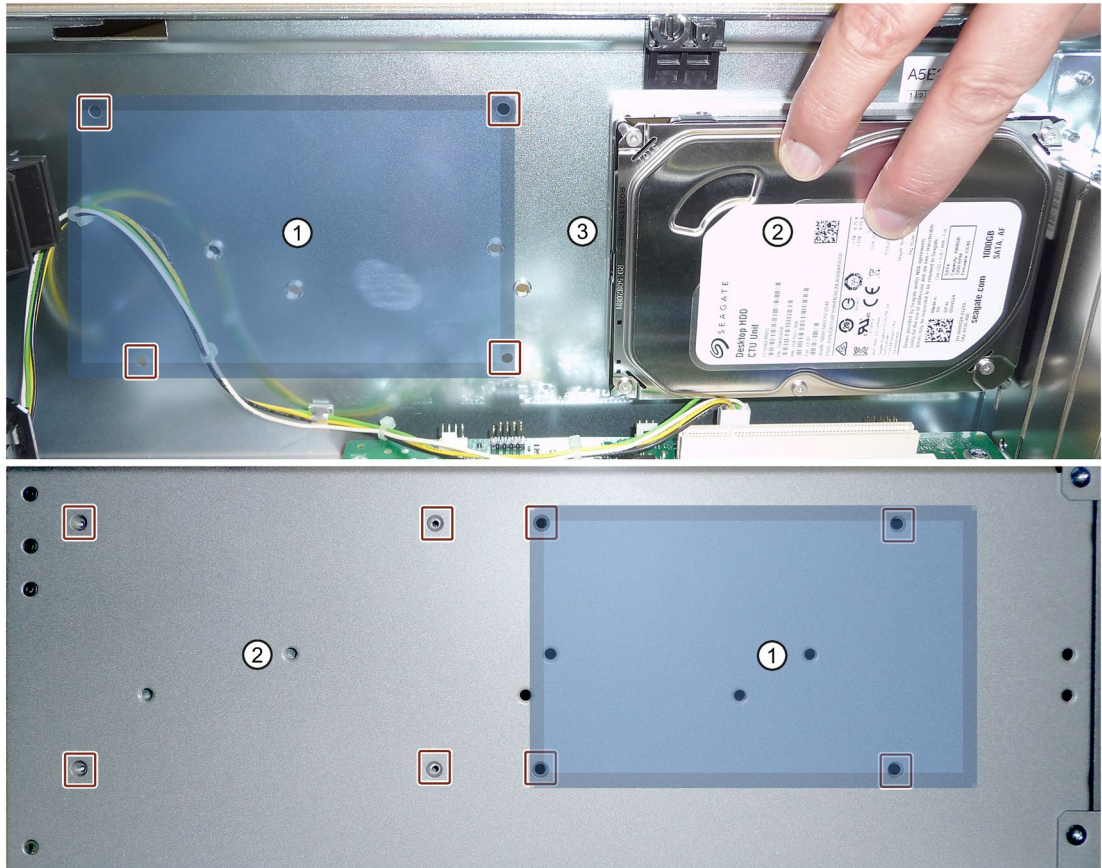
Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Screw the drive to the drive bay plate (available as option, not included in scope of delivery) at the marked holes.



7.7 Installing and removing drives in the device (only possible with standard enclosure)

3. From the outside, screw the drive bay plate to the inside of the side panel of the enclosure, to slot ① or the side panel of the device ②. The SATA connections each lie in the middle ③. The two figures below show the position of the mounting locations ① and ② from the inside (top figure) and from the outside (bottom figure), as well as the position of the SATA connections on the drive ③.



4. Connect the SATA cables to the SATA connectors of the motherboard (Page 151) and to the drive (③).
5. Close the device.
6. Connect the power supply unit.

Device maintenance and repair

8.1 Safety instructions for repairs

Danger from unauthorized or improperly performed repairs

 **WARNING**

Danger due to unauthorized opening of the device and improperly performed repairs

Improper procedures when performing repairs can lead to material damage to the device or the system.

If you cause defects in the device by installing or replacing system extensions, this can result in serious hazards for users of the device or system and the warranty may expire.

- For this reason, please observe the information in "Safety instructions on device and system extensions (Page 50)".

8.2 Maintenance intervals

To maintain high system availability, replace device components that are subject to wear as a preventive measure according to the recommended replacement intervals.

Component	Replacement interval
Drives	3 years
Backup battery	5 years
Fan	3 years
Filter mat of the fan (front fan)	Depending on the degree of soiling

8.3 Removing and installing hardware

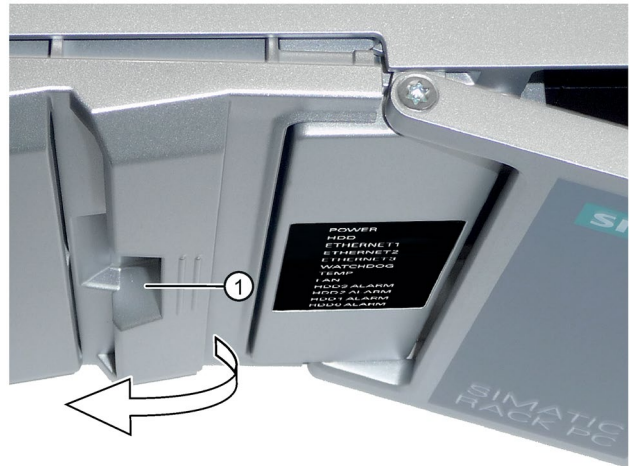
8.3.1 Front fan maintenance

8.3.1.1 Removing the fan cover from the front fan

Information on the position of the fan cover of the front fan is available under "Front panel (Page 15)".

Procedure

1. Open the front door (Page 74) to at least an angle of approx. 45°
2. Take hold of the recessed grip of the fan cover ①.
3. Open the fan cover in the direction of the arrow and remove it.



8.3.1.2 Changing the filter mat of the front fan

Replace or clean the filter mat of the front fan at regular intervals. You can find information on this under "Maintenance intervals (Page 115)".

Only use original spare parts or components approved for this device. You can find information on this under "Hardware accessories (Page 33)".

Procedure

1. Remove the fan cover (Page 116).
2. Remove the filter mat from the fan cover.
3. Insert the new filter mat loosely into the fan cover. Place the filter mat evenly in the fan cover.
4. Replace the fan cover.

8.3.1.3 Changing the front fan

A front fan is located on a fan support on the front of the device behind the fan cover.

Replace the front fan at regular intervals. You can find information on this under "Maintenance intervals (Page 115)".

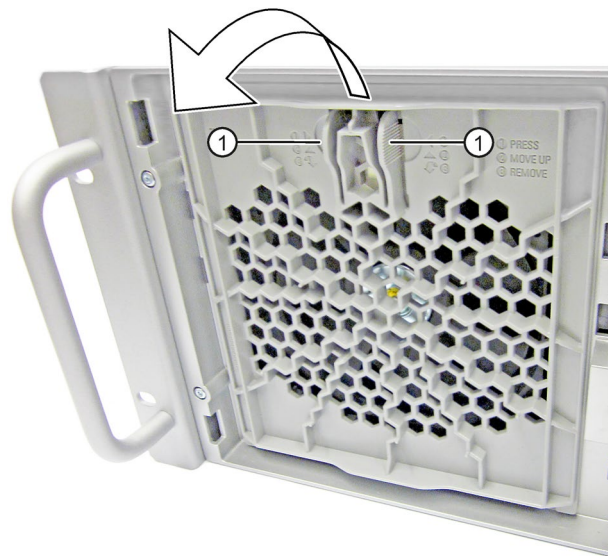
Only use original spare parts or components approved for this device. You can find information on this under "Hardware accessories (Page 33)".

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".

Procedure

1. Remove the front fan cover. (Page 116)
2. Press the locks ① together and keep them pressed.
3. Lift the fan support slightly upwards and remove it to the front from the front of the enclosure.

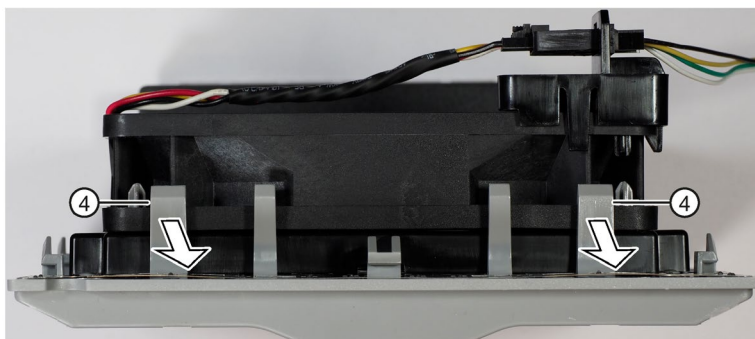


4. Put down the fan support with the openings facing down (fan is above).

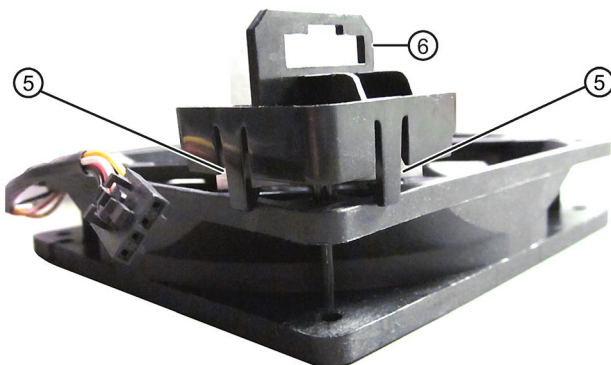
5. Press on the clip on the small fan cable plug connector ② and remove the connector from the larger adapter plug,



6. Press on the side of the clips ③ and loosen the adapter plug from the cable holder.
7. Release the locking latches ④ on the fan support at the rear and front in turn and remove the fan from the fan support.



8. Loosen the locking latches ⑤ of the holder for the adapter plugs ⑥ and remove the holder.



9. Take the new fan and place the holder for the adapter plug ⑥ on the new fan as seen in the figure and snap the holder into place.



10. Then place the new fan on the fan support.
Use the highlighted positions as a guide. Notch in fan support ⑦ and holder for adapter plug ⑥.
11. Snap the fan into place at the locking latches of the fan support ④.
12. Install the larger adapter plug in the holder for the adapter plug ⑥. Press on the side of the clips ③ of the larger adapter plug.
13. Insert the small fan cable connector ② in the larger adapter connector again.
14. Place the fan support with the new fan on the front of the device.
15. Replace the fan cover.

8.3.2 Changing the backup battery

Replace the backup battery in good time. See information under "Maintenance intervals (Page 115)".

Only use original spare parts, e.g. backup batteries of the same type (article number of lithium battery: A5E00369854 Type CR2032)

 **WARNING**

Risk of explosion and release of harmful substances

Before replacing the backup battery, take note of the important safety instructions regarding battery replacement under "General safety instructions (Page 38)".

Observe the local regulations when disposing of used batteries.

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- You have noted the firmware settings because the configuration data of the device may be deleted when the backup battery is replaced.

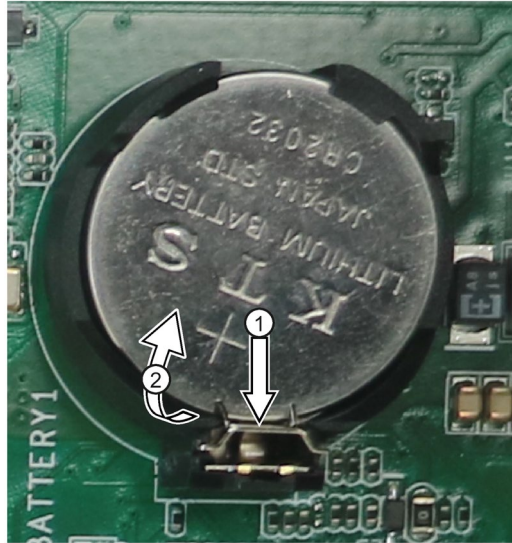
Information on the firmware settings can be found in the User Manual (UM) for the motherboard, see "Important instructions and manuals for operating the device (Page 10)".

- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Remove the expansion cards, if necessary, see "Removing expansion cards (Page 80)".

3. Press a thin, blunt object parallel to the battery on the area marked in the figure with ①.



The battery is unlocked and disengages from the socket.

4. Remove the battery from socket.
5. Insert the new battery into the socket with slight pressure and lock it into place.
6. Close the device.
7. Check the firmware settings.

8.3.3 Replacing the power supply unit 550 W

Only use original spare parts or components approved for this device. You can find more information under "Hardware accessories (Page 33)".

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".
- Screwdriver TORX T10
- Diagonal cutter

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Disconnect the power cables from the drives and the motherboard.
3. Remove the cable ties securing the power cables in the device.
4. Remove the four fixing screws that are marked in the figure below.



5. Pull the power supply unit upward and out of the device.
6. Install the power supply unit.
7. Secure the power supply unit with the screws shown.
8. Connect the cables to the drives and the motherboard.
9. Secure the power supply unit cables in the device again using cable ties.
10. Close the device.
11. Check the safe state of the device.
12. Switch on the power supply unit.

8.3.4 Replacing the processor

Only use original spare parts or components approved for this device. You can find information on this under "Hardware accessories (Page 33)".

NOTICE

Damage to the processor

If the CPU is operated with a higher clock frequency than permitted, it can be destroyed. This leads to data loss.

- Operate the processor only at a clock frequency that is equal to or less than the permitted clock frequency.
- You should therefore only install an approved processor.

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".
- Crosshead screwdriver Philips PH1

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Remove the heat sink of the processor.
3. Lift the release lever ④ and release the processor bracket ①.
4. Carefully lift the release lever ④ upwards. When doing so, ensure that you do not let go of the release lever.

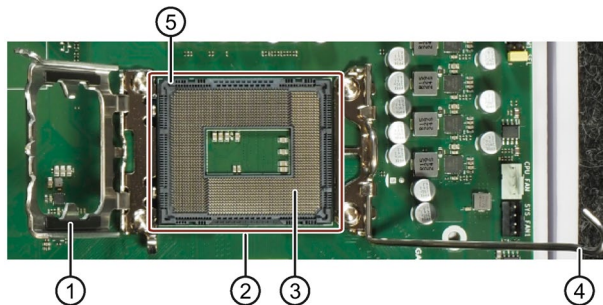


Illustration of processor socket without processor

- Carefully remove the processor.

Note

The contact springs ③ of the processor socket ② are very sensitive.

Take care not to damage these contact springs both when removing and inserting the processor.

Always touch the contact springs with the contact side of the processor only flat.

- Place the new processor in the processor socket.

Pay attention to the correct positioning of the processor in the processor socket at the points marked in red in the following figure.

Insert the processor so that the arrow ⑥ on one corner of the processor is positioned at the location marked with the number ⑤ in the previous figure.



- Apply sufficient thermal paste to the new processor.
- Fold the processor bracket ① down again at the release lever ④ and lock the release lever so that the processor bracket is firmly closed.
- Reinstall the processor heat sink.
- Close the device.

8.3.5 Replacing the motherboard

Only use original spare parts or components approved for this device. You can find information on this under- "Hardware accessories (Page 33)".

The motherboard is supplied as a spare part without a processor and without memory modules.

Requirement

- You are familiar with the important safety instructions under "Safety instructions on device and system extensions (Page 50)".
- You have noted the firmware settings because the configuration data of the device are deleted when the motherboard is replaced.

Information on the firmware settings can be found in the User Manual (UM) for the motherboard, see "Important instructions and manuals for operating the device (Page 10)".

- The device is fully disconnected from the mains voltage, see "Switching off the device (Page 72)".
- Screwdriver TORX T10

Procedure

1. Open the device. See the notes under "Open the device (Page 77)".
2. Remove the expansion cards from the slots. (Page 80)
3. Slide installed 5.25" components forward.
4. Note the assignment of all cables to the motherboard.
5. Disconnect all cables from the motherboard.
6. Remove the processor as described under "Replacing the processor (Page 123)".
7. Unscrew the 11 screws securing the motherboard in the device. You can find information on the location of the screws under "Layout of the motherboard (Page 151)".
8. Remove the motherboard.
9. Carefully insert the new motherboard into the device and fasten the motherboard with the screws.
10. Mount the processor as described under "Replacing the processor (Page 123)".
The processor bracket of the new motherboard contains a plastic cover to protect the contact springs. This is released when the processor bracket is opened for the first time.
11. Reconnect all cables to the corresponding points.
12. Put the 5.25" components back in the correct position.
13. Reinsert all previously removed expansion cards into their slots.
14. Close the device.
15. Reconnect the device to the mains voltage and switch on the device.
16. Update the firmware settings to match the new motherboard version.

8.4 Installing the operating system, software, and driver

8.4.1 Restoring the operating system and partitions with the SIMATIC IPC USB flash drive

For information on restoring the operating system you ordered with the device in the detailed description of the operating system, see "Important instructions and manuals for operating the device (Page 10)".

8.4.2 Installing software and drivers

Requirement

- All files for installing software and drivers are on a bootable USB flash drive.
The following methods can be used to obtain a bootable USB flash drive containing these files:
 - You have ordered a bootable USB flash drive to accompany the delivery of the device.
 - You create this bootable USB flash drive yourself.

Creating a bootable USB flash drive yourself

Requirement

You know the serial number and article number of the device for which you want to install software or drivers. You can find information on this under "Device identification data (Page 56)".

1. On the Internet, go to "Online Service Delivery Portal (<https://www.automation.siemens.com/swdl/register/ipc>)".
2. Log in with your credentials or register.
3. Enter the serial number and article number of the device for which you want to install software or drivers.
4. Download the ISO file appropriate for your device locally.
5. Follow the instructions to create a bootable USB flash drive. For instructions on how to do this, see "Important instructions and manuals for operating the device (Page 10)".

Installing software and drivers from the bootable USB flash drive

1. In the firmware settings, set the device to boot from the USB flash drive at the next startup.
2. You can find information on this in the user manual for the motherboard. See "Important instructions and manuals for operating the device (Page 10)".
3. Insert the provided USB stick into the device.
4. Run the file "START_DocuAndDrivers.CMD".
The "Documentation and Drivers" suite opens.
5. Install the required components.

8.5 Configuring firmware/BIOS

Information on the firmware settings can be found in the User Manual (UM) for the motherboard, see "Important instructions and manuals for operating the device (Page 10)".

Note

Assign a BIOS password

Assign a "User Password" in the "Security" menu immediately after opening the BIOS-Setup. You can find information on this in the User Manual (UM) for the motherboard.

Note

If your device no longer boots, for example, after operating system crash during a firmware update, contact your local SIEMENS contact person.

8.6 Recycling and disposal

The devices described in these operating instructions can be recycled thanks to their low level of pollutants. Contact a certified disposal service company for electronic scrap for environmentally sound recycling and disposal of your old device, and dispose of it according to the relevant regulations in your country.

Technical specifications

9.1 Applicability of technical specifications

Note

The following technical specifications only apply under the following conditions:

- The device is in good working order.
- The fan cover and filter mat are installed.
- The device is closed.
- The connected I/O devices meet the requirements for the respective area of application (interference emission according to EN 61000-6-3 / IEC 61000-6-3, immunity to interference according to EN 61000-6-2 / IEC 61000-6-2).

9.2 General technical specifications

See the note in "Applicability of technical specifications (Page 128)".

	Device with standard enclosure	Device with short enclosure
Article number	6AG4103-6...-.... (for details, refer to the ordering documentation)	
Dimensions	481.4 x 176.6 x 446.6 (W x H x D in mm)	481.4 x 176.6 x 356.6 (W x H x D in mm)
	Detailed dimensional specifications can be found in "Dimension drawings of the device (Page 140)".	
Weight	15 up to 23 kg; depending on the equipment	
Supply voltage (U _N ; AC)	Power supply unit 550 W; AC: <ul style="list-style-type: none"> • 100 V to 240 V AC (-15%; +10%) 	
Transient overvoltages	Device is designed for connection to supply with overvoltage category II (Transient overvoltages up to 2500 V)	
Input current	550 W power supply unit: <ul style="list-style-type: none"> • Continuous current at 100 V: ≤ 8 A • Continuous current at 230 V: ≤ 4 A • At startup ≤ 80 A for 3.6 ms 	
	<p>Information on the dimensioning of fuses in higher-level system circuits</p> <p>A fuse that is designed for the following tripping current is integrated in the power supply unit of the IPC.</p> <ul style="list-style-type: none"> • Typical 6.3 A (for power supply unit 550 W) <p>The pulse currents during startup are also taken into account by the "time lag" type. In the case of a fault, this fuse ensures the correct disconnection of the device from the power supply system.</p> <p>If you connect additional devices to the higher-level power supply circuit, use the following fuses:</p> <ul style="list-style-type: none"> • > 6.3 A (with 550 W power supply unit). <p>The tripping characteristic of the higher-level protection must take into account the starting currents of both the IPC and the other devices.</p>	

	Device with standard enclosure	Device with short enclosure
Frequency of the supply voltage	50 to 60 Hz, min. 47 Hz to max. 63 Hz, sinusoidal	
Transient voltage interruption	Power supply unit 550 W: 20 ms for 300 W ≤ 10 events/h; recovery time ≥ 1 s	
Power consumption	Power supply unit 550 W, with maximum configuration and 300 W secondary: • ≤ 260 W; with 90% efficiency	
Power loss, heat emission	Power supply unit 550 W: • 260 W = 260 J/s = 0.25 BTU/s	
Current output (DC)	Power supply unit 550 W: • +5 V/22 A; +3.3 V/25 A; 150 W are permitted in total • +12 V ₁ /26 A; +12 V ₂ /15 A • -12 V/0.1 A; +5 V _{aux} /2 A The total sum of all voltages is a maximum of 300 W.	
Noise emission	<ul style="list-style-type: none"> • < 55 dB(A) at 25 °C according to EN ISO 7779 All drives in operation, CPU with heavy load • < 45 dB(A) at 25 °C according to EN ISO 7779 All drives in operation, CPU with low load • < 35 dB(A) at 25 °C according to EN ISO 7779 Fan profile silent, idle desktop, drives are not active 	
Pollution degree	Device is designed for environments with pollution degree 2	
Degree of protection ¹	<ul style="list-style-type: none"> • IP 30 (front) with closed front door • IP 20 on the rear according to EN 60529 	
Dust protection	With front door closed: Filter class G2 EN 779; particles > 0.5 mm are 99% retained	
Safety		
Protection class ¹	Protection class I compliant with IEC 61140	
Safety regulations	<ul style="list-style-type: none"> • IEC 61010-2-201 • EN 61010-2-201 • UL 61010-2-201 • CAN/CSA C22.2 No 61010-2-201 	

¹ not evaluated by UL

See also

Safety instructions on ambient and environmental conditions (Page 46)

9.3 Current and power consumption and power supply unit

9.3.1 Current and power requirements of the system components

See the note in "Applicability of technical specifications (Page 128)".

Maximum current values

Component	Voltage					
	+3.3 V	+5 V	+12 V ₁	+12 V ₂	-12 V	5 V _{aux}
Motherboard Core i3 / i5 / i7 CPU with cooling ¹	0.7 A	4.5 A	1.3 A	6.0 A	0 A	0.5 A
SSD SATA (typical)		0.8 A				
Hard disk drive ¹ SATA (typical values)		0.6 A	0.3 A			
Internal fan			0.25 A			
Graphics card: NVIDIA T400	3.1 A		1.7 A			
Individual currents, max. permissible, Power supply unit 550 W	25 A ²	22 A ²	26 A	15 A	0.1 A	2.0 A ³
Total power, permissible, Power supply unit 550 W, (at 40 °C ambient temperature)	300 W					
Efficiency of the 550 W power supply unit ¹	Ca. 88% (230 V; AC) / ca. 88% (120 V; AC)					

¹ Depends on the selected device configuration

² The total sum of the +5 V and +3.3 V supply must not exceed 150 W for the 550 W power supply unit.

³ 2.5 A for 10 seconds

Typical power values

Component	Current consumption (U = 230 V; AC)	Power consumption
Basic device Core i3 / i5 / i7	0.55 A	127 W
1 × hard disk drive SATA	0.03 A	7.3 W
2 × hard disk drives SATA	0.07 A	14.7 W
3 × hard disk drives SATA	0.1 A	22.0 W
1 × SSD 2.5" drive SATA	0.02 A	3.6 W
Graphics card: NVIDIA T400	0.14 A	33.0 W

9.3.2 Technical specifications of the 550 W power supply unit

See the note in "Applicability of technical specifications (Page 128)".

Output voltage and maximum current

Voltage	Maximum current	Voltage stability
+12 V1	26 A	± 5%
+12 V2	15 A	± 5%
-12 V	0.1 A	± 10%
+5 V	22 A ¹	± 5%
+3.3 V	25 A ¹	± 5%
+5 V _{aux}	2 A	+5%, -3%

¹ The total output of the +5 V and +3.3 V voltage must be ≤ 150 W.

The total output of all voltages is max. 550 W.

9.4 Electromagnetic compatibility

See the note in "Applicability of technical specifications (Page 128)".

Interference emission	EN 61000-6-3; EN 61000-6-4; CISPR 32, EN 55032 Class B; FCC Class A; KS C 9832 EN 61000-3-2 class D, EN 61000-3-3
Immunity to interference	EN 61000-6-1; EN 61000-6-2; EN 55035; KS C 9835
Interference immunity on power lines	± 2 kV; according to IEC 61000-4-4; burst ± 1 kV; according to IEC 61000-4-5; surge symm ± 2 kV; according to IEC 61000-4-5; surge symm
Noise immunity on signal lines	± 2 kV; according to IEC 61000-4-4; burst; length > 30 m ± 1 kV; according to IEC 61000-4-4; burst; length < 30 m ± 2 kV; according to IEC 61000-4-5; burst; length > 30 m
Immunity to discharges of static electricity	± 4 kV contact discharge (according to IEC 61000-4-2) ± 8 kV air discharge; (according to IEC 61000-4-2)
Immunity to RF interference	<ul style="list-style-type: none"> • 10 V/m; 80 up to 2700 MHz 80% AM to IEC 61000-4-3 • 3 V/m; 2.7 to 6 GHz 80% AM to IEC 61000-4-3 • 10 V; 10 kHz up to 80 MHz 80% AM to IEC 61000-4-6
Immunity to magnetic fields	30 A/m; 50 Hz; 60 Hz (according to IEC 61000-4-8)

9.5 Climatic and mechanical environmental conditions

See the note in "Applicability of technical specifications (Page 128)".

Climatic ambient conditions	
Temperature	Tested according to IEC 60068-2-2; IEC 60068-2-1; IEC 60068-2-14
Operation	+0 °C to +40 °C Gradient: ≤ 10 K/h; no condensation The maximum permitted power loss of the expansion cards with a 550 W power supply unit is: 80 W This information relates exclusively to the additional power loss of the expansion cards.
Storage/transport	−20 °C up to +60 °C Gradient: ≤ 20 K/h; no condensation
Relative humidity	Tested according to IEC 60068-2-78; IEC 60068-2-30
Operation	0 to 31 °C: 5–85 %; decreasing linearly to 5–50 % at 40 °C
Storage/transport	5% up to 95% at 25 °C to 55 °C; no condensation Gradient: ≤ 20 K/h; no condensation
Atmospheric pressure	
Operation	1080 up to 689 hPa, corresponds to an altitude of −1000 m to 3000 m
Storage/transport	1080 up to 660 hPa, Corresponds to an altitude of -1000 m to 3500 m
Mechanical ambient conditions	
Vibration	Tested according to IEC 60068-2-6; 10 cycles
Operation ¹	20 to 58 Hz, Amplitude 0.015 mm; 58 to 200 Hz: 2 m/s ²
Storage/transport	5 up to 8.51 Hz; amplitude 3.5 mm; 8.51 up to 500 Hz: 9.8 m/s ²
Resistance to shock	Tested in accordance with IEC 60068-2-27
Operation ¹	Half-sine; 9.8 m/s ² ; 20 ms; 100 shocks per axis
Storage/transport	Half-sine; 250 m/s ² ; 6 ms; 1000 shocks per axis
Special features	
Quality assurance	In accordance with ISO 9001

- ¹ The device must be free of any mechanical faults when disk drives are installed in the removable trays.

See also

Installation options for drives with drive cage type C (Page 94)

9.6 Technical specifications of the drives

See the note in "Applicability of technical specifications (Page 128)".

Information on the drives is available in your order documents.

Maximum number	4 (depending on the selected configuration) <ul style="list-style-type: none"> 4 SATA ports: HDD / SSD
HDD	HDD types (Native Command Queuing is supported): <ul style="list-style-type: none"> 3.5" SATA; 6 GB/s; 7200 rpm; 2000 GB
SSD	SSD types (flash memory): <ul style="list-style-type: none"> 2.5" SATA, 6 GB/s; 480 GB 2.5" SATA, 6 GB/s; 960 GB

* You can find the maximum theoretical data rate of a PCIe lane in the technical specifications of the device

9.7 Technical specifications of the motherboard

9.7.1 General technical specifications of the motherboard

See the note in "Applicability of technical specifications (Page 128)".

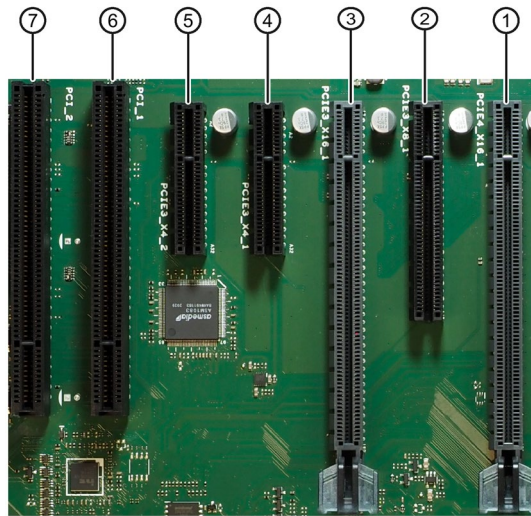
Chipset	Intel® H610 PCH
Processor	<ul style="list-style-type: none"> Core i3-12100E 4C(4P)/8T, 3.2 (4.2) GHz, 12 MB cache Core i5-12500E 6C(6P)/12T, 2.9 (4.5) GHz, 18 MB cache Core i7-12700E 12C(8P+4E)/20T, 2.1 (4.8) GHz, 25 MB cache
RAID (on-board)	-
Slots for memory modules	2 x DIMM sockets for DDR5 4800 MHz, expandable to 64 GB
Main memory	8 to 64 GB, DDR5

See also

Technical specifications of the expansion card slots (Page 134)

9.7.2 Technical specifications of the expansion card slots

Slots for expansion cards on the motherboard



Technical specifications of the slots

Slot Number on the enclosure	Designation on the motherboard	Specification	Maximum current consumption
①	PCIE4_X16_1	PCIe x16¹ <ul style="list-style-type: none"> Gen. 4 Active lanes: 16 	<ul style="list-style-type: none"> 3.3 V; 3 A 12 V; 5.5 A 3.3 V_{aux}; 0.4 A Power loss of the slot, permitted: ≤ 75 W
②	PCIE3_X8_1	PCIe x8² <ul style="list-style-type: none"> Gen. 3 Active lanes: 1 Open slot 	<ul style="list-style-type: none"> 3.3 V; 3 A 12 V; 2.1 A 3.3 V_{aux}; 0.4 A Power loss per slot, permitted: ≤ 25 W
③	PCIE3_X16_1	PCIe x16² <ul style="list-style-type: none"> Gen. 3 Active lanes: 2 	
④	PCIE3_X4_1	PCIe x4² <ul style="list-style-type: none"> Gen. 3 Active lanes: 1 Open slot 	

Slot Number on the enclosure	Designation on the motherboard	Specification	Maximum current consumption
⑤	PCIE3_X4_2	PCIe x4² <ul style="list-style-type: none"> • Gen. 3 • Active lanes: 2 • Open slot 	
⑥	PCI_1	PCI <ul style="list-style-type: none"> • Rev. 2.3 • PCI bus primary 	<ul style="list-style-type: none"> • 5 V; 5 A or 3.3 V; 7 A • 12 V; 0.5 A • 12 V; 0.05 A • 3.3 V_{aux}; 0.2 A Power loss per slot, permitted: ≤ 25 W
⑦	PCI_2	PCI <ul style="list-style-type: none"> • Rev. 2.3 • PCI bus primary 	

¹ PCIe bus CPU

² PCIe bus PCH

Note

In sum, the current for 3.3 V_{aux} must not exceed 1.2 A.

See also

Layout of the motherboard (Page 151)

9.8 Technical specifications of graphic

See the note in "Applicability of technical specifications (Page 128)".

Technical specifications of the integrated graphics interfaces

Graphics controller	<ul style="list-style-type: none"> • Intel® UHD Graphics 730 integrated in processor: <ul style="list-style-type: none"> – Core i3-12100E • Intel® UHD Graphics 770 integrated in processor: <ul style="list-style-type: none"> – Core i5-12500E – Core i7-12700E
Graphics memory	Dynamic Video Memory Technology, uses at least 64 MB in main memory
Resolutions/frequencies/colors	<ul style="list-style-type: none"> • DVI: 1920 × 1200 at 60 Hz; 32-bit color depth • DisplayPort: 4096 × 2304 at 60 Hz; 32-bit color depth • VGA (via DP-VGA adapter): 2560 × 1600 at 60 Hz; 32-bit color depth

Technical specifications of the NVIDIA T400 graphics card

PCIe x16; triple head

You can find information on connection options for monitors with adapters under "Hardware accessories (Page 33)".

- Type: NVIDIA T400, 4 GB graphics memory
- Maximum resolution without adapter:
 - 3x Mini DisplayPort
4096 × 2160 at 60 Hz; 32-bit color depth
 - 1x Mini DisplayPort
5120 × 2880 at 60 Hz; 32-bit color depth
- Maximum resolution with adapter:
 - up to 3x DisplayPort:
4096 × 2160 at 60 Hz; 32-bit color depth
 - 1x DisplayPort:
5120 × 2880 at 60 Hz; 32-bit color depth
 - up to 3x DVI:
1920 × 1200 at 60 Hz; 32-bit color depth
 - up to 3x VGA:
2048 × 1536 at 60 Hz; 32-bit color depth

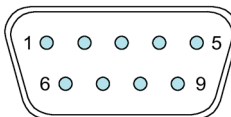
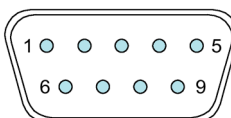
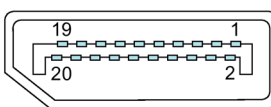
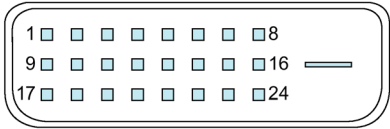
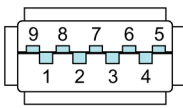
9.9 Technical specifications of the connections

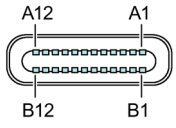
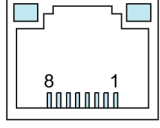
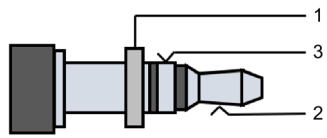
9.9.1 Technical specifications of the connections on the device

See the note in "Applicability of technical specifications (Page 128)".

Note

Detailed information on the position of the connections is available in "Device ports (Page 23)".

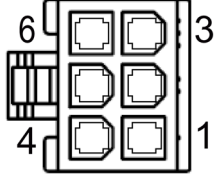
Connection socket	Description	Assignment
COM1	<p>COM:</p> <ul style="list-style-type: none"> Serial interface (RS232/422/485) D-sub socket connector V.24 	 <p>9-pin (±12 V)</p>
COM2 COM3	<p>COM:</p> <ul style="list-style-type: none"> Serial interface (standard: RS-232) D-sub socket connector V.24 	 <p>9-pin (±12 V)</p>
DP	<p>DisplayPort (labeling on the device: DPP)</p> <p>An analog monitor can be used with an adapter cable (optional).</p> <ul style="list-style-type: none"> Connection for monitors with DisplayPort connector Connection for monitors with VGA connector via DP-VGA adapter, See Hardware accessories (Page 33) Connection for monitors with DVI connector via DP-DVI-D adapter, See Hardware accessories (Page 33) 	 <p>20-pin (3.3 V; 500 mA)</p>
DVI-D	<p>DVI-D:</p> <ul style="list-style-type: none"> Connection for monitors with DVI-D connector <p>Monitors with a DVI-D connector can also be connected to the DPP connection socket using an adapter.</p>	 <p>24-pin (5 V; 500 mA)</p>
USB Type A	<p>USB Type A:</p> <ul style="list-style-type: none"> High-current 	 <p>5 V</p>

Connection socket	Description	Assignment
USB Type C	USB Type C: <ul style="list-style-type: none"> High-current 	 <p>5 V; 1.5 A; up to 10 Gbps</p>
LAN 1	Intel® I219-V <ul style="list-style-type: none"> Connection for Ethernet with RJ45 plug The LAN ports are numbered on the enclosure. The numbering by the operating system may differ from this. Data transmission rate: 10/100/1000 Mbps Wake on LAN, remote boot 	 <p>8-pin RJ45 (up to 1 Gbps)</p>
LAN 2	Intel® I210-AT <ul style="list-style-type: none"> Connection for Ethernet with RJ45 plug The LAN ports are numbered on the enclosure. The numbering by the operating system may differ from this. Data transmission rate: 10/100/1000 Mbps Wake on LAN, remote boot 	
Audio	<ul style="list-style-type: none"> Connection for 3.5 mm audio stereo jack: Realtek ALC887, 8-channel DAC support <ul style="list-style-type: none"> Line IN (light blue) Headphone OUT (lime) (max. 2 W at 4 Ω) Microphone IN (pink) 	 <p>1: Ground 2: Audio links 3: Audio right</p>

9.9.2 Technical specifications of the connectors for the power supply of graphics cards

See the note in "Applicability of technical specifications (Page 128)".

6-pin connector for graphics cards

Description	Assignment
Connector on the wiring harness of the 550 W power supply unit	1 = +12 V 2 = +12 V 3 = +12 V 4 = GND 5 = GND 6 = GND 

9.10 Technical specifications of the telescopic rails

Ultimate load per pair	≥ 30 kg
Full extraction length	≥ 470 mm
Rail thickness	≤ 9.7 mm
Mounting screws	M5 x 6 mm The mounting screws of the telescopic rails may not protrude by more than 5 mm into the enclosure.

See also

Dimension drawings for drill holes for telescopic rails (Page 145)

9.11 Technical specifications of the operating systems

Depending on the device configuration ordered, the device comes with or **without** the following operating system.

- Microsoft® Windows® 10
 - Microsoft® Windows® 10 IoT Enterprise 2021 LTSC, 64-bit, Multi-Language*

*Multi-Language User Interface (MUI): 6 languages (English, German, French, Spanish, Italian, Chinese)

You can find information on ordered Microsoft® Windows® operating systems under: Important instructions and manuals for operating the device (Page 10).

Boot mode and partitions in the delivery state

Delivery state for Windows® 10

Windows® 10 operating systems boots in UEFI mode in the delivery state.

The following table lists the partitioning for data storage media in GPT mode:

Partition				Memory capacity					
Partition	Name	Letter of the drive	File system	≥ 64 GB	≥ 128 GB	≥ 256 GB	≥ 512 GB	≥ 1000 GB	≥ 2000 GB
System	Boot	-	FAT32	260 MB	260 MB	260 MB	260 MB	260 MB	260 MB
Windows	System	C:	FAT32 or NTFS	40 GB	60 GB	120 GB	240 GB	300 GB	400 GB
Data	Data	D:	NTFS	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder

Dimension drawings

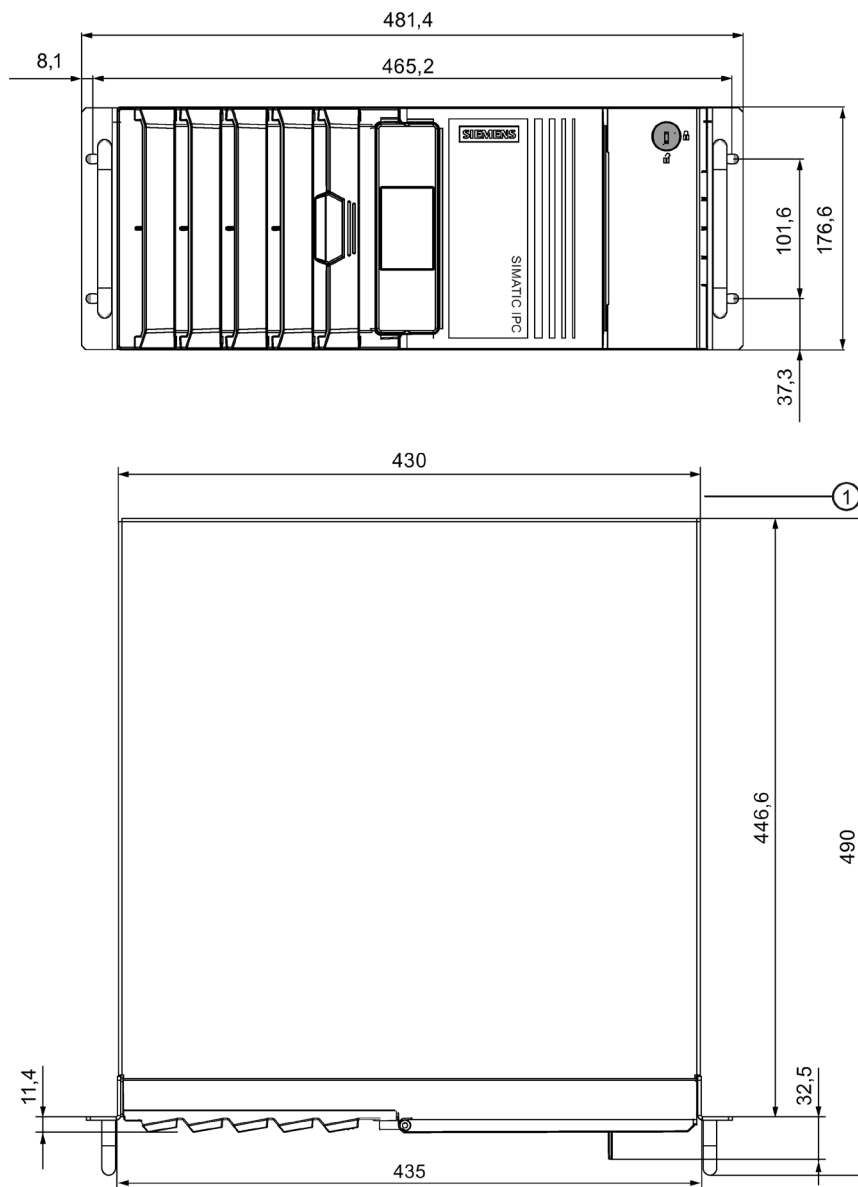
10.1 Dimension drawings of the device

10.1.1 Dimension drawing of the device (standard enclosure)

Note

IEC60297_3_100

The system meets the requirements for 4 U according to IEC60297_3_100.

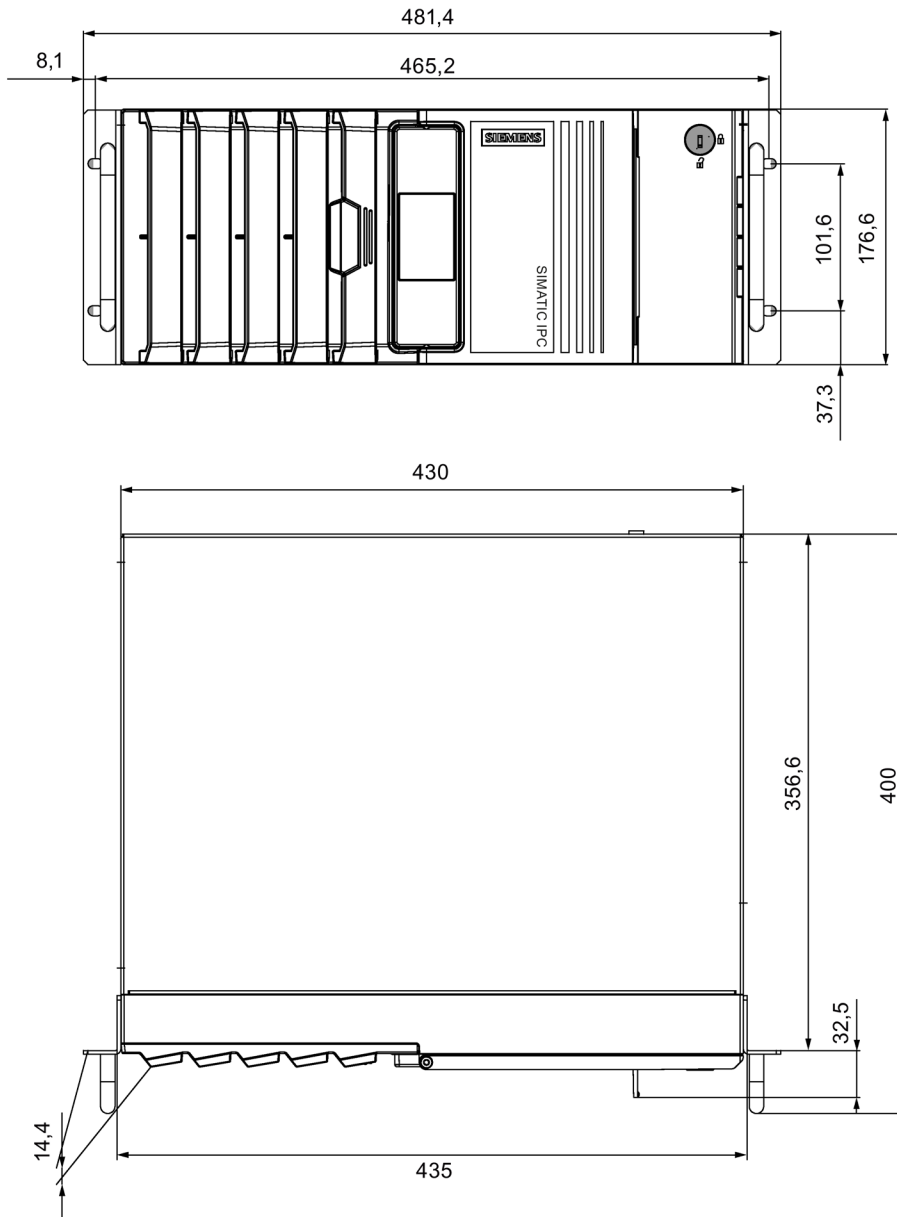


10.1.2 Dimension drawing of the device (short enclosure)

Note

IEC60297_3_100

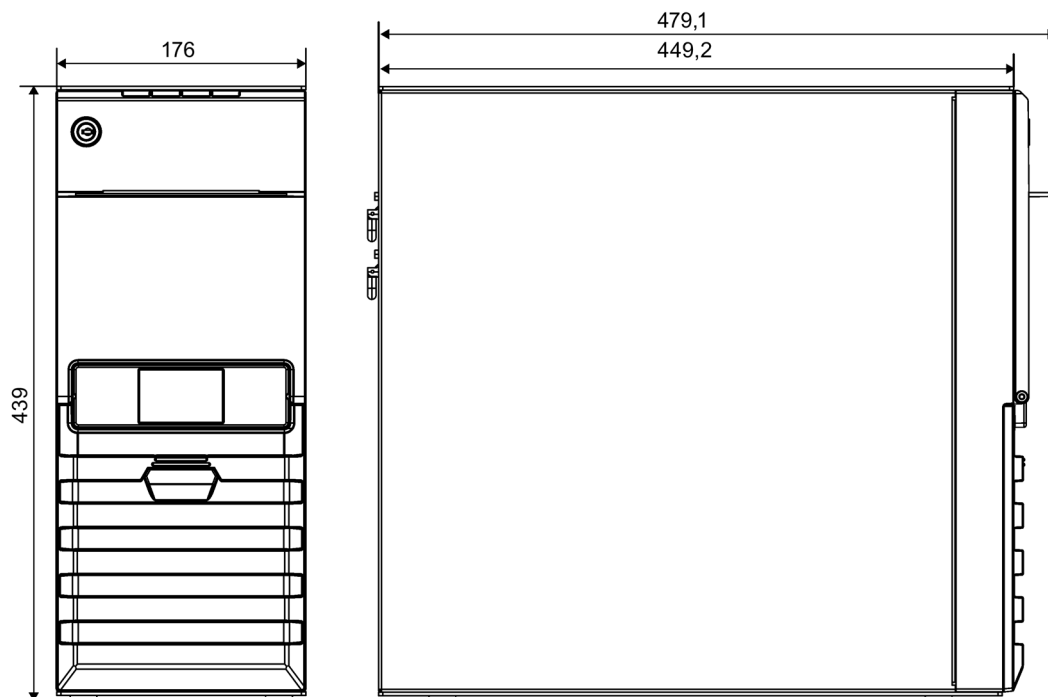
The system meets the requirements for 4 U according to IEC60297_3_100.



10.2 Dimension drawings of the Tower Kit

10.2.1 Dimension drawing of the Tower Kit (standard enclosure)

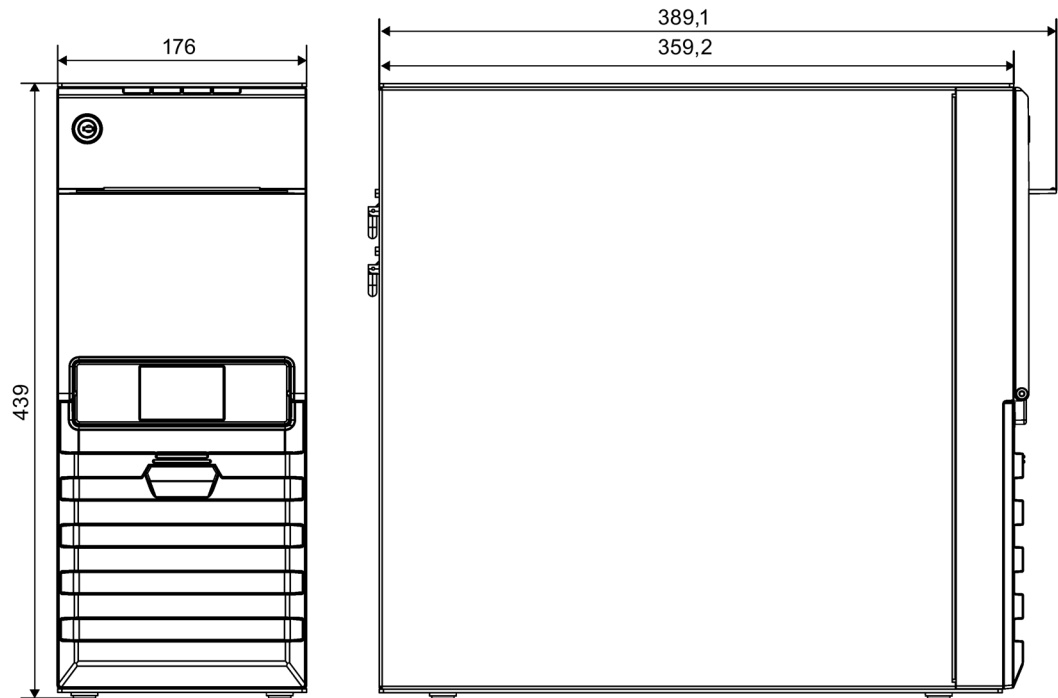
Front view and top view



All dimensions in mm.

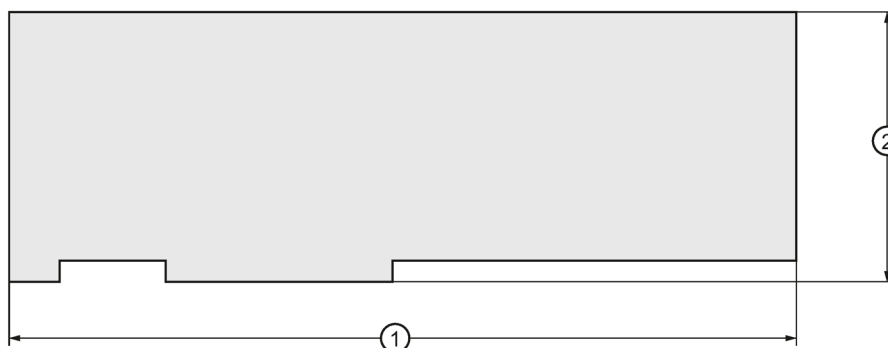
10.2.2 Dimension drawing of the Tower Kit (short enclosure)

Front view and top view



All dimensions in mm.

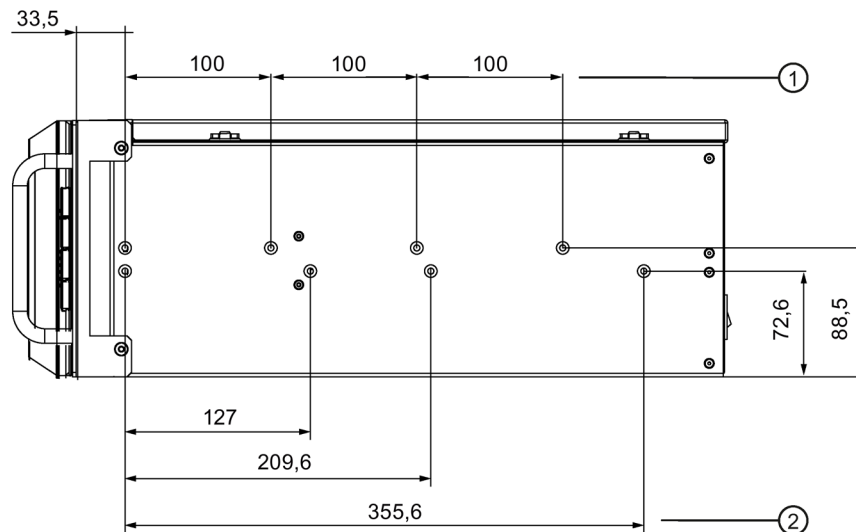
10.3 Dimension drawing of the expansion cards



- ① Length of the expansion car (PCI or PCIe)
 - Device with standard enclosure:
 - without extender: up to 312 mm
 - with extender: 339 mm
 - Device with short enclosure:
 - up to 260 mm
- ② Height of the expansion card
 - PCI: 106.7 mm (free space via expansion card: 38.3 mm)
 - PCIe: 111.2 mm (free space via expansion card: 33.8 mm)

10.4 Dimension drawings for drill holes for telescopic rails

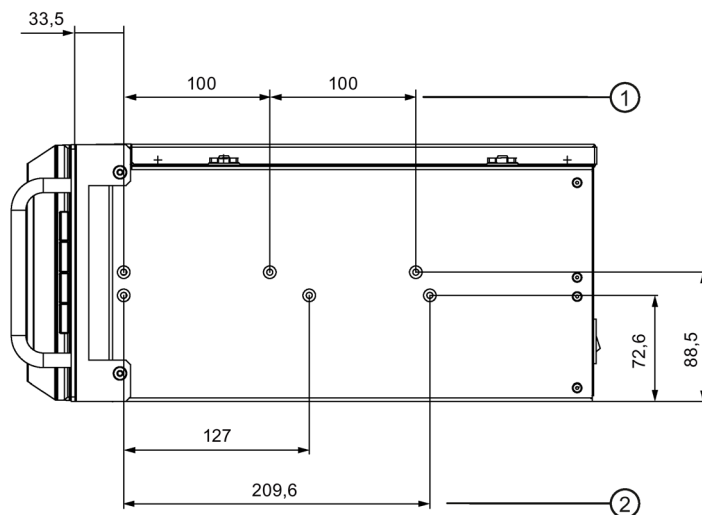
10.4.1 Dimension drawing for drill holes for telescopic rails (standard enclosure)



All dimensions in mm

- ① Dimensions of the Rittal telescopic rails Type 3659
- for 600 mm cabinet; TS 3659.180 or TS 3659.181
 - for 800 mm cabinet; TS 3659.190 or TS 3659.191
- Dimensions of Heitec telescopic rails
- for 600 mm cabinet; RP 3659.180
 - for 800 mm cabinet; RP 3659.190
- ② Dimensions of Schroff telescopic rails; Type 20110-072

10.4.2 Dimension drawing for drill holes for telescopic rails (short enclosure)



All dimensions in mm

- ① Dimensions of the Rittal telescopic rails Type 3659
 - for 600 mm cabinet; TS 3659.180 or TS 3659.181
 - for 800 mm cabinet; TS 3659.190 or TS 3659.191
- ② Dimensions of Schroff telescopic rails; Type 20110-072

Standards and approvals

11.1 Certificates and approvals

11.1.1 ISO 9001 certificate

The Siemens quality management system for our entire product creation process (development, production and sales) meets the requirements of ISO 9001.

This has been certified by DQS (the German society for the certification of quality management systems).

11.1.2 Software license agreements

If the device is supplied with preinstalled software, you must observe the corresponding license agreements.

11.1.3 UL approval



The following approvals are available for the device:

- Underwriters Laboratories (UL) according to the standard UL 61010-2-201 Second Edition, File E85972 (PROG.CNTRL.)
- Canadian National Standard CAN/CSA-C22.2 No. 61010-2-201

11.1.4 UKCA marking



The device complies with the designated British standards (BS) for electrical equipment published in the official consolidated list of the British Government. The device meets the requirements and protection targets of the following regulations and related amendments:

- S.I. 2016 No. 1091
Electromagnetic Compatibility Regulations 2016 (S.I. 2016 No. 1091), and related amendments
- S.I. 2012 No. 3032
Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (S.I. 2012 No. 3032), and related amendments
- S.I. 2016 No. 1101
The Electrical Equipment (Safety) Regulations 2016 (S.I. 2016 No. 1101), and related amendments

UKCA Declaration of Conformity

The associated declaration of conformity is available on the Internet at the following address:

- EU/UK Declaration of Conformity for SIMATIC IPC
(<https://support.industry.siemens.com/cs/ww/en/view/37369031>)

11.1.5 FCC Rules (USA)

Federal Communications Commission Radio Frequency Interference Statement	This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
Shielded Cables	Shielded cables must be used with this equipment to maintain compliance with FCC regulations.
Modifications	Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.
Conditions of Operations	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

11.1.6 ICES Compliance (Canada)

Canadian Notice	This Class B digital apparatus complies with Canadian ICES-003.
Avis Canadien	Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

11.1.7 RCM (Australia / New Zealand)



This product meets the requirements of EN 61000-6-3 Generic standards - Emission standard for residential, commercial and light-industrial environments.

This product meets the requirements of the standard EN 61000-6-3 Generic standards - Emission standard for residential, commercial and light-industrial environments.

11.1.8 Eurasion Customs Union EAC

Identification for Eurasion Customs Union



- EAC (Eurasian Conformity)
- Declaration of conformity according to Technical Regulations of the Customs Union (TR CU)

11.1.9 KC Mark (Korea)



This product meets the requirements of Korean certification.

This product satisfies the requirement of the Korean Certification (KC Mark).

이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며 가정 외의 지역에서 사용하는 것을 목적으로 합니다.

11.2 Directives and declarations

11.2.1 CE marking



The device meets the general and safety-related requirements of the following directives and conforms to the harmonized European standards (EN) published in the official gazettes of the European Union:

EU Declaration of Conformity

The associated declaration of conformity is available on the Internet at the following address:
Rack PC certificates
(<http://support.automation.siemens.com/WW/view/en/10805674/134200>).

11.2.2 EMC directive: Electromagnetic compatibility

2014/30/EU "Electromagnetic Compatibility Directive" (EMC Directive)

Scope of application	Requirements for	
	Interference emission	Immunity to interference
Industrial area	EN 61000-6-4	EN 61000-6-2
Residential and commercial areas and small businesses	EN 61000-6-3	EN 61000-6-1

The devices are compliant with EN 61000-3-2 (harmonic currents) and EN 61000-3-3 (voltage fluctuations and flicker).

11.2.3 Low-voltage guideline

2014/35/EU "Electrical equipment for use within specific voltage limits" (Low-Voltage Directive).

Conformance with this standard has been verified according to EN 61010-2-201.

11.2.4 RoHS directive

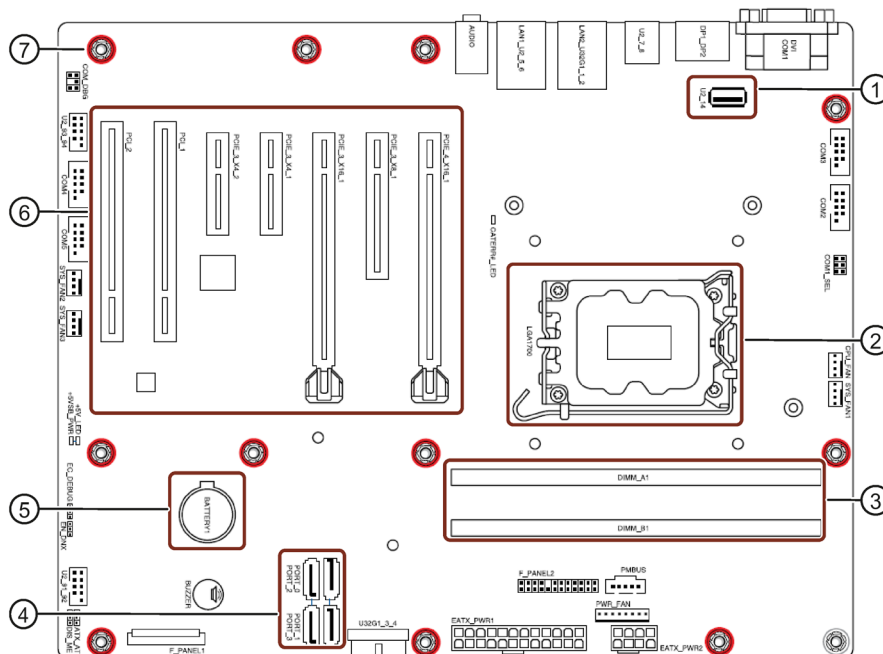
2011/65/EU "Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment" (RoHS Directive).

Hardware description

A.1 Motherboard

A.1.1 Layout of the motherboard

You can find a detailed description of the motherboards and the interfaces on the motherboards on the supplied data storage medium, see "Important instructions and manuals for operating the device (Page 10)".



- ① 1 internal USB port
USB 2.0, Type A vertical
backwards compatible to USB 1.1; 500 mA / high current¹
- ② Processor socket
- ③ Two slots for memory modules
- ④ 4 SATA ports
- ⑤ Backup battery
- ⑥ 7 slots for expansion cards, see "Technical specifications of the expansion card slots (Page 134)"
- ⑦ 11 screws for fastening the motherboard in the device

¹ Sum of the currents on the USB interfaces of the device (including the internal USB interface) ≤ 3 A

Technical features of the motherboard

Technical features of the motherboard can be found under "General technical specifications of the motherboard (Page 133)".

A.2 Expansion cards

A.2.1 Interrupt assignment of the slots for expansion cards

Note

All system resources (hardware addresses, memory allocation, interrupt allocation, DMA channels) are dynamically assigned by the firmware or the operating system based on the hardware equipment, drivers, installed expansion cards and connected external devices.

The assignment is made automatically and depends on the requested resources of the connected devices and installed components. Due to this configuration dependency, clear statements can only be made by determining them in relation to the system in the final configuration.

The resources can be viewed in Windows as follows:

1. Press the "Windows® key" and "R" simultaneously.
 2. Enter the "msinfo32" command in the "Open" field.
 3. Click "OK" to confirm.
-

Motherboard H610E

Information on the slots can be found under "Technical specifications of the expansion card slots (Page 134)".

Slot Reference	PCIE4_X16_1	PCIE3_X8_1	PCIE3_X16_1	PCIE3_X4_1	PCIE3_X4_2	PCI_1	PCI_2
Slot Capability	PEG Gen4 16 Lane	PCIe Gen3 1 Lane	PCIe Gen3 2 Lane	PCIe Gen3 1 Lane	PCIe Gen3 2 Lane		
Host Device	PEG 0:1:0	PCH Port 4	PCH Port 1–2	PCH Port 3	PCH Port 5–6	PCH Port 8	PCH Port 8
Bus APIC Inter- rupt							
INT A	PIRQ A	PIRQ D	PIRQ A	PIRQ C	PIRQ A	PIRQ D	PIRQ D
INT B	PIRQ B	PIRQ A	PIRQ B	PIRQ D	PIRQ B	PIRQ A	PIRQ A
INT C	PIRQ C	PIRQ B	PIRQ C	PIRQ A	PIRQ C	PIRQ B	PIRQ B
INT D	PIRQ D	PIRQ C	PIRQ D	PIRQ B	PIRQ D	PIRQ C	PIRQ C
Organizational Pins							
Request							
Grant							
ID							

A.2.2 Exclusive PCI hardware interrupt

Applications demanding a high-performance interrupt require a high-speed hardware interrupt reaction. The PCI hardware interrupt should be used only by one resource in order to ensure high-speed reaction of the hardware.

Setting an exclusive interrupt on the device

All system resources (hardware addresses, memory allocation, interrupt allocation, DMA channels) are dynamically assigned by the firmware or the operating system based on the hardware equipment, drivers, installed expansion cards and connected external devices.

The assignment is made automatically and depends on the requested resources of the connected devices and installed components. Due to this configuration dependency, clear statements can only be made by determining them in relation to the system in the final configuration.

The resources can be viewed in Windows as follows:

1. Press the "Windows® key" and "R" simultaneously.
2. Enter the "msinfo32" command in the "Open" field.
3. Click "OK" to confirm.

A.3 System resources

A.3.1 Currently allocated system resources

All system resources (hardware addresses, memory configuration, allocation of interrupts, DMA channels) are assigned dynamically by the Windows® operating system, depending on the hardware configuration, drivers and connected external devices. You can view the current configuration of system resources or possible conflicts with Windows®:

1. Press the "Windows® key" and "R" simultaneously.

The "Run" dialog box opens.

2. Enter "msinfo32" in the "Open" field.
3. Confirm your entry with "OK".

A.3.2 I/O address allocation

The table describes the assigned I/O addresses in the delivery state of the device.

I/O address (hex)		Size (bytes)	Description of the basic function
from	to		
0000 0000	0000 0CF7	415	PCI Express Root Complex
0000 0020	0000 0021	2	Programmable Interrupt Controller
0000 0024	0000 0025	2	Programmable Interrupt Controller
0000 0028	0000 0029	2	Programmable Interrupt Controller
0000 002C	0000 002D	2	Programmable Interrupt Controller
0000 002E	0000 002F	2	Motherboard resources
0000 0030	0000 0031	2	Programmable Interrupt Controller
0000 0034	0000 0035	2	Programmable Interrupt Controller
0000 0038	0000 0039	2	Programmable Interrupt Controller
0000 003C	0000 003D	2	Programmable Interrupt Controller
0000 0040	0000 0043	4	System timer
0000 004E	0000 004F	2	Motherboard resources
0000 0050	0000 0053	4	System timer
0000 0061	0000 0061	1	Motherboard resources
0000 0062	0000 0062	1	Microsoft ACPI-Compliant Embedded Controller
0000 0063	0000 0063	1	Motherboard resources
0000 0065	0000 0065	1	Motherboard resources
0000 0066	0000 0066	1	Microsoft ACPI-Compliant Embedded Controller
0000 0067	0000 0067	1	Motherboard resources
0000 0070	0000 0070	1	Motherboard resources
0000 0080	0000 0080	1	Motherboard resources

I/O address (hex)		Size (bytes)	Description of the basic function
from	to		
0000 0092	0000 0092	1	Motherboard resources
0000 00A0	0000 00A1	2	Programmable Interrupt Controller
0000 00A4	0000 00A5	2	Programmable Interrupt Controller
0000 00A8	0000 00A9	2	Programmable Interrupt Controller
0000 00AC	0000 00AD	2	Programmable Interrupt Controller
0000 00B0	0000 00B1	2	Programmable Interrupt Controller
0000 00B2	0000 00B3	2	Motherboard resources
0000 00B4	0000 00B5	2	Programmable Interrupt Controller
0000 00B8	0000 00B9	2	Programmable Interrupt Controller
0000 00BC	0000 00BD	2	Programmable Interrupt Controller
0000 02E8	0000 02EF	8	Communications Port (COM4)
0000 02F8	0000 02FF	8	Communications Port (COM2)
0000 03E0	0000 03E7	8	Communications Port (COM5)
0000 03E8	0000 03EF	8	Communications Port (COM3)
0000 03F8	0000 03FF	8	Communications Port (COM1)
0000 04D0	0000 04D1	2	Programmable Interrupt Controller
0000 0680	0000 069F	32	Motherboard resources
0000 0A00	0000 0A0F	16	Motherboard resources
0000 0A10	0000 0A1F	16	Motherboard resources
0000 0A20	0000 0A2F	16	Motherboard resources
0000 0A30	0000 0A3F	16	Motherboard resources
0000 0A40	0000 0A4F	16	Motherboard resources
0000 0D00	0000 FFFF	62208	PCI Express Root Complex
0000 164E	0000 164F	2	Motherboard resources
0000 1854	0000 1857	4	Motherboard resources
0000 2000	0000 20FE	255	Motherboard resources
0000 3000	0000 3FFF	4096	Intel® PCI Express Root Port #7 - 7ABE
0000 4000	0000 4FFF	4096	Intel® PCI Express Root Port #1 - 7AB8
0000 5000	0000 503F	64	Intel® UHD Graphics 770
0000 5060	0000 507F	32	Standard SATA AHCI Controller
0000 5080	0000 5083	4	Standard SATA AHCI Controller
0000 5090	0000 5097	8	Standard SATA AHCI Controller
0000 EFA0	0000 EFBF	32	Intel® SMBus - 7AA3

A.3.3 Interrupt assignments

The functions are assigned different interrupts, depending on the operating system. APIC mode is used.

PCI/PCIe cards and the on-board PCI/PCIe devices require PCI interrupt lines. These interrupt lines can be shared and are plug-and-play compatible. That is, multiple devices can share the same interrupt. The IRQ is assigned automatically.

The table describes the assignment of the interrupts in the delivery state of the device.

	IRQ number																				Comment				
IRQ (ACPI mode)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	IRQ(ACPI mode)
Host PCI IRQ Line ¹																	A	B	C	D	E	F	G	H	1
Function																									
System timer	X																								Fixed
Communications Port (COM1)				X																					Fixed
Communications Port (COM2)			X																						Fixed
Communications Port (COM3)						X																			Fixed
Communications Port (COM4)										X															Fixed
Communications Port (COM5)											X														Fixed
Intel® Serial IO GPIO Host Controller - INTC1056														X											Fixed
High Definition Audio Controller																		X							Can be deactivated

X: Interrupt in APIC mode

¹ : Host PCI-IRQ A to H is assigned to IRQ 16 to 23 permanently in APIC mode. A specific assignment cannot be forced.

A.3.4 Memory address assignments

The table describes the assignment of the memory addresses in the delivery state of the device.

Address (hex)		Description of the basic function
from	to	
000A 0000	000B FFFF	PCI Express Root Complex
000E 0000	000E 3FFF	PCI Express Root Complex
000E 4000	000E 7FFF	PCI Express Root Complex
000E 8000	000E BFFF	PCI Express Root Complex
000E C000	000E FFFF	PCI Express Root Complex
8040 0000	80DF FFFF	Intel® PCI Express Root Port #1 - 7AB8
8040 0000	BFFF FFFF	PCI Express Root Complex
80E0 0000	80EF FFFF	Intel® PCI Express Root Port #7 - 7ABE
80E7 C000	80E7 FFFF	Intel® I210 Gigabit Network Connection
80E8 0000	80EF FFFF	Intel® I210 Gigabit Network Connection
80F2 0000	80F2 1FFF	Standard SATA AHCI Controller
80F2 2000	80F2 27FF	Standard SATA AHCI Controller
80F2 3000	80F2 30FF	Standard SATA AHCI Controller
BFFE 0000	BFFF FFFF	Intel® Ethernet Connection (17) I219-V
C000 0000	CFFF FFFF	Motherboard resources
E069 0000	E069 FFFF	Intel® Serial IO GPIO Host Controller - INTC1056
E06A 0000	E06A FFFF	Intel® Serial IO GPIO Host Controller - INTC1056
E06B 0000	E06B FFFF	Intel® Serial IO GPIO Host Controller - INTC1056
E06D 0000	E06D FFFF	Intel® Serial IO GPIO Host Controller - INTC1056
E06E 0000	E06E FFFF	Intel® Serial IO GPIO Host Controller - INTC1056
FE01 0000	FE01 0FFF	Intel® SPI (flash) Controller - 7AA4
FED0 0000	FED0 03FF	High precision event timer
FED2 0000	FED7 FFFF	Motherboard resources
FED4 0000	FED4 4FFF	Trusted Platform Module 2.0
FED4 5000	FED8 FFFF	Motherboard resources
FED9 0000	FED9 3FFF	Motherboard resources
FEDA 0000	FEDA 0FFF	Motherboard resources
FEDA1000	FEDA1FFF	Motherboard resources
FEDC 0000	FEDC 7FFF	Motherboard resources
FEE0 0000	FEEF FFFF	Motherboard resources
40 0000 0000	40 0FFF FFFF	Intel® UHD Graphics 770
60 0000 0000	60 00FF FFFF	Intel® UHD Graphics 770
60 0110 0000	60 0110 FFFF	Intel® USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
60 0111 0000	60 0111 7FFF	Intel(R) Crashlog - A77D
60 0112 8000	60 0112 80FF	Intel® SMBus - 7AA3
7F FFEF 8000	7F FFEF 8FFF	Intel® Management Engine Interface #1
7F FFEF 9000	7F FFEF 9FFF	Intel® Serial IO I2C Host Controller - 7ACD
7F FFEF A000	7F FFEF AFFF	Intel® Serial IO I2C Host Controller - 7ACC
7F FFEF B000	7F FFEF BFFF	Intel® GNA Scoring Accelerator module
7F FFEF C000	7F FFEF FFFF	High Definition Audio Controller
7F FFF0 0000	7F FFFF FFFF	High Definition Audio Controller

A.4 Assignment of expansion interfaces to the software in the TIA Portal (CP assignment)

The table below shows the correlation between enclosure labeling of the IPC expansion slots and the designation that is used during assignment of interfaces to the software in the TIA Portal.

Slot Number on the enclosure	Designation on the motherboard	TIA Portal
1	PCIE4_X16_1	X100
2	PCIE3_X8_1	X101
3	PCIE3_X16_1	X102
4	PCIE3_X4_1	X103
5	PCIE3_X4_2	X104
6	PCI_1	X105
7	PCI_2	X106

Technical support

B.1 Service and support

You can find additional information and support for the products described on the Internet at the following addresses:

- Technical support (<https://support.industry.siemens.com>)
- Support request form (<https://www.siemens.com/supportrequest>)
- After Sales Information System SIMATIC IPC/PG (<http://www.siemens.com/asis>)
- SIMATIC Documentation Collection (<https://www.siemens.com/simatic-tech-doku-portal>)
- Your local representative (https://www.automation.siemens.com/aspa_app)
- Training center (<https://siemens.com/sitrain>)
- Industry Mall (<https://mall.industry.siemens.com>)

When contacting your local representative or Technical Support, please have the following information at hand:

- Article number of the device (MLFB)
- BIOS version for industrial PC or image version of the device
- Other installed hardware
- Other installed software

Tools & downloads

Please check regularly if updates and hotfixes are available for download to your device. The download area is available on the Internet at the following link:

After Sales Information System SIMATIC IPC/PG (<http://www.siemens.com/asis>)

B.2 Troubleshooting

B.2.1 Problems with device functions

Problem	Cause	Remedy
The device is not operational	No power supply	<ul style="list-style-type: none"> Check the power supply, the power cable and the power plug. Check to see if the on-off switch is in the correct position.
	Device is being operated outside the specified ambient conditions	<ul style="list-style-type: none"> Check the ambient conditions. After transport in cold weather do not turn the power on until after a waiting period of approximately 12 hours.
The monitor remains dark	The monitor is switched off	Switch on the monitor.
	The monitor is in "power save" mode	Press any key on the keyboard.
	The brightness button has been set to dark	Increase brightness using the brightness button. Detailed information can be found in the operating manual for the monitor.
	The power cord or the monitor cable is not connected.	<ul style="list-style-type: none"> Check if the power cord is properly connected to the monitor and to the system unit or to the grounded shockproof power outlet. Check to make sure the monitor cable is properly connected to the system unit and the monitor. <p>Contact your technical support team if the screen still remains dark after all these controls and measures.</p>
The mouse pointer does not appear on the screen	The mouse driver is not loaded	Check whether the mouse driver is properly installed and available when you start the user program. Detailed information about the mouse driver is available in the corresponding documentation.
	Mouse not connected	<ul style="list-style-type: none"> Check to make sure that the mouse cable is properly connected to the system unit. If you use an adapter or extension cable for the mouse cable make sure to check these connections as well. <p>Contact your technical support team if the mouse pointer still does not appear on the screen after these controls and measures.</p>
Time and/or date of the PC is not correct		<ol style="list-style-type: none"> Open the firmware configuration menu. To do this, press the <F2> key during the boot operation. Set the date and the time in the "Main" tab.

Problem	Cause	Remedy
Time and date are wrong even after correctly setting them in the firmware (BIOS)	The backup battery is dead.	Replace the backup battery.
USB device not responding	USB ports are deactivated in the firmware (BIOS)	Use a different USB port or activate the port.
	Operating system does not support XHCI	Activate the firmware setting "PS/2 Emulation" in the firmware (BIOS) under "Advanced > USB Configuration".
	USB-2.0/3.0 device connected although USB-2.0/3.0 is deactivated	Activate the USB.
	Operating system does not support the USB interfaces	<ul style="list-style-type: none"> • Activate the firmware setting "Legacy USB Support" in the firmware (BIOS) under "Advanced > USB Configuration". • For other devices, you need the USB device drivers for the required operating system.

B.2.2 Problems when booting the device

Problem	Cause	Remedy
After changing the hard disk, the system does not boot from the RAID system	RAID system does not have highest boot priority	Change the boot priority in the firmware (BIOS) under "Boot > Boot device". <ul style="list-style-type: none"> • Permit RAID system in the boot priority • Give RAID system top boot priority
After changing the hard disk, "Unused" is indicated for the relevant SATA port.	System was booted without functioning drive. The removable tray might not be fully pushed in.	Reboot the system with a functioning hard disk.
Computer does not boot or "Boot device not found" is displayed.	The boot medium is not approved	Set the boot priority to "Enabled" in the firmware (BIOS) under "Boot > Boot device".
	The boot device is not in first place of the boot priority in the BIOS setup	Change the boot priority in the firmware (BIOS) under "Boot > Boot device".
	The boot data storage medium is set up with GPT, and UEFI boot is deactivated in the firmware (BIOS)	Activate UEFI mode in the firmware (BIOS).
The startup of a Windows operating system located on a GPT data storage medium is aborted with the following error message: "Status: 0xc0000225 Info: The boot selection failed because a required device is inaccessible"	The settings in the boot loader file "BCD" are incorrect or damaged.	Restore the Windows® operating system. You can find the files and descriptions needed for this on the supplied data storage medium.

B.2.3 Problems when using expansion cards

Problem	Cause	Remedy
<p>The device crashes during startup</p>	<ul style="list-style-type: none"> • Redundant I/O addresses • Redundant hardware interrupts and/or DMA channels • Signal frequencies or signal levels are not adhered to • Different pin assignment 	<p>Check your computer configuration:</p> <ul style="list-style-type: none"> • If the computer configuration corresponds to the delivery state, contact your technical support team. • In the case of a change in the configuration, restore the delivery state. To do this, remove the expansion card and restart the device. If the error no longer occurs, the expansion card was the cause of the fault. Replace this with a Siemens expansion card or contact the supplier of the expansion card. <p>If the device still crashes, contact your technical support team.</p>
<p>The device does not start up or switches off immediately</p>	<p>A counter voltage is fed into the device by connected or installed expansion cards</p>	<p>Clarify the following with the supplier of the component:</p> <ul style="list-style-type: none"> • The component can be operated without an external power supply. • The component can be reconfigured so that it only uses the external power supply or that of the device.
<p>The device does not operate normally if an expansion card is integrated. Examples:</p> <ul style="list-style-type: none"> • The operating system does not boot. • The expansion card is not detected 	<p>Contact problem on the contacts of the expansion card or on the connector</p>	<p>Check the plug-in connection</p> <ul style="list-style-type: none"> • Remove the installed expansion card and reinsert it. • Clean the contact surface of the expansion card with pure ethanol.










Markings and symbols

C.1 Overview



The following tables show all the symbols which may be found on your SIMATIC industrial PC, SIMATIC industrial monitor or SIMATIC Field PG in addition to the symbols which are explained in the operating instructions.

The symbols on your device may vary in some details from the symbols shown in the following tables.

C.2 Symbols for safe use and disposal












Symbol	Meaning	Symbol	Meaning
	Warning, observe the supplied documentation.		Lock is closed
	Attention, radio equipment		Lock is open
	Disconnect the power plug before opening		Opening for Kensington lock
	Attention ESD (Electrostatic sensitive device)		Warning of hot surface
	Disposal information, observe the local regulations.		

C.3 Symbols for operator controls



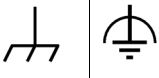






Symbol	Meaning	Symbol	Meaning
	On-off switch, without electrical isolation		
	On-off button, without electrical isolation		

C.4 Symbols of certificates and approvals

The following table shows symbols relating to certificates, approvals and markings which may be on the device. You can find detailed information in the operating instructions for your device:

Symbol	Meaning	Symbol	Meaning
	Approved for Australia and New Zealand		Marking for the Eurasian Customs Union
	Approved for China		Test mark of Factory Mutual Research
	CE markings for European countries		Marking of Federal Communications Commission for the USA
	EFUP (Environment Friendly Use Period) marking for China		Approved for Korea
	Test mark of the Underwriters Laboratories		Approval for United Kingdom
	Approval for India		

C.5 Interface icons

Symbol	Meaning	Symbol	Meaning
	Protective conductor terminal		Line In
	Connection for functional grounding (Equipotential-bonding cable)		Line Out
DPP	DisplayPort interface		Microphone input
	DVI port		
LAN	LAN interface, not approved for connecting WAN or telephone		
	Serial port		
	USB 2.0 high-speed port		
	USB 3.0 Gen 1 SuperSpeed port		

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