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SIMATIC

Industrial PC Workstation SIMATIC IPC RW-545A

Operating Instructions

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Legal information

Warning notice system

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

DANGER

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

AWARNING

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

ACAUTION

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

NOTICE

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

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

Qualified Personnel

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

Proper use of Siemens products

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AWARNING

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 for the installation, electrical connection, commissioning, and device expansion of the SIMATIC IPC RW-545A, and to maintain and repair the device.

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 versions of the SIMATIC IPC RW-545A.

History

Currently released versions of these operating instructions:

Version	Comments
08/2023	First edition

Security information

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

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Product description

1.1 Important instructions and manuals for operating the device

Documentation	Contents	Source
Operating instructions	 Product description Technical specifications Installation of the device Operation of the device Installing and removing hardware Dimension drawings 	Online in the "Rack PC" section under: Documentation for SIMATIC Industrial PC (http://www.siemens.com/simatic-ipc-doku-portal)
Quick Install Guide	 Information on: 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 	Supplied in printed form with the device
User manual (UM) for the motherboard	 Information on: Firmware description Description of the motherboard Description of the interfaces on the motherboard 	Online at: User Manual Mainboard SMS-680-A1 (https://support.industry.siemens. com/cs/ww/en/view/109822600) Name of the file: Mainboard SMS-680-A1_UM.pdf
Windows® operating system	 Information on: Commissioning the operating system Restoring the operating system Configuration of the operating system 	Online at: Microsoft® Windows® 10 (https://support.industry.siemens. com/cs/ww/en/view/109749498)

1.2 Product highlights

Documentation	Contents	Source
SIMATIC IPC Creating a bootable USB flash drive	 Information on: Creating a bootable USB flash drive for recovery of operating system, software and drivers 	Online at: SIMATIC IPC Creating a bootable USB flash drive (https://support.industry.siemens. com/cs/ww/en/view/109811224)
SIMATIC NET	Industrial communication	Online at: SIMATIC NET (http://w3.siemens.com/mcms/au tomation/en/industrielle- kommunikation/Seiten/Default.as px)

1.2 Product highlights

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

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 compatiblity 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 i9, Core i7, Core i5 or Core i3 up to 16 cores / 24 threads
- Graphics controller (770) integrated in processor up to 4 K Ultra HD resolution
- Maximum performance, e.g. through Intel R680E chipset, DDR5 memory with support of dual channel technology
- High data transfer rates, e.g. via PCI Express Technology Gen 4, USB 3.2 Gen 2x2 (20 Gbps), M.2 NVMe SSD
- Powerful graphics cards for high-performance graphics processing (3D) as well as for simulation and AI applications
- Hard drives with a capacity of up to 4 TB for the storage of larger data volumes and greater reliability
- Solid-state drive with up to 1024 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)
- RAID1 configuration: Data mirroring on two drives (HDD or SSD), also in removable trays (hot-swap) and optionally with additional SSD (for operating system)
- Hot swap in the RAID system: Replacing the drive (HDD) during operation. The rebuild process onto the hot-spare drive (HDD) starts automatically
- 3.5" HDD/HDD Enterprise or 2.5" SSD or M.2 NVMe SSD as RAID configurations
- Rapid identification and replacement of the drive in the event of a fault thanks to alarm displays for RAID configurations and unique numbering
- Status display (front LEDs) for Ethernet; alarm display for fan, temperature, watchdog and drives in RAID configurations
- Remote control and remote maintenance through iAMT (Intel® Active Management Technology)

1.2 Product highlights

- Redundant AC power supply with "hot swap" functionality (optional): Replacement of power supply module during operation
- 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
- Up to two secured internal USB slots in the device, for 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® 1 Gb Ethernet
 - 1 x Intel® 2.5 Gb Ethernet
 - 2 x USB 3.2 Gen 1 (front)
 - 4 x USB 3.2 Gen 2 Type A (rear of the device)
 - 2 x USB 3.2 Gen 2x2 Type C (rear of the device)
 - 2 x USB 2.0 (internal)
 - 4 x graphics interfaces
 - Audio
 - 7 x slots for PCI and PCI-Express
- Multi Monitoring: Up to 7 x DisplayPort or 8 x DVI-D via onboard graphics and graphics card (optional, via adapter in some cases) or 7 x VGA via adapter
- Graphics card (optional) for high-performance graphics processing (3D) as well as for simulation and AI applications
- 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 Scope of application

The SIMATIC IPC RW-545A offers system integrators, electrical panel builders, plant builders and machine builders a 19" rack PC platform for high-performance applications and IT applications on the control and cell level for:

- Industrial image processing and AI applications
- Process, visualization and simulation applications
- Quality assurance and monitoring tasks
- 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 and commercial areas and small businesses. In addition to the industrial applications, therefore, it can also be used in building automation or in public facilities.

1.4 External design of the device

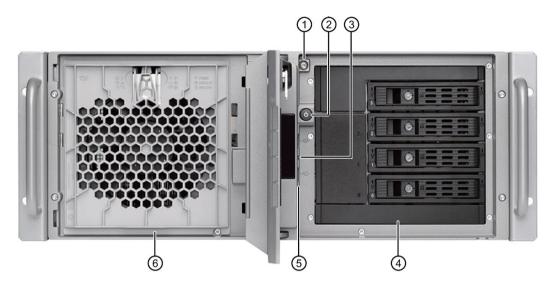
1.4.1 Front panel

Front: Front door is closed



- 19" mounting bracket with handle
- ② Fan cover of front fan with openings for ventilation of the device (locked by front door)
- 3 System status displays (Page 27)
- 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 24)
- 3 Rese pushbutton, see Operator controls (Page 24)
- ④ Drive cage (in this case type A); depending on the expansion variant, see:
 - Drive cage (Page 16)
- (5) Interfaces on the front of the device, see Device ports (Page 20)
- 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.



(0) Mounting location 0 for: 2.5" drive in removable tray • 3.5" drive in removable tray (1) Mounting location 1 for: • 2.5" drive in removable tray 3.5" drive in removable tray (2) Mounting location 2 for: • 2.5" drive in removable tray • 3.5" drive in removable tray (3) Mounting location 3 (5.25" tray) for: 5.25" mounting frame with removable tray for 2.5" and 3.5" drives 5.25" drive or 5.25" component Cover of the mounting frame for removable tray (Page 108) (A) (B) Cover

Components of the removable tray

(C)

(D)

Removable tray

Cover



(1)	Status display (Page 30)
(2)	Status display (Page 30)
(3)	Number of the mounting location (here: Mounting location 0)
(4)	Lock

See also

Installation options for drives with drive cage type A (Page 104)

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").

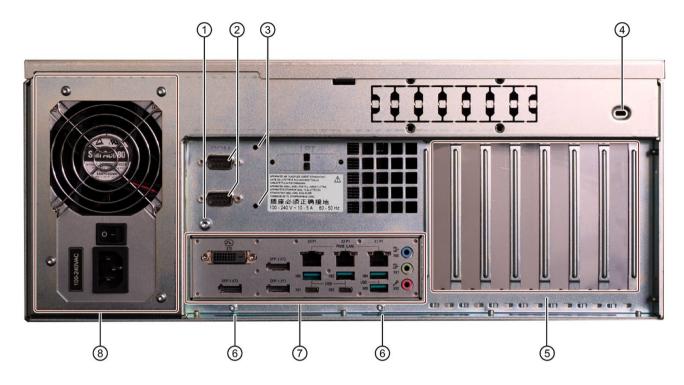


(0)	Mounting location 0 (5.25" tray) for:
	• 2.5" drive in the assembly kit
	3.5" drive in the assembly kit
	5.25" drive or 5.25" component
(1)	Mounting location 1 (5.25" tray) for:
	2.5" drive in the assembly kit
	3.5" drive in the assembly kit
	5.25" drive or 5.25" component
(2)	Mounting location 2 (5.25" tray) for:
	• 2.5" drive in the assembly kit
	• 3.5" drive in the assembly kit
	5.25" drive or 5.25" component
(A)	Cover (if no drive is installed) or drive cover
(B)	Cover

See also

Installation options for drives with drive cage type B (Page 114)

1.4.3 Rear of the device



- ① Connection for functional earthing, see "Connection of equipotential bonding line (Page 58)"
- COM 2, optional (above)
 - COM 1, optional, (below)
- 3 Drill holes for attaching the retainer for the internal USB stick
- 4 Opening, prepared for Kensington lock
- (5) Slot brackets or connections of inserted expansion cards
- 6 Fixing screws for strain relief (Page 72)
- 7 Connections on the rear of the device (Page 21)
- 8 Power supply unit (power supply unit 850 W in this case, see also:
 - "Connection of power supply unit 550 W (Page 22)"
 - "Connection of power supply unit 850 W (Page 23)"
 - "Connection of power supply unit 700 W (2 modules, each 700 W, redundant) (Page 23)")

1.4.4 Device ports

1.4.4.1 Connections on the front of the device

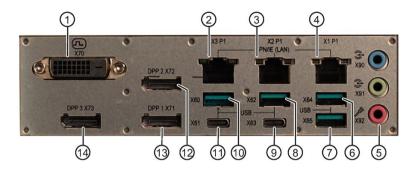
There are two USB connection sockets on the front of the device behind the front panel. Observe the technical specifications of the connections on the device (Page 155).



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	

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 155)".

No.	Connection socket
1	DVI-D, for connection of monitors
	• DVI-D (X70)
2	LAN 3 (X3 P1)
3	LAN 2 (X2 P1)
4	LAN 1 (X1 P1)
(5)	Audio
	Light blue: Line IN for audio devices (X90)
	Lime: Line OUT for headphones or speaker (X91)
	Pink: Microphone IN, (X92)
6	USB 3.2 Gen2 Type A (10 Gbps)
	Backwards compatible to USB 3.0 / 2.0 / 1.1; each 900 mA / high current ¹
	• (X64)
7	USB 3.2 Gen2 Type A (10 Gbps)
	Backwards compatible to USB 3.0 / 2.0 / 1.1; each 900 mA / high current ¹
	• (X65)
8	USB 3.2 Gen2 Type A (10 Gbps)
	SuperSpeed; backwards compatible to USB 3.0 / 2.0 / 1.1; each 900 mA / high current ¹
	• (X62)
9	USB 3.2 Gen2x2 Type C (20 Gbps) ²
	backwards compatible to USB 3.0 / 2.0 / 1.1; each 1500 mA / high current ¹
	• (X63)
10	USB 3.2 Gen2 Type A (10 Gbps)
	Backwards compatible to USB 3.0 / 2.0 / 1.1; each 900 mA / high current ¹
	• (X60)

No.	Connection socket	
(1)	USB 3.2 Gen2x2 Type C (20 Gbps) ²	
	backwards compatible to USB 3.0 / 2.0 / 1.1; each 1500 mA / high current1	
	• (X61)	
12	DisplayPort (labeling on the device: DPP), for connection of monitors	
	• DPP 2 (X72)	
13)	DisplayPort (labeling on the device: DPP), for connection of monitors	
	• DPP 1 (X71)	
14)	DisplayPort (labeling on the device: DPP), for connection of monitors	
	• DPP 3 (X73)	

- 1 Sum of the currents on the USB interfaces of the device (including the internal USB interfaces) \leq 3 A
- Maximum cable length: 3 m; depending on attenuation of the cable and maximum data rate of the connection. Use the original connection technology of the I/O devices to be connected without adapters and without extensions.

Connections of graphics cards

Graphics cards are expansion cards. After installing a graphics card, additional connections are available on the back 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 63)".

You can find information on the graphics cards under "Technical specifications of graphic (Page 152)".

1.4.4.3 Connection of power supply unit 550 W

Socket for power plug



1.4.4.4 Connection of power supply unit 850 W

Socket for power plug



1.4.4.5 Connection of power supply unit 700 W (2 modules, each 700 W, redundant)

Sockets for power plug



1.4.5 Operator controls

1.4.5.1 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 74)".

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 "Switching on the device (Page 73)" and "Switching off the device (Page 74)".

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 74)"

1.4.5.2 Alarm reset button for power supply unit 700 W (2 modules, each 700 W, redundant)

The alarm reset button is only available for devices with redundant power supply unit (700 W) and it is simultaneously the status display of the redundant power supply unit. Use the alarm reset button to switch off the signal tone of the power supply unit in the event of an error.



See also

Switching off the device (Page 74)

1.4.5.3 On-off switch for power supply unit 550 W



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 74)".

On-off switch



1.4.5.4 On-off switch for power supply unit 850 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 74)".

On-off switch



1.4.5.5 Switching off the power supply unit 700 W (2 modules, each 700 W, redundant)

Note

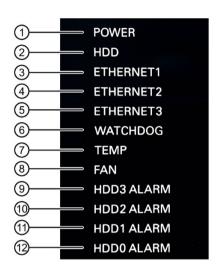
The redundant power supply unit 700 W does not have an on-off switch.

To completely disconnect the device from the mains voltage, follow the instructions under "Switching off the device (Page 74)".

1.4.6 Status displays

1.4.6.1 System status displays

The status displays 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	ETHERNET 1	Ethernet status display	OFF	No connection
45	ETHERNET 2 ETHERNET 3	(see also Status displays of the LAN ports (Page 29))		No data traffic
3)	LITILININETS	, , , , , , , , , , , , , , , , , , , ,	GREEN	Data traffic
6	WATCHDOG	Watchdog status	OFF	Not activated
	(function		GREEN	Activated
	currently not available)		RED	Expired
7	TEMP	Temperature status	OFF	No error
			RED	Possible causes:
				CPU temperature is critical
				Device temperature is critical

8	FAN	Fan status	OFF	No error
			RED	Possible causes:
				Front fan faulty
				The fan on the processor heat sink is faulty
				Fan on drive cage type A faulty
				Fan of the power supply unit 550 W faulty
9	HDD3 ALARM	HDD alarm in connection	OFF	RAID is OK
10	HDD2 ALARM	LARM with RAID and monitoring	A RED LED is lit up	The associated drive is not OK
11)	HDD1 ALARM	software. The number of the HDD alarm corresponds to the number of mounting locations of drives, see "Drive	All RED LEDs are	RAID synchronization running, RAID is not OK
12)	12 HDD0 ALARM		flashing	The hard disk newly integrated in case of error is synchronized with an existing hard disk.
		cage type A (Page 16)" and	All RED LEDs are lit	RAID is not OK
		"Drive cage type B (Page 18)". The numbering of the drives with the "Intel® Optane™ Memory and Storage Management" software differs from this numbering. See important note under "Display of a defective drive of an onboard RAID system (Page 78)".	ир	The faulty drive could not be localized by the monitoring software. It may be possible to detect the defective drive with the RAID software. You can find information under "RAID1 system (Page 78)"

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 21)".

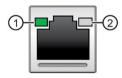
You can find technical information on LAN ports under: "Technical specifications of the connections on the device (Page 155)"

Status display LAN 1 (X1P1) and LAN 2 (X2P1)



Status display	Meaning	Status	Meaning of the status
LED 1	Connection status	OFF	No cable connected
			Cable not active
			Interface disabled
		ORANGE	Active cable connected
		ORANGE flashing	Data transfer active
		ORANGE (Blinking then steady)	Ready to wake up from S5 mode
LED 2	Data transmission rate	OFF	• 10 Mbps
		ORANGE	• 100 Mbps
		GREEN	• 1000 Mbps

Status display LAN 3 (X3P1)



Status display	Meaning	Status	Meaning of the status
LED 1	Connection status	OFF	No cable connected
			Cable not active
			Interface disabled
		GREEN	Active cable connected
		AN	
		GREEN flashing	Data transfer active
		GREEN (Blinking then steady)	Ready to wake up from S5 mode
LED 2	Data transmission rate	OFF	• 10/100 Mbps
		ORANGE	• 1000 Mbps
		GREEN	• 2500 Mbps

1.4.6.3 Status displays of power supply unit 700 W (2 modules, each 700 W, redundant)



Status display	Meaning	Status	Meaning of the status
Module of the power supply unit 700 W	Status of the power supply unit	OFF	Module is out of service, no redundancy in effect.
(2 modules, each 700 W, redundant)		GREEN	 The module is in operation and functioning. Redundancy is in effect when both modules are operating.
		RED	Module failed, no redundancy in effect. See also information in "Alarm reset button for power supply unit 700 W (2 modules, each 700 W, redundant) (Page 25)" for this.

1.4.6.4 Status displays on removable tray for drives



No.	Status display	Meaning	Status	Meaning of the status
1	Power	Status of the removable tray	OFF	Device switched offPower supply not connectedNo drive installed
			GREEN	Device is switched on and a drive is installed
2	Activity	Status of the drive	ORANGE	Drive is active
			OFF	Drive is not active

See also

Drive cage type A (Page 16)

1.5 Internal construction of the device



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

- ① Power supply unit, single or redundant (here in the example: Power supply unit 850 W)
- 2 Heat sink of the processor
- 3 Rod with card holders for expansion cards
- 4 Slots for memory modules
- ⑤ Drive cage (here in the example: Drive cage type A or type B)
- 6 Guide rail for long expansion cards
- Motherboard
- 8 Expansion card slots
- Slot brackets (numbering of the slots for expansion cards on the enclosure)

1.6 Accessories and replacement parts

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 delivery.

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 here 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: Cover Feet Accessories: Screws and rubber feet	6ES7648-1AA01-0XC0

1.6 Accessories and replacement parts

Name	Description	Article number
DisplayPort adapter Connection of monitors with the following adapters possible to: integrated graphics interfaces NVIDIA RTX A4000 graphics card	DP to DVI-D adapter DisplayPort to DVI-D	6ES7648-3AF00-0XA0
NVIDIA RTX A5000 graphics card	DP to VGA adapter DisplayPort to VGA	6ES7648-3AG00-0XA0
Mini-DisplayPort adapter Connection of monitors with the following adapters possible to: NVIDIA T400 graphics card NVIDIA RTX A2000 graphics card	mDP to VGA adapter Mini DisplayPort to VGA	6ES7648-3AL00-0XA0
	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
	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 delivery of NVIDIA T400 and NVIDIA RTX A2000 graphics cards.

1.6 Accessories and replacement parts

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)	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:	6ES7648-0EH00-1BA0
	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	
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	5.25" mounting frame for removable tray.	A5E35804114
HDD / SSD removable tray	You can use a 2.5 "or a 3.5" drive in the removable tray.	

Name	Description	Article number A5E39679590	
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		
Assembly kit HDD / SSD internal, 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 here 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

2.1 General safety instructions

Danger if work is performed incorrectly



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



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.

2.1 General safety instructions

Risk of electric shock when working on the device



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 147).

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 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 74)".
- 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 44)

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 130)".
- 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.

2.2 Safety instructions on transport and storage

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



Risk of physical injury

The device is heavy and may injure persons and be damaged if it falls.

• 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.

- 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.

- 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

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



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 148)"
- "Safety instructions on ambient and environmental conditions (Page 44)"

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 148)"

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 148)".

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 148)"

· 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 58)"

Danger to life when the control cabinet is open



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.

2.4 Safety instructions on ambient and environmental conditions

2.4 Safety instructions on ambient and environmental conditions

Approvals expire if the instructions are not observed



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 148)".
 - 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



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Immunity to RF interference

The device has increased immunity to high-frequency radiation, see information under "Electromagnetic compatibility (Page 147)".

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

2.5 Safety instructions for I/O devices

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



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.

- 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.

• 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



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 74)
- Only install device or system expansions designed for this device.
 Contact your technical support team (Page 175) or the point of sale to find out which device and system expansions are suitable for installation.
- Note the Information on electromagnetic compatibility (Page 165).

2.6 Safety instructions on device and system extensions

Risk of electric shock when working on the device



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 74)"
- 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 93)".

Danger from unauthorized or improperly performed repairs



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



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 141)".



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 181)on the rear of the device.

Observe the Notes on the suitable location of the device (Page 44).

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.

2.6 Safety instructions on device and system extensions

Unpacking and installing the device

3

3.1 Unpacking the device

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 ordered Microsoft® Windows® operating systems under: Important instructions and manuals for operating the device (Page 11) or Technical specifications of the operating systems (Page 158).

3.1 Unpacking the device

Installed software

You will find the information on more software for your device under: Software accessories (Page 35).

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 40)".

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 51) and any accessories (Page 32) 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 53).

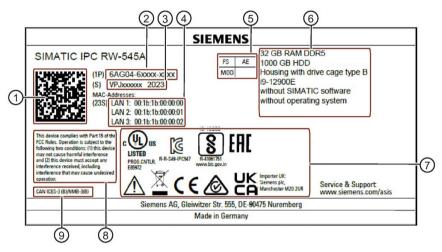
3.1.3 Device identification data

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.



Example: SIMATIC IPC RW-545A nameplate (the information on the nameplate is device-specific)

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 182)
	Symbols for safe use and disposal (Page 181)
8	FCC Rules (USA) (Page 164)
9	ICES Compliance (Canada) (Page 164)

3.2 Mounting the device

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 157)".

Installation in the control cabinet

When mounting the device in a cabinet, use a central and easily accessible mains disconnector (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 are available from Rittal device bases (https://www.rittal.com/de-de/product/list.action?categoryPath=/PG0001/) 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 32)".

More information

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

3.2.2 Securing the device



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 42)
- Safety instructions on ambient and environmental conditions (Page 44)

3.2 Mounting the device

DANGER

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.



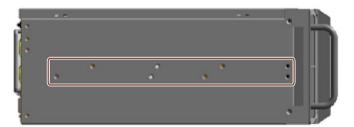
Risk of physical injury

The device is too heavy to be mounted exclusively with the 19" brackets of the front panel.

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

- Secure the device using additional measures. The mounting screws of the telescopic rails may not protrude more than 5 mm into the device.
- Use handles attached to the front to carry and lift the device.

Drill holes for telescopic rails



You can find the dimensions for the drill holes under "Dimension drawing for drill holes for telescopic rails (Page 162)".

You can find detailed information on the telescopic rails under: "Technical specifications of the telescopic rails (Page 157)".

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 cords used are rated for the maximum current input and ambient temperature of the device and 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 input and ambient temperature of the device and 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 cord and may only be connected to a grounded SCHUKO socket outlet.

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

The power supply cable and the device plug must bear the prescribed markings.

4.2 Connection of equipotential bonding line

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 19)".

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 power supply units

4.3.1 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 rated 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.



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.

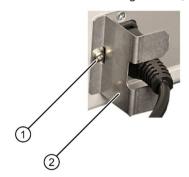
- Always fully disconnect the device from the mains voltage before performing work on the device or when the device will not be used over an extended period of time.
- For control cabinet mounting: Use a central and easily accessible AC circuit breaker near the device.

Requirement

- You have observed the information under "Country-specific information on supply voltage (Page 57)".
- 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 25)".
- 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 22)".
- 3. Insert the power cable in the electrical socket.
- 4. Switch on the device at the on-off switch (position J).
- 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.

4.3 Connecting power supply units

4.3.2 Connecting the power supply unit 850 W



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 rated 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.



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.

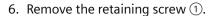
- Always fully disconnect the device from the mains voltage before performing work on the device or when the device will not be used over an extended period of time.
- For control cabinet mounting: Use a central and easily accessible AC circuit breaker near the device.

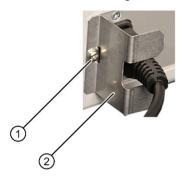
Requirement

- You have observed the information under "Country-specific information on supply voltage (Page 57)".
- 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 850 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 850 W (Page 23)".
- 3. Insert the power cable in the electrical socket.
- 4. Switch on the device at the on-off switch (position |).
- 5. To prevent unintentional removal of the power plug, secure the power plug on the device.





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

4.3.3 Connecting the power supply unit 700 W (2 modules, each 700 W, redundant)



⚠ 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 rated 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 does not fully disconnect the device from the electricity grid.

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 close to the device, if possible.

4.4 Connecting I/O devices

Requirement

- You have observed the information under "Country-specific information on supply voltage (Page 57)".
- Screwdriver TORX T10

Procedure

- 1. Connect the power plug to both sockets. Information on the position of the sockets is available in "Connection of power supply unit 700 W (2 modules, each 700 W, redundant) (Page 23)".
- 2. Connect the power cable to the sockets.

The status display on the modules of the redundant power supply unit lights up green.

Note

If only one of the modules of the redundant power supply unit works, a warning signal sounds. The warning signal goes off by pressing the alarm reset button on the working module of the redundant power supply unit. You can find information on the position of the alarm reset button under "Alarm reset button for power supply unit 700 W (2 modules, each 700 W, redundant) (Page 25)".

4.4 Connecting I/O devices

4.4.1 Connecting external devices



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 46).

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 20)".
- 2. Secure the cables (Page 72) with a strain relief.

4.4.2 Connecting audio devices

Requirement

• You have observed the information under "Connecting external devices (Page 62)" and under "Technical specifications of the connections on the device (Page 155)"

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 20)".
- 2. Secure the cables (Page 72) 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
- Power supply unit 850 W
- Power supply unit 700 W (2 modules, each 700 W, redundant)

Connection sockets on the rear of the device

You will find four connection sockets on the rear of the device for connecting monitors at the integrated graphics interfaces.

- 3 x DP (DisplayPort; labeling on the device: DPP1, DPP2, DPP3)
- DVI-D (labeling on the device: X70)

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.

4.4 Connecting I/O devices

You can find information on the connection sockets on the rear of the device under: "Device ports (Page 20)".

You can find information on the adapters under "Hardware accessories (Page 32)".

Connection socket on monitor		Connection		the integrate	Connection socket on the NVIDIA T400 graphics card			
		DP (DPP1; X71) ¹	DP (DPP2; X72) ¹	DP (DPP3; X73) ¹	DVI-D (X70) ¹	mDP1	mDP2	mDP3
Monitor 1	DP (DisplayPort)	Х						
	DVI	X 2)						
	VGA	X 2)						
Monitor 2	DP (DisplayPort)		Х					
	DVI		X ²⁾					
	VGA		X ²⁾					
Monitor 3	DP (DisplayPort)			Х				
	DVI			X 2)				
	VGA			X 2)				
Monitor 4	DP (DisplayPort)							
	DVI				Х			
	VGA							
Monitor 5	DP (DisplayPort)					X ²⁾		
	DVI					X 2)		
	VGA					X 2)		
Monitor 6	DP (DisplayPort)						X ²⁾	
	DVI						X 2)	
	VGA						X 2)	
Monitor 7	DP (DisplayPort)							X ²⁾
	DVI							X 2)
	VGA							X 2)

¹⁾ Labeling on the device

Requirement

• You have observed the information in the following sections:

²⁾ via adapter, see "Hardware accessories (Page 32)"

[&]quot;Connecting external devices (Page 62)"

Procedure

1. Connect the monitors to the rear of the device (Page 20).

For information on connecting monitors with adapters, see "Hardware accessories (Page 32)".

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 102)".

See also

Technical specifications of graphic (Page 152)

Technical specifications of the connections on the device (Page 155)

4.4.3.2 Connecting monitors for using the NVIDIA RTX A2000 graphics card

Power supply units

The NVIDIA RTX A2000 graphics card can be operated with the following power supply units:

- Power supply unit 550 W
- Power supply unit 850 W
- Power supply unit 700 W (2 modules, each 700 W, redundant)

Connection sockets on the rear of the device

You will find four connection sockets on the rear of the device for connecting monitors at the integrated graphics interfaces.

- 3 x DP (DisplayPort; labeling on the device: DPP1, DPP2, DPP3)
- DVI-D (labeling on the device: X70)

You will find 4 additional connection sockets on the rear of the device for connecting monitors to the optional NVIDIA RTX A2000 graphics card.

• 4 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: "Device ports (Page 20)".

You can find information on the adapters under "Hardware accessories (Page 32)".

4.4 Connecting I/O devices

Connection socket on monitor		Connect	ion socket graphics i	on the inte	grated	Connection socket on the NVIDIA RTX A2000 graphics card				
		DP (DPP1; X71) ¹	DP (DPP2; X72) ¹	DP (DPP3; X73) ¹	DVI-D (X70) ¹	mDP1	mDP2	mDP3	mDP4	
Monitor 1	DP (DisplayPort)	Х								
	DVI	X 2)								
	VGA	X 2)								
Monitor 2	DP (DisplayPort)		Х							
	DVI		X 2)							
	VGA		X 2)							
Monitor 3	DP (DisplayPort)			Х						
	DVI			X ²⁾						
	VGA			X ²⁾						
Monitor 4	DP (DisplayPort)									
	DVI				Х					
	VGA									
Monitor 5	DP (DisplayPort)					X ²⁾				
	DVI					X ²⁾				
	VGA					X 2)				
Monitor 6	DP (DisplayPort)						X ²⁾			
	DVI						X ²⁾			
	VGA						X 2)			
Monitor 7	DP (DisplayPort)							X ²⁾		
	DVI							X 2)		
	VGA							X 2)		
Monitor 8	DP (DisplayPort)								X 2)	
	DVI								X 2)	
	VGA								X ²⁾	

¹⁾ Labeling on the device

Requirement

• You have observed the information in the following sections:

²⁾ via adapter, see "Hardware accessories (Page 32)"

[&]quot;Connecting external devices (Page 62)"

Procedure

1. Connect the monitors to the rear of the device (Page 20).

For information on connecting monitors with adapters, see "Hardware accessories (Page 32)".

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 102)".

See also

Technical specifications of graphic (Page 152)

Technical specifications of the connections on the device (Page 155)

4.4.3.3 Connecting monitors for using the NVIDIA RTX A4000 graphics card

Power supply unit

The NVIDIA RTX A4000 graphics card can be operated with the following power supply unit:

• Power supply unit 850 W

Connection sockets on the rear of the device

You will find four connection sockets on the rear of the device for connecting monitors at the integrated graphics interfaces.

- 3 x DP (DisplayPort; labeling on the device: DPP1, DPP2, DPP3)
- DVI-D (labeling on the device: X70)

You will find 4 additional connection sockets on the rear of the device for connecting monitors to the optional NVIDIA RTX A4000 graphics card.

• 4 x DisplayPort

You can find information on the connection sockets on the rear of the device under: "Device ports (Page 20)".

You can find information on the adapters under "Hardware accessories (Page 32)".

4.4 Connecting I/O devices

Connection socket on monitor		Connect	tion socket o		grated	Connection socket on the NVIDIA RTX A4000 graphics card			
		DP (DPP1; X71) ¹⁾	DP (DPP2; X72) ¹⁾	DP (DPP3; X73) 1)	DVI-D (X70) ¹⁾	DP1 (Display Port)	DP2 (Display Port)	DP3 (Display Port)	DP4 (Display Port)
Monitor 1	DP (DisplayPort)	Х							
	DVI	X 2)							
	VGA	X ²⁾							
Monitor 2	DP (DisplayPort)		Х						
	DVI		X ²⁾						
	VGA		X ²⁾						
Monitor 3	DP (DisplayPort)			Х					
	DVI			X 2)					
	VGA			X 2)					
Monitor 4	DP (DisplayPort)								
	DVI				Х				
	VGA								
Monitor 5	DP (DisplayPort)					X			
	DVI					X ²⁾			
	VGA					X ²⁾			
Monitor 6	DP (DisplayPort)						Х		
	DVI						X ²⁾		
	VGA						X ²⁾		
Monitor 7	DP (DisplayPort)							X	
	DVI							X ²⁾	
	VGA							X ²⁾	
Monitor 8	DP (DisplayPort)								Х
	DVI								X 2)
	VGA								X 2)

¹⁾ Labeling on the device

Requirement

• You have observed the information in the following sections:

²⁾ via adapter, see "Hardware accessories (Page 32)"

[&]quot;Connecting external devices (Page 62)"

Procedure

1. Connect the monitors to the rear of the device (Page 20).

For information on connecting monitors with adapters, see "Hardware accessories (Page 32)".

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 102)".

See also

Technical specifications of graphic (Page 152)

Technical specifications of the connections on the device (Page 155)

4.4.3.4 Connecting monitors for using the NVIDIA RTX A5000 graphics card

Power supply unit

The NVIDIA RTX A5000 graphics card can be operated with the following power supply unit:

• Power supply unit 850 W

Connection sockets on the rear of the device

You will find four connection sockets on the rear of the device for connecting monitors at the integrated graphics interfaces.

- 3 x DP (DisplayPort; labeling on the device: DPP1, DPP2, DPP3)
- DVI-D (labeling on the device: X70)

You will find 4 additional connection sockets on the rear of the device for connecting monitors to the optional NVIDIA RTX A5000 graphics card.

• 4 x DisplayPort

You can find information on the connection sockets on the rear of the device under: "Device ports (Page 20)".

You can find information on the adapters under "Hardware accessories (Page 32)".

4.4 Connecting I/O devices

Connection socket on monitor		Connect	ion socket o graphics in		grated	Connection socket on the NVIDIA RTX A5000 graphics card				
		DP (DPP1; X71) 1)	DP (DPP2; X72) ¹⁾	DP (DPP3; X73) ¹⁾	DVI-D (X70) ¹⁾	DP1(Displ ayPort)	DP2 (Display Port)	DP3 (Display Port)	DP4 (Display Port)	
Monitor 1	DP (DisplayPort)	Х								
	DVI	X 2)								
	VGA	X 2)								
Monitor 2	DP (DisplayPort)		Х							
	DVI		X ²⁾							
	VGA		X 2)							
Monitor 3	DP (DisplayPort)			Х						
	DVI			X 2)						
	VGA			X ²⁾						
Monitor 4	DP (DisplayPort)									
	DVI				Х					
	VGA									
Monitor 5	DP (DisplayPort)					X				
	DVI					X 2)				
	VGA					X 2)				
Monitor 6	DP (DisplayPort)						Х			
	DVI						X ²⁾			
	VGA						X ²⁾			
Monitor 7	DP (DisplayPort)							Х		
	DVI							X ²⁾		
	VGA							X ²⁾		
Monitor 8	DP (DisplayPort)								Х	
	DVI								X 2)	
	VGA								X 2)	

¹⁾ Labeling on the device

Requirement

• You have observed the information in the following sections:

²⁾ via adapter, see "Hardware accessories (Page 32)"

[&]quot;Connecting external devices (Page 62)"

Procedure

1. Connect the monitors to the rear of the device (Page 20).

For information on connecting monitors with adapters, see "Hardware accessories (Page 32)".

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 102)".

See also

Technical specifications of graphic (Page 152)

Technical specifications of the connections on the device (Page 155)

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 ports 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 delivery

Additional 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.

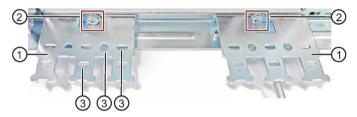
You can mount two strain-relief assemblies.

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 20)".
- 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 58)

Procedure

- 1. For devices with power supply unit 550 W and power supply unit 850 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 24)".

Commissioning the installed Windows® operating system

You can find information on the first switch on of the device and on commissioning the installed Windows® operating system in the documentation of your operating system, see "Important instructions and manuals for operating the device (Page 11)".

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 11)

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 24)".

Result

The "POWER" status display on the front (Page 27) indicates the corresponding energy-saving mode ("Shut down") of the device.

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

Fully disconnecting the device from the line voltage



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 27) 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 24)".

5.3 Switching off the device

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 21)".

To connect several 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 63)
- Installing a graphics card (Page 102)

6.3 Drive configurations

6.3.1 RAID1 system

An RAID1 system works on the principle of "data mirroring on two drives".

In the event of a defective drive, the RAID1 system can continue to work on the remaining drive and thus achieves a high level of availability.

You can find information on operating a RAID1 system here:
 Onboard RAID system (Page 78)

6.3.2 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 11)".

6.4 Onboard RAID system

6.4.1 Display of a defective drive of an onboard RAID system

A defective drive is displayed in conjunction with onboard RAID at the following locations:

- System status displays (Page 27) on the front of the device
- "Intel® Optane™ Memory and Storage Management", see "Monitoring the onboard RAID system with "Intel® Optane™ Memory and Storage Management" (Page 81)"

Numbering of the drives for "Intel® Optane™ Memory and Storage Management" and the device

Note

Different numbering of the drives

Note the different numbering of the drives for "Intel® Optane™ Memory and Storage Management" and the device.

"Intel® Optane™ Memory and Storage Management"	Status display for the system (Page 27) on the front of the device	Mounting location for drive cage type A and drive cage type B (Page 16)	SATA ports on the motherboard (Page 167)
Port 4	HDD0 ALARM	Mounting location 0	PORT_0
Port 5	HDD1 ALARM	Mounting location 1	PORT_1
Port 6	HDD2 ALARM	Mounting location 2	PORT_2
Port 7	HDD3 ALARM	Mounting location 3	PORT_3

6.4.2 Onboard RAID1 system: Installation options for SATA drives

The 2 SATA drives required for an onboard RAID1 system may be installed at the following locations:

- Drive cage type A (Page 16)
- Drive cage type B (Page 18)

6.4.3 Operating onboard RAID system

6.4.3.1 Setting up the onboard RAID system in the firmware (Create Volume)

If you have ordered a device with an onboard RAID system, the RAID system is already configured on delivery.

The subsequent setup of an onboard RAID system is performed in the firmware under "Create Volume".

Once the onboard RAID system has been set up, it can be configured with the "Intel®Optane™ Memory and Storage Management" software.

Requirement

- The drives required for the onboard RAID system are built into the device, see information under:
 - Onboard RAID1 system: Installation options for SATA drives (Page 79)

6.4 Onboard RAID system

Procedure

- 1. Switch on the device or restart it.
- 2. To access the user interface of the firmware, press and hold or <ESC> immediately after switching on the device when the message "Press oder <ESC> to enter setup and press <F7> to enter boot menu appears.

The firmware user interface opens. Here you have the following keys available for navigation:

Navigation in the firmware		
Action	Key	
Select entry	Arrow keys on the keyboard	
(then confirm selection)		
Confirm selection	• <enter> key</enter>	
Exception:	Exception:	
Confirm selection when integrating drives	– <space> keyboard</space>	
Back to previous window	<esc> key</esc>	

- 3. Select: "Advanced > VMD setup menue".
- 4. Assign the "Enable" value to the firmware setting "Enable VMD Controller".
- 5. Return to the previous window "Advanced".
- 6. Select "Intel <R> Rapid Storage Technology".
- 7. Select "Create RAID Volume".
- 8. On the next screen, assign a name for the RAID system.
- $9. \ \ Select \ "RAID \ Level" \ and \ select \ the \ entry \ "RAID1" \ in \ the \ following \ selection \ window.$

A list of available drives is displayed.

10.Select "Select Disks".

A list of available drives is displayed.

11. Select the drives ① from the list that you want to integrate into your RAID system and press the **Space** key.

You can find information on the mounting locations of the drives in the device under "Onboard RAID1 system: Installation options for SATA drives (Page 79)".

- In the list, the mounted drive is marked with an "X" ②.
- You can find the assignment of the drive to the mounting location in the device ③ in front of the drive model designation.

```
3
Select || isks:
SATA 0 0, ST2000NH0008-2F3100 ZDS00K6T, <x>
1.8TB
SATA 0.1, ST2000NH0008-2F3100 ZDS00K71, <x>
1.8TB
```

12. Select "Create Volume".

The following window now displays the details of the RAID system (RAID Volume) that has just been set up.

The onboard RAID system is set up.

13.To exit the firmware settings, press the <F4> button (Save & Exit) and confirm the subsequent dialog with <Y>.

Configuring onboard RAID system with "Intel® Optane™ Memory and Storage Management"

- 1. Select "Start" > "Intel® Optane™ Memory and Storage Management".
- 2. Select the "Manage" tab.

You can find information on configuring a RAID system with "Intel® Optane™ Memory and Storage Management" in the documentation or in the help for the software.

6.4.3.2 Monitoring the onboard RAID system with "Intel® Optane™ Memory and Storage Management"

Use the Intel® Optane™ Memory and Storage Management software to monitor the onboard RAID system.

You can find information on monitoring a RAID system with "Intel® Optane™ Memory and Storage Management" in the documentation or help for the software.

Open "Intel® Optane™ Memory and Storage Management"

1. Select Start > Intel® Optane™ Memory and Storage Management.

Display status of the onboard RAID system (faulty drive)

1. Select the "Manage" tab.

In the right area of the window, a list of the drives mounted in the onboard RAID is displayed under "Storage System View".

Note

Different numbering of the drives

Note the different numbering of the drives for "Intel® Optane™ Memory and Storage Management" and the device. See important note under "Display of a defective drive of an onboard RAID system (Page 78)".

2. Right-click on a drive from the list or on "Volume".

Status displays are shown for functions and components of the drives or the onboard RAID system.

6.4 Onboard RAID system

6.4.3.3 Integrating a new drive into an onboard RAID system

The onboard RAID system is configured in the delivery state so that a new drive must be integrated manually when a defective drive was replaced.

You can also configure the onboard RAID system in such a way that the new drive is automatically mounted when the defective drive is replaced.

Onboard RAID systems with a hot-spare drive are configured so that the hot-spare drive is automatically integrated in the event of an error.

Configure "Automatic integration of a new drive" (before replacing a defective drive)

NOTICE

Risk of data loss

If a new drive is automatically integrated, the new drive is not checked for partition information or existing data.

All partitions and data of the new drive are deleted without warning.

- Insert only a brand new drive or a drive that is configured as a replacement drive.
- 1. Select "Start" > "Intel® Optane™ Memory and Storage Management".
- 2. Select the "Manage" menu.
- 3. Select "Settings".
- 4. Set the "Auto-rebuild on hot plug" option to "Enabled".

Configure the mounted drive under "Create Raid Volume".

Configure "Manual integration of a new drive" (before replacing a defective drive)

The onboard RAID system is configured in the delivery state so that a new drive must be integrated manually when a defective drive was replaced.

You can configure the manual integration of the drive or check the settings yourself.

To do this, disable the function to automatically mount a new drive.

- 1. Select "Start" > "Intel® Optane™ Memory and Storage Management".
- 2. Select the "Manage" menu.
- 3. Select "Settings".
- 4. Set the "Auto-rebuild on hot plug" option to "Disabled".

Configure the mounted drive under "Create Raid Volume".

Mount new drive during operation in the onboard RAID system (after an error has occurred)

Requirement

The system is configured to mount new drives manually (not automatically), see above.

Procedure

- 1. Select "Start" > "Intel® Optane™ Memory and Storage Management".
- 2. Select the "Manage" menu.

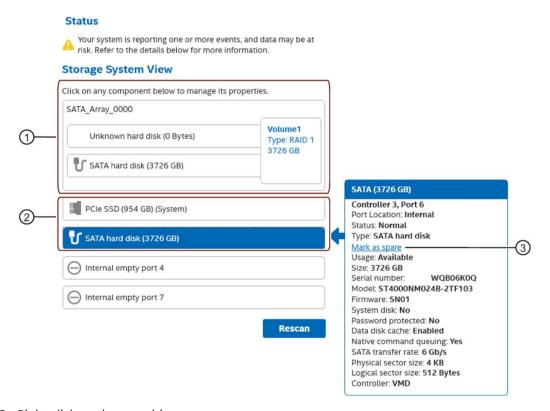
You will find the following components in the "Storage System View" area:

- ① The drives mounted in the onboard RAID system with the information that a drive is not yet mounted (Unknown hard disk).
- ② List of available drives and systems.

Note

Different numbering of the drives

Note the different numbering of the drives for "Intel® Optane™ Memory and Storage Management" and the device. See important note under "Display of a defective drive of an onboard RAID system (Page 78)".



- 3. Right-click on the new drive.
- 4. From the drive information, select the function "Mark as spare" ③.

 The drive is mounted to the onboard RAID system and appears in the mounted drives area.

See also

Data synchronization in the RAID system (Page 84)

6.4.4 Data synchronization in the RAID system

NOTICE

Danger of incorrect operations on machine and plant: delayed system reaction during data synchronization

Data is synchronized if a drive fails.

The system can respond with a delay depending on the size of the drive and system load. In extreme cases, the execution of keyboard, mouse or touch screen commands may be briefly delayed.

The result may be faulty operations of the machine or plant.

• Do not operate safety-critical functions during synchronization of a drive. Stable system statuses are only achieved after successful completion of synchronization.

Duration of data synchronization

The synchronization process may take quite some time, e.g. several hours, with extremely high drive load even days.

Guide value for the duration of data synchronization:

• < 3h at 90% HDD system load

In addition, system performance may be limited in the case of a manually started maintenance operation until completion of the maintenance phase.

6.5 Monitoring of the device

6.5.1 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	 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. 	 Status display "TEMP (Page 27)" 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	 Monitoring of underspeed and failure of a fan as well as cable break of the tachometer cable The operation of the fan is monitored at the following positions: Front panel Processor Drive cage type A 	 Status display "FAN (Page 27)" Fan alarm is output.
Drive monitoring	 Determination of the status of the drives (HDD and SSD) with SMART functionality (SMART: Self-Monitoring, Analysis and Reporting Technology) also in RAID systems (RAID state) The status of an inactive hot swap drive is not displayed. 	 Status display "HDDx ALARM (Page 27)" SMART status of the hard drives The following statuses, for example, are displayed in a RAID system: "Normal", "OK", "Degraded", error "Rebuild", rebuilding

NOTICE

Fan monitoring restricted

The power supply units do not report a fan error.

If the fan of the power supply unit fails or is defective, no fan alarm is output.

The device switches off automatically to protect against overheating.

6.6 Remote maintenance of the device

6.6.1 Remote maintenance functions

Remote maintenance of the devices is performed using Intel® Active Management Technology (iAMT), which is integrated into the hardware and firmware of the computer.

Through remote access to SIMATIC IPCs, system or program errors can be eliminated, program updates can be performed and firmware/BIOS settings can be made from a control room (without on-site presence). Access is possible even if the operating system no longer starts.

Several remote maintenance functions of iAMT are listed as examples below:

Function	Description
Remote operation (keyboard video mouse	With KVM Redirection, you can control SIMATIC IPCs remotely even if they have no operating system or a defective operating system.
redirection)	A KVM remote session is always possible with the KVM server integrated in the firmware. This allows you to restart the IPC and change firmware/BIOS settings remotely.
Remote power management	SIMATIC IPCs can be turned on and off and restarted from another PC.
IDE redirection	An ISO file on the Help Desk PC can be integrated and used on the SIMATIC IPC as a DVD drive.
	An ISO file contains a memory image of the content of a CD or DVD structured in the ISO 9660 format.
Remote booting	A SIMATIC IPC can be booted remotely from a bootable ISO file made available by another PC.

6.6.2 Remote maintenance with Intel® AMT

6.6.2.1 Procedure for using Intel® AMT

To make use of "Intel® Active Management Technology ", proceed as follows:

- 1. Note the information on the device requirements for Intel® AMT. (Page 86)
- 2. First, enable the Intel® AMT functions (Page 87) and then start the device again.
- 3. Log in to MEBx. (Page 88)
- 4. Then configure the Intel® AMT functions in the Options of the MEBx (Page 89).

6.6.2.2 Device requirements for remote maintenance with Intel® AMT

The following device requirements must be met for using Intel® Active Management Technology (iAMT):

- Processor that supports iAMT technology
- Connection to the network

6.6.2.3 Activate Intel® AMT

Note

For information on the firmware settings in the user manual (UM) for the motherboard, see "Important instructions and manuals for operating the device (Page 11)".

Requirement

• The device meets the requirements for remote maintenance with Intel® AMT (Page 86)

Procedure

- 1. Switch on the device or restart it.
- 2. To access the user interface of the firmware, press and hold or <Esc> immediately after switching on the device when the message "Press oder <ESC> to enter setup and press <F7> to enter boot menu appears.

The firmware user interface opens. Here you have the following keys available for navigation:

Navigation in the firmware		
Action	Key	
Select entry	Arrow keys on the keyboard	
(then confirm selection)		
Confirm selection	• <enter> key</enter>	
Back to previous window	<esc> key</esc>	

- 3. Select "Advanced" > "AMT Configuration".
- 4. Assign the "Enabled" value to the firmware setting "AMT BIOS Features".
- 5. Press the button <F4> (Save & Exit) and confirm the subsequent dialog with <Y>.
- 6. Switch off the device or restart it.

6.6 Remote maintenance of the device

6.6.2.4 Logging onto MEBx (assigning password)

Note

For information on the firmware settings in the user manual (UM) for the motherboard, see "Important instructions and manuals for operating the device (Page 11)".

Requirement

- The Intel® AMT functions are enabled. (Page 87)
- The device was switched off or restarted after activating the Intel® AMT functions.

Procedure

- 1. Switch on the device or restart it.
- 2. Immediately after turning on the device, as soon as the message "Press or <ESC> to enter setup" appears, press and hold the or <Esc> button.

The firmware user interface opens. Here you have the following keys available for navigation:

Action	Key	
Select entry (then confirm selection)	Arrow keys on the keyboard	
Confirm selection	• <enter> key</enter>	
Back to previous window	• <esc> key</esc>	

- 3. Select the "MEBx" option.
- 4. Confirm your selection with the <Return> key.
- 5. Enter the following "Intel(R) ME Password" when logging on the first time:

admin

6. Afterwards, change the password immediately.

The new password must contain the following characters:

- A total of at least eight characters
- An upper case letter
- A lower case letter
- Eine Zahl
- A special character . ! @ # \$ % ^ & *

Note

The underscore and blank space are valid password characters but do not increase password complexity.

7. Now configure the Intel® AMT functions in the Options of the MEBx (Page 89).

6.6.2.5 Configuring the AMT functions in the options of the MEBx

Use "Intel® Management Engine BIOS Extension" (MEBx) to configure important firmware settings of your device to use Intel® AMT functions and the Intel® Management Engine (ME). The following options are available for Intel® AMT-enabled devices:

- Redirection features
- User Consent
 - Password Policy
- Network Setup
 - **Network Access State**
- Remote Setup And Configuration
- Power Control

Requirement for the use of "Intel® Management Engine BIOS Extension" (MEBx)

• The device is logged into MEBx (Page 88)

Procedure

You can find information on the configuration of the Intel® AMT functions in the options of the MEBx in the User Manual (UM) for the motherboard, see "Important instructions and manuals for operating the device (Page 11)".

6.6.2.6 Reset Intel® AMT functions to default settings and disabling iAMT

One effect of resetting to the default settings is that Intel® AMT is disabled.

- 1. Switch on the device or restart it.
- 2. Immediately after turning on the device, as soon as the message "Press or <ESC> to enter setup" appears, press and hold the or <Esc> button.

The firmware user interface opens. Here you have the following keys available for navigation:

Action	Key	
Select entry (then confirm selection)	Arrow keys on the keyboard	
Confirm selection	• <enter> key</enter>	
Back to previous window	• <esc> key</esc>	

- 3. Select "Advanced" > "AMT Configuration".
- 4. Assign the "Enabled" value to the firmware setting "Unconfigure ME".
- 5. Press the button <F4> (Save & Exit Setup) and confirm the subsequent dialog with <Y>.
- 6. Switch off the device or restart the device.

6.7 Trusted Platform Module (TPM)

6.6.2.7 Disabling Intel® AMT access to the firmware/BIOS settings

You can prevent access to firmware/BIOS settings with Intel® AMT

This may be necessary, for example, in the following cases:

- When you are no longer using Intel® AMT.
- You want to ensure that Intel® AMT is not used without authorization.

All Intel® AMT functions are thereby reset to default settings.

Procedure

- 1. Switch on the device or restart it.
- 2. Immediately after turning on the device, as soon as the message "Press or <ESC> to enter setup" appears, press and hold the or <Esc> button.

The firmware user interface opens. Here you have the following keys available for navigation:

Action	Key	
Select entry (then confirm selection)	Arrow keys on the keyboard	
Confirm selection	• <enter> key</enter>	
Back to previous window	• <esc> key</esc>	

- 3. Select "Advanced" > "AMT Configuration".
- 4. Assign the "Disabled" value to the firmware setting "AMT BIOS Features".
- 5. Press the button <F4> (Save & Exit Setup) and confirm the subsequent dialog with <Yes>.
- 6. Switch off the device and then configure the Intel® AMT functions.

6.7 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.

NOTICE

Import restrictions for the Trusted Platform Module

Use of the Trusted Platform Module is subject to legal restrictions in some countries and is not permitted there.

 Always observe the respective import restrictions of the country in which the device will be used.

6.7 Trusted Platform Module (TPM)

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 11)".

6.7 Trusted Platform Module (TPM)

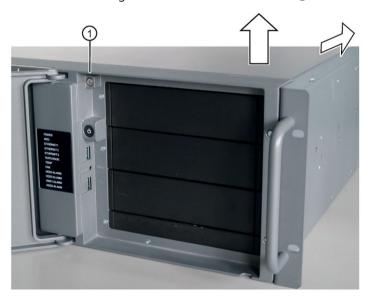
7.1 Open the device

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- Screwdriver TORX T10

Procedure

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Unplug all connecting cables.
- 3. Open the front panel. (Page 77)
- 4. Unscrew the locking screw of the enclosure cover ①.



- 5. Push the enclosure cover back.
- 6. 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 a given slot under "Technical specifications of the expansion card slots (Page 150)".

Requirements for expansion cards

- You can find the permitted dimensions for expansion cards under "Dimension drawing of the expansion cards (Page 161)". To rule out contact problems and malfunctions, do not use any expansion cards that exceed the maximum permissible height.
- Long PCI/PCIe expansion cards must be equipped with an extender so that they can be introduced into the guide rails.

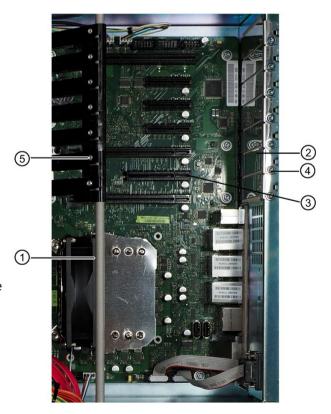
7.2.2 Installing expansion cards

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- You know the Information on using expansion cards. (Page 94)

Procedure

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. 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.
- 4. Remove the slot bracket ② for the required slot.
- 5. Insert the expansion card into the free slot ③ on the motherboard.
- 6. Secure the expansion card with the screw 4.
- 7. Re-insert the bar ① with the card retainers.
- 8. Detach the card retainer in question and place it on the expansion card in the slot ③.
- 9. 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.
- 10.Close the device.



7.2.3 Removing expansion cards

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- You can find Information on the components described in the procedure under "Installing expansion cards (Page 94)".

Procedure

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. Hold the bar with the card retainer at both ends and remove it by pulling it upwards. The bar is latched on both ends.
- 4. Disconnect all cables and the screw of the expansion card that you wish to remove.
- 5. 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.
- 6. 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 DIMM DDR5 memory modules with the following specifications:

- "without ECC"
- Memory transaction rate at least 4400 MT/sec "unbuffered"

The memory transaction rate depends on the combination of memory modules used.

Depending on the combination of memory modules used, the actual memory transaction rate can take the following values due to the system:

- 4400 MT/Sec.
- 4000 MT/Sec.
- 3600 MT/Sec.

7.3 Installing and removing memory modules

Slots for memory modules

Information on the slots of the memory modules can be found under "Layout of the motherboard (Page 167)".

Combination options for memory modules

You can equip each device with 1, 2, 3 or 4 memory modules of the same capacity. Combinations of three memory modules and the mixing of memory capacities are not permitted.

Use the modules to expand the memory capacity of your device to a maximum of 128 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 (external)		Channel B		Maximum expansion
	DIMM_A1	DIMM_A2	DIMM_B1	DIMM_B2	
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
Combination 3	Combinations of three memory modules are not permitted				
Combination 4	8 GB / 16 GB / 32 GB	8 GB / 16 GB / 32 GB	8 GB / 16 GB / 32 GB	8 GB / 16 GB / 32 GB	128 GB

Conditions of use of memory modules

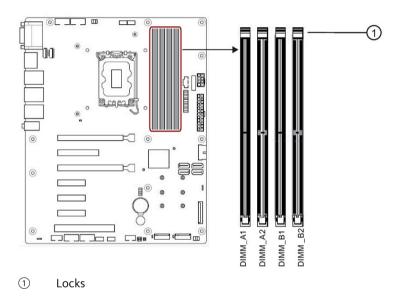
- When two identical memory modules are installed, memory is operated in dual-channel mode.
- If expansion cards with their own memory, such as graphics cards with 256 MB or more are used, the usable memory for an operating system or applications may be less than 128 GB.
- In case of operating errors, 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 know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- You know the Information on using memory modules. (Page 95)

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:

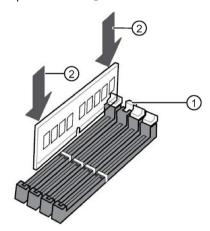
- Memory module 1: DIMM_A1 slot
- Memory module 2: DIMM_A2 slot
- Memory module 3: DIMM_B1 slot
- Memory module 4: DIMM_B2 slot

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

7.3 Installing and removing memory modules

Procedure

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. To obtain better access to the memory modules, remove expansion cards (Page 95) if required.
- 4. Open the lock ① on the slot.



- Remove the memory module from its packaging.Hold it by the upper edges only.
- 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.
- 7. To prevent tilting, press evenly on both sides of the memory module ② until the lock audibly engages.
- 8. Close the device.

Display of a changed memory configuration

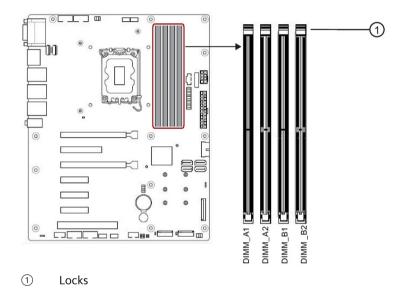
A changed memory allocation is automatically recognized when the device is switched on.

7.3.3 Removing memory modules

Requirement

• You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".

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 B2 slot
- Memory module 2: DIMM B1 slot
- Memory module 3: DIMM A2 slot
- Memory module 4: DIMM_A1 slot

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

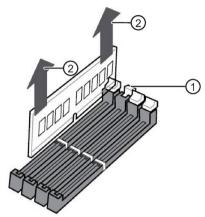
Procedure

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. To obtain better access to the memory modules, remove expansion cards (Page 95) if required.

7.4 Connecting a USB stick to the internal interface

4. 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.



5. 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

The device has one or two internal USB ports to which you can connect a USB stick.

This interface is located on the motherboard (Page 167) at the rear of the device.

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- Retainer for locking the internal USB interface, see "Hardware accessories (Page 32)".
- Screwdriver TORX T10

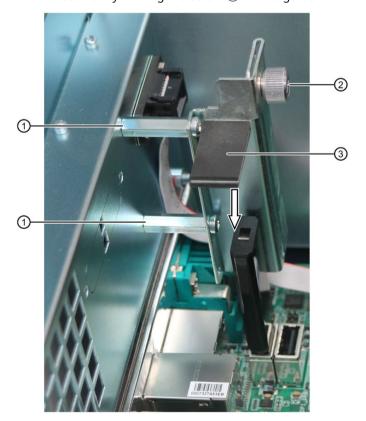
Procedure

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. Insert the USB stick into the socket of the internal USB interface on the motherboard (Page 167).

4. Screw the two hexagon bolts ① with two of the enclosed screws into the first and third drill holes of the retainer.



- 5. 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 19)".
- 6. Slide the bar of the retainer ③ onto the USB stick.
- 7. Fix the retainer by turning the screw ② on the guide rail.



8. 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 20)".

To connect additional monitors to the device (multi-monitoring) (Page 63), you can install a graphics card.

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- A graphics card suitable for this device that supports multi-monitoring, see "Connecting several monitors (multi-monitoring) (Page 63)".
- You know the information about the power supply of the graphics card, see "Technical specifications of the plug connectors for the power supply of graphics cards (Page 157)".
- 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 11)".

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 150)".

Note the information under "Installing expansion cards (Page 94)".

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 plug connectors for the power supply of graphics cards (Page 157)".

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 20)".

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 175)

7.6 Installing and removing drives

7.5.2 Removing a graphics card

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- 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 11)".

Procedure

1. The graphics card is an expansion card.

Remove the graphics card.

Note the information under "Removing expansion cards (Page 95)".

2. Check the firmware settings.

7.6 Installing and removing drives

7.6.1 Installing drives in drive cage type A

7.6.1.1 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 the numbering of the mounting locations in the drive cage type A. (Page 16)

Number of drives per system	Mounting location in drive cage type A	Installation option
1	Drive cage type A: • Mounting location 0	2.5" drive or 3.5" drive in removable tray (Page 106)
2	Drive cage type A: • Mounting location 0 • Mounting location 1	2.5" drive or 3.5" drive in removable tray (Page 106)
3	Drive cage type A:Mounting location 0Mounting location 1Mounting location 2	2.5" drive or 3.5" drive in removable tray (Page 106)
4	Drive cage type A: • Mounting location 0 • Mounting location 1 • Mounting location 2	2.5" drive or 3.5" drive in removable tray (Page 106)
	Drive cage type A: • Mounting location 3	 2.5" drive or 3.5" drive in removable tray (with 5.25" mounting frame) (Page 108) 5.25" drive or 5.25" component (Page 119)
5 1	Drive cage type A: • Mounting location 0 • Mounting location 1 • Mounting location 2	2.5" drive or 3.5" drive in removable tray (Page 106)
	Drive cage type A: • Mounting location 3	 2.5" drive or 3.5" drive in removable tray (with 5.25" mounting frame) (Page 108) 5.25" drive or 5.25" component (Page 119)
	1 x internal in the device	1 x HDD inside on the side panel of the device (Page 121)
6 1	Drive cage type A:Mounting location 0Mounting location 1Mounting location 2	 2.5" drive or 3.5" drive in removable tray (Page 106) 3.5" drive in removable tray (Page 106)
	Drive cage type A: • Mounting location 3	 2.5" drive or 3.5" drive in removable tray (with 5.25" mounting frame) (Page 108) 5.25" drive or 5.25" component (Page 119)
	2 x internal in the device	2 x HDD inside on the side panel of the device (Page 121)

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

7.6 Installing and removing drives

Possible drive configurations in drive cage type A

You can implement the following drive configurations in the drive cage type A and on the side panel of the device.

- Non-RAID system
- Onboard RAID1 system
- Onboard RAID5 system
- Onboard RAID1 system with hot-spare drive
- Onboard RAID5 system with hot-spare drive

7.6.1.2 Change 2.5" and 3.5" drive in removable tray

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- An original spare part, that is, a drive approved for this device.
- You can find information on the removable tray as a replacement part under "Hardware accessories (Page 32)".
- The device is equipped with the drive cage type A.
- You know the information under "Installation options for drives with drive cage type A (Page 104)".
- When replacing an HD: Screwdriver TORX T10
- When replacing an SSD: Screwdriver TORX T8
- The device you wish to replace is inactive.

NOTICE

Risk of damaging the drive and data loss

Drives in removable trays can only be exchanged in conjunction with RAID1 and RAID5 during operation (hot swap).

When you remove the drive while data is being written to it, you may damage the drive and destroy data.

• Only remove the removable tray from the device when the drive is inactive, see "Status displays on removable tray for drives (Page 30)".

Procedure

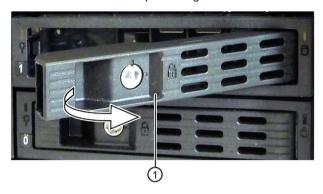
1. If there is no RAID system:

Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".

- 2. Open the front panel (Page 77).
- 3. Open the lock of the removable tray with the appropriate key.

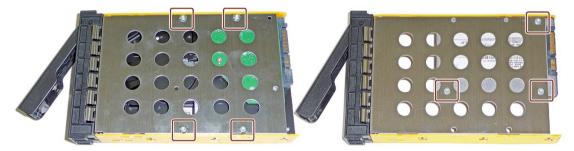


4. Reach into the notch ① in the bracket of the removable tray and pull out the bracket in the direction of the arrow up to a slight resistance.



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

- 5. 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.
- 6. 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.



- 7. Carefully insert the new drive into the removable tray.
 - Take care not to touch the contacts of the drive when you do this.
- 8. Fasten the new drive with the screws to the base of the removable tray. Only use the original screws.
- 9. Carefully insert the removable tray into the drive cage of the device again.
- 10. 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.
- 11.Close the tray bracket.
- 12.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.

7.6.1.3 Installing a 5.25" mounting frame for removable tray

You can install a 5.25" mounting frame for removable trays in the drive cage type A.

You can then use a 2.5 "or a 3.5" drive in the removable tray.



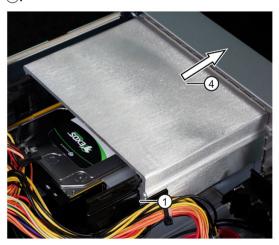
5.25" mounting frame with removable tray

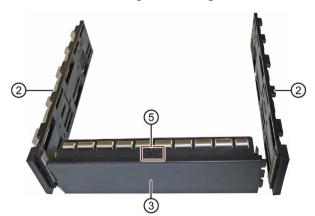
Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- The device is equipped with the drive cage type A.
- You know the information under: Installation options for drives with drive cage type A (Page 104)
- An original replacement part. You can find information on spare parts under "Hardware accessories (Page 32)".
- Screwdriver TORX T10

Procedure

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. 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.





4. 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.

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



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

7.6 Installing and removing drives

7.6.1.4 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.



Removable tray with backplane

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- An original spare part. You can find information on spare parts under "Hardware accessories (Page 32)".
- The device is equipped with the drive cage type A.

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".

3. First remove the cover ②, which is 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.



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



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

7.6 Installing and removing drives

7. Insert the backplane ④ into the drive bay from the front 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.



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

7.6.1.5 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.

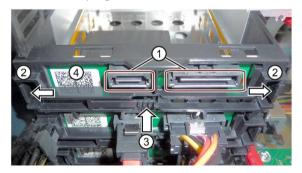


Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- The device is fully disconnected from the line voltage, see "Switching off the device (Page 74)".
- The device is equipped with the drive cage type A.

Procedure

- 1. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 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 board ④ by turning it upwards from the brackets and removing it from the drive cage.



5. Close the device.

7.6.2 Installing drives in drive cage type B

7.6.2.1 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 described below during operation.

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 the numbering of the mounting locations in the drive bay type B. (Page 18)

Number of drives per system	Mounting location	Installation option
1	Drive cage type B: • Mounting location 0	 2.5" drive or 3.5" drive in the assembly kit (Page 116) 5.25" drive or 5.25" component (Page 119)
2	Drive cage type B: • Mounting location 0 • Mounting location 1	 2.5" drive or 3.5" drive in the assembly kit (Page 116) 5.25" drive or 5.25" component (Page 119)
3	Drive cage type B: Mounting location 0 Mounting location 1 Mounting location 2	 2.5" drive or 3.5" drive in the assembly kit (Page 116) 5.25" drive or 5.25" component (Page 119)
4	Drive cage type B: • Mounting location 0 • Mounting location 1 • Mounting location 2	 2.5" drive or 3.5" drive in the assembly kit (Page 116) 5.25" drive or 5.25" component (Page 119)
5 ¹	 1 x internal in the device Drive cage type B: Mounting location 0 Mounting location 1 Mounting location 2 	 1 x HDD inside on the side panel of the device (Page 121) 2.5" drive or 3.5" drive in the assembly kit (Page 116) 5.25" drive or 5.25" component (Page 119)
	2 x internal in the device	2 x HDD inside on the side panel of the device (Page 121)

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.

Possible drive configurations

You can implement the following drive configurations in the drive cage type B and on the side panel of the device.

- Non-RAID system
- · RAID1 system
- RAID5 system
- RAID1 system with hot spare drive
- RAID5 system with hot spare drive

7.6 Installing and removing drives

7.6.2.2 Change 2.5" and 3.5" drive in assembly kit for 5.25" tray

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

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

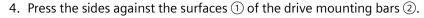


Assembly kit HDD/SSD for 5.25" tray

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- The device is equipped with a drive cage type B.
- You know the information under:
 - Installation options for drives with drive cage type B (Page 114)
- An original spare part, that is, an HDD/SDD assembly kit for 5.25" tray approved for this device. You can find information on spare parts under "Hardware accessories (Page 32)".
- When replacing a 3.5" HDD: Screwdriver TORX T10
- When replacing a 2.5" SSD: Screwdriver TORX T8

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. Remove all power supply and data cables from the drive.





The assembly kit is unlocked.

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



6. Remove the left and right drive mounting bars ② and the drive cover③ from the drive.

Note:

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

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

7.6 Installing and removing drives

7. 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

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

12.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.



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

7.6.3 Installing a 5.25" drive

You can install 5.25" drives in the drive cage type A and drive cage type B.

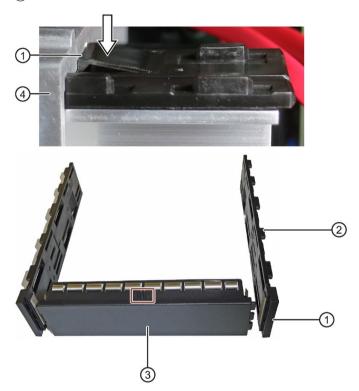
Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- The device is equipped with a drive cage type A or type B.
- You know the information under:
 - Installation options for drives with drive cage type A (Page 104)
 - Installation options for drives with drive cage type B (Page 114)
- An original spare part, that is, a 5.25" drive approved for this device. You can find information on spare parts under "Hardware accessories (Page 32)".
- Screwdriver TORX T10

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".

7.6 Installing and removing drives

- 3. 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.



4. 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.

- 5. 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.
- 6. 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.
- 7. Close the device.

7.6.4 Install the internal drive on the side panel of the device

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- The device is equipped with a drive cage type A or type B.
- Be sure to read the information on the number and location of mounting locations for drives under:
 - Installation options for drives with drive cage type A (Page 104)
 - Installation options for drives with drive cage type B (Page 114)
- A drive bay plate with a corresponding drive (HDD) approved for this device. You can find information on spare parts under "Hardware accessories (Page 32)".
- Screwdriver TORX T10

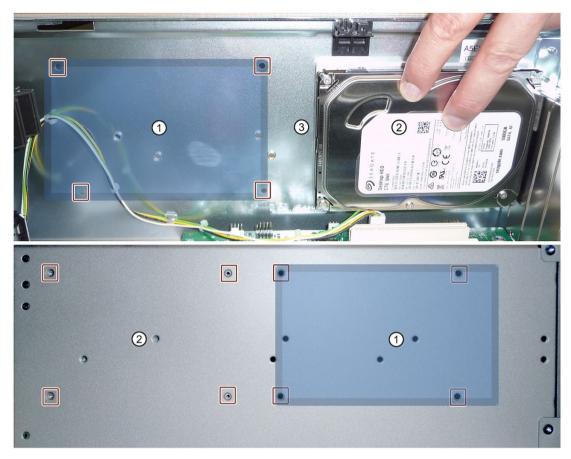
Procedure

1. Screw the drive to the drive bay plate (available as option, not included in scope of delivery) at the marked holes.



2. Screw from outside the drive bay plate on the inside to the side panel of the enclosure, at position ① or position ②. The SATA connections each lie in the middle ③.

7.6 Installing and removing drives



- 3. Connect the SATA cables to the required SATA connectors of the motherboard (Page 167) and to the drive (position ③).
- 4. Close the device.
- 5. Connect the power supply unit.

7.6.5 Install M.2 NVMe SSD

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- An original spare part, i.e. M.2 NVMe SSD with thermal pad approved for this device.
- Screwdriver TORX T10

Procedure

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. Attach the thermal pad ② to the slot for M.2 NVMe SSD ① as shown.

 You can find information on the position of the slot ① under "Layout of the motherboard (Page 167)".



4. Insert the M.2 NVMe SSD ③ slightly inclined from above into the slot parallel to the motherboard.



- 5. Carefully press down M.2 NVMe SSD.
- 6. Fix the end of the M.2 NVMe SSD to the motherboard with a screw.
- 7. Close the device.

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7.6 Installing and removing drives

Device maintenance and repair

8.1 Safety instructions for repairs

Danger from unauthorized or improperly performed repairs



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 systems.

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 47)".

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)".

Requirement

• The front door is open. (Page 77)

Procedure

- 1. Open the front door to at least an angle of approx. 45 $^{\circ}$
- 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

Requirement

- The fan cover has been removed; see "Removing the fan cover from the front fan (Page 126)".
- An original spare part, i.e. a filter mat of the same type. You can find information on spare parts under "Hardware accessories (Page 32)".

Procedure

- 1. Remove the filter mat from the fan cover.
- 2. Insert the new filter mat loosely into the fan cover. Place the filter mat evenly in the fan cover.
- 3. Replace the fan cover.

See also

Maintenance intervals (Page 125)

8.3.1.3 Changing the front fan

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- An original spare part, that is a front fan of the same type. You can find information on spare parts under "Hardware accessories (Page 32)".

Procedure

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Remove the front fan cover. (Page 126)
- 3. Press the locks 1 together and keep them pressed.
- 4. Lift the fan support slightly upwards and remove it to the front from the front of the enclosure.



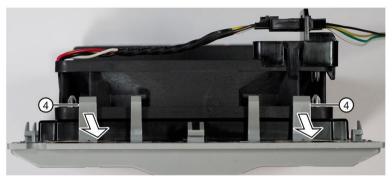
- 5. Put down the fan support with the openings facing down (fan is above).
- 6. Press on the clip on the small fan cable plug connector 2 and remove the connector from the larger adapter plug,



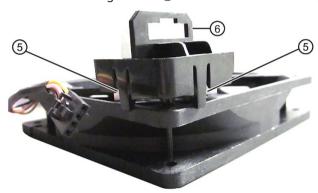
7. Press on the side of the clips ③ and loosen the adapter plug from the cable holder.

8.3 Removing and installing hardware

8. Loosen the locking latches ④ of the fan support one after the other at the front and rear and remove the fan.



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



10. 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.



- 11. 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.
- 12. Snap the fan into place at the locking latches of the fan support ④.
- 13.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.
- 14.Insert the small fan cable connector ② in the larger adapter connector again.
- 15. Place the fan support with the new fan on the front of the device.

See also

Maintenance intervals (Page 125)

8.3.2 Change the fan on drive cage type A

This fan is only installed on RAID systems in conjunction with three or more "Enterprise" type drives in the removable tray (drive cage type A).

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- The device is equipped with the drive cage type A.
- An original spare part, i.e. a fan of the same type. You can find information on spare parts under "Hardware accessories (Page 32)".
- There is no 5.25" component in the corresponding mounting location, see information under "Installation options for drives with drive cage type A (Page 104)".

Procedure

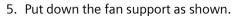
- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. Detach the fan cable from the motherboard.
- 4. Press the upper and lower lock ① on the fan support and remove the fan support from the drive cage.

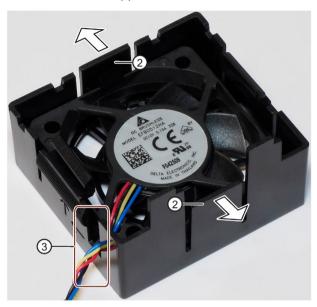


The fan holder is labeled as follows:

- At the top with "Top"
- At the bottom with arrows which indicate the direction of rotation and air flow of the fan.

8.3 Removing and installing hardware





- 6. Bend the locking latches ② of the fan support slightly outwards and remove the fan from the fan support.
- 7. Place the new fan in the fan support as shown.
- 8. Guide the fan cable through the cable outlet ③.
- 9. Finally, snap the new fan completely into place in the locking latches ②.
- 10. Mount the fan support on the drive cage (see above).
- 11. Connect the fan cable to the motherboard.
- 12.Close the device.

See also

Maintenance intervals (Page 125)

8.3.3 Changing the backup battery

Replace spent batteries promptly, see information under "Maintenance intervals (Page 125)".



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 37)".

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- An original spare part, that is, a backup battery of the same type (article number of lithium battery: A5E00369854 type CR2032)
- You have made a note of the firmware settings because the configuration data of the device can be deleted when the backup battery is changed.
 - You can find information on the configuration of the firmware settings in the user manual (UM) for the motherboard, see "Important instructions and manuals for operating the device (Page 11)".
- You have observed the local regulations relating to the disposal of used batteries.

Procedure

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. Remove the expansion cards, if necessary, see "Removing expansion cards (Page 95)".
- 4. 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.

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

8.3.4 Replacing the power supply unit

8.3.4.1 Replacing the power supply unit 550 W

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- An original spare part, i.e. a power supply unit of the same type. You can find information on spare parts under "Hardware accessories (Page 32)".
- Screwdriver TORX T10
- · Diagonal cutter

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. Disconnect the power cables from the drives and the motherboard.
- 4. Remove the cable ties securing the power cables in the device.
- 5. Remove the four fixing screws that are marked in the figure below.



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

8.3.4.2 Replacing the power supply unit 850 W

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- An original spare part, i.e. a power supply unit of the same type. You can find information on spare parts under "Hardware accessories (Page 32)".
- Screwdriver TORX T10
- Diagonal cutter

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. Disconnect the power cables from the drives and the motherboard.
- 4. Remove the cable ties securing the power cables in the device.
- 5. Remove the four fixing screws that are marked in the figure below.



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

8.3 Removing and installing hardware

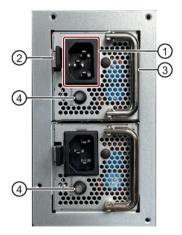
8.3.4.3 Replacing the module of the redundant power supply unit 700 W

If a module of the redundant power supply unit is defective, you can continue to operate the device until the device can be shut down in a controlled manner.

The replacement of one of the two modules of the redundant power supply unit can be performed without shutting down the device.

Requirement

• An original spare part, i.e. a module of the redundant power supply unit of the same type. You can find information on spare parts under "Hardware accessories (Page 32)".



- 1. Use the status display ④ to determine which module is defective, see "Status displays of power supply unit 700 W (2 modules, each 700 W, redundant) (Page 30)".
- 2. Disconnect the defective module from the line voltage.

 Pull the power plug from the socket ① of the defective module.
- 3. Open the locking clip② and pull out the module by the handle ③.
- 4. Insert the new module and push it to the rear edge of the enclosure until it clicks into place there.
- 5. Re-insert the power plug into the socket ① of the newly inserted module.
- 6. Check the safe state of the device. Check the correct function on the status display.

8.3.4.4 Changing the enclosure of the redundant power supply unit 700 W

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- An original spare part, i.e. an enclosure of the same type. You can find information on spare parts under "Hardware accessories (Page 32)".
- Screwdriver TORX T10
- Diagonal cutter

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Remove both modules of the redundant power supply unit (Page 134).
- 3. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 4. Disconnect the power cables from the drives and the motherboard.
- 5. Remove the cable ties securing the power cables in the enclosure of the device.
- 6. Remove the four fixing screws that are marked in the figure below.



- 7. Pull the enclosure of the redundant power supply unit upward and out of the device.
- 8. Install the new enclosure.
- 9. Secure the enclosure with the screws shown.
- 10. Connect the cables to the drives and the motherboard.
- 11.Replace the two modules of the redundant power supply unit and push them to the rear edge of the enclosure until they click into place.
- 12.Insert the power plugs into the sockets of the inserted modules.
- 13. Check the safe state of the device.

8.3.5 Replacing the processor

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- An original spare part, i.e. a processor of the same type. You can find information on spare parts under "Hardware accessories (Page 32)".

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.
- Crosshead screwdriver Philips PH1

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. Remove the heat sink of the processor.
- 4. Lift the release lever (4) and release the processor bracket (1).
- 5. Carefully lift the release lever ④ upwards. When doing so, ensure that you do not let go of the release lever.

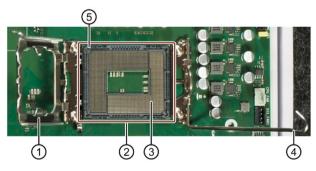


Illustration of processor socket without processor

6. 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.

7. 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.



- 8. Apply sufficient thermal paste to the new processor.
- 9. 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.
- 10. Mount the heat sink of the processor again.
- 11.Close the device.

8.3.6 Replacing the motherboard

Requirement

- You know the important safety instructions under "Safety instructions on device and system extensions (Page 47)".
- An original spare part, that is, a motherboard of the same type. You can find information on spare parts under "Hardware accessories (Page 32)".

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

- You have noted the firmware settings because the configuration data of the device are deleted when the motherboard is replaced.
 - For information on the firmware settings in the user manual (UM) for the motherboard, see "Important instructions and manuals for operating the device (Page 11)".
- Screwdriver TORX T10

8.4 Installing the operating system, software, and driver

Procedure

- 1. Fully disconnect the device from the line voltage, see "Switching off the device (Page 74)".
- 2. Open the device. Be sure to follow the important instructions under "Open the device (Page 93)".
- 3. Remove the expansion cards from the slots. (Page 95)
- 4. If necessary, remove the M.2NVMe SSD. (Page 123)
- 5. Slide installed 5.25" components forward.
- 6. Note the assignment of all cables to the motherboard.
- 7. Disconnect all cables from the motherboard.
- 8. Remove the processor as described under "Replacing the processor (Page 136)".
- 9. Unscrew the 11 screws that fasten the motherboard in the device. You can find information on the location of the screws under "Layout of the motherboard (Page 167)".
- 10. Remove the motherboard.
- 11. Carefully insert the new motherboard into the device and fasten the motherboard with the screws.
- 12. Mount the processor as described under "Replacing the processor (Page 136)".

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.

- 13. Reconnect all cables to the corresponding points.
- 14. Put the 5.25" components back in the correct position.
- 15. Reinsert all previously removed expansion cards into the slots.
- 16.Close the device.
- 17. Reconnect the device to the mains voltage and switch on the device.
- 18. Update the firmware settings to match the new motherboard version.

Please note during the update whether you are operating a device with or without a RAID system.

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 11)".

8.4.2 Installing a new Microsoft® Windows® operating system

The Intel® RST memory driver, which supports the Intel CPU platform of the 12th generation and higher, is not yet available in the Windows® operating system. To recognize all available drives (SATA and/or NVMe), the driver must be installed during the installation process.

Requirement

 USB flash drive (supplied if ordered) with software and tools to restore the installed Microsoft® Windows® operating system

Procedure

- 1. Connect the USB flash drive with software and tool for restoring the installed Microsoft® Windows® operating system to the device.
- 2. Navigate to DocuAndDrivers > Drivers > RST > F6.
- 3. Copy the "VMD" folder to the connected USB flash drive.
- 4. Start the installation process.
- 5. As soon as a message appears stating that no drives were found, click "Load driver".
- 6. When you are asked for the installation medium, select the "VMD" folder that you previously copied to the connected USB flash drive.
- 7. Select the driver "VMD\iaStorVD.inf" (Controller or Manager).
- 8. Select the drive for installing the operating system and complete the installation process.

8.4.3 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 53)".

- 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.

8.5 Configuring firmware/BIOS

- 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 11)".

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 11)".
- 3. Insert the provided USB stick into the device.
- Run the file "START_DocuAndDrivers.CMD".
 The "Documentation and Drivers" suite opens.
- 5. Install the required components.

8.5 Configuring firmware/BIOS

You can find information on the configuration of the firmware settings in the user manual (UM) for the motherboard, see "Important instructions and manuals for operating the device (Page 11)".

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 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 141)".

Article number	6AG4104 -6 (for details, refer to the ordering documentation)			
Dimensions	481.4 x 176.6 x 446.6 (W× H × D in mm)			
	Detailed dimensional specifications can be found in "Dimension drawing of the device (Page 159)".			
Weight	15 up to 23 kg; depending on the equipment			
Supply voltage (Un; AC)	Power supply unit 550 W; AC:			
	• 100 V to 240 V AC (-15%; +10%)			
	Power supply unit 850 W; (AC):			
	• 100 V to 240 V AC (-10%; +10%)			
	Power supply unit 700 W (2 modules, each 700 W, redundant; AC):			
	• 2 × 100 V to 240 V (-15%; +10%)			
Transient overvoltages	Device is designed for connection to supply with overvoltage category II (Transient overvoltages up to 2500 V)			
Input current	Power supply unit 550 W:			
	• Continuous current at 100 V: ≤ 8 A			
	• Continuous current at 230 V: ≤ 4 A			
	• At startup ≤ 80 A for 3.6 ms			

9.2 General technical specifications

	Power supply unit 850 W:				
	• Continuous current at 100 V: ≤ 12 A				
	• Continuous current at 230 V: ≤ 6 A				
	• at startup ≤ 180 A for 3.6 ms				
	Power supply unit 700 W (2 modules, each 700 W, redundant):				
	• Continuous current at 100 V: ≤ 10 A				
	• Continuous current at 230 V: ≤ 5 A				
	At startup ≤ 80 A for 3.6 ms for each module				
	Information on the dimensioning of fuses in higher-level system circuits				
	A fuse that is designed for the following tripping current is integrated in the power supply unit of the IPC.				
	Typical 8 A (for power supply unit 550 W)				
	Typical 12 A (for power supply unit 850 W)				
	Typical 10 A (for redundant power supply unit 700 W).				
	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.				
	If you connect additional devices to the higher-level power supply circuit, use the following fuses:				
	• > 8 A (for power supply unit 550 W).				
	• > 12 A (for power supply unit 850 W).				
	• > 10 A (for redundant power supply unit 700 W).				
	The tripping characteristic of the higher-level protection must take into account the				
Fraguency of the supply voltage	starting currents of both the IPC and the other devices.				
Frequency of the supply voltage Transient voltage interruption	50 to 60 Hz, min. 47 Hz to max. 63 Hz, sinusoidal Power supply unit 550 W:				
Transient voltage interruption	20 ms for 300 W				
	≤ 10 events/h; recovery time ≥ 1 s				
	Power supply unit 850 W:				
	20 ms for 460 W				
	\leq 10 events/h; recovery time \geq 1 s				
	Power supply unit 700 W (2 modules, each 700 W, redundant):				
	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 supply unit 850 W,				
	with maximum configuration and 460 W secondary:				
	• ≤ 600 W with 87% efficiency				
	Power supply unit 700 W (2 modules, each 700 W, redundant),				
	with maximum configuration and 300 W secondary:				
	• ≤ 270 W with 85% efficiency				
Power loss, heat emission	Power supply unit 550 W:				
	• 300 W = 300 J/s = 0.28 BTU/s				
	300 H - 300 H3 - 0.20 B1 0H3				

	Power supply unit 850 W:				
	• 460 W = 460 J/s = 0.44 BTU/s				
	Power supply unit 700 W (2 modules, each 700 W, redundant):				
	• 300 W = 300 J/s = 0.28 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 output of all voltages is max. 550 W.				
	Power supply unit 850 W:				
	• +5 V/35 A; +3.3 V/20 A; in total, 200 W are allowed				
	• +12 V/70 A				
	• -12 V/0.1 A; +5 V _{aux} /2 A				
	The total output of all voltages is max. 850 W.				
	Power supply unit 700 W (2 modules, each 700 W, redundant):				
	• +5 V/20 A, +3.3 V/20 A; 130 W are permitted in total				
	• +12 V ₁ /58.3 A				
	• -12 V/0.5 A; +5 V _{aux} /3 A				
	The total output of all voltages is max. 700 W.				
Noise emission	< 45 dB(A) according to DIN 7779				
	At 20 °C and in Windows idle mode, the result is 40 dB (A).				
Pollution degree	Device is designed for environments with pollution degree 2				
Degree of protection	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	Protection class I compliant with IEC 61140				
Safety regulations	• IEC 61010-2-201				
	• EN 61010-2-201				
	• UL 61010-2-201				
	CAN/CSA C22.2 No 61010-2-201				
L	L				

See also

Safety instructions on ambient and environmental conditions (Page 44)

9.3 Current and power requirements and power supply units

9.3 Current and power requirements and power supply units

9.3.1 Current and power requirements of the system components

See the note in "Applicability of technical specifications (Page 141)".

Maximum current values

Component	Voltage						
	+3.3 V	+5 V	+12 V 1	+12 V ₂	-12 V	5 Vaux	
Motherboard Core i3 / i5 / i7 / i9 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				
Hard disk drive ¹ SATA type Enterprise (typical values)		0.5 A	0.7 A				
M.2 NVMe SSD	2.24 A						
Internal fan			0.25 A				
Graphics card: NVIDIA T400	3.1 A		1.7 A				
Graphics card: NVIDIA RTX A2000	0.4 A		5.7 A				
Graphics card: NVIDIA RTX A4000 ⁵	0.4 A		11.7 A				
Graphics card: NVIDIA RTX A5000 ⁵	0.4 A		17.7 A				
Individual currents, max. permissible,	25 A ²	22 A ²	26 A	15 A	0.1 A	2.0 A ³	
Power supply unit 550 W							
Individual currents, max. permissible,	20 A ²	20 A ²	58.3 A		0.5 A	3.0 A	
Power supply unit 700 W (2 modules, each 700 W, redundant)							
Total power, permissible,	300 W						
Power supply unit 550 W or							
Power supply unit 700 W (2 modules, each 700 W, redundant),							
(at 40 °C ambient temperature)							
Individual currents, max. permissible,	20 A ²	35 A ²	70 A		0.3 A	3.0 A	
Power supply unit 850 W							
Total power, permissible,	300 to 460 W ⁴						
Power supply unit 850 W,							
(at 40 °C ambient temperature)							
Efficiency of the power supply unit 550 W ¹	Ca. 88% (230 V; AC) / ca. 88% (120 V; AC)						
Efficiency of the power supply unit 850 W ¹	Ca. 87% (230 V; AC) / ca. 87% (120 V; AC)						
Efficiency of the power supply unit 700 W (2 modules, each 700 W, redundant) ¹	Ca. 89% (230 V; AC) / ca. 87% (120 V; AC)						

¹ Depends on the selected device configuration

The total power of the +5 V and +3.3 V voltage may be max. 150 W for the power supply unit 550 W, max. 130 W for the redundant power supply unit 700 W and max. 200 W for the power supply unit 850 W.

³ 2.5 A for 10 seconds

⁴ If the power is drawn from an actively cooled expansion card (for example: High-end graphics card) that emits its waste heat directly into the ambient air and not into the interior of the device. The requirements of the expansion card for the temperature of the intake air (inside the device) must be observed.

⁵ Operation only permissible in conjunction with power supply unit 850 W

Typical power values

Component	Current consumption (U = 230 V; AC)	Power consumption
Basic device Core i3 / i5 / i7 / i9	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 × hard disk drive SATA type Enterprise	0.05 A	12.1 W
2 × hard disk drives SATA type Enterprise	0.11 A	24.2 W
3 × hard disk drives SATA type Enterprise	0.16 A	36.3 W
1 × SSD 2.5" drive SATA	0.02 A	3.6 W
1 x M.2 NVMe SSD	0.03 A	5.9 W
Graphics card: NVIDIA T400	0.14 A	33.0 W
Graphics card: NVIDIA RTX A2000	0.32 A	74.0 W
Graphics card: NVIDIA RTX A4000	0.68 A	155.0 W
Graphics card: NVIDIA RTX A5000	1.2 A	255.0 W

9.3.2 Technical specifications of the 550 W power supply unit

See the note in "Applicability of technical specifications (Page 141)".

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 Vaux	2 A	+5%, -3%

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

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

9.3 Current and power requirements and power supply units

9.3.3 Technical specifications of the 850 W power supply unit

See the note in "Applicability of technical specifications (Page 141)".

Output voltage and maximum current

Voltage	Maximum current	Voltage stability
+12 V	70 A	± 5%
-12 V	0.3 A	± 10%
+5 V	35 A ¹	± 5%
+3.3 V	20 A ¹	± 5%
+5 Vaux	3 A	+5%, -3%

¹ The total output of the +5 V and +3.3 V voltage must be \leq 200 W.

The total output of all voltages is max. 850 W.

9.3.4 Technical specifications of the 700 W power supply unit (2 modules, each 700 W, redundant)

See the note in "Applicability of technical specifications (Page 141)".

Output voltage and maximum current

Voltage	Maximum current	Voltage stability
+12 V	58.3 A	± 5%
-12 V	0.5 A	± 10%
+5 V	20 A ¹	± 5%
+3.3 V	20 A ¹	± 5%
+5 Vaux	3.0 A	+5%, -3%

The total output of the +5 V and +3.3 V voltage must be \leq 130 W.

The total output of all voltages is max. 700 W.

9.4 Electromagnetic compatibility

See the note in "Applicability of technical specifications (Page 141)".

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; KS C 9835
Interference immunity on power	± 2 kV; according to IEC 61000-4-4; burst
lines	± 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	± 4 kV contact discharge (according to IEC 61000-4-2)
electricity	± 8 kV air discharge; (according to IEC 61000-4-2)
Immunity to RF interference	• 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 141)".

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 is:	
	For power supply unit 550 W: 80 W	
	For redundant power supply unit 700 W: 80 W	
	For power supply unit ¹ 850 W: Up to 310 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 ²	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 ²	Half-sine; 9.8 m/s²; 20 ms; 100 shocks per axis	
Storage/transport	Half-sine; 250 m/s²; 6 ms; 1000 shocks per axis	
Special features		
Quality assurance	In accordance with ISO 9001	

The power loss of the expansion cards for power supply unit 850 W may be increased from 80 W to 310 W if the additional power loss of 230 W is drawn from an actively cooled expansion card (for example: high-end graphics card) that emits its waste heat directly into the ambient air and not into the interior of the device.

See also

Installation options for drives with drive cage type A (Page 104) Installation options for drives with drive cage type B (Page 114)

² The device must be free of any mechanical faults when disk drives are installed in the removable trays.

9.6 Technical specifications of the drives

See the note in "Applicability of technical specifications (Page 141)". Information on the drives is available in your order documents.

Maximum number	4 SATA ports: HDD / SSD
number	See: "Installation options for drives with drive cage type A (Page 104)" and "Installation options for drives with drive cage type B (Page 114)"
HDD	HDD types (Native Command Queuing is supported):
	• 3.5" SATA; 6 GB/s; 7200 rpm; 2000 GB
	• 3.5" SATA, Enterprise, 6 GB/s; 7200 rpm; 2000 GB and 4000 GB
SSD	SSD types (flash memory):
	• 2.5" SATA, 6 GB/s; 480 GB
	• 2.5" SATA, 6 GB/s; 960 GB
M.2 NVMe SSD	2x M.2-2280 Key M, PCIe Gen4 x4 *; 512 GB and 1024 GB; length: Max. 80 mm

^{*} 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 141)".

Chipset	Intel® R680E PCH
Processor	• Core i3-12100E
	4C(4P)/8T, 3.2 (4.2) GHz, 12 MB Cache • Core i5-12500E
	6C(4P)/12T, 2.9 (4.5) GHz, 18 MB Cache • Core i7-12700E
	12C(8P+4E)/20T, 2.1 (4.8) GHz, 25 MB Cache • Core i9-12900E 16C(8P+8E)/24T, 2.3 (5.0) GHz, 30 MB Cache
RAID (onboard)	Intel® PCH with Intel® Rapid Storage Technology
Slots for memory modules	4 x DIMM sockets for DDR5 4400 MHz, expandable to 128 GB
Main memory	8 to 128 GB, DDR5

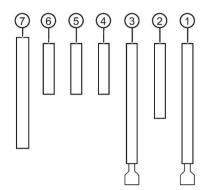
See also

Technical specifications of the expansion card slots (Page 150)

9.7 Technical specifications of the motherboard

9.7.2 Technical specifications of the expansion card slots

Slots for expansion cards on the motherboard



You can find detailed information about the location of the slots in the section "Layout of the motherboard (Page 167)".

Technical specifications of the slots

Slot Number on the enclosure	Designation on the motherboard	Specification	Maximum current consumption
1)	PCIE4X16_1	 PCle x16¹ Gen. 4 Active lanes: 16 (if slot 3 is occupied: Active lanes: 8) 	 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	PCIW3_X8_1	PCle x8 ² • Gen. 3 • Active lanes: 4 • Open slot	 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	PCIX4X16_2	PCle x16 ¹ • Gen. 4 • Active lanes: 8	 3.3 V; 3 A 12 V; 5.5 A 3.3 Vaux; 0.4 A Power loss of the slot, permitted: ≤ 75 W

9.7 Technical specifications of the motherboard

Slot Number on the enclosure	Designation on the motherboard	Specification	Maximum current consumption
4	PCIE3_X4_1	• Gen. 3 • Active lanes: 4 • Open slot	 3.3 V; 3 A 12 V; 2.1 A 3.3 V_{aux}; 0.4 A Power loss per slot, permitted: ≤ 25 W
(5)	PCI4_X4_1	PCle x4 ² • Gen. 4 • Active lanes: 4 • Open slot	
6	PCIE4_X4_2	PCle x4 ² • Gen. 4 • Active lanes: 4 • Open slot	
7	PCI1	PCI Rev. 2.3 PCI bus primary	 5 V; 5 A or 3.3 V; 7 A 12 V; 0.5 A 12 V; 0.05 A 3.3 Vaux; 0.2 A

¹ PCle-Bus CPU

Note

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

Mounting position for graphics card

① Slot 1 (slot 2 cannot be used for graphics card NVIDIA RTX A2000 and RTX A5000)

² PCle-Bus PCH

9.8 Technical specifications of graphic

9.8 Technical specifications of graphic

See the note in "Applicability of technical specifications (Page 141)".

Technical specifications of the integrated graphics interfaces

Graphics controller	Intel® UHD Graphics 730
	integrated in processor:
	– Core i3-12100E
	Intel® UHD Graphics 770
	integrated in processor:
	– Core i5-12500E
	– Core i7-12700E
	– Core i9-12900E
Graphics memory	Dynamic Video Memory Technology,
	uses at least 64 MB in main memory
Resolutions/frequencies/colors	• 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

You can find information on connection options for monitors with adapters under "Hardware accessories (Page 32)".

Type:	NVIDIA T400, 4 GB graphics memory	
	PCIe x16; Triple Head	
Maximum resolution without adapter:	3x Mini DisplayPort	
'	4096 x 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:	
Trun adapton	4096 x 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	

Technical specifications of the NVIDIA RTX A2000 graphics card

You can find information on connection options for monitors with adapters under "Hardware accessories (Page 32)".

Type:	VIDIA RTX A2000, 12 GB graphics memory					
	PCle x16; Quad Head					
Maximum resolution without adapter:	4x Mini DisplayPort:					
·	5120 × 2880 at 60 Hz; 32-bit color depth					
Maximum resolution with adapter:	Up to 4x DVI:					
with adapter.	1920 × 1200 at 60 Hz; 32-bit color depth					
	• Up to 4x VGA:					
	2048 × 1536 at 60 Hz; 32-bit color depth					

Technical specifications of the NVIDIA RTX A4000 graphics card

You can find information on connection options for monitors with adapters under "Hardware accessories (Page 32)".

Туре:	IVIDIA RTX A4000, 16 GB graphics memory Cle x16; Quad Head					
Maximum resolution without adapter:	 4x DisplayPort: 5120 × 2880 at 60 Hz; 32-bit color depth 2x DisplayPort: (two ports of the graphics card are occupied per monitor) 7680 x 4320 at 60 Hz 					
Maximum resolution with adapter:	 Up to 4x DVI: 1920 × 1200 at 60 Hz; 32-bit color depth Up to 4x VGA: 2048 × 1536 at 60 Hz; 32-bit color depth 					

9.8 Technical specifications of graphic

Technical specifications of the NVIDIA RTX A5000 graphics card

You can find information on connection options for monitors with adapters under "Hardware accessories (Page 32)".

Type:	NVIDIA RTX A5000, 24 GB graphics memory
	PCle x16; Quad Head
Maximum resolution without adapter:	• 4x DisplayPort:
	5120 × 2880 at 60 Hz; 32-bit color depth
	• 2x DisplayPort:
	(two ports of the graphics card are occupied per monitor)
	7680 x 4320 at 60 Hz
Maximum resolution with adapter:	• Up to 4x DVI:
With adapter.	1920 × 1200 at 60 Hz; 32-bit color depth
	• Up to 4x VGA:
	2048 × 1536 at 60 Hz; 32-bit color depth

Power supply of the NVIDIA RTX A4000 and NVIDIA RTX A5000 graphics cards

The NVIDIA RTX A4000 and NVIDIA RTX A5000 graphics cards can only be connected, operated and configured for SIMATIC IPC RW-545A for devices with power supply unit 850 W.

The NVIDIA RTX A4000 and NVIDIA RTX A5000 graphics card is then supplied with a voltage of 12 V via the slot on the motherboard and via an 6-pin or 8-pin plug-in connector. In this situation, all pins of the connector must always be connected for trouble-free operation.

You can find information on the 8-pin connector in the section "Technical specifications of the plug connectors for the power supply of graphics cards (Page 157)".

Cooling of the NVIDIA RTX A4000 and NVIDIA RTX A5000 graphics card

The graphics cards feature active cooling that is provided by a fan. Heated air is dissipated via ventilation openings on the graphics card into the inside of the device. The active cooling of the device then transports this heated air directly out of the device via the holes in the perforated slot brackets on the rear of the device.

• Insert the graphics cards on the motherboard only into the "PCIEX16 1" slot. (Page 150)

Note

The "Performance" fan profile of the graphics cards is mandatory for the SIMATIC IPC RW-545A device.

In the delivery state, the fan profile of the graphics card is set to "Performance" and must not be changed.

Observe the safety instructions regarding the risk of overheating when using expansion cards, see the section "Safety instructions on device and system extensions (Page 47)".

See also

Connecting several monitors (multi-monitoring) (Page 63)

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 141)".

Note

Detailed information on the position of the connections is available in "Device ports (Page 20)".

Connectio n socket	Description	Assignment
COM1 COM2	COM: Serial interface (standard: RS-232) Sub-D socket V.24	9-pin (±12 V)
DP	DisplayPort (labeling on the device: DPP) An analog monitor can be used with an adapter cable (optional). Connection for monitors with DisplayPort connector Connection for monitors with VGA connector via DP-VGA adapter, See Hardware accessories (Page 32) Connection for monitors with DVI connector via DP-DVI-D adapter, See Hardware accessories (Page 32)	20-pin (3.3 V; 500 mA)
DVI-D	DVI-D: Connection for monitors with DVI-D connector Monitors with a DVI-D connector can also be connected to the DPP connection socket using an adapter.	1
USB Type A	USB Type A: • High-current	9 8 7 6 5 1 2 3 4
USB Type C	USB Type C: • High-current	A12 A1

9.9 Technical specifications of the connections

Connectio	Description	Assignment
LAN 1	 Intel® I219-LM The LAN ports are numbered on the enclosure. The numbering by the operating system may differ from this. Connection for Ethernet with RJ45 connector Data transmission rate: 10/100/1000 Mbps Support for jumbo frames up to 9 KB The following teaming modes are supported: AMT-capable iAMT and Teaming are not possible at the same time Adapter Fault Tolerance (AFT) Adaptive Load Balancing (ALB) IEEE 802.3ad Dynamic Link Aggregation (DLA) Static Link Aggregation (SLA) 	8 1 1 8-pin, RJ45
LAN 2	 Switch Fault Tolerance (SFT) Intel® I210-AT The LAN ports are numbered on the enclosure. The numbering by the operating system may differ from this. Connection for Ethernet with RJ45 connector Data transmission rate: 10/100/1000 Mbps Support for jumbo frames up to 9 KB Wake on LAN, remote boot Intel® I225-LM 	8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
LAIN 3	 The LAN ports are numbered on the enclosure. The numbering by the operating system may differ from this. Connection for Ethernet with RJ45 connector Data transmission rate: 10/100/1000/2500 Mbps Support for jumbo frames up to 9 KB Wake on LAN, remote boot 	8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Audio	 Connection for 3.5 mm audio stereo jack: Realtek ALC887, 8-channel DAC support Line IN (light blue) Headphone OUT (pastel green) (max. 2 W at 4 Ω) Microphone IN (pink) 	1: Ground 2: Audio links 3: Audio right

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

See the note in "Applicability of technical specifications (Page 141)".

6-pin or 8-pin plug-in connector for graphics cards

For graphics cards that require their own power supply, 6-pin and 2-pin plug-in connectors are available on the wiring harness of the power supply unit. You can create an 8-pin plug-in connector by plugging both plug-in connectors together.

Either a 6-pin plug-in connector or an 8-pin plug-in connector is connected to the respective graphics card.

Depending on the power supply unit, there are either one or more 6-pin connectors and one or more 2-pin extensions on the wiring harness.

- Power supply unit 550 W:
 One 6-pin and 2-pin plug-in connector
- Power supply unit 850 W:
 Two 6-pin and 2-pin plug connectors
- Power supply unit 700 W (2 modules, each 700 W, redundant):
 One 6-pin and 2-pin plug-in connector

Description	Assignment	
Connector on the wiring harness of the power supply	1 = +12 V	
unit	2 = +12 V	8
	3 = +12 V	HIZIETH
	4 = GND	4 A A A
	5 = GND	
	6 = GND	
	7 = GND	
	8 = 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 drawing for drill holes for telescopic rails (Page 162)

9.11 Technical specifications of the operating systems

9.11 Technical specifications of the operating systems

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

If you want to install an operating system, take note of the information under "Installing a new Microsoft® Windows® operating system (Page 139)".

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

You can find information on ordered Microsoft® Windows® operating systems under: Important instructions and manuals for operating the device (Page 11).

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					
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

^{*}Multi-Language User Interface (MUI): 5 languages (English, German, French, Spanish, Italian)

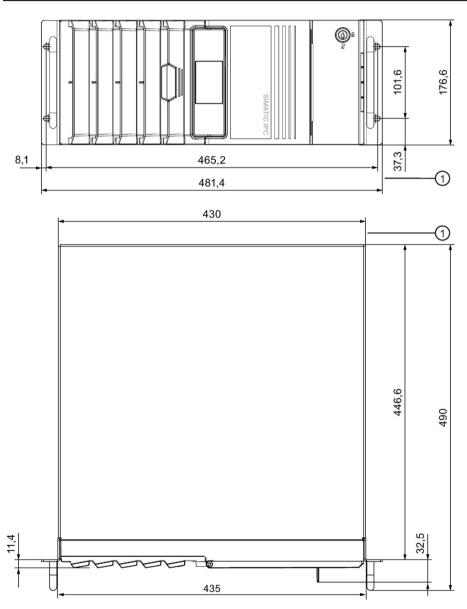
Dimension drawings 10

10.1 Dimension drawing of the device

Note

IEC60297_3_100

The system meets the requirements for 4 U according to IEC60297 3 100.

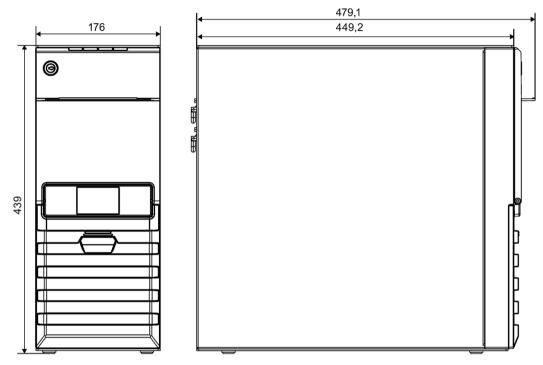


All dimensions in mm.

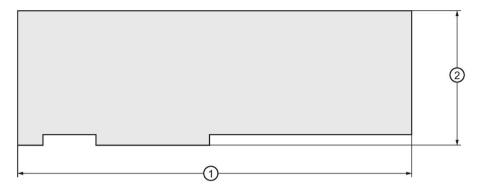
① Upper side of the device when installed vertically

10.2 Dimension drawing of the Tower Kit

Front view and top view



10.3 Dimension drawing of the expansion cards

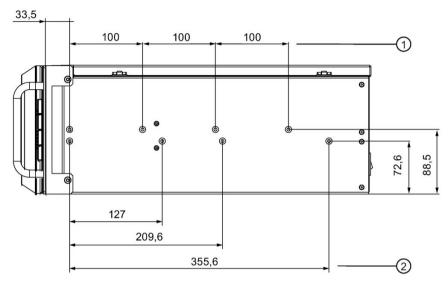


- ① Length of the expansion car (PCI or PCIe)
 - Device without extender: up to 312 mm
 - Device with extender: 339 mm
- ② Height of the expansion card

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 drawing for drill holes for telescopic rails



All dimensions in mm

- ① Dimensions of the Rittal telescopic rails Type 3659
 - for 600 mm cabinet; TS 3659.181
 - for 800 mm cabinet; TS 3659.191

Dimensions of Heitec telescopic rails

- for 600 mm cabinet; RP 3659.181
- for 800 mm cabinet; RP 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.CNTLR.)
- 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:

- Electromagnetic Compatibility Regulations 2016 (EMC)
- Regulations on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2012 (RoHS)

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 Certificates and approvals

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.
- 2011/65/EU "Restriction of the use of certain hazardous substances in electrical and electronic equipment" (RoHS Directive)

11.2 Directives and declarations

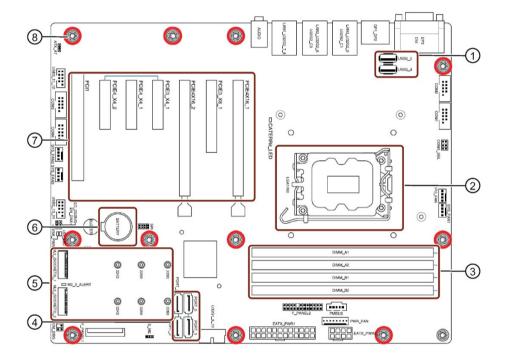
Hardware description



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 11)".



- 2 internal USB ports
 USB 2.0, Type A vertical
 backwards compatible to USB 1.1; 500 mA / high current¹
- 2 Processor socket
- 3 Four slots for memory modules
- 4 SATA ports
- 5 2 slots for M.2 NVMe SSDs
- 6 Backup battery
- 7 slots for expansion cards, see "Technical specifications of the expansion card slots (Page 150)"
- 8 10 screws for fastening the motherboard in the device

Technical features of the motherboard

Technical features of the motherboard can be found under "General technical specifications of the motherboard (Page 149)".

¹ Sum of the currents on the USB ports of the device (including the internal USB ports) \leq 3 A

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 R680E

Information on the slots can be found under "Technical specifications of the expansion card slots (Page 150)".

Slot Reference	PCIE4X16_ 1	PCIE4X16_ 2	M.2_(SO CKET3)_ 1	M.2_(SO CKET3)_2	PCIE3_X8 _1	PCIE3_X4_ 1	PCIE4_X4 _1	PCIE4_X4 _2	PCI Slot 1
Slot Capability	PEG Gen4 16 Lane	PEG Gen4 8 Lane	PEG Gen4 4 Lane	PCle Gen4 4 Lane	PCle Gen3 4 Lane	PCle Gen3 4 Lane	PCIe Gen4 4 Lane	PCle Gen4 4 Lane	
Host Device	PEG 0:1:0	PEG 0:1:1	PEG 0:6:0	PCH Port 13-16	PCH Port 5-8	PCH Port 9-12	PCH Port 25-28	PCH Port 21-24	PCH Port 1
Bus APIC Interrupt									
INT A	PIRQ A	PIRQ B	PIRQ A	PIRQ A	PIRQ A	PIRQ A	PIRQ A	PIRQ A	PIRQ A
INT B	PIRQ B	PIRQ C	PIRQ B	PIRQ B	PIRQ B	PIRQ B	PIRQ B	PIRQ B	PIRQ B
INT C	PIRQ C	PIRQ D	PIRQ C	PIRQ C	PIRQ C	PIRQ C	PIRQ C	PIRQ C	PIRQ C
INT D	PIRQ D	PIRQ A	PIRQ D	PIRQ D	PIRQ D	PIRQ D	PIRQ D	PIRQ D	PIRQ D
Organizationa I Pins									
Request									REQ0
Grant									GNT0
ID									AD16

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®:

- 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
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 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 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	PCI Express Root Port
0000 4000	0000 403F	64	Intel® UHD Graphics 770
0000 FFF8	0000 FFFF	32	Intel [®] Active Management Technology -SOL (COM5)

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. In other words, several devices can share one interrupt. The IRQ is assigned automatically.

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

	IRO	Q nı	umb	er																					Comment
IRQ (ACPI mode)	0	1	2	3	4	5	6	7	8	9	1	1	1 2	1	1 4	1 5	1 6	1 7	1 8	1 9	2	2	2 2	2	IRQ(ACPI mode)
Host PCI IRQ Line 1																	Α	В	С	D	Е	F	G	Н	1
Function																									
System timer	Χ																								Fixed
Communications Port (COM1)					Х																				Fixed
Communications Port (COM2)				Х																					Fixed
Communications Port (COM3)								Х																	Fixed
Communications Port (COM4)							Х																		Fixed
Intel® Serial IO GPIO Host Controller - INTC1056															X										Fixed
High Definition Audio Controller																	Х								Can be deactivated

X: Interrupt in APIC mode

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

^{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 System resources

000E C000 000E FFFF PCI Express Root Complex 5040 0000 BFFF FFFF PCI Express Root Complex 5200 0000 53FF FFFF Intel® RST VMD Controller 467F 5400 0000 541F FFFF Intel® PCI Express Root Port#4-7ABB 5400 0000 540F FFFF Intel® Ethernet Controller (3) 1225-LM 5410 0000 542F FFFF Intel® Ethernet Controller (3) 1225-LM 5420 0000 542F FFFF Intel® 1210 Gigabit Network Connection 5428 0000 542F FFFF Intel® 1210 Gigabit Network Connection 5428 0000 542F FFFF Intel® 1210 Gigabit Network Connection 5428 0000 542F FFFF Intel® 1210 Gigabit Network Connection 5428 0000 542F FFFF Intel® 1210 Gigabit Network Connection 5428 0000 542F FFFF Intel® 1210 Gigabit Network Connection 5428 0000 542F FFFF Intel® 1210 Gigabit Network Connection 5428 0000 542F FFFFF Intel® 1210 Gigabit Network Connection 5428 0000 656FFFF Intel® 1210 Gigabit Network Connection 5428 0000 656FFFFF Intel® 1210 Gigabit Network Connection	000E 8000	000E BFFF	PCI Evarage Poot Compley
5040 0000 BFFF FFFF PCI Express Root Complex 5200 0000 53FF FFFF Intel® PCI Express Root Port#4-7ABB 5400 0000 54FFFFFF Intel® Ethernet Controller (3) I225-LM 5410 0000 54FFFFFF Intel® Ethernet Controller (3) I225-LM 5420 0000 542F FFFF Intel® PCI Express Root Port#2-7AB9 5427 0000 542F FFFF Intel® I210 Gigabit Network Connection 8FFD F000 542F FFFF Intel® 1210 Gigabit Network Connection 8FFD F000 BFFD FFFF Intel® Active Management Technology -SOL (COM5) 8FFE 0000 BFFF FFFF Intel® Ethernet Connection (17) I219-LM 0000 BFFF FFFF Intel® Serial IO GPIO Host Controller - INTC1056 0069 0000 E069 FFFF Intel® Serial IO GPIO Host Controller - INTC1056 0060 0000 E068 FFFF Intel® Serial IO GPIO Host Controller - INTC1056 0060 0000 E06B FFFF Intel® Serial IO GPIO Host Controller - INTC1056 0060 0000 E06E FFFF Intel® Serial IO GPIO Host Controller - INTC1056 0060 0000 E06E FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E06E 0000 FED 0 0FFF			PCI Express Root Complex
5200 0000 53FF FFFF Intel® PCI Express Root Port#4-7ABB 5400 0000 541F FFFF Intel® PCI Express Root Port#4-7ABB 540F C000 540F FFFF Intel® Ethernet Controller (3) 1225-LM 5410 0000 541F FFFF Intel® Ethernet Controller (3) 1225-LM 5420 0000 542F FFFF Intel® PCI Express Root Port#2-7AB9 5427 C000 5427 FFFF Intel® 1210 Gigabit Network Connection 8FFD F000 BFFD FFFF Intel® 1210 Gigabit Network Connection 8FFE 0000 BFFF FFFF Intel® Ethernet Connection (17) 1219-LM C000 0000 CFFF FFFF Motherboard resources E069 0000 E069 FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E064 0000 E064 FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E065 0000 E065 FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E066 0000 E066 FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E065 0000 E065 FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E066 0000 E065 FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E060 0000 E065 FFFF <td< td=""><td></td><td></td><td></td></td<>			
5400 0000 541F FFFF Intel® PCI Express Root Port#4-7ABB 5400 0000 540F FFFF Intel® Ethernet Controller (3) I225-LM 5410 0000 541F FFFF Intel® Ethernet Controller (3) I225-LM 5420 0000 542F FFFF Intel® PCI Express Root Port#2-7AB9 5427 0000 542F FFFF Intel® I210 Gigabit Network Connection BFFD 600 BFFD FFFF Intel® Active Management Technology -SOL (COM5) BFFE 0000 BFFF FFFF Intel® Active Management Technology -SOL (COM5) BFFE 0000 BFFF FFFF Intel® Ethernet Connection (17) I219-LM 000 0000 CFFF FFFF Intel® Ethernet Connection (17) I219-LM 000 0000 E069 FFFF Intel® Serial IO GPIO Host Controller - INTC1056 066 0000 E06A FFFF Intel® Serial IO GPIO Host Controller - INTC1056 060 0000 E06B FFFF Intel® Serial IO GPIO Host Controller - INTC1056 060 0000 E06E FFFF Intel® Serial IO GPIO Host Controller - INTC1056 060 0000 E06E FFFF Intel® Serial IO GPIO Host Controller - INTC1056 060 0000 FED0 10FF Intel® Serial IO GPIO Host Controller - INTC1056 060 0000			·
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5410 0000 541F FFFF Intel® Ethernet Controller (3) 1225-LM 5420 0000 542F FFFF Intel® PCI Express Root Port#2-7AB9 5427 000 542F FFFF Intel® 1210 Gigabit Network Connection 5428 0000 542F FFFF Intel® 1210 Gigabit Network Connection BFFD F000 BFFD FFFF Intel® Active Management Technology -SOL (COM5) BFFE 0000 BFFF FFFF Intel® Ethernet Connection (17) 1219-LM 000 0000 CFFF FFFF Motherboard resources E069 0000 E069 FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E06A 0000 E068 FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E06B 0000 E06B FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E06D 0000 E06E FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E06D 0000 E06E FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E06D 0000 E06E FFFF Intel® Serial IO GPIO Host Controller - INTC1056 FED0 0000 FED0 10FFF Intel® Serial IO GPIO Host Controller - INTC1056 FED1 0000 FED0 30FF Intel® Serial IO GPIO Host Controller - NA4 FED2 0000 <			
5420 0000 542F FFFF Intel® PCI Express Root Port#2-7AB9 5427 C000 5427 FFFF Intel® 1210 Gigabit Network Connection 5428 0000 542F FFFF Intel® 1210 Gigabit Network Connection BFFD FFFD Intel® Active Management Technology -SOL (COM5) BFFF FFFF Intel® Ethernet Connection (17) 1219-LM C000 0000 CFF 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 E06B 0000 E06B FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E06D 0000 E06E FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E06D 0000 E06E FFFF Intel® Serial IO GPIO Host Controller - INTC1056 FED1 0000 FED1 0FFF Intel® SPI (flash) Controller - 7AA4 FED2 0000 FED0 3FFF Motherboard resources FED4 0000 FED4 4FFF Trusted Platform Module 2.0 FED4 5000 FED8 FFFF Motherboard resources FEDA 0FFF </td <td></td> <td></td> <td></td>			
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BFFE 0000 BFFF FFFF Intel® Ethernet Connection (17) I219-LM 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 E06B FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E06D 0000 E06E FFFF Intel® Serial IO GPIO Host Controller - INTC1056 E06D 0000 F6D1 0FFF Intel® Serial IO GPIO Host Controller - INTC1056 FE01 0000 FE01 0FFF Intel® Serial IO GPIO Host Controller - INTC1056 FE01 0000 FE01 0FFF Intel® Serial IO GPIO Host Controller - INTC1056 FED1 0000 FED0 03FF Intel® Serial IO GPIO Host Controller - INTC1056 FED0 0000 FED0 3FFF Motherboard resources FED4 0000 FED7 FFFF Motherboard resources FED4 0000 FED8 FFFF Motherboard resources FED0 0000 FED7 FFF Motherboard resources FED0 0000 FED7 FFF Motherboard resources		542F FFFF	Intel® I210 Gigabit Network Connection
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E06A 0000E06A FFFFIntel® Serial IO GPIO Host Controller - INTC1056E06B 0000E06B FFFFIntel® Serial IO GPIO Host Controller - INTC1056E06D 0000E06D FFFFIntel® Serial IO GPIO Host Controller - INTC1056E06E 0000E06E FFFFIntel® Serial IO GPIO Host Controller - INTC1056E01 0000FE01 0FFFIntel® Serial IO GPIO Host Controller - INTC1056FED1 0000FED1 0FFFIntel® SPI (flash) Controller - 7AA4FED0 0000FED0 03FFHigh precision event timerFED2 0000FED7 FFFFMotherboard resourcesFED4 0000FED4 4FFFTrusted Platform Module 2.0FED4 5000FED8 FFFFMotherboard resourcesFEDA 0000FED9 3FFFMotherboard resourcesFEDA 0000FEDA 0FFFMotherboard resourcesFEDA 0000FEDA 1FFFMotherboard resourcesFEDC 0000FEDC 7FFFMotherboard resourcesFEE0 0000FEEF FFFFMotherboard resources40 0000 0000FEOFF FFFFFIntel® UHD Graphics 77060 0000 000060 01FF FFFFFIntel® UHD Graphics 77060 0000 000060 02FF FFFFIntel® UHD Graphics 77060 0320 000060 0320 FFFFIntel® UHD Graphics 77060 0320 000060 0320 FFFFIntel® UHD Graphics 77060 0320 000060 0321 FFFFIntel® UHD Graphics 77060 0320 000060 0321 FFFFIntel® UHD Graphics 77060 0320 000060 0321 FFFFIntel® UHD Graphics 77060 0321 000060 0321 FFFFIntel® UHD Graphics 740 <t< td=""><td>C000 0000</td><td>CFFF FFFF</td><td>Motherboard resources</td></t<>	C000 0000	CFFF FFFF	Motherboard resources
E068 0000E06B FFFFIntel® Serial IO GPIO Host Controller - INTC1056E06D 0000E06D FFFFIntel® Serial IO GPIO Host Controller - INTC1056E06E 0000E06E FFFFIntel® Serial IO GPIO Host Controller - INTC1056FE01 0000FE01 0FFFIntel® SPI (flash) Controller - 7AA4FED0 0000FED0 03FFHigh precision event timerFED2 0000FED7 FFFFMotherboard resourcesFED4 0000FED4 4FFFTrusted Platform Module 2.0FED4 5000FED8 FFFFMotherboard resourcesFED9 0000FED9 3FFFMotherboard resourcesFEDA 0000FEDA 0FFFMotherboard resourcesFEDA 0000FEDA 1FFFMotherboard resourcesFEDC 0000FEDC 7FFFMotherboard resourcesFEE0 0000FEDF FFFFMotherboard resourcesFEE0 0000FEFF FFFFMotherboard resourcesFEE0 0000FEFF FFFFIntel® UHD Graphics 77060 0000 000060 01FF FFFFIntel® UHD Graphics 77060 0020 000060 02FF FFFFIntel® UHD Graphics 77060 0310 000060 031F FFFFIntel® UHD Graphics 77060 0320 000060 0320 FFFFIntel® UHD Graphics 77060 0320 000060 0321 7FFFIntel® UHD Graphics 77060 0320 000060 0321 7FFFIntel® UHD Graphics 77060 0321 000060 0321 7FFFIntel® UHD Graphics 77060 0321 000060 0321 7FFFIntel® UHD Graphics 77067 FFEF 80007F FFEF 8FFFIntel® Management Engine Interface #17F FFEF 90007F FFEF 8FFF </td <td>E069 0000</td> <td>E069 FFFF</td> <td>Intel® Serial IO GPIO Host Controller - INTC1056</td>	E069 0000	E069 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 FED9 0000 FED9 3FFF Motherboard resources FEDA 0000 FEDA 0FFF Motherboard resources FEDA 0000 FEDA 0FFF Motherboard resources FEDC 0000 FEDC 7FFF Motherboard resources FED 0000 FEDC 7FFF Motherboard resources FEE0 0000 FEDC 7FFF Motherboard resources FEE0 0000 FEDF FFFF Intel® UHD Graphics 770 60 0000 0000 60 01FF FFFF Intel® UHD Graphics 770 60 0000 0000 60 031F FFFF Intel® UHD Graphics 770 60 0310 0000 60 032F FFFF Intel® UHD Graphics 770 60 0320 0000 60 0320 FFFF Intel® UHD Graphics 770 60 0320 0000 60 0321 7FFF Performance Monitor 7F FFFF 8000 7F FFFF 8FFF Intel® USB 3.20 eXtensible Host Controller - 1.20 (Microsoft) 60 0321 0000 7F FFFF FFFF Intel® Serial IO 12C Host Controller - 7ACD 7F FFFF A000 7F FFFF AFFF Intel® Serial IO 12C Host Controller - 7ACC 7F FFFF B000 7F FFFF FFFF Intel® GNA Scoring Accelerator module 7F FFFF FFFF FFFF High Definition Audio Controller	E06A 0000	E06A FFFF	Intel® Serial IO GPIO Host Controller - INTC1056
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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 FEDA 0000 FEDA 0FFF Motherboard resources FEDC 0000 FEDC 7FFF Motherboard resources FED 0000 FEDC 7FFF Motherboard resources FEC 0000 FEFF FFFF Motherboard resources FEO 0000 FEFFFFFF Intel® UHD Graphics 770 60 0000 0000 60 01FF FFFF Intel® UHD Graphics 770 60 0000 0000 60 02FF FFFF Intel® UHD Graphics 770 60 0310 0000 60 031F FFFF Intel® UHD Graphics 770 60 0320 0000 60 0320 FFFF Intel® UHD Graphics 770 60 0320 0000 60 0321 7FFF Performance Monitor 7F FFEF 8000 7F FFEF 8FFF Intel® Management Engine Interface #1 7F FFEF 8000 7F FFEF 8FFF Intel® Serial IO I2C Host Controller - 7ACD 7F FFEF 8000 7F FFEF 8FFF Intel® GNA Scoring Accelerator module 7F FFEF FFFF FFFFF FFFFF Intel® GNA Scoring Accelerator module 7F FFEF FFFFF FFFFF High Definition Audio Controller	E06D 0000	E06D FFFF	Intel® Serial IO GPIO Host Controller - INTC1056
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			-
/ F FFFU UUUU - / F FFFF FFFF - MIGH DEHHILIUH AUGHO CONTROLLET	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	PCIE4X16_1	X100
2	PCIE3_X8_1	X101
3	PCIE4X16_2	X102
4	PCIE3_X4_1	X103
5	PCIE4_X4_1	X104
6	PCIE_X4_2	X105
7	PCI1	X106

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

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	 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	 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.	 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.
		connected to the system unit and the monitor. Contact your technical support team if the screen still remains dark after all these controls and measures.
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	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.
		Contact your technical support team if the mouse pointer still does not appear on the screen after these controls and measures.
Time and/or date of the PC is not correct		 Open the firmware configuration menu. To do this, press the <f2> key during the boot operation.</f2> 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	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	RAID system does not have highest boot priority	Change the boot priority in the firmware (BIOS) under "Boot > Boot device".
the RAID system		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	The boot medium is not approved	Set the boot priority to "Enabled" in the firmware (BIOS) under "Boot > Boot device".
displayed.	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	The settings in the boot loader file	Restore the Windows® operating system.
operating system located on a GPT data storage medium is aborted with the following error message:	"BCD" are incorrect or damaged.	You can find the files and descriptions needed for this on the supplied data storage medium.
"Status: 0xc0000225 Info: The boot selection failed because a required device is inaccessible"		

B.2.3 Problems with RAID systems

Problem	Cause	Remedy
The RAID software reports the following errors:	RAID is not activated	The messages have no negative effect on the operation of the device and can be ignored.
The RAID plug-in failed to		Acknowledge the messages.
load, because the drive is not installed.	RAID is activated	Install the software again with the help of the supplied data storage medium.
The Serial ATA plug-in failed to load, because the driver is not installed correctly.		
The Intel® Storage Console was unable to load a page for the following reason:		
 A plug-in did not provide a page for the selected device 		
 A plug-in failed to load 		

B.2.4 Problems when using expansion cards

Problem	Cause	Remedy
The device crashes during startup	 Redundant I/O addresses Redundant hardware interrupts and/or DMA channels Signal frequencies or signal levels are not adhered to Different pin assignment 	 Check your computer configuration: 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. If the device still crashes, contact your technical support team.

Problem	Cause	Remedy
The device does not start up or switches off immediately	A counter voltage is fed into the device by connected or installed	Clarify the following with the supplier of the component:
	expansion cards	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.
The device does not operate	Contact problem on the contacts of	Check the plug-in connection
normally if an expansion card is integrated. Examples:	the expansion card or on the connector	Remove the installed expansion card and reinsert it.
The operating system does not boot.		Clean the contact surface of the expansion card with pure ethanol.
The expansion card is not detected		

B.2 Troubleshooting

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
\triangle	Warning, observe the supplied documentation.	1	Lock is closed
(!)	Attention, radio equipment	1	Lock is open
	Disconnect the power plug before opening	R	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
G 0 1 0	On-off switch, without electrical isolation		
Ф	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	EAC	Marking for the Eurasian Customs Union
(M)	Approved for China	FM	Test mark of Factory Mutual Research
(€	CE markings for European countries	F©	Marking of Federal Communications Commission for the USA
10	EFUP (Environment Friendly Use Period) marking for China		Approved for Korea
c (UL) us	Test mark of the Underwriters Laboratories	UK	Approval for United Kingdom
8	Approval for India		

C.5 Interface icons

Symbol	Meaning	Symbol	Meaning
(‡)	Protective conductor terminal	((v))	Line In
计牵	Connection for functional grounding (Equipotential-bonding cable)	(₩	Line Out
DPP	DisplayPort interface	D	Microphone input
<u>F</u>	DVI port		
LAN P	LAN interface, not approved for connecting WAN or telephone		
IOIOI	Serial port		
•	USB 2.0 high-speed port		
SSC	USB 3.0 Gen 1 SuperSpeed port		

C.5 Interface icons

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