SIEMENS

SIMATIC

Industrial PC
SIMATIC IPC677E

Operating Instructions

Legal information

Warning notice system

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

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

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

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

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

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

Qualified Personnel

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

Proper use of Siemens products

Note the following:

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

Trademarks

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

Disclaimer of Liability

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

Preface

Purpose of the operating instructions

These operating instructions contain all the information you need for the installation, electrical connection, commissioning and expansion of the SIMATIC IPC677E and to maintain and repair the device. They are intended for the following qualified specialist personnel:

- Installation personnel
- Commissioning engineers
- IT administrators
- Service and maintenance personnel

Basic knowledge required

A solid background in electrical installation, personal computers, Microsoft operating systems and network technology is required to understand this manual. General knowledge in the field automation control engineering is recommended.

Scope of the operating instructions

These operating instructions are valid for all order versions of the SIMATIC IPC677E.

History

The following editions of these operating instructions have already been published:

Edition	Comment
04/2019	First edition

Security information

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

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

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

For additional information on industrial security measures that may be implemented, please visit (http://www.siemens.de/industrialsecurity).

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

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under (http://www.siemens.de/industrialsecurity).

Disclaimer for third-party software updates

This product includes third-party software. Siemens AG only provides a warranty for updates/patches of the third-party software, if these have been distributed as part of a Siemens software update service contract or officially released by Siemens AG. Otherwise, updates/patches are undertaken at your own risk. You can find more information about our Software Update Service offer on the Internet at Software Update Service (http://www.automation.siemens.com/mcms/automation-software/en/software-update-service).

Table of contents

Product description

1

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	• Supplied data storage medium • Online at: SIMATIC IPC Documentation (https://support.industry.siemens.com/cs/ww/en/view/109760621)
Quick Install Guide	Information on: • Operating Instructions of the device • Installation of the device • Connecting the device to the power supply • Connecting I/O devices • Switching the device on	• Supplied in printed form with the device • Supplied data storage medium
Current product information	• Current notes on the device • Changes compared with these Operating Instructions	• Online at: SIMATIC IPC Documentation (https://support.industry.siemens.com/cs/ww/en/view/109760621)
Firmware/BIOS description	Information on: • Important firmware settings • Firmware settings in the delivery state • Boot modes	• Supplied data storage medium • Online at: Firmware/BIOS description (https://support.industry.siemens.com/cs/ww/en/view/109760621)
Windows® operating system	Information on: • Commissioning the operating system • Restoring the operating system • Configuration of the operating system	• Supplied data storage medium • Online at: Microsoft® Windows® 10 (https://support.industry.siemens.com/cs/ww/en/view/109749498)

Documentation	Contents	Source
SIMATIC IPC DiagBase	Information on: • Temperature monitoring • Fan monitoring • Monitoring drives • Watchdog • Operating hours counter • Battery monitoring	• Supplied data storage medium • Online at: SIMATIC IPC DiagBase (https://support.industry.siemens.com/cs/ww/en/view/109749690)
SIMATIC IPC Diag-Monitor	Monitoring functions such as with SIMATIC IPC DiagBase with additional extended functions.	• Online at: SIMATIC IPC DiagMonitor (https://support.industry.siemens.com/cs/ww/en/view/39129913)
SIMATIC IPC Remote Manager	Information on: • Remote maintenance of SIMATIC Industrial PCs (IPCs) via a management PC. • Using Intel ®Active Management Technology (Intel® AMT).	• Online at: SIMATIC IPC Remote Manager (http://support.automation.siemens.com/WW/view/en/48707158)
SIMATIC IPC Image & Partition Creator	Information on: • Backup and recovery of files, directories, drive partitions.	• Online at: SIMATIC IPC Image Partition Creator (https://support.industry.siemens.com/cs/de/en/view/21766418)
SIMATIC NET	Industrial communication	• Online at: SIMATIC NET (http://w3.siemens.com/mcms/automation/en/industrial-communications/Pages/Default.aspx)
SIMATIC Industrial PC Panel Drivers and Tools	Information on: • Setting the brightness • Configuration of the screen saver • Touch settings for resistive touch and multi-touch	• Online at: SIMATIC Industrial PC Panel Drivers and Tools V1.3 PDT IPC/IFP with capacitive multi-touch screen (https://support.industry.siemens.com/cs/ww/en/view/109751260)

1.2 Product highlights

The SIMATIC IPC677E is a powerful industrial PC. It is perfectly suited for PC applications with high-level industry functionality.

Device view

Note

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

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

- Maximum processor power (in full configuration) without loss of power (throttling) at up to +45 °C ambient temperature
- Full metal enclosure with high electromagnetic compatibility (EMC) for use in industry
- Independent industrial product design for high shock and vibration resistance
- CE marking for the industrial field

High productivity through fast data processing

- 8th generation Intel® processors: Celeron, Core i3 and i7
- Graphics controller (630/P630) integrated in processor up to 4K Ultra HD resolution, three independent graphic interfaces
- Maximum performance, e.g. through Intel C246 chip set, DDR4 memory (up to 64 GB) with support of dual channel technology
- High data transfer rates, e.g. with PCI Express Gen 3 technology, USB 3.1 Gen 2 SuperSpeed (SuperSpeed+) (10 Gbps), M.2 NVMe
- Low noise level due to variable-speed fans

High system availability thanks to minimization of standstill times

- Hot swap (swapping of drive during operation) in removable drive bays in RAID systems
- Efficient event diagnostics through the SIMATIC IPC DiagBase or DiagMonitor monitoring software (optional) and signaling software OPC/SNMP/LAN
- Remote control and remote maintenance of the device through iAMT (Intel® Active Management Technology)
- SSD as 2.5" SATA or M.2 NVMe
- Preventative data backup with the SIMATIC IPC Image & Partition Creator

High investment protection

- Platform with embedded Intel components for long-term stability
- Availability: 3 to 6 years
- Assured spare parts availability: 5 years after end of production
- Certified for worldwide marketing (cULus)
- Support of legacy interfaces (COM)
- Compatible installation across device generations
- Worldwide service and support

Device variants

Devices with capacitive multi-touch screen display:

- 19" display, resolution: 1920 x 1080 pixels
- 22" display, resolution: 1920 x 1080 pixels
- 24" display, resolution: 1920 x 1080 pixels

User-friendly application scenarios for commissioning, use and service

- High flexibility and expandability thanks to integrated interfaces and up to 2 slots (PCI and PCI Express)
- Pre-installed and activated operating system
- Fast restoration of delivery state of the operating system (with supplied data storage medium)
- Gbit LAN with teaming capability (3 x LAN 10/100/1000 Mbps connections)
- Service-friendly equipment design (modifications, service)
- Can be used flexibly in a wide variety of positions

1.3 Applications

The device offers industrial PC systems for high-performance and space-saving applications in particular for manufacturers in the field of machine, plant and control cabinet engineering:

- Operating, process and visualization applications
- Industrial image processing
- Quality assurance and monitoring tasks
- Measurement, control and rule-based tasks
- Data acquisition and management

The SIMATIC IPC has the CE mark for use in industrial environments.

1.4 External design of the device

1.4.1 Side view, right
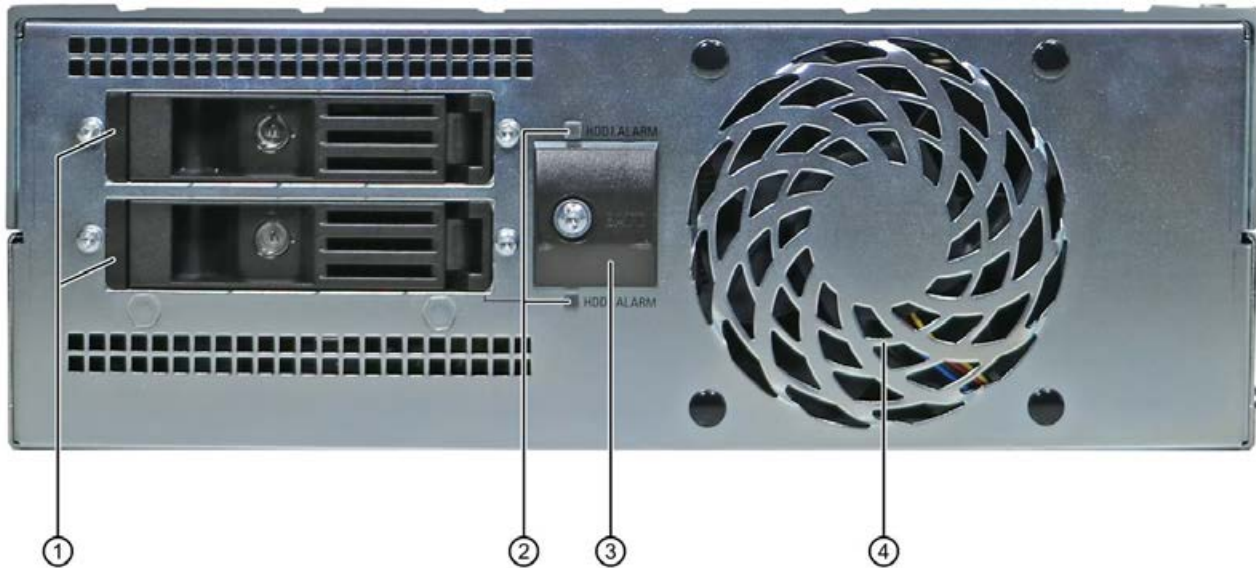
①	Removable drives	Slots for removable drives
②	RAID status indicators	HDD alarm
③	Battery compartment	CMOS backup battery
④	Front fan	

1.4.2 Side view, left

Connection side
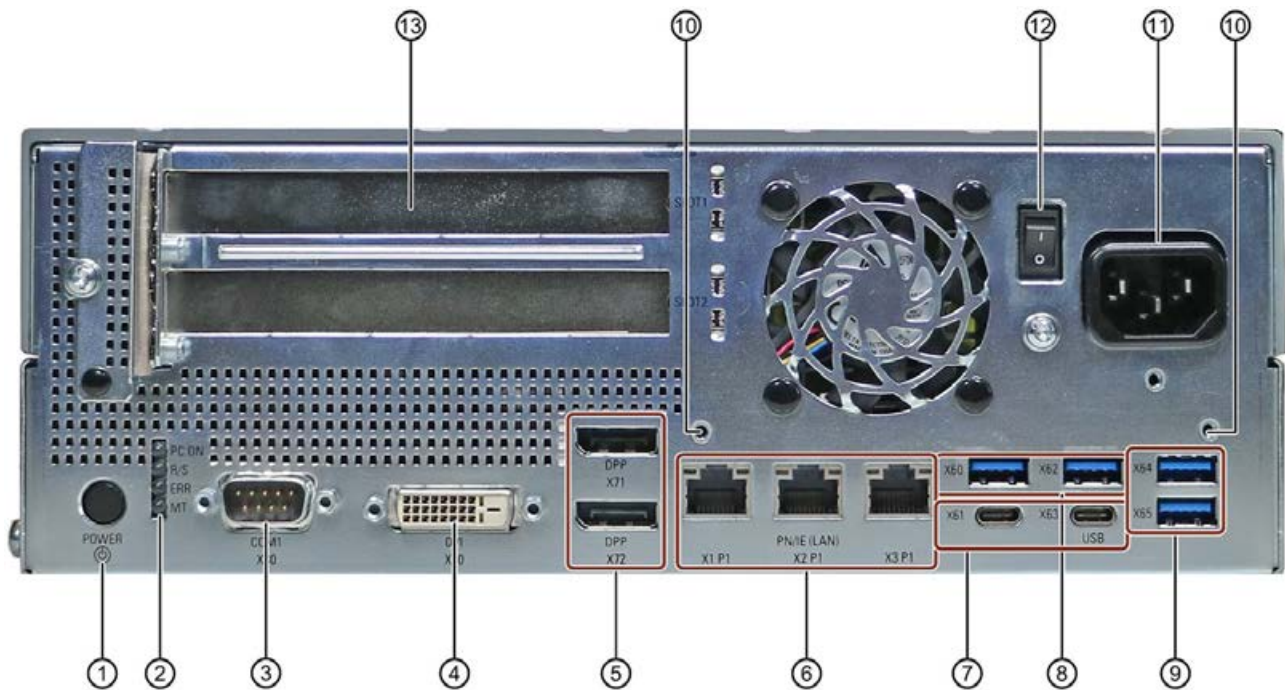
① On/off button   The on/off button has three functions:

- Switch on the PC: Briefly press once

- Shut down operating system and switch off PC: Briefly press once

- Switch off PC without shutting down the operating system (hardware reset): Press for more than 4 seconds.

Note: The BIOS setup entry "After Power Failure" has been set to "Power On". This means the device is switched on with the on/off switch. You then do not need to press the on/off button.

② 4 status LEDs   Status display of the status indicators (Page 19)

③ COM1 X30   Serial interface

④ DVI/VGA X70   DVI-D connection for CRT or LCD monitor with DVI port

⑤ DisplayPort X71/X72   DisplayPort connection for digital monitor

⑥ 3 × Ethernet X1P1/X2P1/X3P1
- X1P1, left: RJ45 Ethernet port 1 (exclusive PCI interrupt) with 10/100/1000 Mbps, iAMT capable

- X2P1, center: RJ45 Ethernet port 2 (shared PCI interrupt) with 10/100/1000 Mbps

- X3P1, right: RJ45 Ethernet port 3 (shared PCI interrupt) with 10/100/1000 Mbps

⑦	2 × USB X61/X63	USB 3.1 GEN 2 Type C high current, backward compatible with USB 3.0/2.0/1.1
⑧	2 × USB X60/X62	USB 3.1 GEN 2 Type A high current, backward compatible with USB 3.0/2.0/1.1
⑨	2 × USB X64/X65	USB 3.1 GEN 2 Type A high current, backward compatible with USB 3.0/2.0/1.1
⑩	Fixing screws for strain relief	
⑪	100 V AC to 240 V AC	Power supply connection
⑫	On/off switch	You switch on the device with the on/off switch. This requires that the BIOS setup entry "After Power Failure" is set to "Power On". The on/off switch does not isolate the device from the power supply. Position "ON", when the "-)" symbol is pressed inward on the device. Position "OFF" is the delivery state.
⑬	PCI/PCIe expansion cards, USB on expansion card (optional)	2 slots for expansion cards (Slot1/X101, Slot2/X102)

1.4.3 Status displays

The status display consists of four multi-colored LEDs.

Position	Status indicator	Color	Description
①	PC ON/WD	Off	-
		Green	BIOS ready to boot
		Flashing green/yellow (1 Hz)	BIOS in POST, power switch on
		Yellow	Idle state
		Flashing red (1 Hz)	Watchdog status display: active
②	RUN/STOP or L1	Off	-
		Green	Can be controlled by user program
		Yellow	Can be controlled by controller program (e.g. SoftPLC)
③	ERROR or L2	Off	-
		Red	-
		Flashing red	Can be controlled by user program or controller program (e.g. SoftPLC)
④	MAINT or L3	Off	-
		Yellow	-
		Red	Can be controlled by controller program (e.g. SoftPLC)

For additional information on controlling the LEDs or the NVRAM with a Windows operating system, please refer to "Buffer memory NVRAM (optional) (Page 69)". Example programs for controlling the LEDs under Windows operating systems are available on the Internet at the following address: Technical support (https://support.industry.siemens.com/cs/ww/en/)

RAID status indicators in removable drive bay

Status indicator position, see also Side view, right (Page 16).
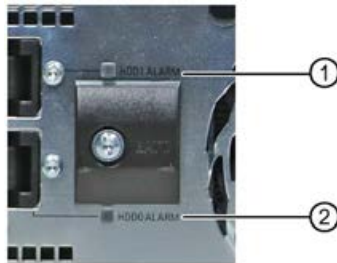
Display	Meaning	Color	Description
LED "HDDx ALARM"	HDD alarm in connection with RAID and monitoring software	Both off	RAID is OK
		LED ① lights up red	HDD1 is not OK
		LED ② lights up red	HDD2 is not OK
		Both light up red	RAID is not OK For information on locating the hard disk, see section "Displaying a defective hard disk of a RAID system in the RAID software".
		Both flash	RAID is synchronized

Ethernet status indicators
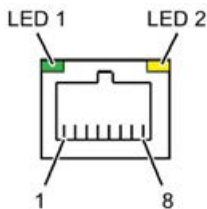
Status indicator	Status	Meaning of the status
LED 1	Off	10 Mbps
	Lit green	100 Mbps
	Lit orange	1000 Mbps
LED 2	Lit	Connection exists
	Flashes	Activity

1.5 Internal design of the device
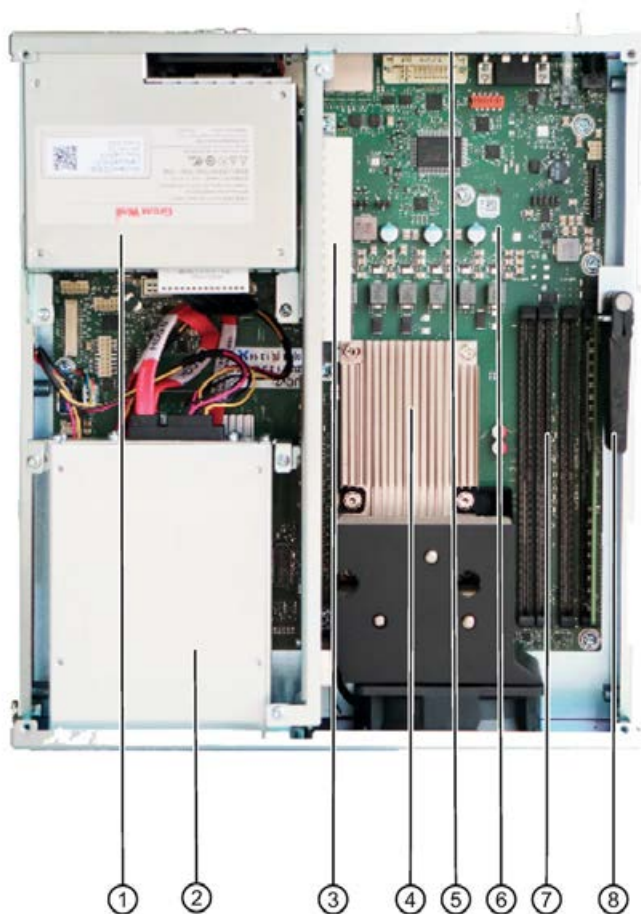
①	100 V AC to 240 V AC power supply
②	Slots for removable drives
③	Expansion card slots
④	Heat sink of the processor
⑤	Expansion card slots
⑥	Motherboard
⑦	Slots for memory modules
⑧	Retainer for expansion cards

1.6   Accessories and spare parts

1.6.1   Accessories: Hardware

Accessories from Siemens are available for your device that are not included in the scope of delivery.

Obtaining accessories and original spare parts via the SIEMENS Industry Mall

1. On the Internet, go to Industry Mall (https://mall.industry.siemens.com).

2. Log in with your customer data.

3. Select your user language.

4. Go to your device in the product catalog (tree structure on left):

   "Automation technology > PC-based Automation > Industrial PC > Box PC> ..."

5. In the tree structure on the left, click on: SIMATIC IPC677E.

6. Select the "Accessories" tab in the display area.

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)".

1.6.2 Accessories: Software

The following software products, among others, can be additionally ordered for your device:

Software	Description
SIMATIC IPC Image & Partition Creator	This tool provides convenient and efficient functions for backing up and restoring the full content of memory cards, hard disks and individual partitions (images).
	The SIMATIC IPC Image & Partition Creator can be ordered using the Siemens online ordering system (https://mall.industry.siemens.com).
SIMATIC IPC DiagMonitor	The SIMATIC IPC DiagMonitor software offers additional alarm and linking options in addition to the local monitoring functions of the SIMATIC IPC DiagBase software and includes:
	• The software for the stations to be monitored.
	• A library for creating user-specific applications.
SIMATIC IPC Remote Manager	The SIMATIC IPC Remote Manager enables the use of Intel® Active Management Technology (Intel® AMT).
	Remote access to SIMATIC IPCs enables, for example, system or program errors to be corrected as well as firmware/BIOS and program updates to be performed from a control room (without deployment in the field).
	Access is possible even if the operating system no longer starts.
	Processors of the type i7 offer iAMT functionality.

Further information on the software products and references to the online catalog and ordering system (Industry Mall) can be found on the SIMATIC IPC software (http://www.automation.siemens.com/mcms/pc-based-automation/en/industrial-pc/expansion_components_accessories) homepage.

See also

Industry Mall (https://mall.industry.siemens.com)

Safety instructions

2

2.1 General safety instructions

⚠ WARNING
The installer of the system is responsible for the safety of a system in which the device is integrated. There is a risk of malfunction which could result in death or serious injury. • Ensure that only suitably qualified personnel perform the work.

Risk due to electric shock

⚠ WARNING
Risk of electric shock The on/off button and on/off switch do not fully disconnect the device from the supply voltage. There is also a risk of fire if the device or connecting lines are damaged. • Always fully disconnect the device from the supply 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. • When you install the device, make sure that the power supply connector is easily accessible.

Risk of lightning strikes

⚠ DANGER
Risk of lightning strikes A lightning flash may enter the mains cables and data transmission cables and jump to a person. Death, serious injury and burns may result. • Disconnect the device from the power supply in good time when a thunderstorm is approaching. • Do not touch power cables and data transmission cables during a thunderstorm. • Keep sufficient distance from electric cables, distributors, systems, etc.

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.

TFT displays

Note
Burn-in effect and backlighting
The brightness of the backlighting deteriorates over the course of the screen's life cycle. A permanent picture with bright screen objects leads to a burn-in effect.
• Use a screen saver to extend the life of the screen and the backlighting and to prevent the burn-in effect.

Note
Defective pixels in the display
The manufacturing process of modern displays does not currently guarantee that all pixels of the display are perfect. It is therefore inevitable that the display will contain a small number of defective pixels. This does not limit the function in any way provided the defective pixels are not all in one location.

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.

ESD directive

Electrostatic sensitive devices can be labeled with an appropriate symbol.

NOTICE
Electrostatic sensitive devices (ESD)
The device contains electronic components which may be destroyed by electrostatic charge. This can result in malfunctions and damage to the machine or plant.
Take corresponding precautionary measures before you open the device.

2.2 Note on transport and storage

Damage caused by transportation 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.

⚠ 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.

Damage from 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.
• Bring the device to room temperature before starting it up.
• 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   Notes on mounting

Device in the control cabinet

⚠ 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 bodily injury.
• Always disconnect the cabinet from the mains before opening it.
• Ensure that the power to the control cabinet cannot be turned on accidentally.

2.4   Notes on ambient and environmental conditions

Certifications and approvals

NOTICE
Voided approvals
If the following conditions for system installation are not observed, approvals in accordance with UL 61010-2-201 and EN 61010-2-201 are rendered void and there is a risk of overheating and personal injury.
• You should observe the following information on ambient and environmental conditions.

Ambient and environmental conditions

NOTICE
Ambient conditions and chemical resistance
Unsuitable environmental conditions can cause faults or damage the device. Failure to comply nullifies the warranty in accordance with IEC/EN/UL 61010-2-201.
• Operate the device only in closed rooms.
• Only operate the device in the ambient conditions specified in the technical specifications.
• Observe the permitted mounting positions of the device.
• Do not obstruct the venting slots of the device.
• Please note that when the device is operated in severe environments which are subject to caustic vapors or gases, the provision of clean air is ensured.
• Clean the enclosure surface with a damp cloth and make sure that no water enters the device.

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

● Take note of the climatic and mechanical ambient conditions (Page 115).

● You must observe the Mounting positions (Page 37) when mounting the device.

● For installation in a cabinet, observe the SIMATIC setup guidelines as well as the relevant DIN/VDE requirements or the applicable country-specific regulations.

● When the device is used in the programmable controller area in accordance with IEC/EN/UL61010-2-201, note that the device is classified as "Open Equipment". An IEC/EN/UL61010-2-201 compliant enclosure is therefore a mandatory requirement for approval or operation according to IEC/EN/UL61010-2-201.

● The device must be installed in such a way that it is part of a restricted access location (e.g. a locked control cabinet, control panel or server room).

● Always maintain a minimum clearance of 100 mm to the area of the ventilation slots and do not cover the ventilation slots of the enclosure.

High frequency radiation

⚠ CAUTION
Immunity to RF interference
The device has an increased immunity to RF radiation according to the specifications on electromagnetic compatibility in the technical specifications.
High frequency radiation, e g. from a cellular phone, 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 Information on I/O devices

⚠ CAUTION
Fault caused by I/O devices
The connection of I/O devices can cause faults in the device.
The result may be personal injury and damage to the machine or plant.
• 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.

NOTICE
Damage through regenerative feedback
Regenerative feedback of voltage to ground by a connected or installed component can damage the device.
Connected or built-in I/Os, for example, a USB drive, are not permitted to supply any voltage to the device.
Regenerative feedback is generally not permitted.

Note

Checking the regenerative feedback

When measuring the counter emf, remember the following:

• The computer in question must be turned off and the power supply connector must be plugged in.

• During the measurement, all cables from the plant to the computer should be connected.

• All other components in the plant must be active.

2.6 Notes on device and system extensions

Device and system extensions

⚠ CAUTION
Fire hazard due to overheating of the device
Expansion cards generate additional heat. The device can overheat or cause a fire. • Observe the safety and installation instructions for the expansion cards. • Observe the max. permissible power consumption values.

NOTICE
Damage caused by device and system extensions
Device and system expansions may contain faults and affect the entire device, machine or plant. They may also 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. • Always disconnect the power plug before you open the device. • Only install device or system expansions designed for this device. • Observe the information on "Electromagnetic compatibility" provided in the technical specifications.

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

NOTICE
"Open Equipment" IEC/EN/UL61010
The device is designed for use as a programmable controller, OpenType according to IEC/EN/UL 61010-2-201. The installation of the device in a fire protection housing in accordance with IEC/EN/UL 61010-2-201 is therefore a mandatory requirement for approval or operation.

Limitation of liability

• Observe the installation instructions for expansion components in the associated documentation.

• UL approval of the device only applies when the UL-approved components are used according to their "Conditions of Acceptability".

• We are not liable for functional limitations caused by the use of third-party devices or components.

Mounting and connecting the device

3

3.1 Preparing for mounting

3.1.1 Scope of delivery

Device and hardware for the device

- Panel PC SIMATIC IPC677E
- Mounting clips
- Strain relief
- Power plug latch
- USB stick

Optional:

- DiagMonitor
- Image & Partition Creator
- Power supply cable

Supplied data medium

On the supplied data medium (read-only), you can find:

- Software and tools to restore your ordered Microsoft® Windows® operating system.
- Device drivers for installation in operating systems
- SIMATIC IPC677E Quick Install Guide
- SIMATIC IPC677E Operating Instructions
- Product information
- Firmware/BIOS description
- Operating instructions for your ordered Microsoft® Windows® operating system on this device

Operating system

Depending on the ordered device configuration, the device comes with an installed operating system.

- Microsoft® Windows® 10
  (https://support.industry.siemens.com/cs/ww/de/view/109749498/en?dl=en)

- Without operating system

Installed software

- Monitoring software SIMATIC IPC DiagBase (only with installed Microsoft® Windows® operating system)

- SIMATIC Panel Driver and Tools (only with installed Microsoft® Windows® operating system)

You will find the latest information on additional software for your device under: Accessories and spare parts (Page 22)

Printed documents

- SIMATIC IPC677E Quick Install Guide

- Product Information "Important notes on your device"

- SIMATIC IPC/PG Quality Control Report

3.1.2 Checking the delivery package

> ⚠ **WARNING**
>
> **Electric shock and fire hazard due to damaged device**
>
> Damaged devices due to improper storage or transport may lead to personal injury and/or substantial damage to equipment.
>
> - You must observe the warnings in "Note on transport and storage (Page 27)".

Procedure

1. Check the packaging and package contents for 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 33) and any accessories you may have ordered for completeness and damage. Please inform the delivery service immediately if the package contents are incomplete or damaged or do not correspond with your order. Fax the enclosed form "SIMATIC IPC/PG Quality Control Report".

5. Please keep the enclosed documentation in a safe place. It belongs to the device. You need the documentation when you commission the device for the first time.

6. Write down the Identification data of the device (Page 36) identification data of the device.

3.1.3 Identification data of the device

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 following image shows the nameplate on the SIMATIC IPC677E as an example.

COA label

Microsoft Windows "Product Key" is the "Certificate of Authenticity" (COA):
The COA label is only available for devices delivered with Microsoft® Windows® operating system installed and is located on the rear of the device.

Example of COA label for the Microsoft® Windows® 10 operating system:

The Microsoft® Windows® 10 COA label has an additional security feature which conceals part of the product key.

● The scratch-off panel consists of a small transparent label with a silver-colored scratch coating, which was applied to conceal part of the 25-character product key. This scratch-off panel is designed to protect the product key from being obtained and used by unauthorized third parties.

● You usually do not need this product key for commissioning because a valid product key has already been integrated into the pre-installed operating system.

See also

Important instructions and manuals for operating the device (Page 11)

3.1.4 Mounting positions

NOTICE
"Open Equipment" IEC/EN/UL61010
The device is designed for use as a programmable controller, OpenType according to IEC/EN/UL 61010-2-201. The installation of the device in a fire protection housing in accordance with IEC/EN/UL 61010-2-201 is therefore a mandatory requirement for approval or operation.

The following mounting positions are permitted for the device.

For information on the maximum permissible ambient temperatures during operation, refer to section "Ambient conditions (Page 115)".

Mounting positions according to UL61010

> **Note**
> **Operation in closed rooms**
>
> The device is approved for operation in closed rooms only. Note the Ambient conditions (Page 115).

Mounting in horizontal format
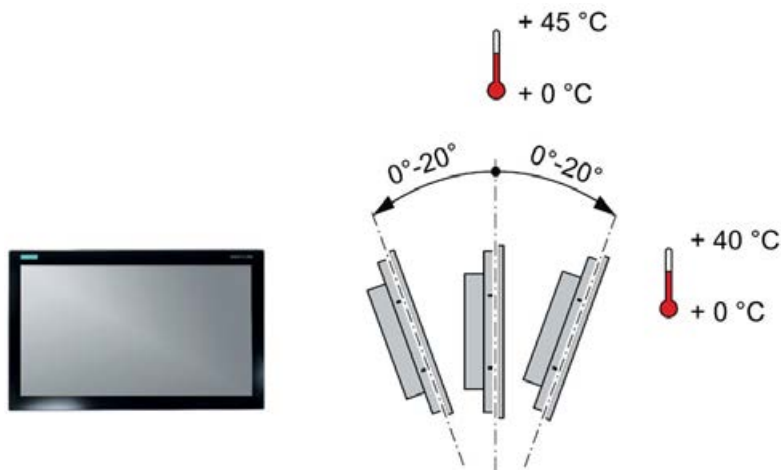
> **Note**
> **Mounting precautions**
> - The total power for USB and PCI/PCIe expansions cannot exceed 30 W.

Additional mounting positions according to UL61010/CSA 22.2 No. 142

> **Note**
>
> **Operation in closed rooms**
>
> The device is approved for operation in closed rooms only. Note the Ambient conditions (Page 115).

Mounting in vertical format
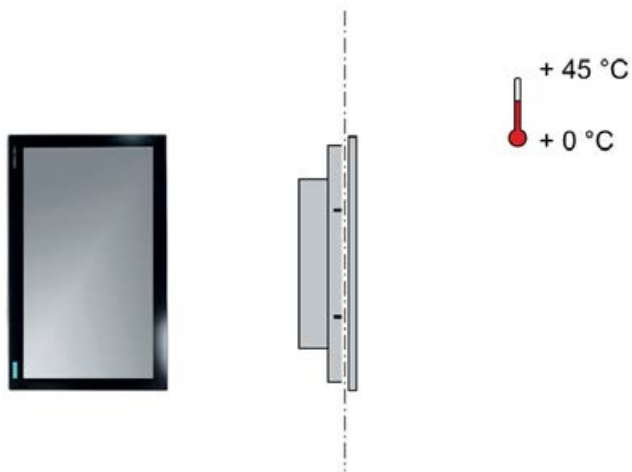
> **Note**
>
> **Mounting precautions**
>
> • The total power for USB and PCI/PCIe expansions cannot exceed 30 W.

3.1.5 Preparing the mounting cutout

Note

Stability of the mounting cutout

The material in the area of the mounting cutout must provide sufficient strength to guarantee the enduring and safe mounting of the HMI device.

The force of the clamps or operation of the device may not lead to deformation of the material in order to achieve the degrees of protection described below.

Note

Read the information in the section "Installation guidelines (Page 41)".

Requirements for complying with degree of protection

The degree of protection of the HMI device can only be guaranteed if the following requirements are met:

- Material thickness at the mounting cutout for IP65 degree of protection, or for enclosure type 4X/type 12 (indoor use only): 2 mm to 6 mm

- Permissible deviation from plane at the mounting cutout: ≤ 0.5 mm

  This condition must be fulfilled for the mounted HMI device.

- Permissible surface roughness in the area of the mounting seal: ≤ 120 µm (R_z 120)

Dimensions of the mounting cutout
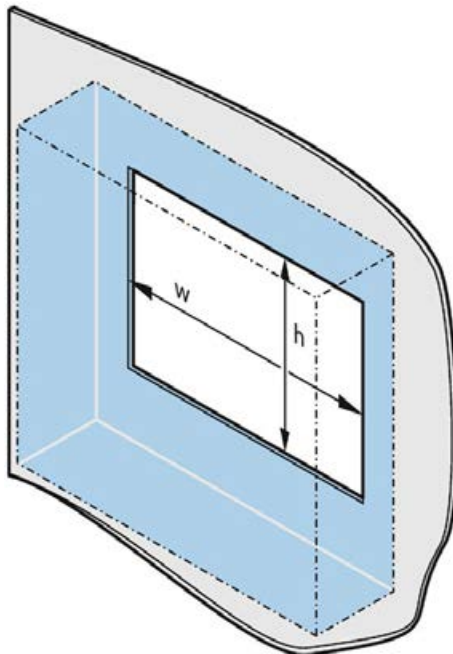
Mounting cutout	Multi-touch device [2]		
	19"	22"	24"
Width w [1]	448^{+1} mm	513^{+1} mm	569^{+1} mm
Height h [1]	278^{+1} mm	315^{+1} mm	347^{+1} mm

[1]   Width and height must be interchanged for mounting in vertical format.

[2]   Device with capacitive multi-touch screen

Installation depth

Information on the overall depth is available in the section "Dimension drawings (Page 121)".

3.2   Mounting the device

3.2.1   Installation guidelines

Procedure during installation and mounting

> ⚠️ **WARNING**
>
> **Dangerous voltage and fire hazard**
>
> Improper actions during installation and assembly may lead to personal injury and/or substantial damage to equipment.
>
> You should observe the installation and assembly notes under:
> - Notes on mounting (Page 28)
> - Notes on ambient and environmental conditions (Page 28)

> **NOTICE**
>
> **Insufficient load carrying capacity**
>
> If the wall it is mounted on does not have a sufficient load-bearing capacity, the device may fall and be damaged.
> - Ensure that the mounting surface on the wall can bear four times the total weight of the device, including fixing elements.

> **NOTICE**
>
> **Incorrect fixing elements**
>
> The device may not be securely fitted if you use fixing elements other than those specified below for mounting. The device can fall and may be damaged.
> - Use only the specified fixing elements.

Note
- See the notes under Preparing the mounting cutout (Page 39).
- For installation in control cabinets, note the SIMATIC setup guidelines as well as the relevant DIN/VDE requirements or the country-specific regulations.
- Ensure that the device is classified as "Open Equipment" when using it in the area of Industrial Control Equipment (UL 61010). A UL 61010 compliant enclosure is therefore a mandatory requirement for approval or operation according to UL 61010.
- Provide adequate volume in the control cabinet for air circulation and heat transport. Keep at least 5 cm distance between the device and control cabinet.
- The ventilation slots of the device may not be covered or obstructed.
- Ensure there is enough clearance in the control cabinet to allow the backplane cover to be removed.
- Equip the control cabinet with struts for stabilizing the mounting cut-out. Install struts where necessary.

See also

Ambient conditions (Page 115)

Mounting positions (Page 37)

3.2.2 Mounting the device with mounting clips

Positions of the mounting clips

To achieve the degree of protection for the device, the positions for the mounting clips shown below must be adhered to.

Requirement

- All packaging components and protective films have been removed from the device.
- To install the device, you need the mounting clips from the accessory kit.
- The mounting seal on the front of the device is not managed.

Procedure

Note

If the mounting seal is damaged or protrudes from the device, the guaranteed degree of protection is not ensured.

It is prohibited from mounting the device if the mounting seal is damaged.

1. Working from the front, insert the device into the mounting cut-out.
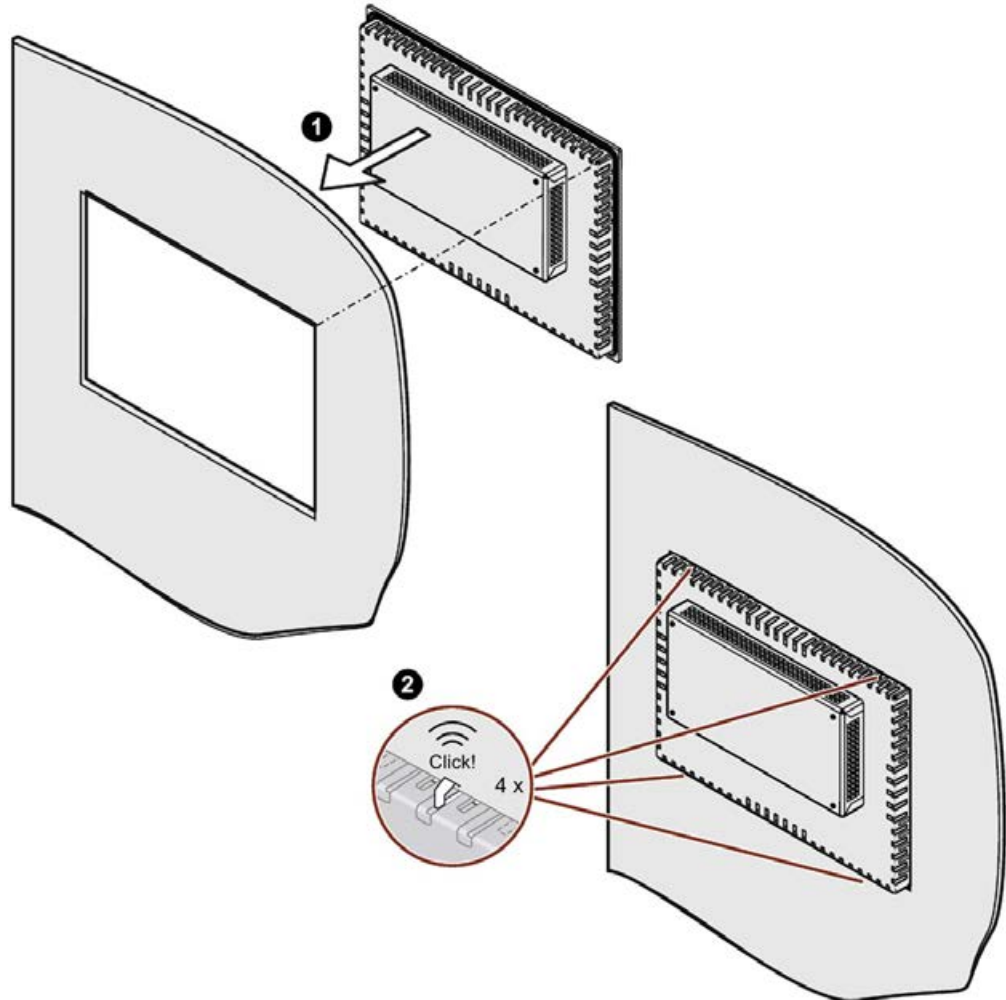
2. Make sure that all four spring fasteners latch fully into place on the upper and lower side of the device. If necessary, press the device again carefully into the mounting slot at the place that is not fully latched into position.

3. Insert a mounting clip into the cutout provided on the device.

   Note the correct position of the mounting clips.
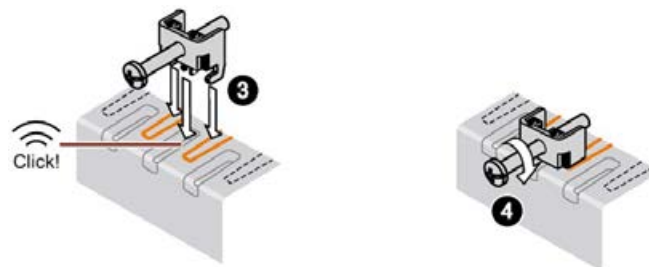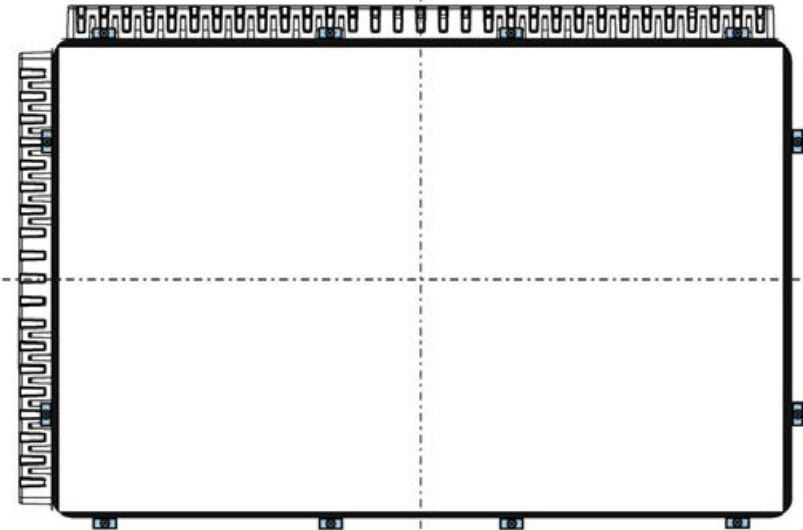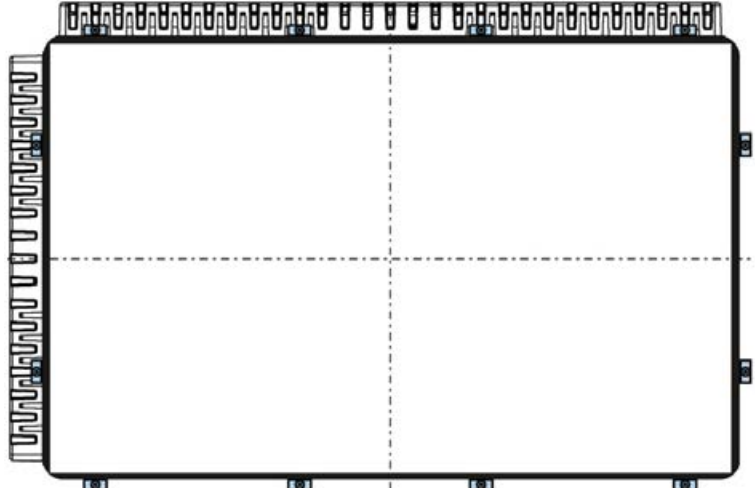
4. To secure the mounting clip, tighten the grub screw with the slot screwdriver, torque 0.5 Nm.
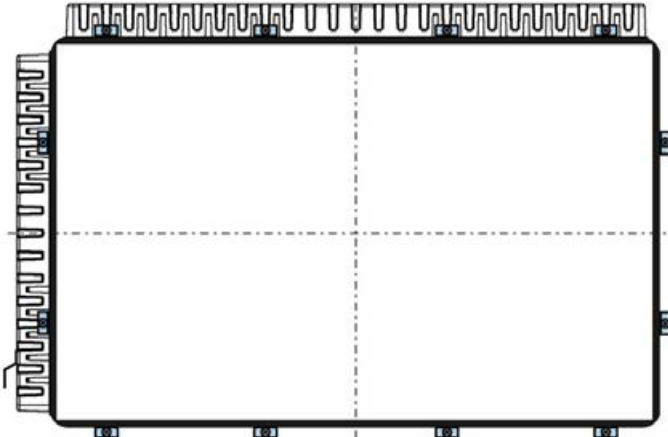
5. Repeat steps 3 and 4 until all mounting clips are securely fastened.

6. Check the fit of the mounting seal.

Position of the mounting clips for multi-touch devices

Fasten the mounting clips to the positions as illustrated.

Device	Position
24" display	
22" display	

Device	Position
19" display	

3.3 Connecting the device

3.3.1 Country-specific information on supply voltage

USA and Canada

Supply voltage 120 V / 230 V / 240 V AC

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, connection 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

For countries other than the 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 supply cord, use a flexible cable that is rated for the maximum current consumption and highest ambient temperature of the device and complies with the safety regulations of the country in which the device is installed.

The power supply cord and the plug connector must bear the prescribed markings.

3.3.2 Connection of equipotential-bonding cable

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

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:

Requirements

For the equipotential bonding connection, you require:

● A T20 screwdriver

● An equipotential bonding cable with a minimum cross-section of 2.5 mm^2

Procedure

1. Connect the marked equipotential bonding connection (M4 thread) of the device with the equipotential bonding cable.
   Make sure the equipotential bonding cable has contact with the enclosure over a large area.

2. Connect the equipotential bonding cable with the central grounding point of the control cabinet.
   Make sure the equipotential bonding cable has contact with the central grounding point over a large area.

3.3.3 Connecting the power supply

3.3.3.1 Connecting 100-240 VAC power supply

⚠️ **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 supply voltage.
- Operate the device only in grounded power supply networks (TN networks in accordance with VDE 0100, Part 100 or IEC 60364-1).
- Operation in non-grounded or impedance-grounded networks is not permitted.

⚠️ **WARNING**

Safety regulations- connecting cable

Use only AC or DC connecting cables which comply with the local safety regulations.

Otherwise, there is a risk of fire and electric shock. This can result in personal injury or property damage.

- Ensure that the AC or DC connecting cables comply with the safety regulations of the country in which the device is installed and bear the marks required in each case.
- Connect the protective conductor in accordance with the operating instructions.

⚠️ **WARNING**

Risk of electric shock

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

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

- Always fully disconnect the device from the line 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 AC circuit breaker as near as possible to the device and connect the device to a protective conductor.
- When you install the device, make sure that the power supply connector is easily accessible.

Note

The varying voltage power supply module is designed for operation on 120/230/240 V AC networks. The setting of the voltage range takes place automatically.

Requirement

- You have observed the information under "Country-specific information on supply voltage (Page 46)".

- Screwdriver T10

Procedure

1. Make sure that the ON/OFF switch is in position "I" (Off) to avoid unintentional startup of the device when you plug in the power cord.

2. Connect the appliance connector to the device.

3. Connect the power cable with the safety power outlet.
4. If necessary, install the enclosed cable grip.

3.3.3.2 Connecting the 24 VDC power supply

⚠ WARNING
Safety regulations- connecting cable
Use only AC or DC connecting cables which comply with the local safety regulations.
Otherwise, there is a risk of fire and electric shock. This can result in personal injury or property damage.
• Ensure that the AC or DC connecting cables comply with the safety regulations of the country in which the device is installed and bear the marks required in each case.
• Connect the protective conductor in accordance with the operating instructions.

⚠ WARNING
Risk of electric shock
The on/off button and on/off switch do not fully disconnect the device from the mains.
There is also a risk of fire if the device or connecting lines are damaged.
• Always fully disconnect the device from the line 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 an easily accessible central disconnect switch as near as possible to the device and connect the device to a protective conductor.
• When you install the device, make sure that the power supply connector is easily accessible.

Note

Safety extra-low voltage (SELV)

- The device must only be connected to a 24 V DC power supply which meets the requirements of safe extra-low voltage (SELV) according to IEC/EN/DIN EN 60950-1. A protective conductor must also be used.
- The conductors must withstand the short-circuit current of the 24 V DC power source, so that a short-circuit will not damage the cable.
- Only connect cables with a minimum cross-section of 1.3 mm^2 (AWG16) and a maximum cross-section of 3.3 mm^2 (AWG12).

Requirement

- You have observed the information under "Country-specific information on supply voltage (Page 46)".

- The 24 V DC power source must be adapted to the input data of the device (see Technical specifications (Page 111)).

Procedure

1. Make sure that the ON/OFF switch is in the position "I" (OFF) to prevent unintentional startup of the device when it is connected to the 24 V DC power supply.

2. Switch off the external 24 V DC power supply.

3. Connect the 24 V DC plug connector to the device.

   Observe the correct polarity of the contacts:
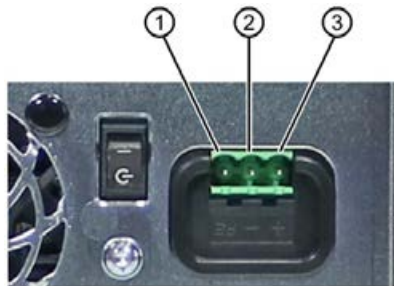
   ① Protective conductor

   ② Ground

   ③ 24 V DC

4. If necessary, install the enclosed cable grip.

5. Secure the 24 V DC cable to the cable grip using a cable tie.

Note

Reverse-polarity protection

The 24 V DC power supply is protected against polarity reversal. When you confuse the 24 V DC connecting cables and ground, the device is not damaged but does not switch on. After the power supply has been connected correctly, the device will again be ready to operate.

3.3.4 Connecting I/O devices

⚠ CAUTION
Fault caused by I/O devices
The improper connection of I/O devices can cause faults in the device.
The result may be personal injury and damage to the machine or plant.
• You should observe the warnings relating to the connection of I/O devices in "Information on I/O devices (Page 30)".

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 "Side view, left (Page 17)".

2. Secure the cables with the strain relief.

   See: Connecting Ethernet/USB strain relief (Page 54)

Connecting several monitors (multi-monitoring)

You will find up to three ports on the rear of the device for connecting monitors. These ports are connected to the motherboard.

Parameter assignment is performed by means of the Control Panel in Windows®.

The IPC is factory set for multi-monitoring. If needed, you can configure the multi-monitoring function and the output of the boot screen in the firmware settings, see "Multi-monitoring (Page 59) ".

The following table shows the various connection options for the monitors on the device interfaces.

		Motherboard		
		DPP1	DPP2	DVI-D
Variant 1				
Monitor 1	DP	X	-	-
	DVI	X [1]	-	-
	VGA	X [2]	-	-
Monitor 2	DP	-	X	-
	DVI	-	X [1]	-
	VGA	-	X [2]	-

		Motherboard		
		DPP1	DPP2	DVI-D
Variant 2				
Monitor 1	DP	X	-	-
	DVI	X [1]	-	-
	VGA	X [2]	-	-
Monitor 2	DP	-	-	-
	DVI	-	-	X
	VGA	-	-	-

1) - via DP to DVI-D adapter

2) - via DP-VGA adapter

3.3.5   Connecting the device to networks

The following options are available for the integration in existing or planned system environments or networks:

Ethernet

The integrated Ethernet port (10/100/1000 Mbps) can also be used for communication and data exchange with automation devices such as SIMATIC S7.
This functionality requires the "SOFTNET S7" software package.

PROFINET

PROFINET can be operated via

- Standard Ethernet interfaces (RT)

Additional information

Additional information is available in the catalog and the online ordering system Technical support (https://support.industry.siemens.com/cs/ww/en/).

See also

SIMATIC NET (http://w3.siemens.com/mcms/automation/en/industrielle-kommunikation/Seiten/Default.aspx)

3.3.6 Connecting Ethernet/USB strain relief

The Ethernet/USB strain relief supplied in the product package is used to prevent accidental removal of the Ethernet cable and Industrial Ethernet FastConnect connector from the device. You need two cable ties to use the strain relief. In addition to the Ethernet cables, you can also use this strain relief to protect the four USB cables from inadvertent removal.

To secure the Ethernet strain relief, you will need a T10 screwdriver.

Procedure

1. Secure the Ethernet/USB strain relief with two oval-head screws M3 ① to the device housing.

2. Connect the network and USB cables with the device and secure the connectors to the strain relief with cable ties ②.

3. Secure the connectors of the COM and DVI connection by screwing the connectors.

Commissioning the device

<div align="right">

4

</div>

4.1 Switching on the device

Requirements for commissioning

- The following hardware is connected:
  - One USB keyboard
  - One USB mouse
- The protective conductor is connected.
- The connection cables are plugged in correctly.
- An operating system is installed. Information on commissioning Microsoft® operating systems can be found in the documentation on the supplied data storage medium.
- The device is connected to the power supply, see "Connecting the power supply (Page 48)".

Switching on the device

1. Switch on the on/off switch on the left side of the device (position |).
2. Press the on/off button on the left side of the device.

Information on the position of the switch and button can be found at "Side view, left (Page 17)".

Commissioning the installed Windows® operating system

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

4.2 Configuring automatic switch-on of device

In the firmware settings you can specify that the device automatically starts up again after a separation from the mains voltage of at least 20 ms as soon as the mains voltage is available again.

Configure this function with the firmware setting (Setup Utility > Advanced > PCH-IO Configuration):

- State After G3

The exact minimum supply voltage downtime that is required is dependent on the device equipment and the application.

You can find information on the configuration of this function in the detailed firmware/BIOS description under "Important instructions and manuals for operating the device (Page 11)".

4.3 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 (unless otherwise configured in the power options). Information on the position of the button is available under: "Side view, left (Page 17)".

Result

The operating system is shut down. The "POWER" status indicator is lit yellow. The device is switched off but not fully disconnected from the line voltage.

Fully disconnecting the device from the line voltage

⚠ WARNING
Risk of electric shock
The on/off button and on/off switch do not fully disconnect the device from the mains.
There is also a risk of fire if the device or connecting lines are damaged.
• Always fully disconnect the device from the line voltage before performing work on the device or when the device will not be used over an extended period of time.
• For control cabinet installation: Use a central, easily accessible AC circuit breaker close to the device, if possible.
• When you install the device, make sure that the power supply connector is easily accessible.

Shut down the operating system and unplug the power plug from the rear of the device, see "Side view, left (Page 17)".

The device is switched off and fully disconnected from the line voltage. No trickle current is flowing.

Hardware reset

With the hardware reset, you can restart the device if it does no longer respond to keyboard or mouse input.

Any running operating system will not shut down safely.

NOTICE
Data loss
If a hardware reset is performed, the device undergoes a hard reboot.   • Data in the main memory is deleted.   • Data on the hard disk drive may be lost.   • The device may be damaged.   Perform a hardware reset only in the case of an emergency.

Procedure

1. Press the on/off button for more than 4 seconds. The unit switches off.

Information on the position of the buttons is available under: "Side view, left (Page 17)".

See also

General safety instructions (Page 25)

Operating the device

<div align="right">5</div>

5.1 Multi-monitoring

You can operate several monitors on one device at the same time. Read the information in the corresponding section under "Connecting I/O devices (Page 52)".

Note

Information on graphics cards which support multi-monitoring can be obtained from your local contact person, see "Service and support (Page 143)".

Procedure

1. Install a suitable graphics card.

2. Configure the function "Multi-monitoring" in the firmware settings of the device. You can find information on this in the detailed firmware/BIOS description, see "Important instructions and manuals for operating the device (Page 11)".

5.2 Drive configurations

5.2.1 RAID1 system

The 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.

RAID1 system with associated software

If you have ordered a RAID1 system with pre-installed operating system, the RAID1 system is monitored with the installed diagnostics software SIMATIC IPC DiagBase or DiagMonitor.

The following software is available to monitor the RAID1 system:

● Onboard RAID system: Intel® Rapid Storage Technology

5.3 Operating RAID systems

5.3.1 Display of a defective drive of a RAID system

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

- SIMATIC IPC DiagBase or SIMATIC IPC DiagMonitor monitoring software
- For onboard RAID system:

  "Intel® Rapid Storage Technology", see "Monitoring the onboard RAID system with "Intel® Rapid Storage Technology" (Page 62)".

5.3.2 RAID1 system: Installation options for drives

The two hard disks required for a RAID1 system can be installed in SIMATIC IPC677E in the following locations:

- For onboard RAID system:
  - "Drives (Page 79)"

5.3.3 Configure the onboard RAID system

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

If you subsequently set up an onboard RAID system, you will still have to configure it.

Requirements

- The drives required for the onboard RAID system are built into the device, see:
  - RAID1 system: Installation options for drives (Page 60)

Navigation in the firmware of the onboard RAID system

Action	Button
• Select entry (then confirm selection)	• Arrow buttons on the keyboard
• Confirm selection	• <Return> button
• Back to the previous screen	• <Esc> button

Set up the onboard RAID system (Create Volume)

1. Switch on the device or restart it.

2. Immediately after turning on the device, as soon as the message "`Press ESC for boot options`" appears, press and hold the <Esc> button.

3. From the firmware selection menu, using the arrow keys, select the entry "Device Management" and confirm your selection.

4. From the "Devices List", select the entry "Intel <R> Rapid Storage Technology".

5. Select under "Create RAID Volume".

6. On the next screen, assign a name for the RAID system.

7. Select "RAID Level" and select the entry "RAID1" in the following selection window. A list of the available drives is displayed.

8. Under "Select Disc" select the drives ① that you want to integrate into your RAID system and confirm your selection.
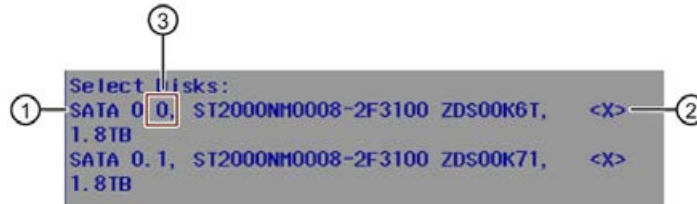
   – The mounted drive is provided with a check mark in the list ②.

   – You will find the assignment of the drive to the installation location in the drive cage after the drive name, see ③.

9. Select "Create Volume".

   The following screen shows the details on the RAID system just set up (RAID Volume).

   The onboard RAID system is set up.

10. Press the <Esc> multiple times in succession until you reach the "Main Page" of the firmware/BIOS menu.

Note

Confirm "Exit Discarding Changes" message with "YES"

If when exiting the firmware/BIOS menu with the <Esc> button, the warning message "Exit Discarding Changes" is displayed, confirm this message with "Yes".

The prenumbered settings are saved nonetheless and you can leave the firmware/BIOS menu.

---

11. In the Main Page of the firmware/BIOS menu, select "Continue".

   Your device continues the boot operation and switches on.

5.3.4 Monitoring the onboard RAID system with "Intel® Rapid Storage Technology"

Open software for monitoring the "Intel® Rapid Storage Technology" onboard RAID system

1. Select "Start > Programs > Start > Intel".

Display status of the onboard RAID system (faulty drive)

1. Select the "Status" tab.

   In the "Storage System View" area on the right side of the window, you will find information on:

   – a defective drive

   – a functioning drive

   Example display status of a RAID1 system:
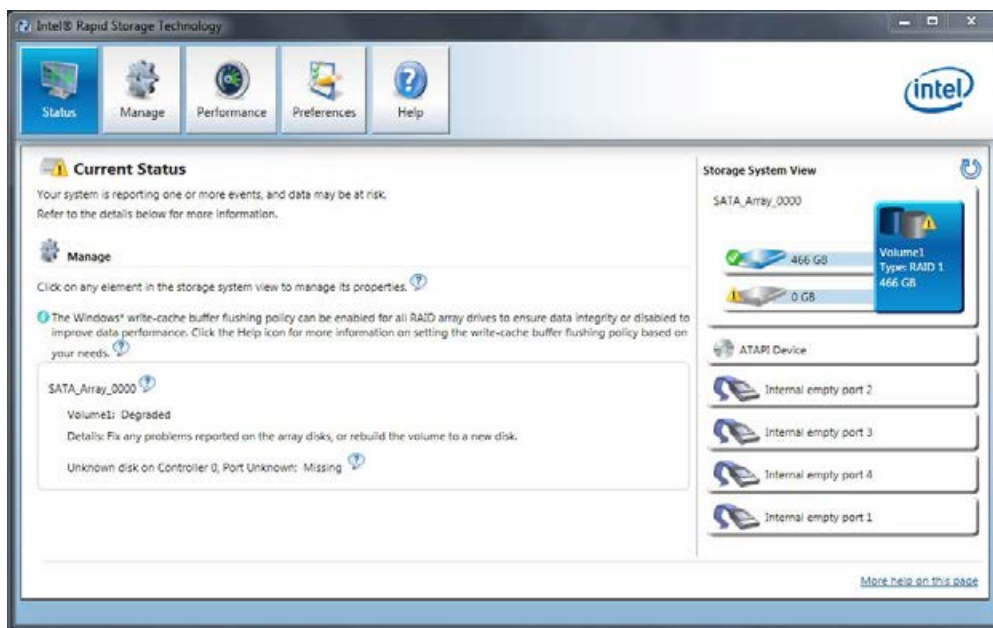
Displaying details on the onboard RAID system

1. Select the "Manage" tab.

   Details on your onboard RAID system are displayed in the "Advanced" area.

Creating a report on the onboard RAID system

1. Select the "Help" tab.

2. Select "System Report" > "Save".

5.3.5 Integrating a new drive into the onboard RAID system

The 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 RAID system in such a way that the new drive is automatically mounted when the defective drive is replaced.

Configuring "Automatic mounting 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. • Only use a brand new drive or a drive that has been set up as a replacement drive. • You can find notes on setting replacement drives in the controller documentation.

1. Select "Start" > "Intel" > "Intel Rapid Storage Technology".
2. Select the "Preferences" menu.
3. In the area "Automatic Rebuild", enable the option "Auto-rebuild on hot plug".

Configuring "Manual mounting of a new drive " (before replacing a defective drive)

The 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.

1. Select "Start" > "Intel" > "Intel Rapid Storage Technology".
2. Select the "Preferences" menu.
3. In the area "Automatic Rebuild", enable the option "Auto-rebuild on hot plug".

Manually integrating a replaced drive (after a fault)

You can manually install a replaced drive in the onboard RAID system as follows:

● In the running system (without restarting the device).

● After switching off the unit

Integrating a replaced drive in the running system (without restarting the device)

1. Select "Start" > "Intel" > "Intel Rapid Storage Technology".

2. Select the "Status" menu.

   The new drive is displayed on the right-hand side of the program window in the "Storage System View" area.

   If the new drive is not shown, click the "Run Hardware Scan now" icon .

3. Click on the RAID volume in the "Storage System View" area on the right-hand side of the program window.

4. Click on the link "Rebuild to another Disk" in the "Manage" menu.

5. In the following dialog, select the newly installed drive and click on "Rebuild".

   The RAID system data synchronization (Page 64) is started.

5.3.6 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.

5.4 Monitoring of the device

5.4.1 Monitoring functions

You can monitor the following device functions with the software products SIMATIC DiagBase or SIMATIC DiagMonitor:

Monitoring	Description	Status indicator and actions
Temperature monitoring	• Monitoring for temperature high and low limits as well as cable breaks of the temperature sensors • Temperature sensors record the temperature at critical device points, e.g. at the processor. • The temperature thresholds are defined for the individual temperature sensors. • With SIMATIC IPC DiagBase or SIMATIC IPC DiagMonitor, actions are triggered when the temperature thresholds are exceeded.	• Speed control of the device fans, the power supply fan and the fan of the optional graphics card • Temperature alarm is generated.
Fan monitoring	• Monitoring for underspeed and fan failure as well as cable breaks of the speedometer cable	• Fan alarm is output.
Watchdog	• Monitoring of the system status and message to determine if a station is still operational • If the watchdog is not addressed within a configured monitoring time, a watchdog alarm is output. • A change to the monitoring time is effective immediately.	Depending on the setting, the following actions are triggered: • Reset on: Hardware reset is performed • Reset off: No action is performed • The device is restarted • The device is shut down
Voltage monitoring	• Monitoring the charge status of the backup battery (CMOS) • When the first warning threshold is reached, the backup battery will run for at least one more month.	• An alarm is generated in the event of a critical or faulty state.
Drive monitoring	• Determination of the status of the drives (HDD and SSD) with SMART functionality, also in RAID systems (RAID status)	• SMART status of the hard disks • For example, the following states are displayed in a RAID group: "Normal", "OK", "Degraded", error "Rebuild", rebuilding

Software for device monitoring

You can find information on the monitoring software and its documentation under:

• SIMATIC IPC DiagBase (Page 66) for monitoring and alarming locally on the device

• SIMATIC IPC DiagMonitor (Page 66) for monitoring and alarming via network

5.4.2 SIMATIC IPC DiagBase

In delivery state the monitoring software SIMATIC IPC DiagBase is installed on your device.

Information on the software and documentation of SIMATIC IPC DiagBase can be found under:

- SIMATIC IPC DiagBase
  (https://support.industry.siemens.com/cs/ww/en/view/109749690)
- Important instructions and manuals for operating the device (Page 11)

5.4.3 SIMATIC IPC DiagMonitor

The SIMATIC IPC DiagMonitor monitoring software can be ordered optionally.

If a device is ordered with SIMATIC IPC DiagMonitor, the software is included with the device in the delivery state.

Information on the software and documentation of SIMATIC IPC DiagMonitor can be found under:

- SIMATIC IPC DiagMonitor
  (https://support.industry.siemens.com/cs/ww/en/view/39129913)
- Important instructions and manuals for operating the device (Page 11)

Note

SIMATIC IPC DiagMonitor version 5.1.0 and higher

SIMATIC IPC DiagMonitor only supports the device hardware as of version 5.1.0. Older versions do not support the device hardware.

5.5 Remote maintenance of the device

5.5.1 Remote maintenance functions

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

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

Some examples of iAMT's remote maintenance functions are listed below:

Function	Description
Remote operation (Keyboard-Video-Mouse-Redirection)	With KVM-Redirection, you can operate SIMATIC IPCs remotely, even if they have no operating system or the operating system is corrupt.
	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.
Remotes Booting	A SIMATIC IPC can be booted remotely from a bootable ISO file made available by another PC.

Requirement

The following requirements must be fulfilled in order to use the remote maintenance functions:

- A device with a processor using iAMT technology
- A configured management engine (ME)
- The computer must be connected to the power grid and the network.

Configuring iAMT

You configure iAMT with Intel® Management Engine BIOS Extension (MEBx) in the firmware.

You can find information on this in the detailed firmware/BIOS description, see "Important instructions and manuals for operating the device (Page 11)".

Software for remote maintenance of the device

You can find information about the software for remote maintenance of the device and its documentation under:

- SIMATIC IPC Remote Manager (Page 68)

5.5.2 SIMATIC IPC Remote Manager

The SIMATIC IPC Remote Manager software for remote maintenance of your device can be ordered as an option.

You can find information on the software and documentation of SIMATIC IPC Remote Manager under:

- SIMATIC IPC Remote Manager (http://support.automation.siemens.com/WW/view/en/48707158)

- Important instructions and manuals for operating the device (Page 11)

See also

SIMATIC IPC software (http://www.automation.siemens.com/mcms/pc-based-automation/en/industrie-pc/erweiterungskomponenten)

5.6 Trusted Platform Module (TPM)

Depending on the ordered configuration of your device, a Trusted Platform Module according to Standard TPM V2.0 may be available. The Trusted Platform Module is a chip that enhances your device with security functions. It provides improved protection from manipulation of the PC, for example.

NOTICE
Import restrictions
TPM technology is subject to legal restrictions in some regions and may not be used there.   • Note the respective import provisions for the TPM module.

Activating the Trusted Platform Module

You can find information on activating the Trusted Platform Module in the corresponding firmware/BIOS description, see "Important instructions and manuals for operating the device (Page 11)".

5.7 Buffer memory NVRAM (optional)

For applications to store data following a power failure, motherboards feature battery-buffered NVRAM. If the supply voltage fails for more than 20 ms for the AC power supply or more than 5 ms for the DC power supply, then you will be informed about this situation by the NAU signal.

At least 10 ms is available to copy the data to the buffered RAM. During this time, 128 Kb can be saved with a full load and even more with a smaller configuration, in other words, a lesser load. A memory window with a maximum size of of 512 KB can be displayed by means of a PCI address register. The base address is initialized by the BIOS.

A corresponding function is implemented there for using the NVRAM under SoftPLC.

See also

Status displays (Page 19)

Expanding the device and assigning device parameters

<div align="right">6</div>

6.1 Opening the Device

⚠ WARNING

Risk due to unauthorized opening and improper repairs or expansions

Improper procedure when carrying out expansions may result in substantial damage to equipment or endanger the user.

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

- For this reason, please observe the information in "Notes on device and system extensions (Page 31)".

⚠ WARNING

Malfunctions and electric shock

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

The results can be personal injuries and damage to the plant.

Take the following precautions:

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

NOTICE

Electrostatic-sensitive components

The device contains electronic components which may be destroyed by electrostatic charge.

Take suitable precautionary measures when you open the device.

Requirement

- All connecting cables are unplugged
- Screwdriver T10

Limitation of liability

All technical data and approvals apply only to expansion units which are released by SIEMENS.

Siemens disclaims any liability for impairment of functions caused by the use of third-party devices or components.

Observe the installation instructions for the components. UL approval of the device only applies when the UL-approved components are used according to their "Conditions of Acceptability".

Procedure

1. Remove the four marked screws in the cover.
2. Remove the cover by lifting it up.

6.2 Expansion cards

6.2.1 Usable expansion cards

Expansion cards compliant with the following standards are supported:

- PCI; Rev 2.3 Expansion cards with 3.3 V and 5 V supply voltage can be used.
- PCIe; Gen. 1, Gen. 2, Gen. 3

Conditions of use of expansion cards

- The expansion cards must not exceed the specified dimensions. If the height is exceeded, you may experience contact problems, malfunctions and difficulties with the assembly.

  You can find the permitted dimensions for expansion cards under "Dimension drawing of the expansion cards (Page 124)".

See also

Design and principle of operation of the bus board (Page 133)

6.2.2 Installing/removing expansion cards

Note
Requirement for expansion cards

You can find the permitted dimensions for expansion cards under "Dimension drawing of the expansion cards (Page 124)". If the permissible height is exceeded, contact problems, malfunctions and installation difficulties cannot be ruled out.

Requirement

- The device is open, see important information regarding this under Opening the Device (Page 71).

Procedure - Installation

NOTICE
Damage to the expansion card.
The expansion card can break if excessive force is used.
• Do not apply any pressure.
• Do not apply excessive force on the slider when you push it onto the expansion card.

1. Remove the marked screw ① and swivel the cover to the side as shown. Then remove the marked screws and the panels.

2. Insert the expansion card into the relevant slot.

3. Secure the expansion card with the card retainer.

4. Fasten the slot cover of the expansion card (see step 1.)

Notes on the allocation of resources

The slots for the expansion cards come with exclusive interrupts. The assignment of the PCI IRQ line to the PCI slot is explained in the chapter "Bus board (Page 133)".

Procedure - Removal

Proceed in reverse order of installation.

6.3 Memory modules

6.3.1 Usable memory modules

Combination options for memory modules

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

This allows you to expand IPC memory capacity to up to 64 GB, of which you can use approx. 3.2 GB for operating systems and applications with 32-bit operating systems.

Depending on the number of memory modules used, these are inserted in defined slots on the motherboard.

The slots are labeled on the motherboard.

Combination option	Channel A		Channel B (external)		Maximum expansion
	Slot X19 DIMM1-1	Slot X190 DIMM1-2	Slot X20 DIMM2-1	Slot X200 DIMM2-2	
Combination 1	-	-	4 GB / 8 GB / 16 GB	-	16 GB
Combination 2	4 GB / 8 GB / 16 GB	-	4 GB / 8 GB / 16 GB	-	32 GB
Combination 3	Combinations of three memory modules are not permitted				
Combination 4	4 GB / 8 GB / 16 GB	4 GB / 8 GB / 16 GB	4 GB / 8 GB / 16 GB	4 GB / 8 GB / 16 GB	64 GB

Usable memory modules

- DIMM DDR4 memory modules
- Memory transaction rate 2666 MT/sec "unbuffered"
- "without ECC"

Conditions of use of memory modules

- Memory is operated in dual-channel mode if two modules are installed.
- Only modules of the same module organization 2Rx8 or 1Rx8 may be used per channel.
- If expansion cards with their own memory, such as graphics cards, with 256 MB or more are used, the memory that can be used for the operating system or applications may be less than 64 GB.
- In case of operating errors, it may be sufficient to remove one or two memory modules or to use a memory module with lower capacity so that the physical memory expansion on the motherboard and the reserved memory of the expansion card do not overlap.

See also

Opening the Device (Page 71)

6.3.2 Installing and removing memory module

Requirement

- The device is disconnected from the mains and all connecting cables have been removed.

- You have noted the information on combination options and the conditions of use of memory modules under "Usable memory modules (Page 76)".

- The device is open, see "Opening the Device (Page 71)".

NOTICE
Electrostatic discharge
The electronic components on the assembled PCBs are highly sensitive to electrostatic discharge and can be destroyed by it.
Take appropriate precautionary measures.
• See the notes under "General safety instructions (Page 25)".

Note

When equipping the memory modules, make sure that the memory modules are equipped in the following order:
- 1 memory module: Slot at the very end (2-1)
- 2 memory modules: Slot at the very end (2-1) and the third from the end (1-1)
- 3 memory modules: not allowed
- 4 memory modules: all slots (2-1, 2-2, 1-1, 1-2)

Installing a memory module

1. Note where the cutout ① (reverse polarity protection) is located on the pin side of the RAM module before inserting it.

2. Open the two locking mechanisms on the left ② and right ③ of the slot.
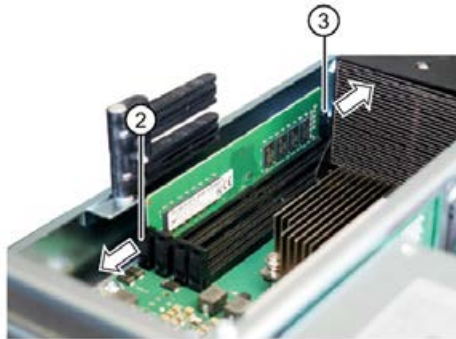
3. Insert the module downwards, applying slight pressure and press it until the locking snaps into place.

4. Close the device.

Removing a memory module

Note

Also observe the order for equipping the memory modules described above when removing the memory modules.

---

1. Loosen the locking mechanisms on the left ② and right ③ of the slot.

2. Remove the memory module from the slot.

3. Close the device.

Display of the current memory configuration

The new memory configuration is detected automatically. When switching on the device and starting the BIOS Setup using <F2>, the current memory size is displayed under "Total Memory".

6.4 Drives

6.4.1 Changing the drive in the removable tray

NOTICE
Risk of damaging the drive and data loss
Drives in the removable drive bays can only be replaced during operation in connection with RAID1 (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.
• Observe the ESD guidelines.

Requirement

● An original spare part, that is a drive approved for this device, see notes in "Accessories: Hardware (Page 22)".

● If there is no RAID system: The device is fully disconnected from the line voltage, see "Switching off the device (Page 56)".

● The device you wish to replace is inactive.

Procedure

1. Open the lock of the removable tray with the appropriate key.

2. Fold out the removable tray bracket somewhat to the front and pull out the removable tray by the tray bracket in the direction of the arrow.

3. Loosen the highlighted screws on the bottom of the removable tray and remove the drive.

4. Carefully insert the new drive into the removable tray.

   Take care not to touch the contacts of the drive when you do this.

5. Fasten the new drive with the screws to the base of the removable tray.

   Only use the original screws.

6. 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.

7. Close the tray bracket.

8. 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.

6.4.2 Changing internal SSD

Requirement

- The device is disconnected from the mains and all connecting cables have been removed.

- The device is open, see important information regarding this under "Opening the Device (Page 71)".

- An original spare part, that is an SSD of the same type, see information under "Accessories: Hardware (Page 22)".

Procedure - Removal

1. Remove the marked screws.

2. Remove the marked screws and place the SSD on its side.
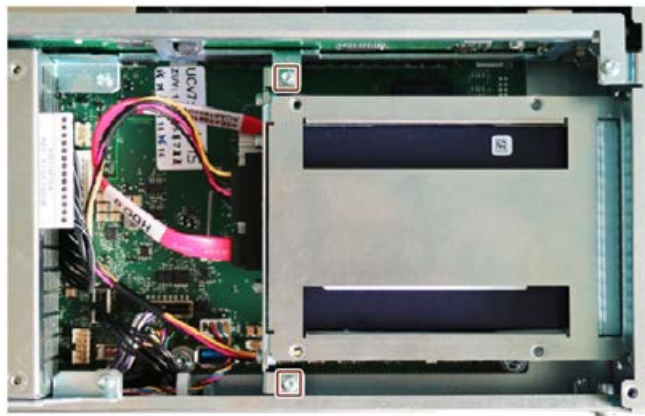
3. Remove the marked connectors.

4. Remove the marked screws.

5. Remove the carrier with the connectors, remove the marked screws and take out the SSD.
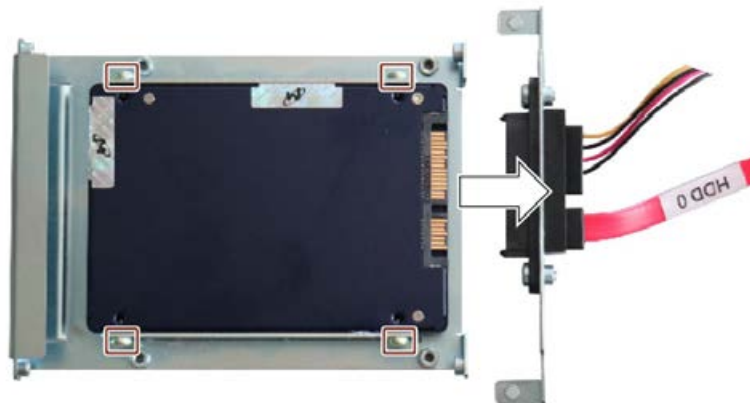
Procedure - Installation

Proceed in reverse order.

When connecting multiple drives, observe the assignments of the port connections (see PCB labeling).
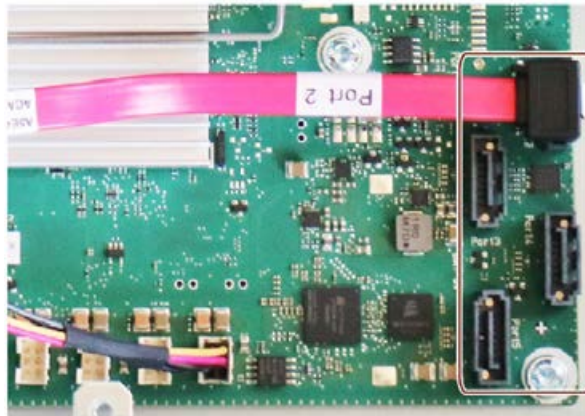
6.4.3 Changing internal hard disk drive

Requirement

- The device is disconnected from the mains and all connecting cables have been removed.

- The device is open, see important information regarding this under Opening the Device (Page 71).

- An original spare part, that is a hard disk drive of the same type, see information under Accessories: Hardware (Page 22).

Procedure - Removal

1. Remove the marked screws and place the hard disk drive on its side.
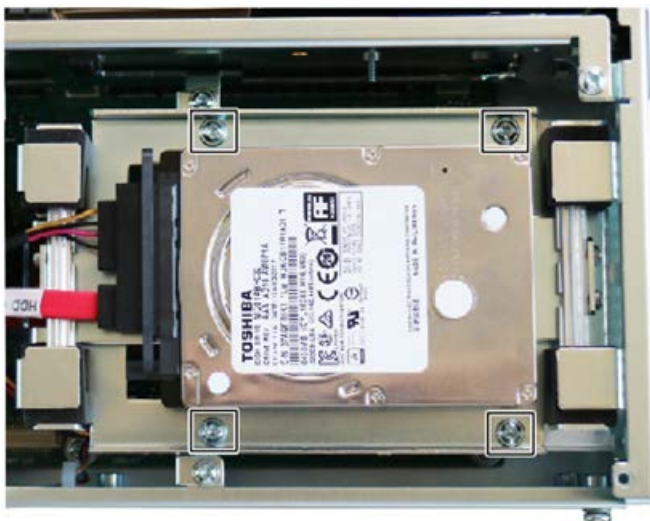
2. Remove the marked screws and the drive carrier.
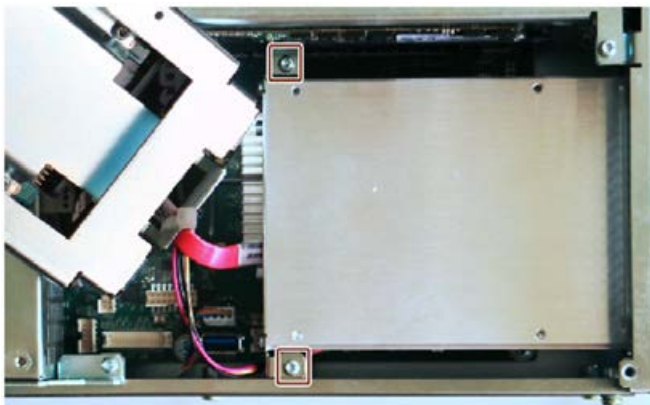
3. Remove the marked connectors and remove the hard disk.

Procedure - Installation

Proceed in reverse order.

6.4.4   Replacing a drive in the RAID system

A drive can only be replaced during operation in the removable drive bay in connection with a configured RAID1 system. This functionality is referred to as "Hot Swap".

Note

If you have configured a non-RAID system with several drives, or in the case of an internally installed drive, you need to turn off the device before you replace a drive.

- Observe the ESD guidelines.
- Always replace the drive with a new drive of the same type and capacity.

Mounting locations for drives in the RAID1 system

Drives for a RAID1 system are installed in the removable tray or inside the device.

Note

The replacement of a RAID drive **with removable drive bay** can be performed without shutting down the device.

The new drive can be integrated into the RAID system at operating system level with the RAID software. Synchronization may take several hours, depending on system load.

Replacing a defective drive in the RAID system

1. Determine which drive was reported by the RAID software as defective.

2. Replace the appropriate drive (see: "Drives (Page 79)").

3. Replace the defective drive with a new one of the same type and capacity.

Information about the recovery of the RAID system is available in section "Integrating a new drive into the onboard RAID system (Page 63)".

Note
Replacing the drive in the RAID system when switched off

The RAID system does not automatically boot up when restarted if a defective drive was replaced while the RAID system is switched off.

Therefore, place the RAID system in the first place of the bootable sources in the BIOS setup menu "Boot > EFI".

Otherwise, the system is booted from the drive you have just installed and the message "Operating system not found" is displayed.

6.4.5 Replacing M.2 NVMe SSD

Note

An M.2 NVMe SSD cannot be operating in a RAID-System.

Requirements

Note

Observe the ESD guidelines.

- M.2 NVMe SSDs with an length of up to 110 mm
- Phillips screwdriver P1
- The drive bay module and the power supply are removed, see Replacing the bus board (Page 102)

Procedure

1. Place the bus board on a suitable surface so that it lies flat and plane.

2. Remove the marked screw.

3. Lift the M.2 NVMe SSD slightly as shown and pull it out of the direct connector socket.

4. Lay the thermal pad on the bus board in such a manner that it is covered completely by the M.2 NVMe SSD after the SSD's installation.

5. Insert the M.2 NVMe SSD slightly inclined from above into the provided direct connector socket.

6. Carefully push the M.2 NVMe SSD down and secure it with the screw.

7. Install the bus board and then the drive bay module and the power supply again.

Maintaining and servicing your device

<div style="text-align:right; font-size:3em;">7</div>

7.1 Repair information

> ⚠ **WARNING**
>
> **Risk due to unauthorized opening and improper repairs or expansions**
>
> Improper procedure when carrying out expansions may result in substantial damage to equipment or endanger the user.
>
> If you install or exchange system expansions and damage your device, the warranty becomes void.
>
> • The device may only be repaired by qualified personnel.

Safety when working in and on electrical systems

Work in or on electrical systems may only be carried out by authorized persons. The following safety regulations apply in Germany for the prevention of electric shock and electrocution:

1. Switch off the system
2. Secure the system to prevent it switching back on
3. Check the system to ensure it is de-energized
4. Ground and short the system
5. Cover or shield adjacent live parts

These safety rules are based on the DIN VDE 0105 standard.

Note

These safety steps must always be taken in the above order before any work on electrical systems. Once work on an electrical system is finished, cancel the safety steps starting with the last and finishing with the first.

Note

In accordance with the applicable safety regulations, clearly indicate on an electrical system that work on it is underway.
Observe the safety regulations applicable in the country of operation.

See also

Spare parts and repairs (http://support.automation.siemens.com/WW/view/en/16611927)

Spare parts service (https://support.industry.siemens.com/cs/ww/en/sc/2110)

7.2 Maintenance intervals

To maintain high system availability, we recommend the preventative replacement of those PC components that are subject to wear. The table below indicates the intervals for this replacement.

Component	Replacement interval:
Hard disk drive	3 years
Fan	3 years
CMOS backup battery	5 years
SSD	Depends on the type of use [1]

[1] The interval for replacement of the flash drives (SSD) depends greatly on the type of use. A specific interval cannot be given.

Note

All drives are monitored with the SIMATIC DiagBase or SIMATIC DiagMonitor software tools on the basis of their Smart status.

As soon as the Smart status of the data storage medium goes to "Not OK", a message is generated in SIMATIC DiagBase or SIMATIC DiagMonitor or also during a system start of the device. You should then back up your data and replace the drive.

7.3 Cleaning the Device Front

The device is designed for low-maintenance operation. You should still clean the device front regularly, however.

> ⚠️ **CAUTION**
>
> **Unwanted reactions when cleaning the device**
>
> You risk unintentional actuation of control elements if you clean the device while it is switched on.
>
> You may possibly trigger unwanted actions of the device or controller that are liable to cause personal injury or damage to the machinery.
>
> - Always switch off the device before you clean it.

Cleaning Agents

> **NOTICE**
>
> **Damage to the HMI device caused by impermissible cleaning agents**
>
> Impermissible and unsuitable cleaning agents may cause damage to the HMI device.
>
> Use dish soap or foaming screen cleaner only as cleaning agents.
>
> - See the notes under "Notes on ambient and environmental conditions (Page 28)".

Cleaning the Device Front

1. Switch off the device.
2. Dampen the cleaning cloth.
3. Spray the cleaning agent on the cloth and not directly on the device.
4. Clean the device with the cleaning cloth.

7.4 Removing and installing hardware

7.4.1 Replacing device fans

Requirement

- The device is disconnected from the mains and all connecting cables have been removed.
- The device is open, see important information regarding this under Opening the Device (Page 71).
- An original spare part, that is a fan of the same type, see information under Accessories: Hardware (Page 22).

Procedure - Removal

1. Remove the two screws ① and remove the air guide pulling it up vertically.
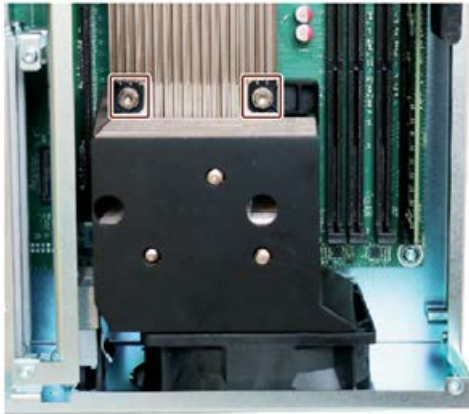
2. Loosen the plastic rivets.
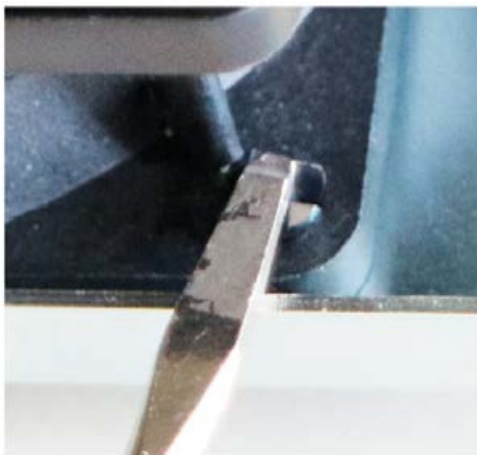
3. Remove the four plastic rivets ② on the enclosure.
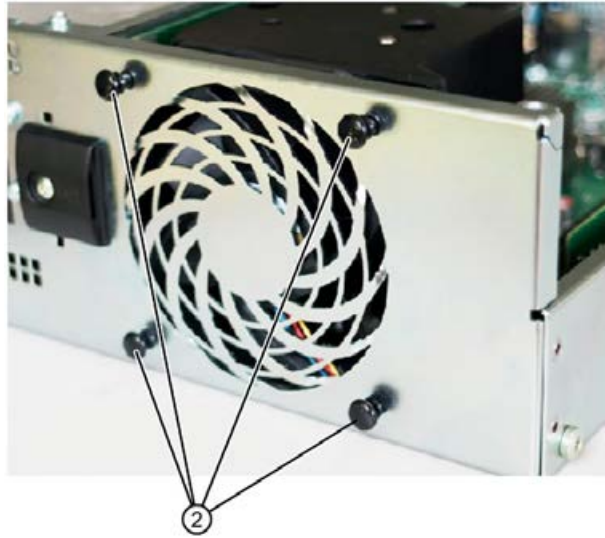
4. Take the fan out of the enclosure.

5. Pull out the fan plug.

Procedure - Installation

Proceed in reverse order of removal.

Note

- Install only a fan of the same type.
- Note the correct mounting position of the fan.
- Direction of flow: Make sure that the blades/bars of the fan housing are on the outside of the enclosure.
- Run the power supply cable along the enclosure edge and fasten the cable.

The marked symbols show the rotation and flow direction of the fan.

7.4.2 Replace power supply fan

Requirement

- The device is disconnected from the mains and all connecting cables have been removed.
- The device is open, see important information regarding this under Opening the Device (Page 71).
- An original spare part, that is a fan of the same type, see information under Accessories: Hardware (Page 22).

Procedure - Removal

1. Remove the four plastic rivets on the enclosure and remove the marked screw ①.

2. Pull the power supply connector and remove the marked screws.

3. Take the power supply out of the enclosure.

4. Remove the power supply fan and pull the fan plug.

Procedure - Installation

Proceed in reverse order of removal.

Note

- Install only a fan of the same type.
- Note the correct mounting position of the fan.
- Direction of flow: Make sure that the blades/bars of the fan housing are on the outside of the enclosure.
- Run the power supply cable along the enclosure edge and fasten the cable.

The marked symbols show the rotation and flow direction of the fan.

7.4.3 Changing the backup battery

> ⚠️ **WARNING**
>
> **Risk of explosion and release of harmful substances**
>
> Improper handling of lithium batteries can result in an explosion of the batteries.
>
> Explosion of the lithium batteries and the resulting release of harmful substances can cause severe physical injury.
>
> - Replace spent batteries promptly.
> - Replace the lithium battery only with an identical battery or types recommended by the manufacturer.
> - Do not throw lithium batteries into fire, do not solder on the cell body, do not recharge, do not open, do not short-circuit, do not reverse polarity, do not heat above 100°C and protect from direct sunlight, moisture and condensation.

Requirement

- An original spare part, that is a backup battery of the same type (article number of lithium battery: A5E00047601 CR2450-N), see Accessories: Hardware (Page 22).

- You have noted the current firmware settings as the configuration data of the device is deleted when the battery is replaced.

- You can find information on this in the detailed firmware/BIOS description, see Important instructions and manuals for operating the device (Page 11).

- The device is open, see important information regarding this under Opening the Device (Page 71).

- You have observed the local regulations relating to the disposal of used batteries.

Procedure

1. Remove the marked screw.

2. Remove the battery holder.

3. Replace the battery, reinsert the battery holder and fasten it with the screw.

7.4.4 Replace power supply

Requirement

- The device is disconnected from the mains and all connecting cables have been removed.
- The device is open, see important information regarding this under Opening the Device (Page 71).
- An original spare part, i.e. a power supply of the same type, see notes under Accessories: Hardware (Page 22).

Procedure - Removal

1. Remove the marked screw ①.

2. Pull the power supply connector and remove the marked screws.

3. Take the power supply out of the enclosure.

Procedure - Installation

Note

Install only a power supply of the same type.

Proceed in reverse order.

7.4.5 Replacing the bus board

Requirement

- The device is disconnected from the mains and all connecting cables have been removed.
- The device is open, see important information regarding this under Opening the Device (Page 71).

Procedure - Removal

1. Remove all modules from the slots.
2. Remove the marked screws on the bus board.

3. Remove the marked screws.

4. Remove the back-up battery holder, see Changing the backup battery (Page 98).

5. Remove the marked screws and remove the top drive bay module (including hard disk).

6. Remove the marked hexagonal pins and remove the bottom drive bay module (including hard disk).

SIMATIC IPC677E

104   Operating Instructions, 04/2019, A5E45117996-AA
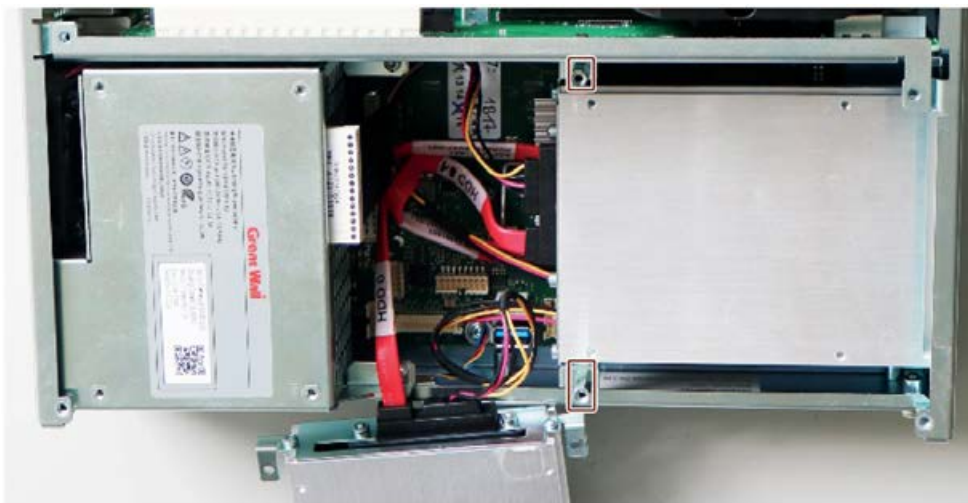
7. Remove the power supply, see also Replace power supply (Page 100).

8. Pull the bus board from the motherboard as shown in the figure.

Procedure - Installation

> **Note**
>
> Install only a bus board of the same type.
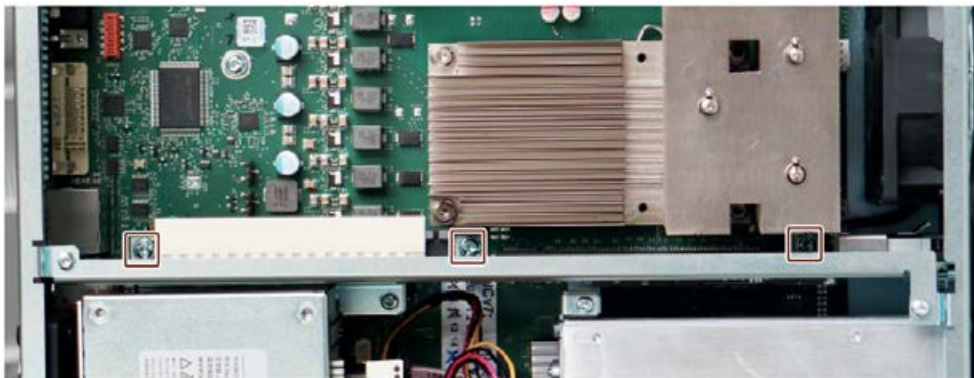
Proceed in reverse order.

7.4.6 Replacing the processor

Requirement

- The device is disconnected from the mains and all connecting cables have been removed.

- The device is open, see important information regarding this under Opening the Device (Page 71).

- The memory modules have been removed.

- The air guide has been removed (see chapter "Replacing device fans (Page 92)").

- An original spare part, i.e. a processor of the same type.

  Only an approved processor is permitted to be installed on the motherboard.

NOTICE
Damage to the processor
If the installed processor is operated with a higher clock frequency than permitted, it can be destroyed or cause loss of data.
• Operate the processor only at a clock frequency that is equal to or less than the permitted clock frequency.

Procedure

1. Loosen the marked screws and remove the heat sink.
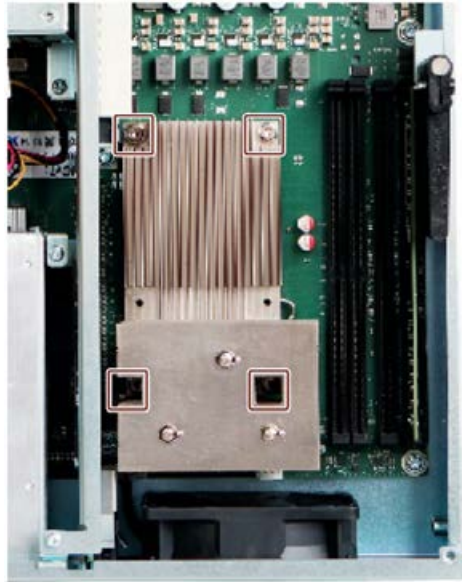
2. Release the lever of the processor bay and tilt it all the way back. The bay releases the processor.

3. Remove the processor by grabbing the marked rails on the side. Do not touch the processor and its connections in the process (see "ESD guidelines" under General safety instructions (Page 25)).

Note

The contact springs of the socket are highly sensitive to mechanical damage, e.g. caused by an incorrectly inserted CPU or foreign objects, and their entire surface may only touch the contact side of the processor flat.

---

4. Install the new processor on the socket, as shown in the figure.

   During positioning, make sure to take the highlighted arrow on the processor into consideration.

5. Tilt the lever to the front again. Make sure that the bay covers the screw.

6. Press the lever all the way down and lock it again.

NOTICE
Damage to the processor due to excessive force
The locking mechanism may be stuck. The locking mechanism is damaged while being pressed down.
The processor is not correctly locked in place by the bay. The result may be malfunctions.
• Do not use excessive force.
• Tilt the lever back again and try again.

See also

Contacts (http://www.siemens.com/automation/partner)

SIMATIC IPC after-sales information system (http://www.siemens.com/asis)

7.5 Installing operating system, software and drivers

7.5.1 Installing the operating system

Information on reinstallation and setting up the operating system can be found in the detailed operating system description, see "Important instructions and manuals on operation of the device (Page 11)".

7.5.2 Installing software and drivers

On the supplied USB stick (read only), you will find the "Documentation and Drivers" suite, which you use to install all supplied software and drivers.

Requirements

- A Windows® operating system is booted.
- Internet Explorer 11 (or higher) is installed.
- "Scripts and ActiveX controls" are enabled in the browser.

Procedure

1. Connect the supplied USB flash drive.
2. Wait until the USB stick is detected and connected as a drive.
3. Start the "Documentation and Drivers" suite from the USB stick by running the file "START_DoucAndDrivers.CMD".
4. Install the desired software and drivers.

7.6 Configuring firmware/BIOS

You can find information on configuring firmware/BIOS and on the firmware settings in the delivery state in the: "SIMATIC IPC firmware/BIOS description (https://support.industry.siemens.com/cs/ww/en/view/109760621)".

Note

If your IPC no longer boots, e.g. due to a crash during a BIOS update, contact your local SIEMENS contact person. You can find information on "BIOS Recovery" and "ME Update" under "Assignment of the internal interfaces (Page 131)".

7.7 Backing up data and changing partitions

We recommend the "SIMATIC IPC Image & Partition Creator" software to back up data under Windows®, which supports the hardware of the IPC677E as of version 3.5.3.

You will find detailed information on this software in: "SIMATIC IPC Image & Partition Creator (https://support.industry.siemens.com/cs/ww/de/view/21766418/en)".

Please also observe the information in "Technical specifications of the operating systems (Page 119)".

7.8 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 8

8.1 Applicability of technical specifications

Note

The following technical specifications only apply under the following conditions:

- The device is in good working order.
- The device is closed.
- The I/O devices fulfill the requirements for the respective area of application (interference emission according to EN 61000-6-4 / IEC 61000-6-4, interference immunity according to EN 61000-6-2 / IEC 61000-6-2).

8.2 General technical specifications

See the note in "Applicability of technical specifications (Page 111)".

Article numbers	6AV7261-.....-.... (for details, refer to the ordering documentation)		
Dimensions IPC677E	19"	22"	24"
(W x H x D in mm)	464 x 294	529 x 331	585 x 363
Weight	19"	22"	24"
	9.5 kg	10.5 kg	12.5 kg
Supply voltage AC	Nominal 100 V AC to 240 V AC (-15% / +10%) (wide range)		
Supply voltage DC [1]	Nominal 24 V DC (-20% / +20%), SELV [1]		
Input current AC	Continuous current up to 2.5 A (up to 50 A for 1 ms at startup)		
Input current DC	Continuous current up to 8 A (up to 14 A for 20 ms at startup)		
Line voltage frequency	50 Hz to 60 Hz (47 Hz to 63 Hz)		
Short-term voltage interruption in accordance with Namur	max. 20 ms (at 93 to 264 V) (max. 10 events per hour; recovery time at least 1 s)		
Max. power consumption AC and DC	Active power 176 W		
Degree of protection	IP20 - Front when installed IP65 according to IEC 60529		
Protection class	Protection class I to IEC 61140		
Safety specifications	• IEC 61010-2-201 • EN 61010-2-201 • UL 61010-2-201 • CSA C22.2 No. 61010-2-201		

Noise emission	< 55 dB(A) according to EN ISO 7779
Quality assurance	In accordance with ISO 9001
Degree of pollution	Device is designed for environments with pollution degree 2
Transient overvoltages	Device is designed for connection to supply with overvoltage category II (transient overvoltages up to 2500 V)

[1] The device must only be connected to a 24 V DC power supply which meets the requirements of safe extra-low voltage (SELV) according to IEC/EN/DIN EN/UL 601010-2-201. A protective conductor must also be used (see chapter "Connecting the 24 VDC power supply (Page 50)").

8.3 Current/power consumption and power supply

8.3.1 Current/power consumption of the system components

Maximum current values

Component	Voltage			
	+3.3 V	+5 V	+12 V	-12 V
Base device [1, 2]	1.4 A	0.2 A	8.2 A	
2 × 2.5" SATA SSD [2]		1.6 A		
1 x 2.5" SATA HDD [2]		0.6 V		
M.2 NVMe SSD	2.24 A			
USB ports [3] [4]		2 A		
PCI/PCIe slots [4] total	6 A	4 A	2 A	0.1 A
Maximum per PCI slot	6 A	4 A	0.5 A	0.1 A
Maximum per PCIe slot	3 A	-	2 A	-
Internal front interfaces for panel PC			2.41 A	
Individual currents (max. permissible)	**14 A**	**14 A**	**12.5 A**	**0.3 A**

[1] Base device includes motherboard, processor, memory, both fans, CF

[2] Depends on the selected device configuration

[3] 2 × USB3.1 type C high current and 4 × USB3.1 low current.

[4] The total power for individual PCI/PCIe slots cannot exceed 25 W.
    The total power for USB and PCI/PCIe slots cannot exceed 30 W.

Typical power values

Table 8- 1   IPC677E - two expansion slots

Component	Current consumption 230 V AC	Current consumption 24 V DC	Power consumption 0.85 efficiency
Base device	0.4 A	3.75 A	90 W
1 × 2.5" SATA SSD	0.02 A	0.17 A	7 W
1 × M.2 NVMe SSD	0.04 A	0.33 A	7 W
1 × 2.5" SATA HDD	0.02 A	0.13 A	3 W
USB ports	max. 0.06 A	max. 0.54 A	max. 13 W
PCI/PCIe slots	0.16 A max.	1.54 A max.	Max. 37 W

8.3.2 Technical specifications AC power supply (AC)

Technical specifications

Note

The power supply contains an active PFC (Power Factor Correction) circuit to conform to the EMC guidelines.

Uninterruptible AC power systems (UPS) must supply a sinusoidal output voltage in the normal and buffered mode when used with SIMATIC PCs with an active PFC.

UPS characteristics are described and classified in the standards EN 50091-3 and IEC 62040-3. Devices with sinusoidal output voltage in the normal and buffered mode are identified with the classification "VFI-SS-...." or "VI-SS-....".

Power supply characteristics	AC power supply
Input data	
Voltage	Nominal 100 - 240 V AC (-15% / +10%), wide range
Frequency	Nominal 50 Hz to 60 Hz (min. 47 Hz to max. 63 Hz), sinusoidal
Continuous current	Max. 2.5 A
Starting current (load-independent)	to 50 A for 1 ms
Active power	176 W
Apparent power	190 VA
Output data	
Voltages	+12 V / 12.5 A
Secondary power output	Max. 150 W

8.3.3 Technical specifications of direct voltage power supply (DC)

Technical specifications

Power supply characteristics	DC power supply
Input data	
Voltage	Nominal 24 V DC (-20% / +20%), SELV, isolated
Continuous current	Max. 8 A
Starting current (load-independent)	up to 14 A for 20 ms
Active power	176 W
Output data	
Voltages	+12 V / 12.5 A
Secondary power output	Max. 150 W

8.4 Electromagnetic compatibility

See the note in "Applicability of technical specifications (Page 111)".

Interference emission	EN 61000-6-4, CAN/CSA CISPR22 Class A; FCC Class A
Immunity with regard to conducted interference on the supply lines	± 2 kV according to IEC 61000-4-4; burst ± 1 kV according to IEC 61000-4-5; symmetrical surge ± 2 kV according to IEC 61000-4-5; asymmetrical surge
Noise immunity on signal lines	± 1 kV to IEC 61000-4-4; Burst; Length < 3 m ± 2 kV in accordance with IEC 61000-4-4; Burst; length > 3 m ± 2 kV in accordance with IEC 61000-4-5; Surge; length > 30 m
Immunity to electrostatic discharge	± 6 kV contact discharge in accordance with IEC 61000-4-2 ± 8 kV air discharge in accordance with IEC 61000-4-2

Immunity to RF interference	• 10 V/m 80 MHz – 2.7 GHz,
	  80% AM to IEC 61000-4-3
	
	• 3 V/m 2.7 – 6 GHz,
	  80% AM to IEC 61000-4-3
	
	• 10 V 10 KHz to 80 MHz,
	  80% AM to IEC 61000-4-6

Immunity to magnetic fields	100 A/m, 50/60 Hz according to IEC 61000-4-8

8.5 Ambient conditions

See the note in "Applicability of technical specifications (Page 111)".

Climatic ambient conditions	
Temperature - Operation [1]	Tested according to IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14 +0 °C to +45 °C
- Storage/transport	-20 °C to +60 °C
- Gradient	max. 10 °C/h in operation, 20 °C/h storage, no condensation
Relative humidity - Operation - Storage/transport	tested to IEC 60068-2-78, IEC 60068-2-30 0 to 31 °C: 5-80%; decreasing linearly to 5-25% at 45° C 5% to 95 % at 25° C (no condensation)
Air pressure - Operation	 1080 to 795 hPa (corresponds to an altitude of -1000 to 2000 m)
- Storage/transport	1080 to 660 hPa (corresponds to an altitude of -1000 to 3500 m)
Mechanical ambient conditions	
Vibration - Operation - Storage/transport	tested to DIN IEC 60068-2-6 10 to 58 Hz: 0.0375 mm, 58 Hz to 500 Hz: 1 m/s 5 Hz to 9 Hz: 3.5 mm, 9 to 500 Hz: 9.8 m/s
Shock resistance - Operation - Storage/transport	Tested to IEC 60068-2-27, IEC 60068-2-29 half-sine 50 m/s, 30 ms half-sine 250 m/s, 6 ms

[1]   Restrictions to operation with HDD:
      The low limit temperature here is +5 °C.

8.6 Technical specifications of the drives

See the note in "Applicability of technical specifications (Page 111)".

Hard disk drive	2.5" SATA HDD, ≥ 320 GB
Solid State Disk	2.5" SATA SSD, ≥ 480 GB standard
	M.2 NVMe SSD 480 GB,
	4x PCIe 3.0, form factor 22 mm x 80 mm, Type M

8.7 Technical specifications of the motherboard

See the note in "Applicability of technical specifications (Page 111)".

Chipset	Intel C246
Processor	• Intel® Celeron® G4900 2 cores/2 threads, 3.1 GHz, 2 MB cache, VT • Intel® Core™ i3-8100 4 cores/4 threads, 3.6 GHz, 6 MB cache, VT • Intel® Core™ i7-8700 6 cores/12 threads, 3.2 (4.6) GHz, 12 MB cache, VT, iAMT
Main memory	Expansion options: • 4 up to 64 GB, DDR4 SDRAM, equipment see ordering documentation
Buffer memory	512 KB NVRAM
Expansion slots	Maximum 2 expansion slots
Maximum bandwidth of PCI slots	Rev. 2.3: 133 Mbps
Maximum bandwidth of PCI slots	Rev. 3.0: 8 GT/s (985 Mbps) bandwidth per lane
Max. permissible power loss per slot	Total power consumption (all voltages) may not exceed 25 W.

Expansion card slots

Expansion card slots (bus module 2 x PCI)	
Slot 1	PCI: Specification Rev. 2.3, length: Max. 185 mm
Slot 2	PCI: Specification Rev. 2.3, length: Max. 185 mm
Expansion card slots (bus module 1 x PCI and 1 x PCIexpress (x16))	
Slot 1	PCI: Specification Rev. 2.3, length: Max. 185 mm
Slot 2	PCIexpress x16: Specification Rev. 3.0, length: Max. 185 mm
Expansion card slots (bus module 2 x PCIexpress (x16, x4))	
Slot 1	PCIexpress x4: Specification Rev. 3.0, length: max. 185 mm
Slot 2	PCIexpress x16: Specification Rev. 3.0, length: max. 185 mm

8.8 Technical specifications of graphics/display

Graphics controller

See the note in "Applicability of technical specifications (Page 111)".

Graphics controller	• Core i7: Intel® UHD Graphics 630 • Core i3: Intel® UHD Graphics 630 • Celeron: Intel® UHD Graphics 610
Graphics memory	32 - 4 GB Shared Memory
Resolutions/frequencies/colors	DVI-D: 640 × 480 to 1920 × 1200 / 80 Hz / 24 bit DisplayPort: max. 3840 × 2160 / 130 Hz / 30 bits

Display

	19"	22"	24"
Display type	LCD TFT	LCD TFT with extended viewing angle	LCD TFT with extended viewing angle
Active display area	410 mm x 230 mm	475 mm x 267 mm	527 mm x 296.5 mm
Resolution	1920 x 1080 pixels	1920 x 1080 pixels	1920 x 1080 pixels
Possible colors	Up to 16.7 million		
Brightness control	Yes, value range 0 to 99 [1] 0 = backlighting off		
Backlighting Half Brightness Life Time (MTBF[12])	LED 50000 h	LED 30000 h	LED 30000 h
Pixel error class in accordance with ISO 9241-307	II		
Power consumption	25 W	25 W	32 W

[1]   Via SetBrightness dialog: 9 to 99 (≙ 10 to 100%),
      via SetBrightness command line call: 0 to 99

[2]   MTBF: Operating hours after which the maximum brightness is reduced by half compared to the original value. MTBF is increased by using the integrated dimming function, for example, time-controlled via screensaver or centrally via PROFIenergy.

8.9 Technical specifications of the interfaces

Observe the information in "Applicability of technical specifications (Page 111)" and use only original connections of the I/O to be connected.

DisplayPort [4]	2 x connection of DisplayPort monitor
DVI-D	Connection of DVI monitor, with adapter also VGA monitor

Keyboard	USB support
Mouse	USB support
USB	4 × USB 3.1, type A, high current, backward compatible
	2 × USB 3.1, type C, high current, backward compatible
Ethernet [1]	3 × Ethernet ports (RJ45), 10/100/1000 Mbp • 1 x Ethernet 1: Intel® Jacksonville i219-LM; AMT-capable [4] • 2 x Ethernet 2, 3: Intel® Springville i210-AT
	Wake on LAN, Remote Boot and the following Teaming modes are supported: • Adapter Fault Tolerance (AFT) • Adaptive Load Balancing (ALB) • IEEE 802.3ad Dynamic Link Aggregation (DLA) • Static Link Aggregation (SLA) • Switch Fault Tolerance (SFT)
COM1	RS232, 115 kbps max., 9-pin SUB-D, male
Free slots for expansion cards (see Motherboard (Page 129))	Versions with 2 and 5 PCI(e) cards

[1] For unique labeling, the Ethernet ports are numbered on the enclosure. The numbering by the operating system can differ.

[2] No teaming with AMT.

[3] When using AMT, the interface X1P1 must be used for connection to remote maintenance.

[4] An analog monitor can be used with an adapter cable (optional).

8.10   Technical specifications of the operating systems

Depending on the ordered device configuration, the device is equipped with or without one of the following installed operating systems.

- Microsoft® Windows® 10 Enterprise 2016 LTSB, 64-bit, Multi-Language*

* Multi-language user interface (MUI): 5 languages (English, German, French, Spanish, Italian)

You can find information on ordered Microsoft® Windows® operating systems under:

Important instructions and manuals for operating the device (Page 11)

Partitioning in the delivery state for Microsoft® Windows® 10

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

The following table lists the partitioning for disks ≥ 200 GB in GPT mode:

| Partition	Name	Size	File system
First	Boot	260 MB	FAT32
Second	MSR	128 MB	None
Third	System	160 GB	NTFS (compressed)
Fourth	WinRE	500 MB	NTFS (compressed)
Fifth	Data	Remainder	NTFS (compressed)

Dimension drawings

9

9.1 Dimension drawing of 19" device with capacitive multi-touch screen
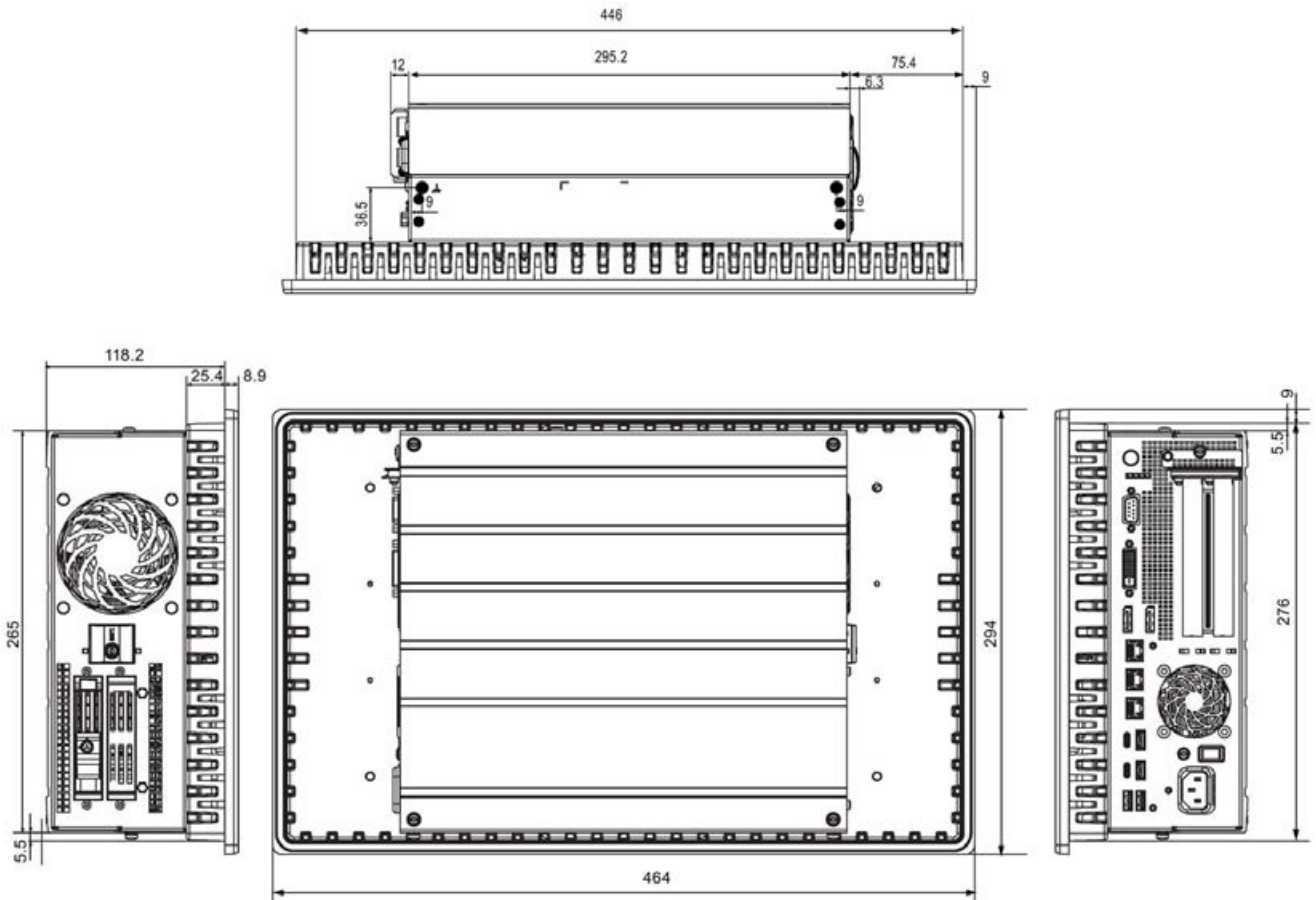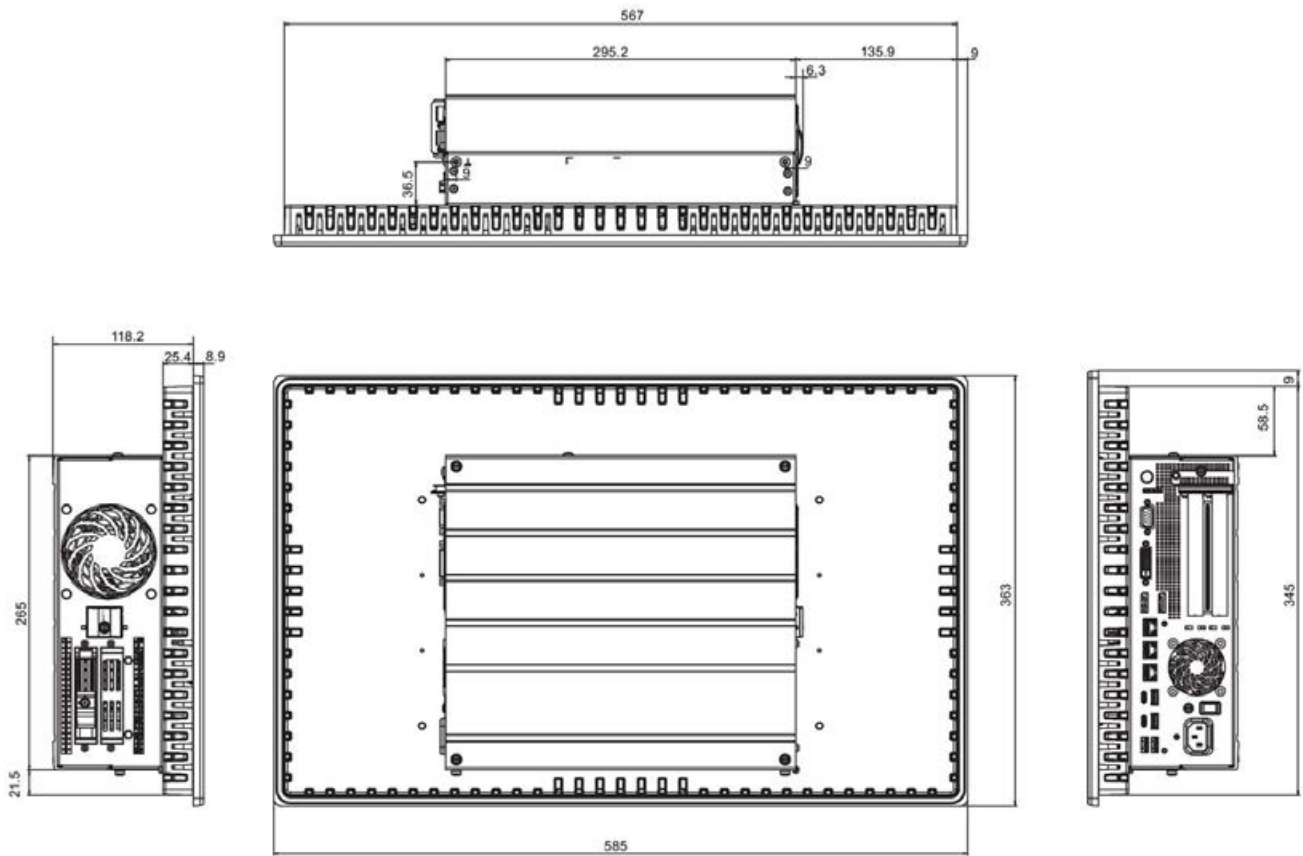

All dimensions in mm

9.2 Dimension drawing of 22" device with capacitive multi-touch screen
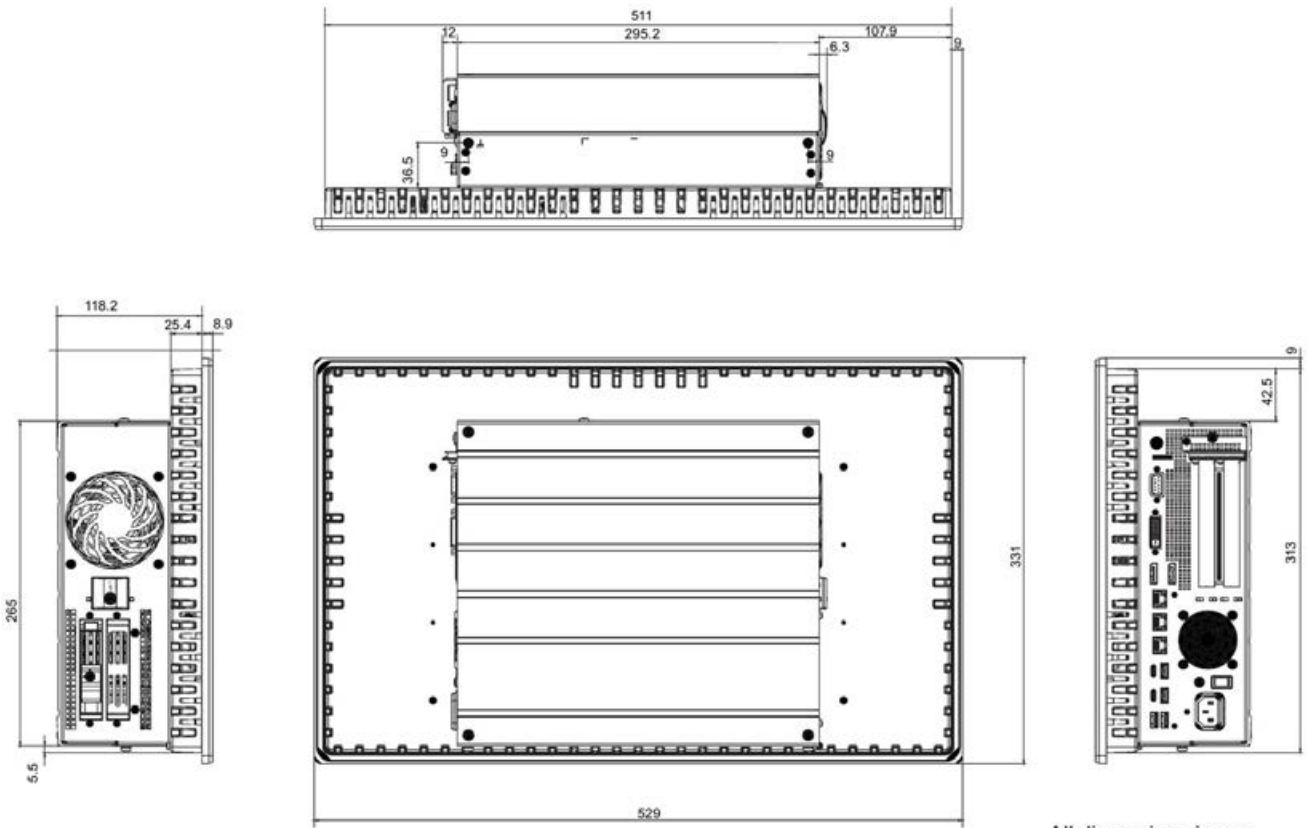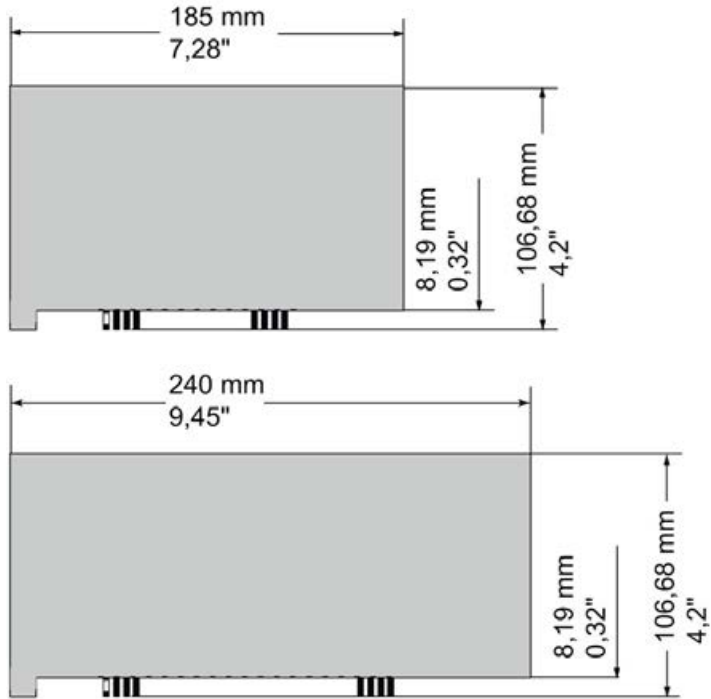

All dimensions in mm

9.3 Dimension drawing of 24" device with capacitive multi-touch screen

All dimensions in mm

9.4 Dimension drawing of the expansion cards

Short PCI or PCIe expansion card

Standards and approvals

10

10.1 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:

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

  The device is designed for the following areas of application corresponding to the CE marking:

Scope of application	Requirement for	
	Interference emission	Immunity to interference
Industry	EN 61000-6-4	EN 61000-6-2
AC devices are compliant with EN 61000-3-2 (Transient currents) and EN 61000-3-3 (Voltage fluctuation and Flicker).		

- 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. [*]

  [*] relevant only for AC devices

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

EU Declaration of Conformity

The associated declaration of conformity is available on the Internet at the following address: Certificate Box PC (http://support.automation.siemens.com/WW/view/us/10805671/134200).

10.2   DIN ISO 9001 certificate and software license agreements

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).

Certificate no.: 001323 QM08

Software license agreements

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

10.3   UL approval

The following approvals are available for the device:

- Underwriters Laboratories (UL) according to Standard UL 61010-2-201 Second Edition, File E85972 (PROG.CNTLR.)

- Canadian National Standard CAN/CSA-C22.2 No. 61010-2-201 Second Edition

10.4 FCC (USA)

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.

Responsible party for Supplier's Declaration of Conformity

Siemens Industry, Inc.

Digital Factory - Factory Automation

5300 Triangle Parkway, Suite 100

Norcross, GA 30092

USA

mailto: amps.automation@siemens.com

10.5 Canada

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

10.6 Australia / New Zealand

RCM AUSTRALIA/NEW ZEALAND

This product meets the requirements of EN 61000-6-4 Generic standards – Emission standard for industrial environments.

This product meets the requirements of the standard EN 61000-6-4 Generic standards – Emission standard for industrial environments.

10.7 Eurasion Customs Union EAC

Identification for Eurasion Customs Union

- EAC (Eurasian Conformity)
- Customs union of Russia, Belarus and Kazakhstan
- Declaration of conformity according to Technical Regulations of the Customs Union (TR CU)

10.8 Korea

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.

Hardware descriptions

<div align="right">

A
</div>

A.1 Motherboard

A.1.1 Layout of the motherboard

The motherboard consists of these main components: Processor and chip set, four slots for memory modules, internal and external interfaces, and the Flash BIOS.
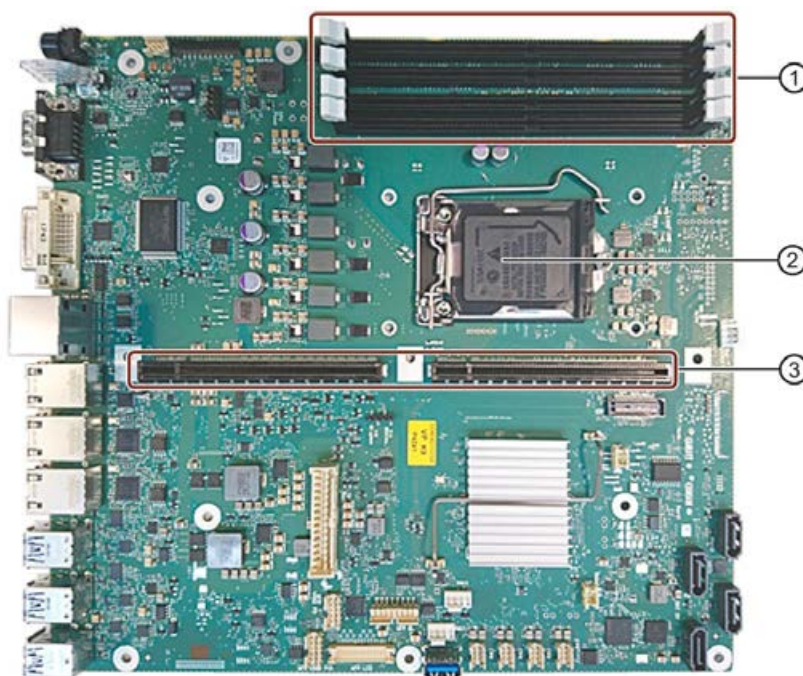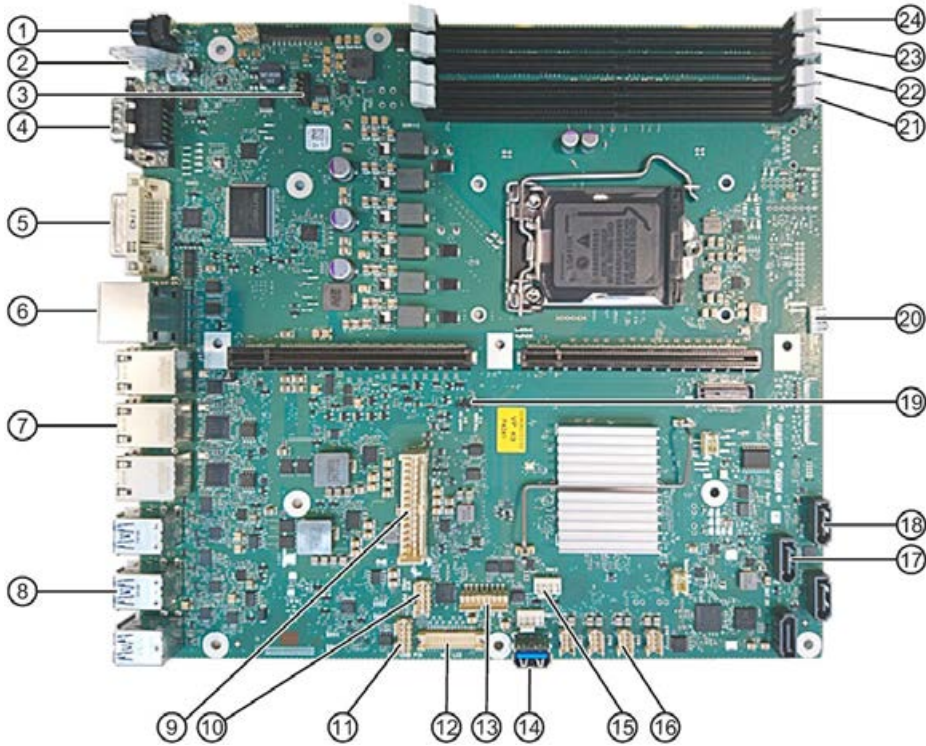

①	Slots for memory modules
②	Processor
③	Slots for bus boards

Technical features of the motherboard

Technical features of the motherboard can be found under "Technical specifications of the motherboard (Page 116)".

A.1.2 Position of the interfaces on the motherboard

(1)	Power button	(8)	USB 3.1 (X60-X65) 4x type A, 2x type C	(17)	SATA 1 (Port3) (X523)
(2)	Status LEDs	(9)	Power supply (X800)	(18)	SATA 0 (Port2) (X526)
(3)	2xUSB 2.0 (X13)	(10)	USB 2.0 (X15), IPC677E only	(19)	BIOS Recovery (X594)
(4)	COM1 (X30)	(11)	USB 2.0 (X17), IPC677E only	(20)	CPU fan (X513)
(5)	DVI (X70)	(12)	LVDS (X9), IPC677E only	(21)	RAM DIMM1-2 (X190)
(6)	2x DPP (X71/X72)	(13)	Backlight (X4007)	(22)	RAM DIMM1-1 (X19)
(7)	LAN 1 (X1 P1) LAN 2 (X2 P1) LAN 3 (X3 P1)	(14)	1x USB 2.0 (X562)	(23)	RAM DIMM2-2 (X200)
		(15)	PS fan (X52)	(24)	RAM DIMM2-1 (X20)
		(16)	4x SATA-SV (X516-X519)		

A.2 Internal Interfaces

A.2.1 Assignment of the internal interfaces

Interface	Position	Description
Memory	Internal	4 DIMM sockets, 64-bit
Bus expansion	Internal	Socket for bus expansion, assigned PCI bus signals
Power supply	Internal	20-pin connection plug for power supply
BIOS Recovery	Internal	Jumper: • Jumper on pins 2 to 3: default • Replug to pins 3 to 4 for BIOS Recovery [*] • Replug to pins 1 to 2 for ME Update [*] [*] A special USB stick is required for this (not included in scope of delivery; contact your local SIEMENS contact person)
Serial ATA	Internal	Serial ATA, max. 2/4 drives operable
Connection for PS serial ATA	Internal	Power supply for serial ATA
Connection for PS fan	Internal	Power supply for CPU fan, 4-pin, male connector
Connection for device fan	Internal	Power supply for device fan, 4-pin, male connector
Backup battery	Internal	Power supply for backup battery, 2-pin, male connector
USB port	Internal	USB channel 6 and 7, 10-pin male connector on expansion card (optional) guided
USB port	Internal	USB channel 9, upright USB socket
Spare HDD	Internal	LED display

A.2.2 Device fan supply (X512)

Pin	Name	Meaning
1	GND	Ground
2	+12 V	Switched voltage supply
3	CPU FAN_CLK	Clock signal
4	PWM	PWM signal

A.2.3 Supply for the power supply fan (X515)

Pin	Name	Meaning
1	GND	Ground
2	+12 V	Switched voltage supply
3	PG1 FAN_CLK	Clock signal
4	PWM	PWM signal

A.2.4 Supply for the serial ATA drives (X516 - X521)

Pin	Name	Meaning
1	+12 V	Output power supply
2	GND	Ground
3	GND	Ground
4	+5 V	Output power supply
5	+3.3 V	Output power supply

A.3 Bus board

A.3.1 Design and principle of operation of the bus board

The bus board is designed as a link between the motherboard and the expansion cards. The bus board is available in the following designs:

Information on pin assignment is available in the sections below.

Version 1 (IPC677E; 2 slots)

①	Slot 1/2 PCI
②	12 V power supply connection; see Pin assignment 12 V power supply connection for expansion cards (Page 134)

Version 2 (IPC677E; 2 slots)

①	Slot 1 PCI Express x16
②	Slot 2 PCI Express x4 (mechanical x16)
③	12 V power supply connection; see Pin assignment 12 V power supply connection for expansion cards (Page 134)

Version 3 (IPC677E; 2 slots)
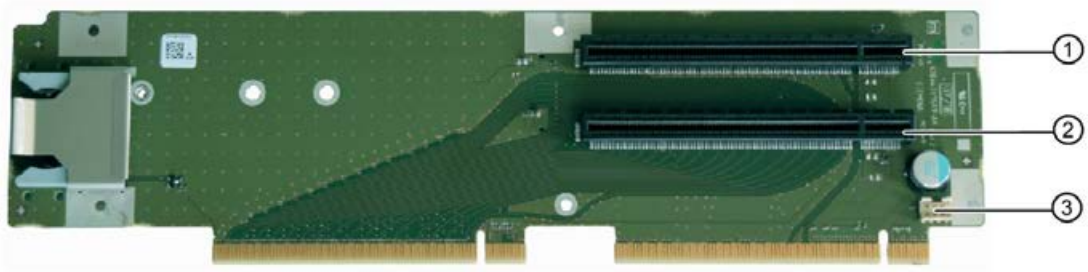
①	Slot 1 PCI Express x4 (mechanical x16)
②	Slot 1 PCI Express x16
③	12 V power supply connection; see Pin assignment 12 V power supply connection for expansion cards (Page 134)

A.3.2 Pin assignment 12 V power supply connection for expansion cards

Pin	Name	Meaning	Input/Output
1	+12 V [1]	12 V voltage	Output
2	GND	Ground	-
3	GND	Ground	-
4	+5 V [1]	5 V voltage	Output
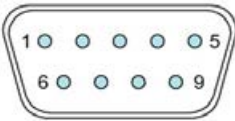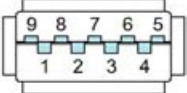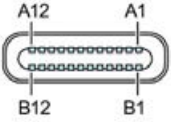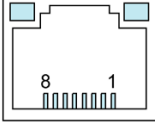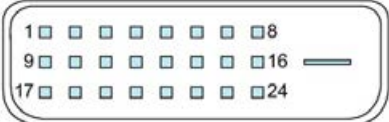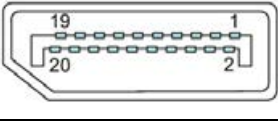
[1] max. permitted current: 1 A; with this power demand the total power demand for the PCI slots are not allowed to be exceeded.

A.4 External interfaces

> **Note**
>
> **Interface specification**
>
> The data of all external interfaces listed below correspond to the respective interface specifications and the intended use.

Interface	Connector	Description	Assignment
COM1	X30	9-pin standard plug (± 12 V)	
USB 3.1	X2 A, B X4 A, B	USB3 Port 0, 1; USB2 Port 0, 1 interface side (3.3 V; 900 mA; up to 10 Gbps)	
USB 3.1 type C	X61, X63	USB3 Port 0, 1; USB2 Port 0, 1 interface side (5 V; 1.5 A to 3.0 A; up to 10 Gbps)	
Ethernet 1, 2 and 3	X4, X2, Xn	RJ45 (up to 1 Gbps)	
DVI-D	X70	24-pin DVI-D female connector (3.3 V; 500 mA)	
DPP	X71, X72	20-pin DisplayPort connector	

A.5 System resources

A.5.1 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® as follows:

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

   The "Run" dialog box opens.

2. Enter "msinfo32" in the "Open" field.

3. Confirm your entry with "OK".

A.5.2 I/O address allocation

The following tables describe the system resources in the factory state of the device.

Static area

I/O address (hex)		Size [byte]	Description of the basic function	Alternative function
From	To			
0000	001F	32	DMA controller	
0020	0021	2	Programmable interrupt controller	
0022	0023	2	<Not used>	
0024	0025	2	Programmable interrupt controller	
0026	0027	2	<Not used>	
0028	0029	2	Programmable interrupt controller	
002A	002B	2	<Not used>	
002C	002D	2	Programmable interrupt controller	
002E	002F	2	Motherboard resources	
0030	0031	2	Programmable interrupt controller	
0032	0033	2	<Not used>	
0034	0035	2	Programmable interrupt controller	
0036	0037	2	<Not used>	
0038	0039	2	Programmable interrupt controller	
003A	003B	2	<Not used>	
003C	003D	2	Programmable interrupt controller	
003E	003F	2	<Not used>	
0040	0043	4	System timer	
0044	004D	10	<Not used>	
004E	004F	2	Motherboard resources	

I/O address (hex)		Size [byte]	Description of the basic function	Alternative function
From	To			
0050	0053	4	System timer	
0054	005F	12	<Not used>	
0060	0060	1	Keyboard controller	
0061	0061	1	Motherboard resources	
0062	0062	1	<Not used>	
0063	0063	1	Motherboard resources	
0064	0064	1	Keyboard controller	
0065	0065	1	Motherboard resources	
0066	0066	1	<Not used>	
0067	0067	1	Motherboard resources	
0068	006F	8	<Not used>	
0070	0070	1	Motherboard resources	Cascaded
0070	0077	8	System CMOS/real-time clock	
0078	007F	8	<Not used>	
0080	0080	1	Motherboard resources	
0081	0091	17	DMA controller	
0092	0092	1	Motherboard resources	
0093	009F	13	DMA controller	
00A0	00A1	2	Programmable interrupt controller	
00A2	00A3	2	<Not used>	
00A4	00A5	2	Programmable interrupt controller	
00A6	00A7	2	<Not used>	
00A8	00A9	2	Programmable interrupt controller	
00AA	00AB	2	<Not used>	
00AC	00AD	2	Programmable interrupt controller	
00AE	00AF	2	<Not used>	
00B0	00B1	2	Programmable interrupt controller	
00B2	00B3	2	Motherboard resources	
00B4	00B5	2	Programmable interrupt controller	
00B6	00B7	2	<Not used>	
00B8	00B9	2	Programmable interrupt controller	
00BA	00BB	2	<Not used>	
00BC	00BD	2	Programmable interrupt controller	
00BE	00BF	2	<Not used>	
00C0	00DF	32	DMA controller	
00E0	00EF	16	<Not used>	
00F0	00F0	1	Numeric data processor	
00F1	0277	391	<Not used>	
0278	027F	8	<Reserved>	Reserved for LPT1
0280	02E7	104	<Not used>	

I/O address (hex)		Size [byte]	Description of the basic function	Alternative function
From	To			
02E8	02EF	8	<Reserved>	Reserved for COM1 or COM2
02F0	02F7	8	<Not used>	
02F8	02FF	8	COM2	Can be deactivated in setup, then free Reserved for COM1 or COM2
0300	0377	120	<Not used>	
0378	037F	8	LPT1	Can be deactivated in setup, then free Reserved for LPT1
0380	03AF	48	<Not used>	
03B0	03BB	12	Graphics	
03BC	03BF	4	<Reserved>	
03C0	03DF	32	Graphics	
03E0	03E7	8	<Not used>	
03E8	03EF	8	<Reserved>	Reserved for COM1 or COM2
03F0	03F7	8	<Not used>	
03F8	03FF	8	COM1	Can be deactivated in setup, then free Reserved for COM1 or COM2

Dynamic range – resources are managed by means of Plug and Play functionality

I/O address (hex)		Size [byte]	Description of the basic function	Alternative function
From	To			
0400	0453	84	Motherboard resources	
04D0	04D1	2	Programmable interrupt controller	
0680	069F	32	Motherboard resources	
0800	087F	128	Motherboard resources	
164E	164F	2	Motherboard resources	
1800	18FE	255	Motherboard resources	
1854	1857	4	Motherboard resources	Cascaded
2004	2007	4	Motherboard resources	
FFFF	FFFF	1	Motherboard resources	

A.5.3 Interrupt Assignments

The functions are assigned different interrupts, depending on the operating system. A distinction is made between the PIC and APIC modes.

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

Function	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 A	17 B	18 C	19 D	20 E	21 F	22 G	23 H	Comment
Timer output 0	X																								Fixed
Keyboard		X																							Fixed
Cascaded (IRQ9)			X																						Fixed
Serial interface 2				X																					Can be disabled
Serial interface 1					X																				Can be disabled
FD controller							X																		Can be disabled
Parallel interface 1								X																	Can be disabled
Real-time clock (RTC)									X																
PS/2 mouse													X												Fixed, can be disabled
Numeric processor														X											Fixed
SATA												Z												Y	Can be disabled
USB Port 0/1												Z												Y	Cannot be disabled
USB Port 2/3												Z												Y	Cannot be disabled
USB Port 4/5											Z												Y		Cannot be disabled
USB 2.0 controller											Z												Y		Can be disabled
Ethernet 1											Z						Y								Can be disabled
Ethernet 2											Z							Y							Can be disabled
VGA											Z						Y								Can be disabled
Profibus or Profinet						Z														Y					Option, can be disabled

Y   Interrupt in APIC mode

Z   BIOS Default Interrupt in PIC mode, e.g., DOS

[1]   Host PCI-IRQ A to H is assigned to IRQ 16 to 23 permanently in APIC mode. Host PCI-IRQ A to H will be automatically assigned IRQ 0 to 15 by BIOS in PIC mode. A specific assignment can not be enforced.

Interrupt assignment of the slot connectors on the bus board

	IRQ Number																								Comments
ACPI IRQ	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
IRQ	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	◄								
Host PCI IRQ Line																	A (1)	B (2)	C (3)	D (4)	E (5)	F (6)	G (7)	H (8)	[1]
Function																									
Slot 1 (PCI)																									
PCI INT Pin A	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	
PCI INT Pin B	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	
PCI INT Pin C	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	
PCI INT Pin D	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	
Slot 2 (PCI)																									
PCI INT Pin A	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	
PCI INT Pin B	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	
PCI INT Pin C	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	
PCI INT Pin D	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	
Slot 2 (PCIexpress)																									
PCI INT Pin A	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	-	
PCI INT Pin B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-	
PCI INT Pin C	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	Y	-	-	-	-	-	
PCI INT Pin D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	

[1] Host PCI-IRQ A to H will be assigned IRQ 16 to 23 permanently in ACPI mode. Host PCI-IRQ A to H will be automatically assigned IRQ 0 to 15 in PIC mode. A specific assignment can not be enforced.

Y Interrupt in APIC mode

Z BIOS Default Interrupt in PIC mode (e.g. DOS)

A.5.4   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.

Exclusive interrupt on the device (APIC mode)

	IRQ assignments for Windows systems, (APIC mode)
Ethernet 1	16 [1, 2]
Ethernet 2	17 [1]
Profibus/MPI	19 [1]
PCI slot 1	20 [1]
PCI slot 2	21 [1]
PCI Express slot	16 [1, 3]

[1]   Requirement: The modules in the PCI slots each require only one interrupt

[2]   Requirement: VGA and PCIexpress do not require an interrupt

[3]   Requirement: VGA does not require an interrupt and Ethernet1 is disabled

Assigning exclusive interrupts in the firmware (PIC mode)

The interrupts are automatically assigned to the slots at system startup due to the default settings in system BIOS.

Several slots may share the same interrupt, depending on the system configuration. This functionality is known as interrupt sharing. Exclusive interrupts are not available in PIC mode. Disable specific system resources in order to obtain exclusive interrupts. BIOS assigns the PIC interrupts at random during restart of the system.

A.5.5 Memory address assignments

PCI VGA modules can be operated with expansion ROM up to 48 K.

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

Address		Size	Description of the basic function	Alternative function
From	To			
0000 0000	0007 FFFF	512 K	Conventional system memory	
0008 0000	0009 F7FF	126 K	Conventional system memory extended	
0009 F800	0009 FFFF	2 K	XBDA, extended Bios Data Area	
000A 0000	000A FFFF	64 K	VGA graphics refresh memory	Shared SMM for power management
000B 0000	000B 7FFF	32 K	Software graphics / text refresh memory	Not used
000B 8000	000B FFFF	32 K	VGA graphics/text refresh memory	
000C 0000	000C BFFF	48 K	VGA BIOS expansion	
000C 0000	000C FFFF	64 K	VGA BIOS	Always allocated or reserved
000E 0000	000F FFFF	2 × 64K	DMI data, System BIOS, Options ROMs: PXE, RAID	
0010 0000	CFFF FFFF	3.2 GB	System memory 4 GB memory configuration	Depends on memory configuration
EFFF F000	EFFF FFFF	4 K	Motherboard resources	
F000 0000	F3FF FFFF	64 M	Motherboard resources	
FED0 0000	FED0 03FF	1 K	High Precision Event Timer	
FED1 0000	FED1 7FFF	32 K	Motherboard resources	
FED1 8000	FED1 8FFF	4 K	Motherboard resources	
FED1 9000	FED1 9FFF	4 K	Motherboard resources	
FED1 C000	FED1 FFFF	16 K	Motherboard resources	
FED2 0000	FED3 FFFF	128 K	Motherboard resources	
FED4 0000	FED4 4FFF	20 K	Trusted Platform Module 2.0	
FED9 0000	FED9 3FFF	16 K	Motherboard resources	
FEE0 0000	FEEF FFFF	1 M	Motherboard resources	
FF00 0000	FFFF FFFF	16 M	Motherboard resources	Intel® 82802 firmware hub

Technical support

B

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/cs/ww/en/)
- Support request form (http://www.siemens.com/automation/support-request)
- After-sales information system for SIMATIC PC / PG (http://www.siemens.com/asis)
- SIMATIC Documentation Collection (http://www.siemens.com/simatic-tech-doku-portal)
- Your local contact person (http://www.automation.siemens.com/mcms/aspa-db/en/Pages/default.aspx)
- Training center (http://sitrain.automation.siemens.com/sitrainworld/?AppLang=en)
- Industry Mall (https://mall.industry.siemens.com)
- TIA Selection Tool (http://w3.siemens.com/mcms/topics/en/simatic/tia-selection-tool)

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

- Article number of the device (MLFB)
- BIOS version (industry PC) or image version (HMI device)
- Installed additional hardware
- Installed additional 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 for SIMATIC PC / PG (http://www.siemens.com/asis)

B.2 Troubleshooting

B.2.1 Problems with device functions

Problem	Cause	Remedy
The device is not operational	There is no power supply to the device.	• Check the power supply, the power cord 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, wait approximately 12 hours before switching on the device.
Windows no longer boots	Settings in the BIOS Setup are incorrect	• Check the settings in the BIOS Setup "SATA Configuration" submenu • Check the setting in the BIOS Setup Boot menu.
The external 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 the screen brightness. For detailed information, refer to the monitor operating instructions.
	The power cord or the monitor cable is not connected.	• Check whether the power cord has been properly connected to the monitor and to the system unit or to the grounded shockproof outlet. • Check whether the monitor cable has been properly connected to the system unit and to the monitor.
		If the monitor screen still remains dark after you have performed these checks, please contact your technical support team.
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.
	The mouse is not connected.	• Check whether the mouse cord is properly connected to the system unit. • If you use an adapter or expansion for the mouse cable, also check these connectors.
		If the cursor still does not appear on the screen after you have performed these checks and actions, contact your technical support team.
Wrong time and/or date on the PC.		1. Press <F2> during the booting process to open the BIOS Setup. 2. Set the time and date in the setup menu.

Problem	Cause	Remedy
Although the BIOS setting is OK, the time and data are still wrong	The backup battery is dead.	Replace the backup battery.
USB device not responding.	USB ports are deactivated in the BIOS Setup	Use a different USB port or activate the port.
	Operating system does not support the USB port.	• Activate the "Legacy USB Support" setup parameter in the "Advanced > USB Configuration" menu of the BIOS Setup. • For other devices, you need the USB device drivers for the required operating system.

B.2.2 Problems when booting the device

Problem	Cause	Remedy
After changing the hard disk, the system does not boot from the RAID array	RAID array does not have highest boot priority	BIOS setup, Boot menu: • Permit RAID system in the boot priority • Give RAID system top boot priority
After changing the drive, "unused" is indicated for the relevant SATA port	System was booted without functioning hard disk. The removable tray might not be fully pushed in.	Reboot the system with a functioning hard disk.
Computer does not boot or "Boot device not found" is displayed.	The boot medium is not approved	Allow the boot device in the boot priority in the "Boot" menu of the BIOS Setup.
	The boot device is not in first place of the boot priority in the BIOS setup	In the BIOS setup "Boot" menu, change the boot priority of "Boot device".

B.2.3 Problems with RAID systems

Problem	Cause	Remedy

The RAID software reports the following errors:
 	
• The RAID plug-in failed to load, because the drive is not installed.
 	
• The Serial ATA plug-in failed to load, because the driver is not installed correctly.
 	
• The Intel® Matrix 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
	RAID is not activated	The messages have no negative effect on the operation of the device and can be ignored. Acknowledge the messages.

	RAID is activated	Install the software again with the help of the supplied USB sticks.

B.2.4 Problems when using expansion cards

Problem	Cause	Remedy
The device crashes during startup.	• I/O addresses are assigned twice. • Hardware interrupts and/or DMA channels are assigned twice • Signal frequencies or signal levels are not adhered to • Different pin assignment	Check your computer configuration: • If the computer configuration corresponds to the delivery condition, contact your technical support team. • In the case of a change in the configuration, restore the delivery condition. 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.

Markings and symbols

C

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 Safety

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

C.3 Operator controls
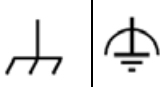
Symbol	Meaning		Symbol	Meaning
	On/off switch, without electrical isolation			On/off switch, without electrical isolation

C.4 Certificates, approvals and markings

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

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

C.5 Interfaces

Symbol	Meaning		Symbol	Meaning
===	Connection to the power supply			PS/2 mouse interface
	Protective conductor terminal			PS/2 keyboard-interface
	Connection for functional earthing (equipotential bonding line)			Multimedia Card Reader
DPP	DisplayPort interface			Smart Card Reader
	DVI-D interface			Line In
LAN	LAN interface, not approved for connecting WAN or telephone			Line Out
IOIOI	Serial interface			Microphone input
	USB port			Universal Audio Jack
	USB 2.0 high-speed port			Headphone output
SS	USB 3.0 super-speed port			
SS 10	USB 3.1 SuperSpeedPlus port			

List of abbreviations

<div style="text-align: right; font-size: 3em;">D</div>

D.1 Abbreviations

Abbreviation	Term	Meaning
AC	Alternating current	Alternating current
AHCI	Advanced Host Controller Interface	Standardized controller interface for SATA devices. This is supported in Microsoft Windows XP as of SP1 and IAA driver.
APIC	Advanced Programmable Interrupt Controller	Extended programmable interrupt controller
ATA	Advanced Technology Attachment	
AWG	American Wire Gauge	US standard for the cable diameter
BIOS	Basic Input Output System	Basic Input Output System
CAN	Controller Area Network	
CE	Communauté Européenne (CE symbol)	The product is in conformance with all applicable EC directives
CLK	Clock pulse	Clock signal for controllers
CMOS	Complementary Metal Oxide Semiconductors	Complementary metal oxide semiconductors
COA	Certificate of Authenticity	Microsoft Windows Product Key
COM	Communications Port	Term for the serial interface
CP	Communication Processor	Communication computer
CPU	Central Processing Unit	CPU
CRT	Cathode Ray Tube	
CSA	Canadian Standards Association	Canadian organization for tests and certifications according to own or binational standards (with UL / USA) standards
DC	Direct Current	DC current
DCD	Data Carrier Detect	Data carrier signal detection
DMA	Direct Memory Access	Direct memory access
DPP	DisplayPort	New powerful digital monitor port
DQS	Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagement mBH	
DSR	Data Set Ready	Ready for operation
DTR	Data Terminal Ready	Data terminal is ready

Abbreviation	Term	Meaning
DVD	Digital Versatile Disk	Digital versatile disk
DVI / DVI-D	Digital Visual Interface	Digital display interface without VGA signals
DVI-I	Digital Visual Interface	Digital display interface with digital and VGA signals
ECC	Error checking and correction	Error correction code
EFI	Extensible Firmware Interface	
ESD	Electrostatic-sensitive components	
EN	European standard	
ESC	Escape character	Control character
GND	Ground	Chassis ground
HD	Hard disk	Hard disk
HDD	Hard Disk Drive	Hard disk drive
Hardware	Hardware	
I/O	Input/Output	Data input/output on computers
IDE	Integrated Device Electronics	
IEC	International Electronical Commission	
IP	Ingress Protection	Degree of protection
IRQ	Interrupt Request	Interrupt request
KVM	Keyboard Video Mouse	Keyboard video mouse bypass
LAN	Local Area Network	Computer network that is limited to a local area.
LCD	Liquid Crystal Display	Liquid crystal display
LED	Light Emitting Diode	Light emitting diode
LPT	Line Printer	Printer port
MAC	Media access control	Media access control
MLFB	Machine-readable product designation	
MUI	Multilanguage User Interface	Multilanguage operating system with Windows with language toggling; 5 languages: German, English, French, Spanish and Italian
NC	Not Connected	Not connected
NEMA	National Electrical Manufacturers Association	Syndicate of manufacturers of electrical components in the USA
NVRAM	Non Volatile Random Access Memory	Non-volatile data memory. Data memory is retained without external power supply.
OPC	OLE for Process Control	Standardized interface for industrial processes
PC	Personal computer	
PCI	Peripheral Component Interconnect	High-speed expansion bus
PCIe	Peripheral Component Interconnect express	High-speed serial, differential full-duplex PtP interface with high data rate.
PG	Programming device	
PIC	Programmable Interrupt Controller	Programmable interrupt controller
POST	Power On Self Test	
PXE	Preboot Execution Environment	Software for running new PCs without hard disk data via the network

Abbreviation	Term	Meaning
RAID	Redundant Array of Independent Disks	Redundant hard disk array
RAM	Random Access Memory	
RI	Ring Input	Incoming call
ROM	Read-Only Memory	
RS 485	Reconciliation Sublayer 485	Bi-directional bus system designed for up to 32 nodes
SATA	Serial Advanced Technology Attachment	
SELV	Safety Extra Low Voltage	Safety extra low voltage
SMART	Self Monitoring Analysis and Reporting Technology	Hard disk error diagnostics program
SNMP	Simple Network Management Protocol	Network protocol
SSD	Solid State Drive	
SW	Software	
TxD	Transmit Data	Data transfer signal
UL	Underwriters Laboratories Inc.	US organization for tests and certifications according to own or binational standards (with CSA / Canada) standards.
USB	Universal Serial Bus	
VCC		Positive supply voltage of integrated circuits
VDE	Verein deutscher Elektrotechniker (Union of German Electrical Engineers)	
VGA	Video Graphics Array	Video adapter which meets industrial standard
VT-D	Virtualization Technology for Directed I/O	Enables the direct assignment of a device (e.g. network adapter) to a virtual device.
WD	Watchdog	Program monitoring with error detection and alarming.

Index

Interference emission, 115
Internal Interfaces, 131
Interrupt reaction time, 141

L

Labeling, 128
   Korea, 128

M

Main memory, 116
Marking
   EU Declaration of Conformity, 125
Mechanical ambient conditions, 115
Memory configuration, 78
Memory expansion, 76
Memory modules, 116
   Installing, 76, 78
   Removing, 78
Modules
   Installing, 76
Motherboard
   Design, 129
   Internal Interfaces, 131
Mounting
   Memory modules, 78
   Multi-touch device, 42
Mounting clip
   Installing multi-touch device, 42
Mounting cutout
   Dimensions, 39
   Preparing, 39
Mounting positions, 37
Multi-touch device
   Mounting, 42

N

New Zealand, 128

O

Onboard RAID system
   Displaying details on the onboard RAID system, 62
   Show faulty drive, 62
Online ordering system, 53
Open
   Device, 72

Operating system
   Initial commissioning, 55

P

Package contents, 35
   Checking, 35
Packaging, 35
   Checking, 35
   Removing, 35
Partitioning, 119
PCI hardware interrupt, 141
Power consumption, 111
Power factor correction, 114
Power requirements, 113
Power supply
   AC voltage supply, 114
   DC voltage supply, 114
   WinAC module, 134
Power supply fan
   Removal, 95, 100
Power supply unit, 100
Power supply unit
   Removing, 100
Processor, 116
   Removal, 107
PROFINET, 53

R

RAID system
   Automatically integrating a new drive, 63
   Data synchronization, 64
   Display of the defective drive, 60
   Manually integrating a new drive, 63, 64
RAID1 system
   Installation options for drives, 60
   Mounting locations for drives, 86
   Replacing a defective hard disk, 86
Removing
   Fan, 92
   Memory modules, 78
   Power supply fan, 95, 100
   Power supply unit, 100
   Processor, 107
Repairs, 89
Replacing
   Bus board, 102
RJ45 Ethernet, 53

S

Scope, 3
Setup, (BIOS Setup)
SIMATIC IPC Image & Partition Creator, (Image &
Partition Creator)
SIMATIC IPC Remote Manager, 68
SIMATIC S7, 53
Slot cover, 75
Strain relief
    Ethernet cable, 54
Supply voltage, 111
    For countries other than the USA and Canada, 46
    USA and Canada, 46
Switching on the device
    Configure automatic startup, 55
System resources, 136
    I/O address allocation, 136

T

Temperature, 115

W

Weight, 111
WinAC module
    Power supply connection, 134