SIEMENS

# SIMATIC

# Industrial PC
# SIMATIC IPC PX-39A

Operating Instructions


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07/2025
A5E51699601-AD

# Legal information

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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.

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# 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 IPC PX-39A and to service and maintain 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 IPC PX-39A.

## History

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

| Edition | Comment |
|---|---|
| 08/2022 | First edition |
| 06/2024 | Expansion:<br>• RAID1 system<br>• 12" display |
| 02/2025 | Update |
| 07/2025 | Addition:<br>• Microsoft® Windows® 11 IoT Enterprise LTSC 2024 |

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# Product description

# 1

## 1.1 Important instructions and manuals for operating the device

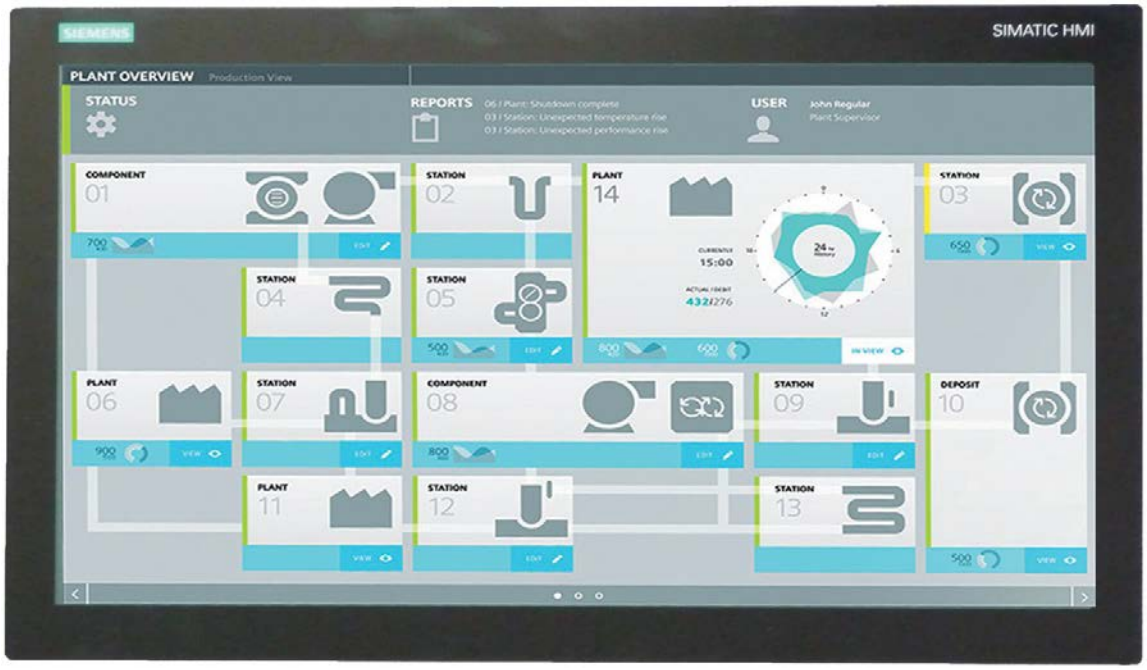
| Documentation | Contents | Source |
|---|---|---|
| Operating instructions | • Product description<br>• Technical specifications<br>• Installation of the device<br>• Operation of the device<br>• Installing and removing hardware<br>• Dimension drawings | • Online at:<br>SIMATIC IPC Documentation (http://www.siemens.com/simatic-ipc-doku-portal) |
| Quick Install Guide | Information on:<br>• Operating Instructions of the device<br>• Installation of the device<br>• Steps for connecting the device to the power supply<br>• Connecting I/O devices<br>• Switching the device on | • Supplied in printed form with the device |
| Current product information | • Current notes on the device<br>• Changes compared with these operating instructions | • Online at:<br>SIMATIC IPC Documentation (http://www.siemens.com/simatic-ipc-doku-portal) |
| Firmware/BIOS description | Information on:<br>• Important firmware settings<br>• Firmware settings in the factory state<br>• Boot modes | • Online at:Firmware/BIOS description SIMATIC IPC BX-39A, IPC PX-39A, IPC PX-39A PRO (https://support.industry.siemens.com/cs/ww/en/view/109811365) |
| Windows® operating system | Information on:<br>• Commissioning the operating system<br>• Restoring the operating system<br>• Configuration of the operating system | • Online at:<br>Microsoft® Windows® 10 (https://support.industry.siemens.com/cs/ww/en/view/109749498)<br>Microsoft® Windows® 11 (https://support.industry.siemens.com/cs/ww/en/view/109817190) |

| Documentation | Contents | Source |
|---|---|---|
| SIMATIC IPC Image & Partition Creator | Information on:<br>• Backup and recovery of files, directories, drive partitions. | • Online at:<br>SIMATIC IPC Image & Partition Creator (https://support.industry.siemens.com/cs/ww/en/view/109803590) |
| SIMATIC NET | Industrial communication | • Online at:<br>SIMATIC NET (http://w3.siemens.com/mcms/automation/en/industrial-communications/Pages/Default.aspx) |
| SIMATIC IPC Panel Drivers and Tools | Information on:<br>• Setting the brightness<br>• Configuration of the screen saver<br>• Touch settings for resistive touch and multi-touch | • Online at:<br>SIMATIC Industrial PC Panel Drivers and Tools with capacitive multi-touch screen (https://support.industry.siemens.com/cs/ww/en/view/109964184) |
| SIMATIC IPC Creating a bootable USB flash drive | Information on:<br>• Creating a bootable USB flash drive for recovery of operating system, software and drivers | • Online at:<br>SIMATIC IPC Creating a bootable USB flash drive (https://support.industry.siemens.com/cs/ww/en/view/109811224) |

## 1.2 Product highlights

The SIMATIC IPC PX-39A is a powerful Industrial Panel 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.

### High productivity through fast data processing

- High Performance in the embedded segment with Intel Core i processors of the 11th generation
- Scalable with four different processors - from Intel Celeron to Intel Xeon
- Latest memory technology with ECC and DDR4 up to 32 GB

### Flexibility during installation for use in machines

- Minimal mounting depth for space-optimized installation
- Flexible mounting options (portrait, landscape)
- Rugged enclosure concept for use at ambient temperatures up to 50 °C

**Industrial functionality and flexibility for implementation of the embedded solution**

- Flexible memory concepts (2 x SSD, external access)
- 4 x LAN 10/100/1000 Mbps connections; teaming capability
- 4 x High-Speed USB 3.2 ports; up to 2 serial interfaces
- Easy expandability (up to 1 PCIe slot and 2 x M.2 modules each)
- On/off switch

**High system availability thanks to minimization of standstill times**

- Maintenance-free because there are no rotating parts (fans, hard drives) and operation without batteries is possible
- Up to two M.2 NVMe SSDs, easily accessible via SIMATIC IPC Slider
- 512 KB NVRAM for SIMATIC Software Controller for backup of critical data (M.2 module)
- SIMATIC software

**High investment safety to reduce engineering costs**

- Long-term availability: Service and support offered for 8 to 10 years as of market launch
- Installation and interface compatibility

**Device variants**

**Devices with capacitive multi-touch screen display:**

- 12" display, resolution: 1280 x 800 pixels
- 15" display, resolution 1920 × 1080 pixels
- 19" display, resolution: 1920 x 1080 pixels
- 22" display, resolution: 1920 x 1080 pixels
- 24" display, resolution: 1920 x 1080 pixels

## 1.3 Applications

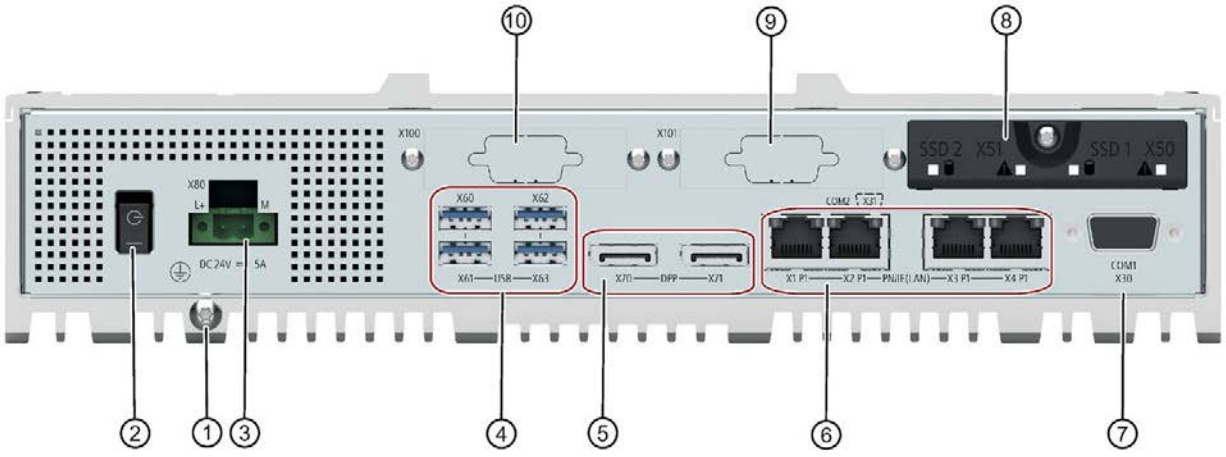
The device offers industrial PC systems for high-performance and space-saving applications in particular for manufacturers in the field of machine, plant and control cabinet engineering:

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

# 1.4 External design of the device

## 1.4.1 Interfaces and operator controls for devices with 24 V DC power supply

### Device without expansion slot




| | | |
|---|---|---|
| ① | Protective conductor | Connection for protective conductor |
| ② | On/off switch | You switch on the device with the on/off switch. The on/off switch does not isolate the device from the power supply.<br>• Position "ON", when the "_" symbol is pressed.<br>• Position "OFF" is the delivery state. |
| ③ | 24 V DC<br>X80 | Power supply connection |
| ④ | 4 × USB<br>X60/X61/X62/X63 | USB 3.2 Gen 2 type A, high current, backward compatible |
| ⑤ | 2 x DPP<br>X70/X71 | Connection for monitors with DisplayPort interface |
| ⑥ | 4 × Ethernet<br>X1 P1/X2 P1/X3 P1/X4 P1 | Connections for Ethernet RJ45 for 10/100/1000 Mbps<br>• Ethernet X1 P1 is iAMT-capable<br>• Ethernet X2 P1, Ethernet X3 P1 and Ethernet X4 P1 |
| ⑦ | COM1 X30 | Serial interface 1 (V.24), 9-pin SUB-D socket |
| ⑧ | 2 x slot for SSD drive<br>SSD1 X50/SSD2 X51 | SSD drives in NVMe format, installed in SIMATIC IPC Slider |
| ⑨ | Opening for expansion interface X101 or | Interfaces of external expansion modules (M.2 format) |
| | COM2 X31 (optional) | Serial interface 2 (V.24), 9-pin SUB-D socket (optional) |
| ⑩ | Opening for expansion interface X100 | Interfaces of external expansion modules (M.2 format) |

### Device with expansion slot

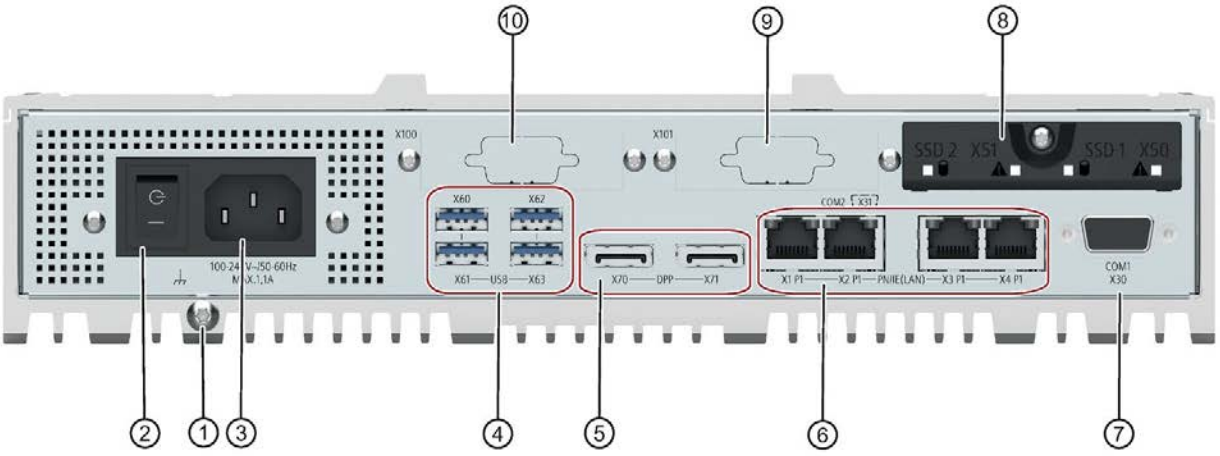
Other device variants (Page 52):

- with slot for one PCIe expansion card

You can find more information about expansion cards under "Expansion cards (Page 71)".

## 1.4.2 Interfaces and operator controls for devices with 100-240 V AC power supply

### Device without expansion slot




| | | |
|---|---|---|
| ① | Protective conductor | Connection for functional grounding |
| ② | On/off switch | You switch on the device with the on/off switch. The on/off switch does not isolate the device from the power supply.<br>• Position "ON", when the "_" symbol is pressed.<br>• Position "OFF" is the delivery state. |
| ③ | 100-240 V AC<br>X80 | Power supply connection |
| ④ | 4 × USB<br>X60/X61/X62/X63 | USB 3.2 Gen 2 type A, high current, backward compatible |
| ⑤ | 2 x DPP<br>X70/X71 | Connection for monitors with DisplayPort interface |
| ⑥ | 4 × Ethernet<br>X1 P1/X2 P1/X3 P1/X4 P1 | Connections for Ethernet RJ45 for 10/100/1000 Mbps<br>• Ethernet X1 P1 is iAMT-capable<br>• Ethernet X2 P1, Ethernet X3 P1 and Ethernet X4 P1 |
| ⑦ | COM1 X30 | Serial interface 1 (V.24), 9-pin SUB-D socket |
| ⑧ | 2 x slot for SSD drive<br>SSD1 X50/SSD2 X51 | SSD drives in NVMe format, installed in SIMATIC IPC Slider |
| ⑨ | Opening for expansion interface X101 or | Interfaces of external expansion modules (M.2 format) |
| | COM2 X31 (optional) | Serial interface 2 (V.24), 9-pin SUB-D socket (optional) |
| ⑩ | Opening for expansion interface X100 | Interfaces of external expansion modules (M.2 format) |

### Device with expansion slot

Other device variants (Page 52):

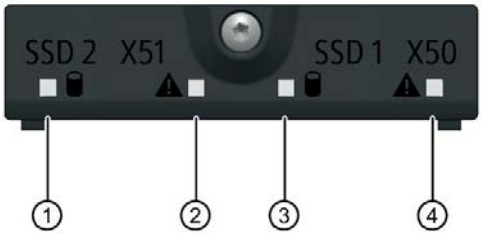
- with slot for one PCIe expansion card

You can find more information about expansion cards under "Expansion cards (Page 71)".

## 1.4.3 Status displays

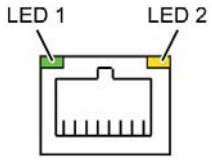
### Status indicator device

The status indicator consists of multi-colored LEDs.



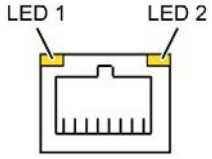

| Position | Status indicator | Color | Description |
|---|---|---|---|
| ① | SSD2 activity | Off | - |
| | | Green | Access to drive |
| ③ | SSD1 activity | Off | - |
| | | Green | Access to drive |
| SDD alarm in connection with RAID and monitoring software: | | | |
| ②<br>④ | SSD2 alarm<br>SSD1 alarm | Off | RAID is OK |
| | | One LED lit RED | Associated drive is not OK |
| | | All LEDs flashing RED | RAID initialization or verification running, RAID OK<br>or<br>RAID rebuild running, RAID not OK.<br>The replacement drive just mounted in the error case is being synchronized with an existing drive. |
| | The number of the SDD alarm corresponds to the number of the drive mounting locations.<br>The numbering of the drives with the "Intel® Optane™ Memory and Storage Management" software differs from this numbering. See important note under "Display of a defective drive of an onboard RAID system (Page 60)". | | |

### Status indicator Ethernet interfaces X1 P1 and X2 P1




| Status indicator | Status | Meaning of the status |
|---|---|---|
| LED 1 | Off | 10 Mbps |
| | Lit green | 100 Mbps |
| | Lit orange | 1000 Mbps |
| LED 2 | Off | No connection |
| | Lit orange | Connection exists |
| | Flashing orange | Activity |

### Status indicator Ethernet interfaces X3 P1 and X4 P1



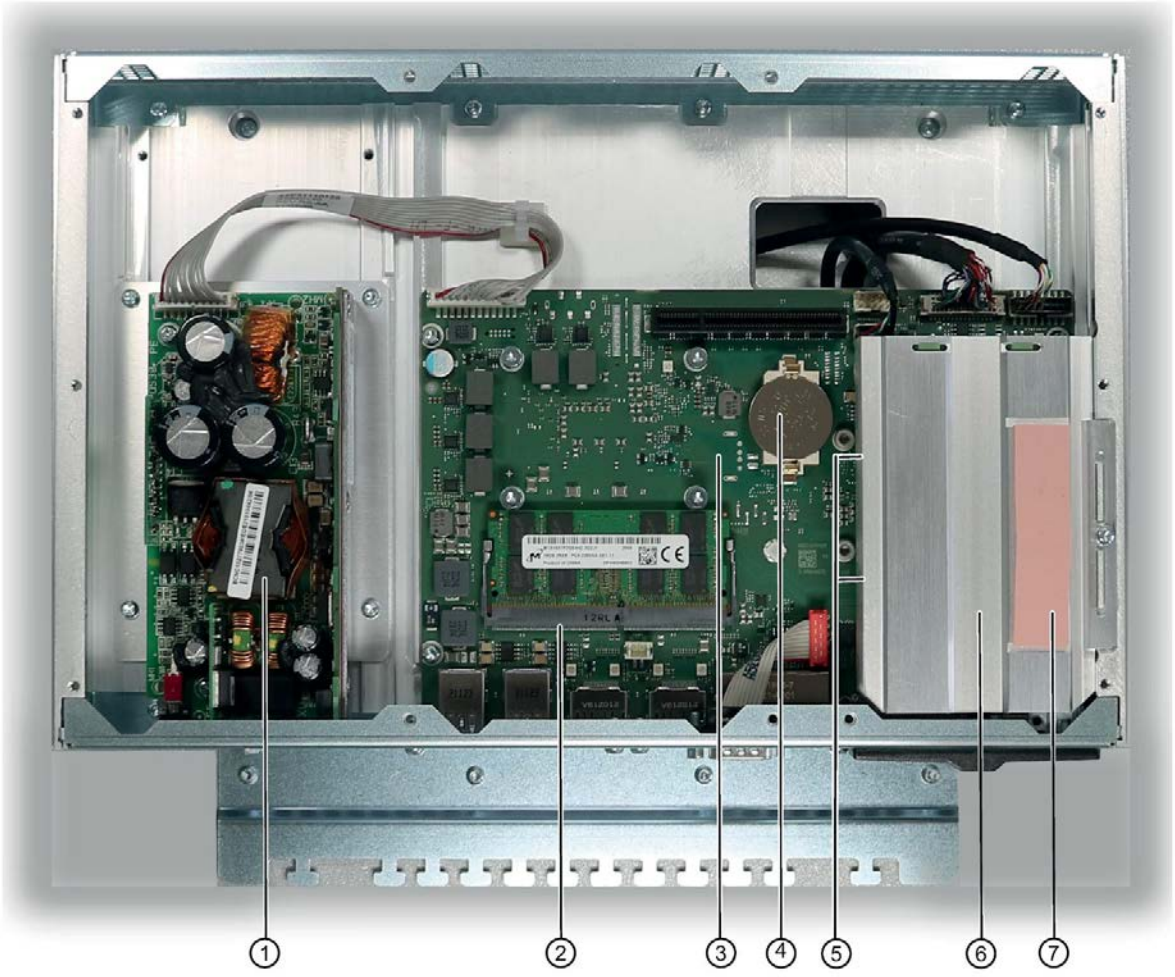

| Status indicator | Status | Meaning of the status |
|---|---|---|
| LED 1 | Off | 10 Mbps or 100 Mbps |
| | Lit orange | 1000 Mbps |
| LED 2 | Off | No connection |
| | Lit orange | Connection exists |
| | Flashing orange | Activity |

### See also

RAID1 system (Page 59)

# 1.5 Internal design of the device

### Device - with power supply 24 V DC as example




① 24 V DC power supply
② Slot for memory module
③ Motherboard
④ Backup battery
⑤ Slots for M.2 expansion modules (under removable drives)
⑥ Slot for removable drives (SSD)
⑦ Heat conduction pad

# 1.6 Accessories and spare parts

## 1.6.1 Hardware accessories

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

### Obtaining accessories from 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 > Panel PC > ..."
5. In the tree structure on the left, click on: SIMATIC IPC PX-39A.
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 Software accessories

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

| Software | Description |
|---|---|
| SIMATIC IPC Image & Partition Creator | SIMATIC IPC Image & Partition Creator enables easy backup and quick recovery of individual data and files, complete hard disks and other data storage media.<br>The intuitive user interface provides disk and partition management functions. |

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

# 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.

### Danger of burns

**⚠ CAUTION**

**Danger of burns**

The surface of the device can reach temperatures of over 65 °C.

- Any unprotected contact may cause burns.
- Avoid direct contact during operation of the device.
- Touch the device only with appropriate protective gloves.

### 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.

### LCD-TFT display

**NOTICE**

**"Image Sticking" and backlighting**

Despite the use of modern LCD technologies, the "Image Sticking" effect can occur if the display is used unfavorably. Image Sticking is a phenomenon in which a faint outline of the previous screen content remains visible after the content has changed.

The long-term display of static screen content at high brightness can lead to "Image Sticking". High ambient temperatures can accelerate this effect.

Observe the following information to maximize the technical service life of the display and ensure an optimal viewing experience:

- Prevention: Avoid displaying static screen content.
- Color management: Use low-contrast colors for symbols, texts and backgrounds. For intense colors, use a color gradient (gray levels/pastel colors). Avoid border lines.
- Brightness control: Dim the LCD brightness during periods of inactivity to reduce power consumption and extend the service life of the display.
- Screen saver: Activate the screen saver for longer periods of inactivity.
- After longer operating time > 8 hrs: Switch off the display for at least 20% of the active time or activate the screen saver.
- Ambient temperature: At high ambient temperatures, it is advisable to switch off the display more frequently or to use a screen saver.

### SIMATIC screen saver "Anti Image Sticking"

The SIMATIC screen saver "Anti Image Sticking" is a standalone software component that is installed automatically with the configuration tool SIMATIC IPC Panel Drivers and Tools (PDT) V1.7 or higher. SIMATIC IPC Panel Drivers and Tools V1.7 or higher differs from the previous version only with respect to the SIMATIC screen saver, which you configure using the IPC Configuration Center.

**NOTICE**

**Intended use**

SIMATIC IPC Panel Drivers and Tools V1.7, or higher, can only be used with devices intended for it. You can find information on valid devices and the corresponding software versions in the associated documentation at (Page 10).

## Defective pixels in the LCD-TFT display

**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)**<br>The device contains electronic components which may be destroyed by electrostatic charge. This can result in malfunctions and damage to the machine or plant.<br>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, some areas or components may, possibly due to other devices, be under life-threatening voltage.

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

### Ambient and environmental conditions

**NOTICE**

**Ambient conditions and chemical resistance**

Unsuitable ambient conditions can cause faults or damage the device.
Failure to comply nullifies the warranty in accordance with IEC/UL/EN/DIN-EN 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:

- The climatic and mechanical environmental conditions specified in the operating instructions.
- Do not operate the device in severe operating conditions which are subject to caustic vapors or gases.
- For installation in a cabinet, observe the SIMATIC setup guidelines as well as the relevant DIN/VDE requirements or the applicable country-specific regulations.
- Always maintain a minimum clearance of 50 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 outside the specified interference immunity ranges can result in device malfunctions.

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.

## See also

Ambient conditions (Page 92)

## 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**

When measuring the counter emf, remember the following:

- The IPC 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 IPC should be connected.
- All other components in the plant must be active.

## 2.6 Notes on the touch screen

**⚠ WARNING**

**Personal injury or property damage due to incorrect operation**

Incorrect operation of devices with a touch screen can occur. This can result in personal injury or property damage.

Take the following precautions:

- Configure the plant so that safety-related functions are not operated with the touch screen.
- Switch off the device for cleaning and maintenance.
- Make sure that the touch screen is kept free of dirt.

**NOTICE**

**Damage to the touch screen**

Impact with hard objects as well as touching the touch screen with pointed or sharp objects can damage it and lead to a significant reduction in service life or even total failure of the touch screen.

Never touch the touch screen with pointed or sharp objects. Only touch the touch screen with your fingers, a touch stylus or an approved touch glove.

## Avoiding malfunctions

**⚠ WARNING**

**Personal injury or property damage due to no protective conductor**

An inadequate protective conductor or the lack of one might cause malfunction of the capacitive touch screen. Functions may not work properly. This can result in personal injury or property damage.

- Always connect the device to a protective conductor.
- Additional information on connecting the protective conductor can be found in the section "Connecting the protective conductor (Page 45)."

**⚠ WARNING**

**Danger of malfunction due to improper execution of gestures on the touch screen**

If gestures are executed incorrectly on the touch screen with multi-touch function, these gestures might not be recognized or could be recognized incorrectly. The entries made are then not implemented by the device or are implemented incorrectly or in an unintended manner.

Incorrect execution of multi-touch functions can lead to errors in the operation of the plant and thus to physical injury.

Note the following when operating the touch screen with multi-touch function:

- The touch screen reacts to contact on its surface, not to pressure.
- When using a touch pen: Operate the touch screen only with a touch pen for capacitive touch.
- Avoid unintended multiple touches, for example, with your knuckles.

Before you start to operate the device, make sure you are familiar with the multi-touch functions of the Windows operating system, as well as with the application to be used and its functions. Ensure that the gestures which the user executes on the multi-touch display are recognized by the application. It is possible that certain gestures need to be trained beforehand.

**⚠ CAUTION**

**Unintentional actions with touch screen operation**

If you touch the touch screen while system-internal processes are running, unintended reactions of the device might be triggered.

Do not touch the screen in the following situations:

- During the boot process
- When plugging or unplugging USB components
- While Scandisk is running
- During a BIOS update

## 2.7 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 for the device.
- When in doubt, install the device in an enclosure that meets the requirements of paragraph 9.3.2 of the IEC/UL/EN/DIN-EN 61010-2-201 standard.

**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.

### 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.

# Installing and connecting the device

# 3

## 3.1 Preparing for installation

### 3.1.1 Scope of delivery

#### Device and hardware for the device

- Panel PC SIMATIC IPC PX-39A
- 12 mounting clips
- 1 power plug latch
- 1 strain relief for USB and LAN interfaces (only if ATEX option ordered)
- 1 USB flash drive with Restore or Documentation and Drivers set (optional, if ordered)

#### Operating system

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

You can find information on ordered Microsoft® Windows® operating systems under: Important instructions and manuals for operating the device (Page 10) or Technical specifications of the operating systems (Page 97).

#### Installed software

- 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 19)

#### Printed documents

- Quick Install Guide SIMATIC IPC PX-39A
- Product Information "Important notes on your device"

### 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 24)".

**Procedure**

1. Check the delivery unit for any signs of visible transport damage.

   If any transport damage is present at the time of delivery, lodge a complaint at the shipping company in charge. Have the shipper confirm the transport damage immediately.

2. Unpack the device at its installation location.
3. Keep the original packaging in case you have to transport the unit again.
4. Check the Scope of delivery (Page 31) and any accessories you may have ordered for completeness and damage.

   If the contents of the package are incomplete, damaged or do not correspond to your order, you can use the After Sales Information System (ASIS) (http://siemens.com/asis) to provide feedback on product deliveries and repairs.

   Complete the online form for product delivery (quality control notification) under the heading "Product delivery: Feedback on quality control and repairs".

5. Please keep the documentation in a safe place. It is required for initial commissioning and is part of the device.
6. Note down the Identification data of the device (Page 33).

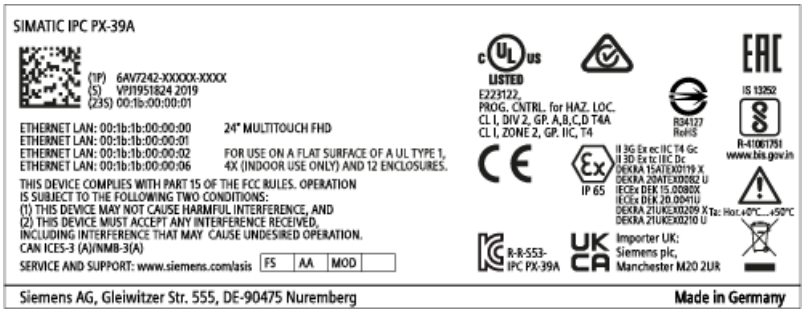
## 3.1.3 Identification data of the device

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 figure shows the nameplate on the SIMATIC IPC PX-39A as an example.




### COA label

The COA label (Certificate of Authenticity) is located on the side of the device.

**Note**

The COA label is only available on devices shipped with an installed Microsoft® Windows® operating system.

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



## 3.1.4 Mounting positions

**NOTICE**

**Approval in accordance with IEC/EN/UL61010**

The device meets the requirements for a fire protection enclosure according to section 9.3.2. c) of IEC/UL/EN/DIN-EN 61010-1 and IEC/UL/EN/DIN-EN 61010-2-201 only in the standard mounting position, installation in horizontal format with maximum inclination of ±45° (see screen).

If the device is installed in an enclosure that complies with section 9.3.2. c) of IEC/UL/EN/DIN-EN 61010-1 und IEC/UL/EN/DIN-EN 61010-2-201, the device can also be operated in vertical mode. The device is then classified as "OPEN EQUIPMENT".

**Note**

**Operation in closed rooms**

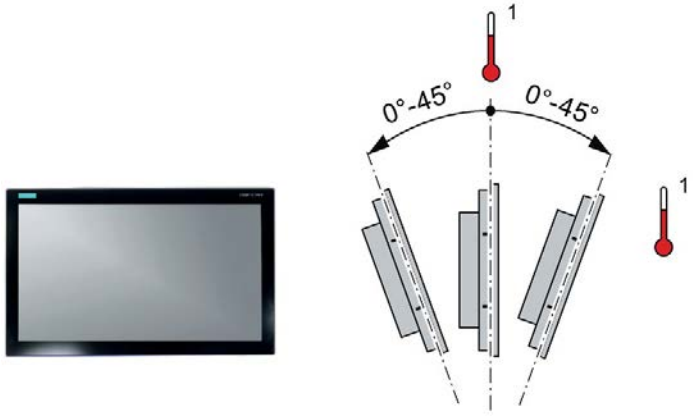
The device is approved for operation in closed rooms only.

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 92)".

### Mounting in horizontal format

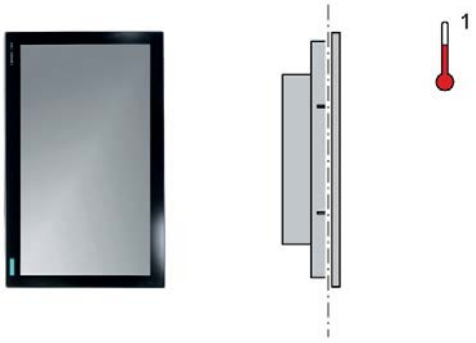
Vertical mounting in horizontal format or inclined mounting in horizontal format with vertical inclination of max. ±45°:




[1] For temperature specifications, see section "Ambient conditions (Page 92)".

### Mounting in vertical format

Upright mounting in vertical format:




[1] For temperature specifications, see section "Ambient conditions (Page 92)".

The power supply is located at the top.

## 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 37)".

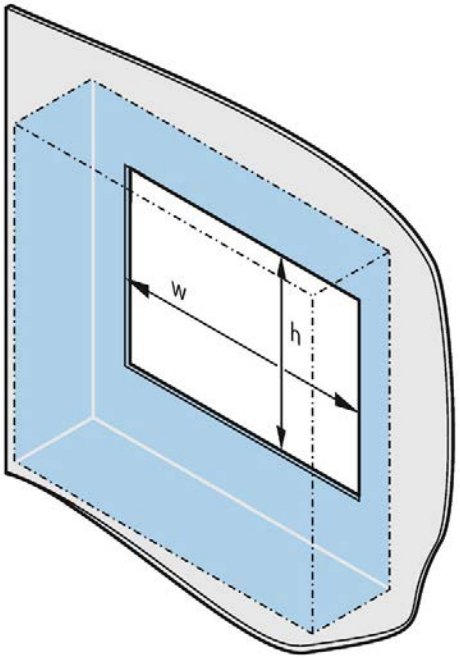
### Requirements for complying with degree of protection

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 a degree of protection IP65 or Enclosure Typ 4X/Typ 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 | | | |
|---|---|---|---|---|---|
| | **12"** | **15"** | **19"** | **22"** | **24"** |
| Width w [1] | $310^{+1}$ mm | $382^{+1}$ mm | $448^{+1}$ mm | $513^{+1}$ mm | $569^{+1}$ mm |
| Height h [1] | $221^{+1}$ mm | $241^{+1}$ mm | $278^{+1}$ mm | $315^{+1}$ mm | $347^{+1}$ mm |

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

### Installation depth

Information on the overall depth is available in the section "Dimension drawings (Page 98)".

# 3.2 Installing 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 25)
- Notes on ambient and environmental conditions (Page 25)

**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 35).
- For installation in control cabinets, note the SIMATIC setup guidelines as well as the relevant DIN/VDE requirements or the country-specific regulations.
- Provide adequate volume in the control cabinet for air circulation and heat transport. Keep at least 50 mm 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

Mounting positions (Page 34)

## 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.

### Requirements

- 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.

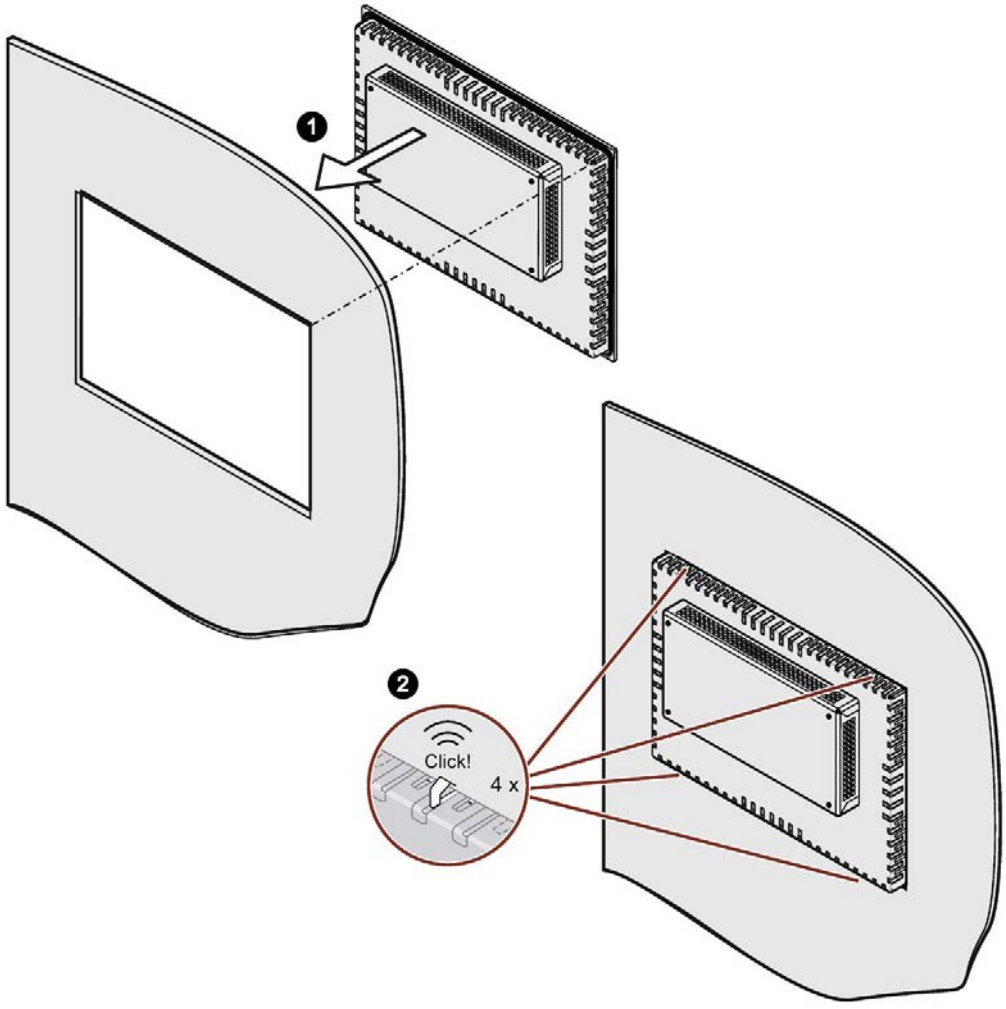
### Procedure

**Note**

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

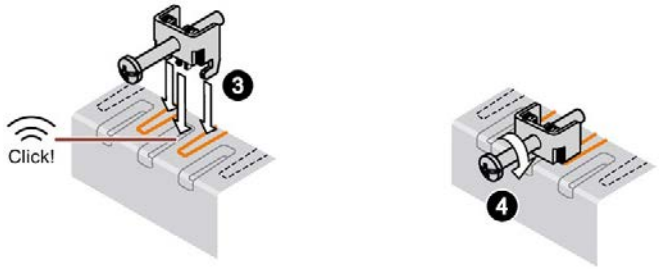
It is prohibited from mounting the device if the mounting seal is damaged.

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.

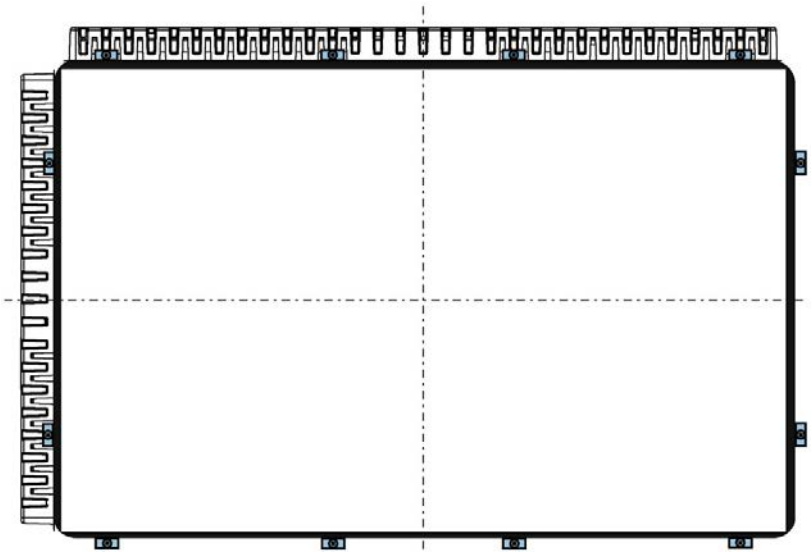
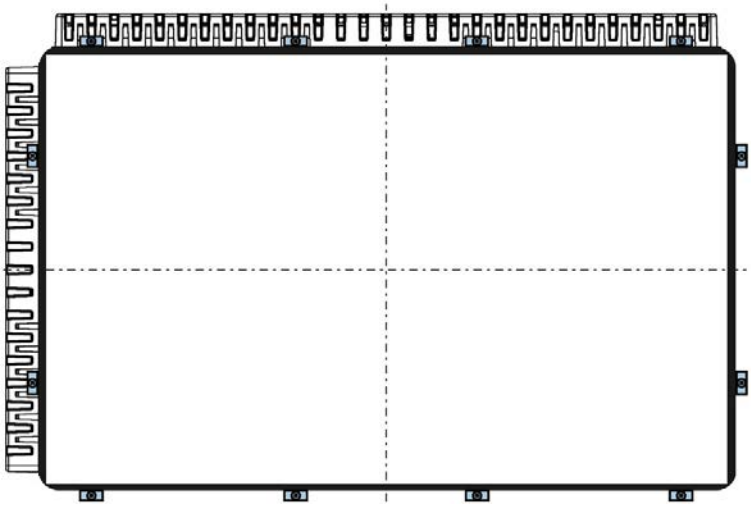


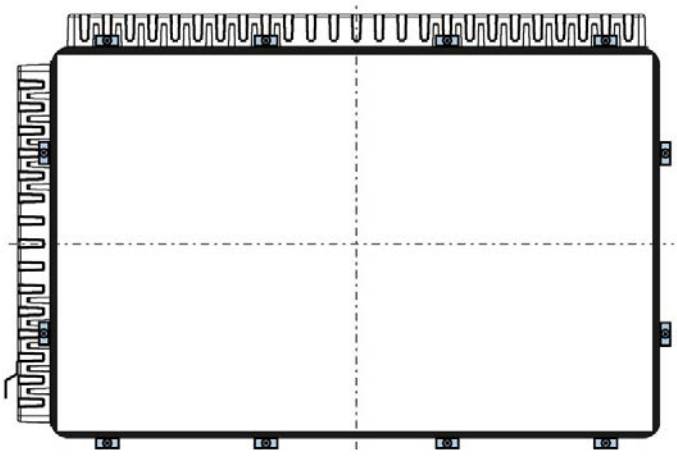
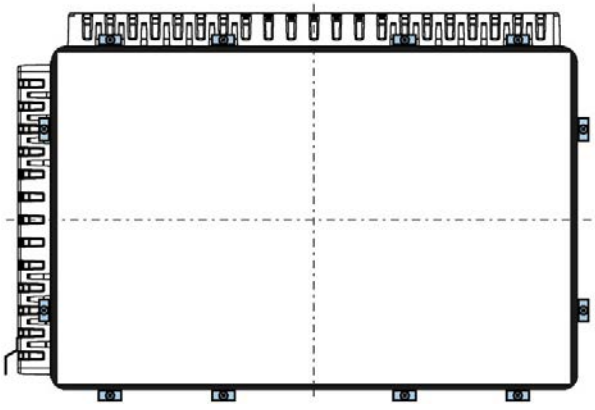
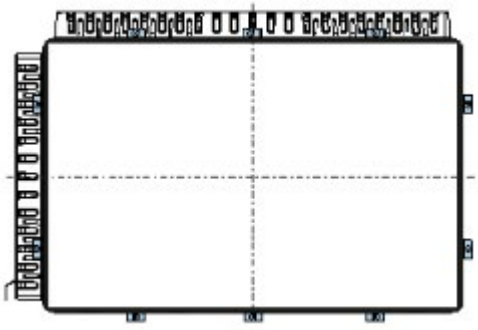

4. To secure the mounting clip, tighten the grub screw with the slot screwdriver, torque 0.5 Nm.

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 |  |
| 15" display |  |
| 12" display |  |

### 3.2.3 Fastening a device using a VESA adapter

You can also fasten the SIMATIC IPC PX-39A up to a display size of 24" using a 100 x 100 mm VESA adapter.

Different models of VESA adapters are offered by third-party manufacturers.

**NOTICE**

**Approval in accordance with IEC/EN/UL61010**

The device meets the requirements for a fire protection enclosure according to section 9.3.2. c) of IEC/UL/EN/DIN-EN 61010-1 and IEC/UL/EN/DIN-EN 61010-2-201 only in the standard mounting position, installation in horizontal format with maximum inclination of ±45° (see screen).

Using the device in the vertical mounting position with a VESA adapter is not permitted within the scope of UL61010-2-201.

**NOTICE**

**Degree of protection for overall device**

If you are fastening the device via a VESA adapter, degree of protection IP65 of the device is lost.

Spray and water jets as well as penetrating substances can then damage the device.

**NOTICE**

**Dimensioning of the VESA adapter**

When selecting the VESA adapter, make sure that it is designed for at least four times the weight of the device.

**WARNING**

**The device must be mounted securely**

Inadequately dimensioned fastening material may cause the device to fall down. Serious bodily injury may result.

Make sure that fasteners are adequately dimensioned during installation of the device. Make sure to consider the weight of the device and the forces acting on the device when dimensioning the fasteners. This applies in particular to dynamic load of the device. All fasteners including mounting surfaces, support arm systems, and fastening elements such as screws must be able to carry at least four times the weight of the device.

Observe any further statutory specifications applying at the location of use of the device and further applicable regulations with regard to the fastening of the device.

## Procedure

1. Attach the VESA adapter 100 x 100 mm to the marked locations.
2. To do this, use M4x10 screws with property class 8.8 and tighten these with a torque of 3 Nm.



# 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 Connecting the protective conductor

The protective conductor connection is needed to protect the device. The protective conductor discharges dangerous currents, triggering a surge protection switch. The protective conductor also improves the discharge of interference generated by external power cables, signal cables or cables for I/O devices to ground.

The connection for the protective conductor is labeled with the following symbol:



### Requirement

- The device has been installed.
- 1 protective conductor, minimum cross section 2.5 $mm^2$ = AWG14
- 1 T20 screwdriver
- 1 x M4 cable lug

### Procedure

1. Crimp the cable lug onto the protective conductor.
2. Screw the cable lug onto the protective conductor connection as shown.



3. Wire the protective conductor to the protective conductor connection of the control cabinet in which the device is installed.

### 3.3.3 Connecting the power supply

#### 3.3.3.1 Connecting 100-240 VAC power supply

**WARNING**

**Safety regulations- connecting cable**

Use only AC 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 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 switch does not fully disconnect the device from the line voltage.

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, 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.

**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.

**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

- The device has been installed.
- You have observed the information under "Country-specific information on supply voltage (Page 44)".
- Screwdriver T10

## Procedure

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



2. Insert the capacitor IEC plug at the marked position.



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

## See also

Connecting the protective conductor (Page 45)

### 3.3.3.2 Connect terminal for 24 V DC

The connection terminal for connecting the power supply is fitted to the device.

- The connection terminal is designed for wires with a cross-section of between 0.25 mm² and 2.5 mm².
- Only connect cores with a cross-section of ≥ 0.5 mm².
- You can use either semi-rigid or flexible cables.
- You do not need to use end sleeves.

#### Requirements

- The external 24 V DC power supply is switched off.
- 1 connection terminal
- 1 0.6 × 3.5 mm Philips screwdriver

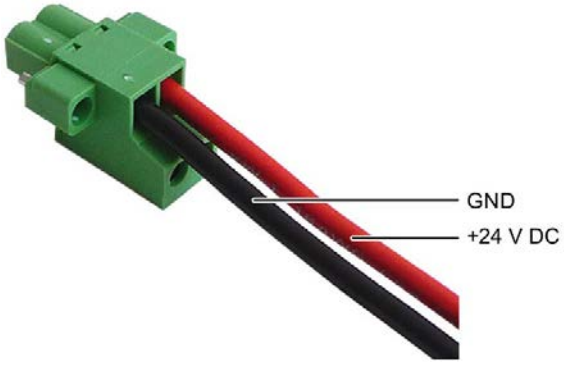
#### Procedure

| NOTICE |
| --- |
| **Damage to the device**<br>Do not adjust the screws in the connection terminal when it is plugged into the device.<br>The pressure of the screwdriver on the connection terminal and the socket can damage the device.<br>• Connect the wires to the connection terminal when it is not plugged in. |

**Note**

Make sure that the cores are connected to the correct terminals. Observe the labeling for the contacts on the device.

1. Connect the cables as shown with a tightening torque of 2.5 Nm. Make sure the connection terminal is in the correct position as shown.



### 3.3.3.3 Connecting the 24 V DC power supply

Please note the following to ensure you operate the device safely and in accordance with regulations:

**⚠ WARNING**

**Safety regulations - connecting cable**

Use only 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 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 switch does not fully disconnect the device from the line voltage.

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.

**NOTICE**

**Approval in accordance with IEC/EN/UL61010**

The device may only be connected to a 24 V DC power supply which meets the requirements of a safe extra-low voltage (SELV/PELV) in accordance with standard IEC/UL/EN/DIN EN 61010-2-201.

**Note**

**Reverse polarity protection**

The 24 V DC power supply is protected against polarity reversal. If you mix up 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.

## Requirement

- The device has been installed.
- The protective conductor (Page 45) is connected.
- 1 wired terminal (Page 48).

  The corresponding 24 V DC power supply is off.
- A two-core copper cable with a cable cross-section of ≥ 0.5 $mm^2$ for the 24 V DC connection

  The two-core copper cable must be suitable for temperatures of at least 95 °C.
- 1 0.6 × 3.5 mm flat-tip screwdriver

## Procedure

1. Ensure that the ON/OFF switch is in position "O" (Off) to avoid unintentional startup of the device when you plug in the power cable.
2. Insert the terminal at the marked position.
3. Secure the terminal using the integrated screws.



## 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 27)".

### 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 "Interfaces and operator controls for devices with 24 V DC power supply (Page 14)" or "Interfaces and operator controls for devices with 100-240 V AC power supply (Page 15)".

2. Secure the cables with the strain relief.

   See: Securing the lines (Page 54)

### Connecting several monitors (multi-monitoring)

You will find two ports on the front 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 necessary, you can configure the multi-monitoring function and the output of the boot screen in the firmware/BIOS settings, see "Multi-monitoring (Page 58) ".

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

| | | Motherboard | |
|---|---|---|---|
| | | DPP1 | DPP2 |
| Monitor 1 | DP | X | - |
| | DVI | X 1) | - |
| | VGA | X 2) | - |
| Monitor 2 | DP | - | X |
| | DVI | - | X 1) |
| | VGA | - | X 2) |

1) - via DP to DVI-D adapter

2) - via DP-VGA adapter

## 3.3.5 Connecting expansion cards

This section applies to devices with expansion cards.

**CAUTION**

**Fire hazard due to overheating of the device**

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

- Observe the safety and installation instructions for the expansion cards.
- Observe the max. permissible power consumption values for the device.
- When in doubt, install the device in an enclosure that meets the requirements of paragraph 9.3.2 of the IEC/UL/EN/DIN-EN 61010-2-201 standard.

### Requirements

- The device is switched off.

### Procedure

The procedure is described based on the example of a USB expansion card.

1. Connect the cable to one of the indicated slots.



### 3.3.6 Connecting the device to networks

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

#### Ethernet

You can use the integrated Ethernet interfaces (10/100/1000 Mbps) for communication and data exchange with automation devices, e.g. SIMATIC S7.

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

#### PROFINET

PROFINET can be operated via:

- Standard Ethernet interfaces (RT)

#### SIMATIC NET

Use this software package to create, operate and configure an innovative network for Field & Control level. You can find information on this under SIMATIC NET (http://w3.siemens.com/mcms/automation/en/industrial-communications/Pages/Default.aspx).

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

#### Additional information

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

## 3.3.7 Securing the lines

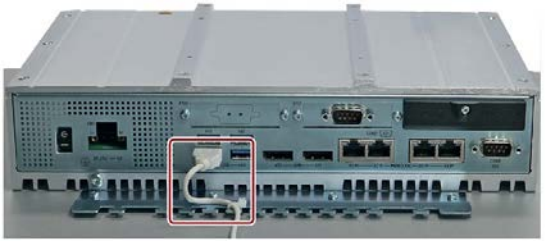
The strain relief (see "scope of delivery (Page 31)") provided is used to prevent accidental loosening of the interface cables from the device.

### Requirements

- I/O devices are connected to the respective interfaces.
- Cable ties (not included in the scope of delivery)

### Procedure

1. Pass the cable tie around the strain relief bar and secure the cables as shown.
2. Cut off the protruding ends of the cable ties.



# Commissioning the device

# 4

## 4.1 Switching on the device

### Requirements

- The power supply is connected.

### Procedure

1. Switch the ON/OFF switch at the front of the device on ("ON" position when the symbol "_" is pressed in).

Information on the position of the switch is available under "Interfaces and operator controls for devices with 24 V DC power supply (Page 14)" or "Interfaces and operator controls for devices with 100-240 V AC power supply (Page 15)".

### 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.

See also "Important instructions and manuals for operating the device (Page 10)" for more on this.

## 4.2 Switching off the device

### Shutting down the operating system

**For active operating system**

- Shut down the operating system properly.

**Result**

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 switch does not fully disconnect the device from the line voltage.

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, 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 front of the device, see "Interfaces and operator controls for devices with 24 V DC power supply (Page 14)" or "Interfaces and operator controls for devices with 100-240 V AC power supply (Page 15)".

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.

- Press the on/off switch to trigger a hardware reset, see "Interfaces and operator controls for devices with 24 V DC power supply (Page 14)" or "Interfaces and operator controls for devices with 100-240 V AC power supply (Page 15)".

### See also

General safety instructions (Page 20)

# Operating the device

# 5

## 5.1 Operator input options

### 5.1.1 Operating a device with capacitive multi-touch screen

Depending on your device and the connected I/O devices, the following operating options are available:

- Touch screen for touch device
- Screen keyboard for touch device
- External keyboard, connected via USB
- External mouse, connected via USB

#### Operating the multi-touch screen

**⚠ WARNING**

**Danger due to improper operation of the multi-touch screen**

Improper handling of the multi-touch screen may result in property damage or danger to the user.

- For this reason, please observe the information in "Notes on the touch screen (Page 28)".

- You operate the multi-touch screen with up to five fingers simultaneously.
- In addition, you operate via gestures that are supported by the operating system or software installed on the device.

**Note**

Multi-touch operation can provide advanced features or pose limitations depending on the operating system and the software installed on the device. Observe the corresponding documentation.

Note when operating the multi-touch screen:

- Surface contact with a diameter of about 5 to 20 mm is required for an operator action to be detected.
- An operation with gloves with a material thickness of < 2 mm is detected in most cases. Check the usefulness of the gloves you are using.

- To avoid incorrect operation, certain inputs are ignored and blocked from further entry:
  - Simultaneous operation with more than 5 fingers.
  - Surface contact with a diameter of > 3 cm, for example, resting the palm of the hand on the multi-touch screen
  - As soon as the multi-touch screen is no longer touched, input is possible again.
- In the event of the following malfunctions, the multi-touch screen is locked for safety reasons:
  - On the multi-touch screen there is a conductive liquid with ground contact via the housing or e.g. the operator.
  - Electromagnetic interference is present that exceeds the specification according to EN 61000-4-2.
  - As soon as the malfunction has been remedied, the multi-touch screen is unlocked.

### 5.1.2 SIMATIC IPC Panel Drivers and Tools

The "SIMATIC IPC Panel Drivers and Tools" software installs the "IPC Configuration Center" and, optionally, the "IFP Ethernet Monitor" software. The existing hardware components are automatically detected.

The most important features of the software are:

- Configuration with IPC Configuration Center:
  - Brightness
  - Screen saver
  - Tools
  - Touch settings
- Configuration with IFP, Ethernet monitor:
  - Ethernet Monitor settings

For information on the software and documentation of "SIMATIC IPC Panel Drivers and Tools", refer to the detailed PDT description, see "Important instructions and manuals for operating the device (Page 10)".

## 5.2 Multi-monitoring

You can operate several monitors on one device at the same time. You have the following option for multi-monitoring:

Direct connection of the monitors to the two DisplayPort ports on the front of the device, see "Connecting I/O devices (Page 51)"

**See also**

Service and support (Page 123)

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

Expansion cards (Page 71)

# 5.3 Drive configurations

## 5.3.1 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.

- You can find information on operating a RAID1 system here:

  Onboard RAID system (Page 60)

## 5.3.2 System with 2 drives

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

In the device delivery state, the second drive is not yet set up. You have the option of backing up your data to this drive.

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

# 5.4 Onboard RAID system

## 5.4.1 Display of a defective drive of an onboard RAID system

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

- Status displays (Page 16) on the front of the device
- "Intel® Optane™ Memory and Storage Management (Page 60)"

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

**Note**

**Different numbering of the drives**

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

| "Intel® Optane™ Memory and Storage Management" | Status indicator for the system (Page 16) on the front of the device | Mounting location |
|---|---|---|
| Controller 3, Port 0 | SSD1 ALARM | Mounting location X50 |
| Controller 2, Port 0 | SSD2 ALARM | Mounting location X51 |

## 5.4.2 Operating an onboard RAID system

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

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

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

### Open "Intel® Optane™ Memory and Storage Management"

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

## Initializing the onboard RAID system

**Note**

The onboard RAID system must be initialized once after the device is commissioned to guarantee proper functioning of the onboard RAID system.

1. Select the "Manage" tab.
2. Left-click on the "Volume" tile.

   An additional menu opens.
3. Left-click on "Initialize" in this menu.

   The onboard RAID system is initialized. The initialization can take quite some time, e.g. several hours or even days with extremely high drive load.

## Display status of the onboard RAID system (faulty drive)

1. Select the "Manage" tab.

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

   **Note**

   **Different numbering of the drives**

   Note the different numbering of the drives for "Intel® Optane™ Memory and Storage Management" and the device. See important note under "Display of a defective drive of an onboard RAID system (Page 60)".
2. Right-click on a drive from the list or on the "Volume" tile.

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

### 5.4.2.2 Integrating a new drive into an onboard RAID system

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

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

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

| **NOTICE** |
| --- |
| **Risk of data loss**<br>If a new drive is automatically integrated, the new drive is not checked for partition information or existing data.<br>All partitions and data of the new drive are deleted without warning.<br>• Insert only a brand new drive or a drive that is configured as a replacement drive. |

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

As soon as the replacement drive has been plugged in, the rebuild process starts on this drive.

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

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

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

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

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

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

### Requirement

- The system is configured to mount new drives manually (not automatically), see above.
- The defective drive has been removed from the device and the new replacement drive has been installed in its place (hot-swapping possible). See important information under "Display of a defective drive of an onboard RAID system (Page 60)".

### Procedure

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

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

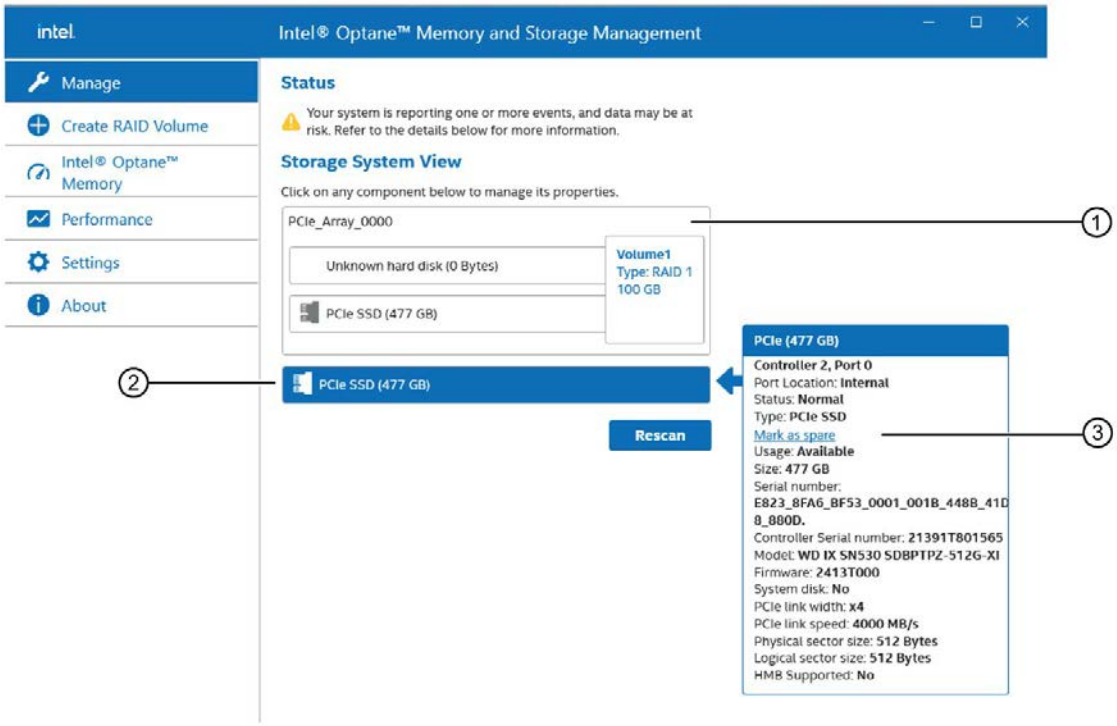
   ① The drives mounted in the onboard RAID system with the information that a drive is not yet mounted (Unknown hard disk).

   ② List of available drives and systems.

**Note**

**Different numbering of the drives**

Note the different numbering of the drives for "Intel® Optane™ Memory and Storage Management" and the device. See important note under "Display of a defective drive of an onboard RAID system (Page 60)".



4. Right-click on the new drive.
5. From the drive information, select the function "Mark as spare" ③ and confirm your selection.

   The rebuild operation starts immediately on the plugged replacement drive.

**See also**

Data synchronization in the RAID system (Page 64)

## 5.4.3 Data synchronization in the RAID system

| NOTICE |
| --- |
| **Danger of incorrect operations on machine and plant: delayed system reaction during data synchronization**<br>Data is synchronized if a drive fails.<br>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.<br>The result may be faulty operations of the machine or plant.<br>• 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.

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

# 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 into the hardware and firmware/BIOS of the computer.

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 control (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.<br>A KVM remote session is always possible with the KVM server integrated in the firmware/BIOS. 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.<br>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. |

### Requirements

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/BIOS.

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

## 5.6 Trusted Platform Module (TPM)

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

| **NOTICE** |
| --- |
| **Import restrictions for the Trusted Platform Module**<br>Use of the Trusted Platform Module is subject to legal restrictions in some countries and is not permitted there.<br>• Be sure to observe the respective import restrictions of the country in which the device will be used. |

### Activate the Trusted Platform Module

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

## 5.7 Buffer memory NVRAM (optional)

Depending on the configuration ordered, the motherboard is equipped with an NVRAM that applications can use to back up data in the event of a power failure.

Failure of the supply voltage for a duration longer than 5 ms is indicated by the DC FAIL signal.

Depending on the system utilization, up to 512 KB can be saved in the NVRAM. A memory window with a maximum size 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 SIMATIC Software Controller.

# Expanding and assigning parameters to the device 6

## 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 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 30)".

**⚠ 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:

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

**NOTICE**

**Electrostatic sensitive devices (ESD)**

The device contains electronic components which may be destroyed by electrostatic charge. This can result in malfunctions and damage to the machine or plant.

Take corresponding precautionary measures before you open the device.

### Requirements

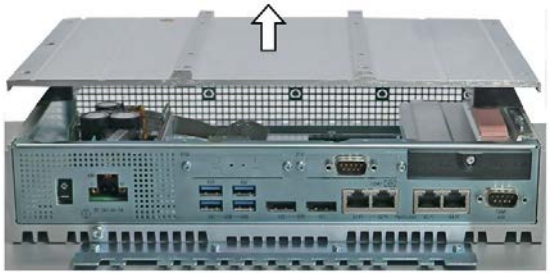
- The device is fully disconnected from the line voltage, see "Switching off the device (Page 56)".
- All connecting cables are unplugged.
- Screwdriver of type Torx T10

## Procedure

1. Remove the marked screws.



2. Lift off the front panel.
3. Put down the front panel.



Close the device in reverse order.

## 6.2 Open device with expansion slot

**⚠ WARNING**

**Risk due to unauthorized opening and improper repairs or expansions**

Improper procedure when carrying out expansions may result in 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 30)".

**⚠ 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:

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

**NOTICE**

**Electrostatic sensitive devices (ESD)**

The device contains electronic components which may be destroyed by electrostatic charge. This can result in malfunctions and damage to the machine or plant.

Take corresponding precautionary measures before you open the device.

### Requirements

- The device is fully disconnected from the line voltage, see "Switching off the device (Page 56)".
- All connecting cables are unplugged.
- Screwdriver of type Torx T10

## Procedure

1. Remove the marked screws.



2. Lift off the front panel in the direction of the arrow.
3. Put down the front panel.



Close the device in reverse order.

# 6.3 Expansion cards

## 6.3.1 Usable expansion cards

Expansion cards compliant with the following standards are supported:

- PCIe; Gen. 1, Gen. 2, Gen. 3, Gen. 4 (see also "Technical specifications of the motherboard (Page 94)")

### 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 107)".

### See also

Slot for expansion cards on the bus board (Page 117)

## 6.3.2 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 107)". If the permissible height is exceeded, contact problems, malfunctions and installation difficulties cannot be ruled out.
- You can find information on the type of expansion card you can install in specific slots under "Slot for expansion cards on the bus board (Page 117)".

### Device version




Figure 6-1 Device version with one PCIe slot

### Requirements

- You are familiar with the information on expansion cards and the conditions of use of expansion cards, see "Usable expansion cards (Page 71)".
- The device is open, see important information regarding this under "Open device with expansion slot (Page 69)".
- If the PCIe card to be used has external interfaces, you can use the installed slot brackets for mounting the connectors. You can also use a slot plate with connector perforations.
- Screwdriver of type Torx T10

### Procedure - Installation

1. Remove the screw (1) in the blanking plate for the slot and remove the blanking plate.
2. Remove the retainer (2).




3. Insert the expansion card into the slot on the bus board (3).
   Secure the expansion card with the corresponding screw.




4. Reinsert the clamp and slide the clamp in the direction indicated.
   Secure the clamp with the corresponding screw.



5. Close the device as specified in section "Open device with expansion slot (Page 69)".

### Procedure - Removal

Proceed in reverse order of installation.

### Configuring BIOS setup

You may need to make settings in the BIOS Setup. For detailed information about installation, please refer to the documentation provided with the specific expansion card.

# 6.4 Expansion modules (M.2)

## 6.4.1 Usable expansion modules (M.2)

The expansion modules (M.2) are referred to as **M.2 modules** below.

One or two M.2 modules compliant with the following specifications are supported:

| | **M.2 module 1 (X100)** | **M.2 module 2 (X101)** |
|---|---|---|
| Dimensions | 2230, 2242, 2260, 3030, 3042 | 2230, 2242, 2260, 3030, 3042 |
| Interface | Key B | |
| Protocols | 1 × PCIe 3.0 x2 lane<br>1 × USB 2.0 | |
| Buffer memory NVRAM | x | x |
| WLAN module[1], e.g. WiFi | x | x |
| WWAN module, e.g. LTE/ 5G | x | - |
| Field Bus | x | x |
| M.2 NVMe SSD | - | - |
| Artificial Intelligence | x | x |
| Special (Digital IO) | x | x |

[1] Key E/Key A+E is also possible via M.2 Key E-Key B adapter

### Conditions of use of M.2 modules

- The dimensions of the M.2 modules must not exceed the specified dimensions. If the dimensions are exceeded, you may experience contact problems, malfunctions and difficulties with the assembly.
- The connecting cable between M.2 modules and conditioner card should be at least 150 mm long.

### See also

Position of the interfaces on the motherboard (Page 115)

Dimension drawing of expansion modules (M.2) (Page 108)

## 6.4.2 Installing/removing expansion modules (M.2)

**Note**

**Requirement for M.2 modules**

- You can find the permitted dimensions for M.2 modules under "Usable expansion modules (M.2) (Page 73)". If the permissible height is exceeded, contact problems, malfunctions and installation difficulties cannot be ruled out.
- You can find information on which M.2 modules you can install in which slot under "Usable expansion modules (M.2) (Page 73)".

### Requirements

- You are familiar with the information on M.2 modules and the conditions of use of M.2 modules, see "Usable expansion modules (M.2) (Page 73)".
- The device is open, see important information regarding this under "Opening the Device (Page 67)" or "Open device with expansion slot (Page 69)".
- The M.2 NVMe SSDs in the SIMATIC IPC Slider have been removed, see "M.2 NVMe SSD in the SIMATIC IPC Slider (Page 79)".
- Adapter plates: If the M.2 module to be used has external interfaces, you can use the adapter plates supplied with the M.2 module to install the connectors.
- Screwdrivers of type Torx T10 and T8

### Procedure - Installation

1. Remove the SSD drive bay. To do this, remove the designated screw with the screwdriver of the type Torx T10 and pull out the SSD drive bay upwards.

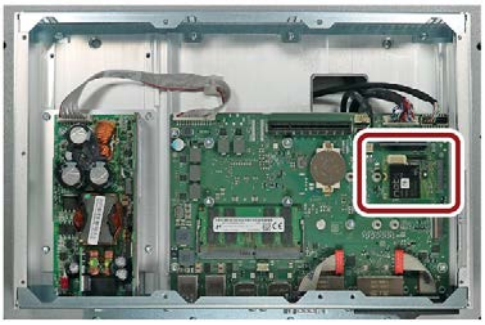
   Put down the SSD drive bay carefully on the side.



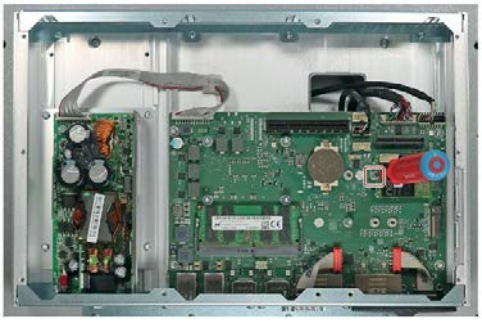
2. Remove the designated screw on the motherboard with the screwdriver of the type Torx T8.



3. Insert the M.2 module into the relevant slot (X100 or X101).
   Take care not to touch the contacts of the M.2 module when you do this.



4. Fasten the M.2 module with the screw that you removed in step 2.
   Only use the original screws with the spacers.
   **Note**: Make sure that the M.2 module is between the head and the spacer of the screw.



If the M.2 module includes a cable with an additional interface card that must be connected to the enclosure opening, you must also execute the following steps:

5. Loosen the marked screws for fixing the blanking cover using the Torx T10 screwdriver.



6. Place the additional interface card from the inside against the empty enclosure opening and fasten it using the screw.



7. Connect the cable of the interface card to the M.2 module.



8. Reinstall the SSD drive bay. To do so, insert it from the top at the respective location in the device and plug in the connector.

   **Note**: Be careful not to damage the cables.

   Reinstall the marked screw.



9. Close the device as specified in section "Opening the Device (Page 67)" or "Open device with expansion slot (Page 69)".

## Procedure - Removal

Proceed in reverse order of installation.

## Configuring BIOS setup

You may need to make settings in the BIOS Setup. For detailed information about installation, please refer to the documentation provided with the specific expansion module.

# 6.5 Memory modules

## 6.5.1 Installing and removing a memory module

The motherboard is equipped with one slot for an SO-DIMM DDR4 memory module. You can use it to expand the memory capacity of the device to a maximum of 32 GB.

### Usable memory modules

- DIMM DDR4 memory modules
- Memory transaction rate 3200 MT/sec "unbuffered"
- "without ECC" or "with ECC"

**Note**

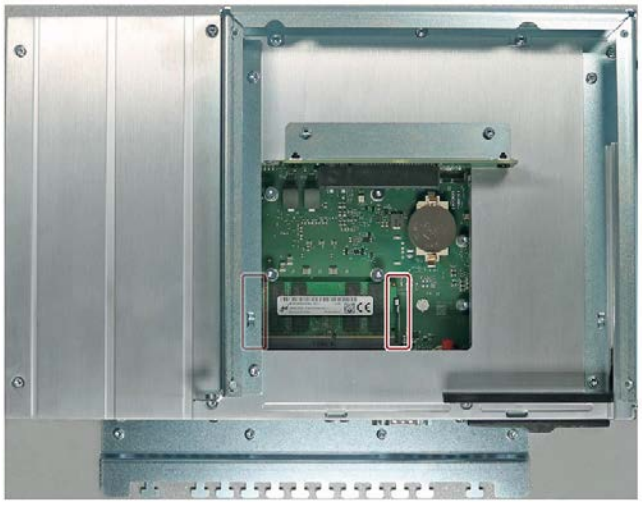
Use only the memory modules recommended by Siemens AG.

### Requirement

- The device is open, see important information under "Opening the device (Page 67)".

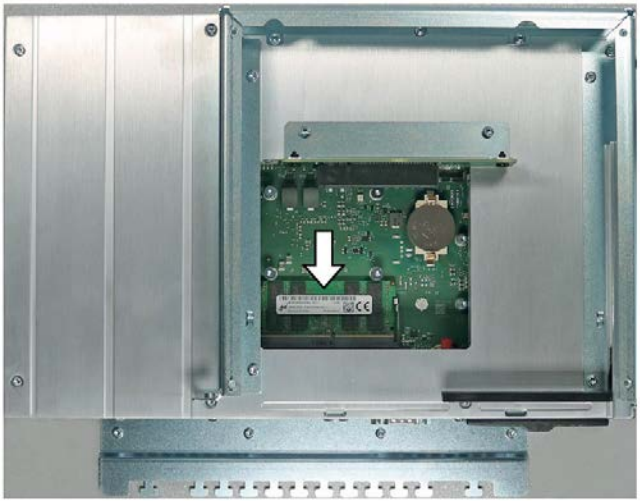
### Procedure - Removal

1. Push down the module clips towards the outside.
   The memory module tilts forward.
   **Note**: The left holder is located under the cover (not immediately visible from above)
2. Remove the memory module from the slot.



## Procedure - Installation

1. Insert the memory module into the marked slot at an incline with the contact side facing the motherboard.
2. Carefully press the memory module into the contact strip until the latches engage.



## After insertion and removal

Close the device.

The new memory capacity will be automatically detected and displayed in the BIOS setup when the device is switched on.

# 6.6 Drives

## 6.6.1 M.2 NVMe SSD in the SIMATIC IPC Slider

| NOTICE |
| --- |
| **Risk of damaging the drive and data loss**<br>When you remove the drive while data is being written to it, you may damage the drive and destroy data.<br>• Only remove the SIMATIC IPC Slider from the device when the drive is inactive.<br>• Observe the ESD guidelines. |

### Requirements

- Option 1: A drive of the same type approved for this device in the SIMATIC IPC Slider as an original spare part, see notes under "Hardware accessories (Page 19)".
- Option 2: M.2 NVMe SSDs with a length of 30, 42 or 80 mm
- The device is fully disconnected from the line voltage, see "Switching off the device (Page 56)".
- Screwdrivers of type Torx T10 and T8

### Procedure - Option 1

If you change a drive together with slider, then only steps 1 to 3 and then steps 12 and 13 need to be performed.

### Procedure - Option 2

1. Loosen the screw of the removable slider with the Torx T10 type screwdriver.



2. Remove the cover from the device and place it on the side.



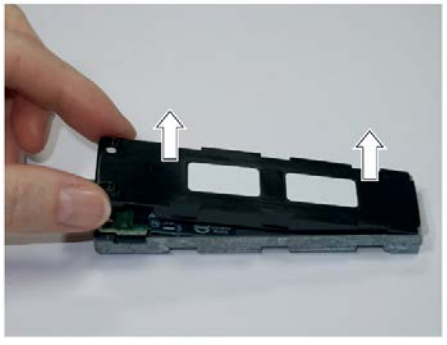
3. Pull out the slider in the direction of the arrow using the lug.



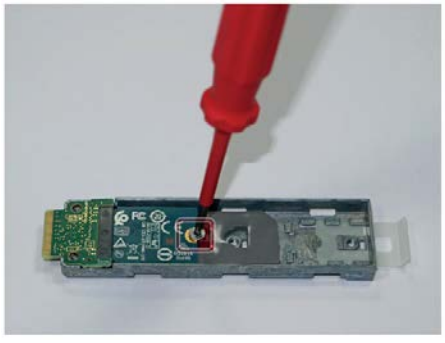
4. Place the slider on a suitable surface.
5. Remove the marked screws with the screwdriver of type Torx T8.



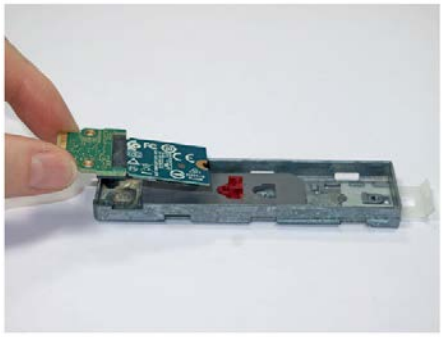
6. Remove the black plastic cover.



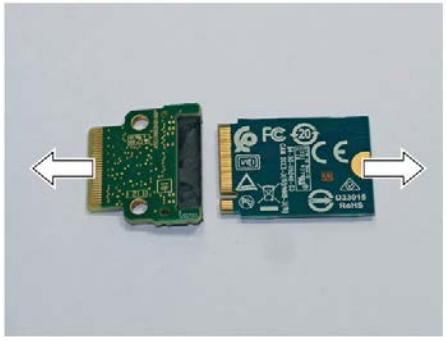
7. Remove the marked screw with the screwdriver of type Torx T8.



8. Remove the M.2 NVMe SSD as shown out of the slider.



9. Carefully separate the M.2 NVMe SSD from the adapter plate.



10. Plug the new M.2 NVMe SSD into the adapter plate. Make sure that the coding is aligned correctly.
11. Reassemble the slider completely with the newly inserted M.2 NVMe SSD - in reverse order to steps 8 to 5.

    Only use the original screws.

    If the card length has changed, the red spacer must be moved to the suitable screw position.
12. Slide the slider into the drive bay until you hear the slider click into place.
13. Place the slider cover in the device and fasten it with the Torx T10 type screwdriver.

**Note**

To ensure reliable operation of the devices with SIMATIC IPC Slider, the slider must be closed with the cover.

# Device maintenance and repair

# 7

## 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.

- For this reason, please observe the information in "Notes on device and system extensions (Page 30)".

## 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 |
|---|---|
| Backup battery | 5 years |
| SSD | Depending 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.

## 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 only a damp cloth to clean the device.

- See the notes under "Notes on ambient and environmental conditions (Page 25)".

### Cleaning the Device Front

1. Switch off the device.
2. Dampen the cleaning cloth.
3. Clean the device with the cleaning cloth.

# 7.4 Removing and installing hardware

## 7.4.1 Changing the backup battery

**WARNING**

**Risk of explosion and release of harmful substances**

Improper use and 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. Damaged batteries jeopardize the function of the device.

- Replace spent batteries promptly. See information in "Maintenance intervals (Page 82)".
- Replace the lithium battery only with an identical battery or types recommended/approved by SIEMENS.
- 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.

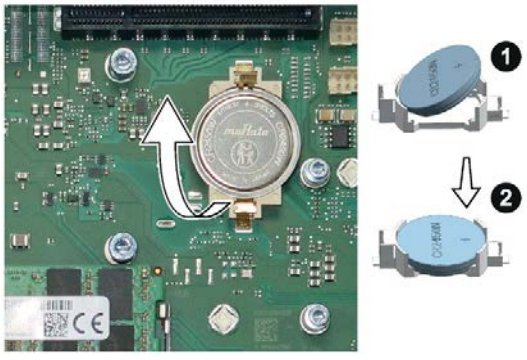
### Requirements

- An original spare part, that is a backup battery of the same type (article number of lithium battery: A5E50549527 CR2450-W).
- You have noted the current firmware/BIOS settings, because the configuration data of the device may be 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 10).
- The device is open, see important information regarding this under Opening the Device (Page 67).
- You have observed the local regulations relating to the disposal of used batteries.

### Procedure

1. Remove the battery from socket as shown.
2. Place the new battery below the two contacts (1) and press it into the base (2) while applying slight pressure.
3. Close the device.
4. Check the firmware/BIOS settings.



## 7.5 Installing operating system, software and drivers

You can restore the factory settings of the target system (i.e. the volume partitions, the operating system with installed device drivers, and the SIEMENS software products). This allows you to restore your device quickly if it has suffered damage.

### Provision of operating system, software and drivers

Possible sources of the Restore or Documentation and Drivers set:

- USB flash drive supplied (optional, if ordered)
- Online Software Delivery Portal: You can download the Restore or Documentation and Drivers Set for the device from the Online Software Delivery Portal. To do this, log in to Online Software Delivery Portal (https://www.automation.siemens.com/swdl/register/ipc), download the required data set and use it to create a bootable USB flash drive.
  For more information, see the Product Information for creating a bootable USB flash drive, see"Important instructions and manuals for operating the device (Page 10)".

### Installing the operating system

Additional information on restoring or reinstalling the operating system you ordered with the device can be found in the detailed description of the operating system, see "Important instructions and manuals for operating the device (Page 10)".

### Installing software and drivers

1. Insert the bootable USB flash drive into the device.
2. Start the "Documentation and Drivers" suite from the USB flash drive by executing the "START_DoucAndDrivers.CMD" file.
3. Install the desired software and drivers.

## 7.6 Configuring firmware/BIOS

For information on configuring firmware/BIOS and on the firmware/BIOS settings in the delivery state, refer to the detailed firmware/BIOS description, see "Important instructions and manuals for operating the device (Page 10)".

**Note**

If your IPC fails to boot, for example, by crashing during a BIOS update, contact your local SIEMENS representative.

You can find information on "BIOS Recovery" and "ME update" under "Pin assignment of the internal interfaces (Page 116)".

## 7.7 Backing up data and changing partitions

We recommend the "SIMATIC IPC Image & Partition Creator" software to back up data under Windows®, see "Important instructions and manuals for operating the device (Page 10)".

## 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 under "Validity of the technical specifications (Page 87)".

| | | | | | |
|---|---|---|---|---|---|
| Article number | 6AV7242-.....-.... (for details, refer to the ordering documentation) | | | | |
| Dimensions (W x H x D in mm) | 12" | 15" | 19" | 22" | 24" |
| Base device: | 326 x 237 x 99 | 398 x 257 x 101 | 464 x 294 x 101 | 529 x 331 x 101 | 585 x 361 x 101 |
| Device with 1x expansion: | 326 x 237 x 124 | 398 x 257 x 126 | 464 x 294 x 126 | 529 x 331 x 126 | 585 x 361 x 126 |
| Weight | 12" | 15" | 19" | 22" | 24" |
| Base device: | Approx. 6 kg | Approx. 7 kg | Approx. 8 kg | Approx. 9.5 kg | Approx. 11 kg |
| Device with 1x expansion: | Approx. 6.5 kg | Approx. 7.5 kg | Approx. 8.5 kg | Approx. 10 kg | Approx. 11.5 kg |
| Supply voltage AC | Nominal 100 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 1.1 A | | | | |
| Input current DC | Continuous current up to 5 A | | | | |
| Short-term voltage interruption in accordance with Namur | max. 20 ms<br>(Max. 10 events per hour; recovery time of at least 1 s) | | | | |
| Max. power consumption | 98 W | | | | |
| Noise emission | < 40 dB(A) according to DIN 45635-1 | | | | |
| Degree of protection | IP 20 according to IEC 60529 [2]<br>IP 65 (front) UL50E Type 1, 4X (indoor) and 12 | | | | |
| Quality assurance | In accordance with ISO 9001 | | | | |

| **Safety** | |
|---|---|
| Protection class | Protection class I to IEC 61140 |
| 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) |
| Safety specifications | • IEC 61010-2-201<br>• EN 61010-2-201<br>• DIN EN 61010-2-201<br>• UL 61010-2-201<br>• CSA C22.2 No 61010-2-201 |

[1] The device may only be connected to a 24 V DC power supply that meets the requirements for safe extra-low voltage (SELV/PELV) in accordance with the IEC/UL/EN/DIN-EN 61010-2-201 standard (see section "Connecting the 24 V DC power supply (Page 49)").

[2] not evaluated by UL

# 8.3 Current/power requirements and power supply

## 8.3.1 Current and power requirements of the system components

### Maximum current values

| Component | Voltage | | |
|---|---|---|---|
| | +3.3 V | +5 V | +12 V |
| USB port [1, 4] | - | 0.9 A | - |
| DisplayPort | 1 A | - | - |
| M.2 NVMe SSD in the SIMATIC IPC Slider | 3.3 A | - | - |
| M.2 slot [2, 4] | 2 A | - | - |
| PCIe slot [3, 4] | 1.5 A | - | 0.5 A |

1 Maximum total power 10 W for all USB devices

2 The total power for each M.2 slot must not exceed 2.5 W. The total power for both M.2 slots must not exceed 5 W.

3 The total power for each PCIe slot must not exceed 8 W.

4 The total power for all USB ports, M.2 and PCIe slots must not exceed 15 W.

### Typical power values

| Component | Current consumption 24 V DC | Power consumption efficiency 0.85 |
|---|---|---|
| Device with BIOS setting "Power & Performance Scenario" = "High Temperature" or "Stable Performance" | 1 A | 25 W |
| Device with BIOS setting "Power & Performance Scenario" = "Balanced" | 1.3 A | 31 W |
| Device with BIOS setting "Power & Performance Scenario" = "Max Performance" | 1.75 A | 42 W |
| USB ports - additional | 0.5 A | 12 W |
| NVMe SSDs in the SIMATIC IPC Slider - additional | 0.25 A | 5.9 W |
| M.2 slots - additional | 0.25 A | 5.9 W |
| PCIe slot - additional | 0.38 A | 9.2 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. 1.1 A |
| Starting current (load-independent) | to 50 A for 1 ms |
| **Output data** | |
| Voltages | 12 V DC / 6.7 A |
| Secondary power output | Max. 80 W |

## 8.3.3 Technical specifications DC power supply (DC)

| | |
|---|---|
| Degree of protection | IP20 (in installed state) |
| Protection class | VDE 0106 |

| Power supply characteristics | DC power supply |
|---|---|
| **Input data** | |
| Voltage | Nominal 24 V DC (-20% / +20%), SELV, isolated |
| Continuous current | Max. 5 A |
| Starting current (load-independent) | Max. 75 A for 0.2 ms<br>Max. 9 A for further 5 ms<br>Max. 8 A for further 40 ms |
| • $I^2t$ value: | Max. 4.1 $A^2s$ |
| Active power | 94 W |
| **Output data** | |
| Voltages | +12 V / 6.7 A |
| Secondary power output | Max. 80 W |

## 8.4 Electromagnetic compatibility

See the note in "Applicability of technical specifications (Page 87)".

| | |
|---|---|
| Interference emission | EN 61000-6-4, CAN/CSA CISPR32 Class A; KS C 9610-6-3, FCC Class A |
| Immunity to interference | EN 61000-6-1; EN 61000-6-2; KS C 9610-6-2 |
| Interference immunity on the supply lines | ± 2 kV according to IEC 61000-4-4; burst<br>± 1 kV according to IEC 61000-4-5; symmetrical surge<br>± 2 kV according to IEC 61000-4-5; asymmetrical surge |
| Noise immunity on signal lines | ± 1 kV acc. to IEC 61000-4-4; burst; length < 30 m<br>± 2 kV acc. to IEC 61000-4-4; burst; length > 30 m<br>± 2 kV acc. to IEC 61000-4-5; surge; length > 30 m |
| Immunity to electrostatic discharge | ± 6 kV contact-mode discharge in accordance with IEC 61000-4-2<br>± 8 kV air discharge in accordance with IEC 61000-4-2 |
| Immunity to RF radiation | • 10 V/m 80 MHz – 2.7 GHz, 80% AM to IEC 61000-4-3<br>• 3 V/m 2.7 – 6 GHz, 80% AM to IEC 61000-4-3<br>• 10 V 10 KHz – 80 MHz, 80% AM to IEC 61000-4-6 |
| Immunity to magnetic fields | 100 A/m; 50 Hz; 60 Hz (according to IEC 61000-4-8) |

## 8.5 Ambient conditions

See the note in "Applicability of technical specifications (Page 87)".

| **NOTICE** |
|---|
| **Temperature – during operation**<br>When operating with maximum expansion and maximum application load, the temperature in the PCIe expansion card area may increase up to 25 °C compared to the ambient temperature, depending on the device mounting position. |

| **Climatic ambient conditions** | |
|---|---|
| **Temperature**<br>– Operation | **Landscape format - horizontal:**<br>**19" display:**<br>Operation with two M.2 NVMe SSDs:<br>• With 1 expansion card (max. load 8 W): 0 to +45 °C [1)]<br>• Without expansion card: 0 to +50 °C [1)]<br>**12"/15"/22"/24" display:**<br>Operation with two M.2 NVMe SSDs:<br>• With 1 expansion card (max. load 8 W): 0 to +40 °C [1)]<br>• Without expansion card: 0 to +45 °C [1)]<br>**Horizontal format - inclined max. ± 45°:**<br>**19" display:**<br>Operation with two M.2 NVMe SSDs:<br>• With 1 expansion card (max. load 8 W): 0 to +45 °C [1)]<br>**12"/15"/22"/24" display:**<br>Operation with two M.2 NVMe SSDs:<br>• With 1 expansion card (max. load 8 W): 0 to +40 °C [1)]<br>**Portrait format - vertical:**<br>**12"/15"/19"/22"/24" display:**<br>Operation with two M.2 NVMe SSDs:<br>• With 1 expansion card (max. load 8 W): 0 to +40 °C [1)]<br>[1)] These specifications apply to the "Balanced" setting in the BIOS setup, menu "Advanced" > "Power&Performance" > "CPU Power Management Control" > "Power & Performance Scenario". The maximum ambient temperature must be reduced by 5 °C for the settings "Stable Performance" and "Max Performance".<br>If PLP NVMe SSD drives are used, the maximum ambient temperature must be reduced by 5 °C. |
| - Storage/transport | -20 to +60 °C |
| - Gradient | Max. 10 °C/h in operation, 20° C/h storage, no condensation |

| **Climatic ambient conditions** | |
|---|---|
| **Relative humidity**<br>– Operation | Tested according to IEC 60068-2-78, IEC 60068-2-30<br>Temperature 30 °C, relative humidity 85%;<br>Permitted range: 0 to 31 °C: 5 ... 80%; decreasing linearly to 5 ... 25% at 55 °C |
| - Storage/transport | Temperature 25 °C - 55 °C, relative humidity 95% |
| **Air pressure**<br>– Operation | 1080 to 689 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 environmental conditions** | |
| Vibration<br>– Operation<br>– Storage/transport | Tested according to DIN IEC 60068-2-6<br>5 to 9 Hz: 7 $mm^{pp}$, 9 to 500 Hz: 9.8 $m/s^2$<br>5 to 9 Hz: 7 $mm^{pp}$, 9 to 500 Hz: 9.8 $m/s^2$ |
| Shock resistance<br>– Operation<br>– Storage/transport | Tested to IEC 60068-2-27, IEC 60068-2-29<br>half-sine 150 $m/s^2$, 11 ms<br>half-sine 250 $m/s^2$, 6 ms |

## 8.6 Technical specifications of the drives

See the note in "Applicability of technical specifications (Page 87)".

| | |
|---|---|
| SSD | M.2 NVMe SSD >= 240 GB, form factor 22 mm x 30 mm or 22 mm x 80 mm, type M |

# 8.7 Technical specifications of the motherboard

See the note in "Applicability of technical specifications (Page 87)".

| | |
|---|---|
| Chipset | Intel® RM590E |
| Processor | • Intel® Celeron® 6600HLE 2 cores/2 threads, 2.1 GHz, 8 MB cache, ECC, TCC<br>• Intel® Xeon® W-11155MLE 4 cores/8 threads, 1.8 (3.1) GHz, 8 MB cache, ECC, TCC<br>• Intel® Xeon® W-11555MLE 6 cores/12 threads, 1.9 (4.4) GHz, 12 MB cache, vPro (iAMT), ECC, TCC<br>• Intel® Xeon® W-11865MLE 8 cores/16 threads, 1.5 (4.5) GHz, 24 MB cache, vPro (iAMT), ECC, TCC |
| Main memory | 4 up to 32 GB, DDR4 SDRAM, SODIMM<br>see ordering documents for features |
| Buffer memory | 512 KB NVRAM |
| Expansion slots IPC PX-39A | Version<br>• Without expansion slot<br>• With 1 expansion slot |
| Maximum bandwidth of the PCI slot | Slot 1: Rev. 4.0: 16 GT/s (1969 Mbps) bandwidth per lane |
| Max. permissible power loss per slot | Total power consumption (all voltages) must not exceed 8 W. |

### Slot for expansion card

| Slot for expansion card IPC PX-39A with **one** expansion slot<br>(Bus board 1 x PCIe) | |
|---|---|
| Slot 1 | PCI Express x4 (mechanical x8): Specification Rev. 4.0, length: Max. 175 mm |

# 8.8 Technical specifications of graphics/display

See the note in "Applicability of technical specifications (Page 87)".

## Graphics controller

| | |
|---|---|
| Graphics controller | Intel® UHD Graphics 16 EUs:<br>• Intel® Celeron® 6600HLE<br>• Intel® Xeon® W-11155MLE<br>Intel® UHD Graphics 32 EUs:<br>• Intel® Xeon® W-11865MLE<br>• Intel® Xeon® W-11555MLE |
| Resolutions/frequencies/colors | DisplayPort: Max. 4096 × 2304 / 60 Hz / 36 bits |

## Display

| | 12" | 15" | 19" | 22" | 24" |
|---|---|---|---|---|---|
| Display type | LCD TFT with extended viewing angle | LCD TFT with extended viewing angle | LCD TFT with extended viewing angle | LCD TFT with extended viewing angle | LCD TFT with extended viewing angle |
| Active display area | 261 x 163 mm | 344 x 194 mm | 410 x 230 mm | 475 mm x 267 mm | 527 mm x 296.5 mm |
| Resolution | 1280 x 800 pixels | 1920 x 1080 pixels | 1920 x 1080 pixels | 1920 x 1080 pixels | 1920 x 1080 pixels |
| Displayable colors | Up to 16.7 million | | | | |
| Brightness control | Yes, value range 0 to 99 [1]<br>0 = backlighting off | | | | |
| Backlight Half-brightness Lifetime (MTBF[1, 2]) | LED<br>50000 h | LED<br>50000 h | LED<br>50000 h | LED<br>30000 h | LED<br>30000 h |
| Pixel error class in accordance with ISO 9241-307 | II | | | | |
| Power consumption | 6 W | 14 W | 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 screen saver or centrally via PROFIenergy.

## LCD-TFT display

**Note**

**"Image Sticking" and backlighting**
The brightness of the backlighting deteriorates over the course of the screen's service life. A permanent picture with bright screen objects leads to a burn-in effect.

- Use a screen saver to extend the service life of the screen and the backlighting and to prevent the "Image Sticking" effect.

More information is available under "General safety instructions (Page 20)".

## 8.9 Technical specifications of the interfaces

Observe the information in "Applicability of technical specifications (Page 87)" and use only original connections of the I/O to be connected.

| | |
|---|---|
| DisplayPort [1] | 2 x connection of DisplayPort monitor |
| Keyboard | USB support |
| Mouse | USB support |
| USB | 4 × USB 3.2 Gen 2 type A, high current, backward compatible |
| Ethernet [2] | 4 × Ethernet interface (RJ45), 10/100/1000 Mbps<br>• 1 x Ethernet 1: Intel® Jacksonville i219-LM; iAMT-capable [3, 4]<br>• 1 x Ethernet 2: Intel® Springville i210-IT<br>• 2 x Ethernet 3, 4: Intel® EC 1000S |
| | Wake on LAN, Remote Boot and the following Teaming modes are supported [5]:<br>• Adapter Fault Tolerance (AFT)<br>• Adaptive Load Balancing (ALB)<br>• IEEE 802.3ad Dynamic Link Aggregation (DLA)<br>• Static Link Aggregation (SLA)<br>• Switch Fault Tolerance (SFT) |
| COM1, COM2 (optional) | RS232 / RS422 / RS485, 115 kbps max., 9-pin D-sub, male |
| Free slot for PCIe expansion cards (see Bus board (Page 117)) | |

1 An analog monitor can be used with an adapter cable (optional).

2 For unambiguous labeling, the Ethernet interfaces are numbered on the enclosure. The numbering by the operating system can differ.

3 No teaming with iAMT

4 When using iAMT, the X1 P1 interface must be used to connect to remote maintenance.

5 Only possible with ports X1 P1 and X2 P1

## 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
  - Microsoft® Windows® 10 IoT Enterprise LTSC 2021, 64 bit, Multi-Language*
- Microsoft® Windows® 11
  - Microsoft® Windows® 11 IoT Enterprise LTSC 2024, 64 bit, Multi-Language*

* Multi-language user interface (MUI): 6 languages (English, German, French, Spanish, Italian, Chinese)

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

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

### Boot mode and partitions in the delivery state

**Delivery state for Windows® 10 or Windows® 11**

Windows® 10 or Windows® 11 boots in UEFI mode in the delivery state.

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

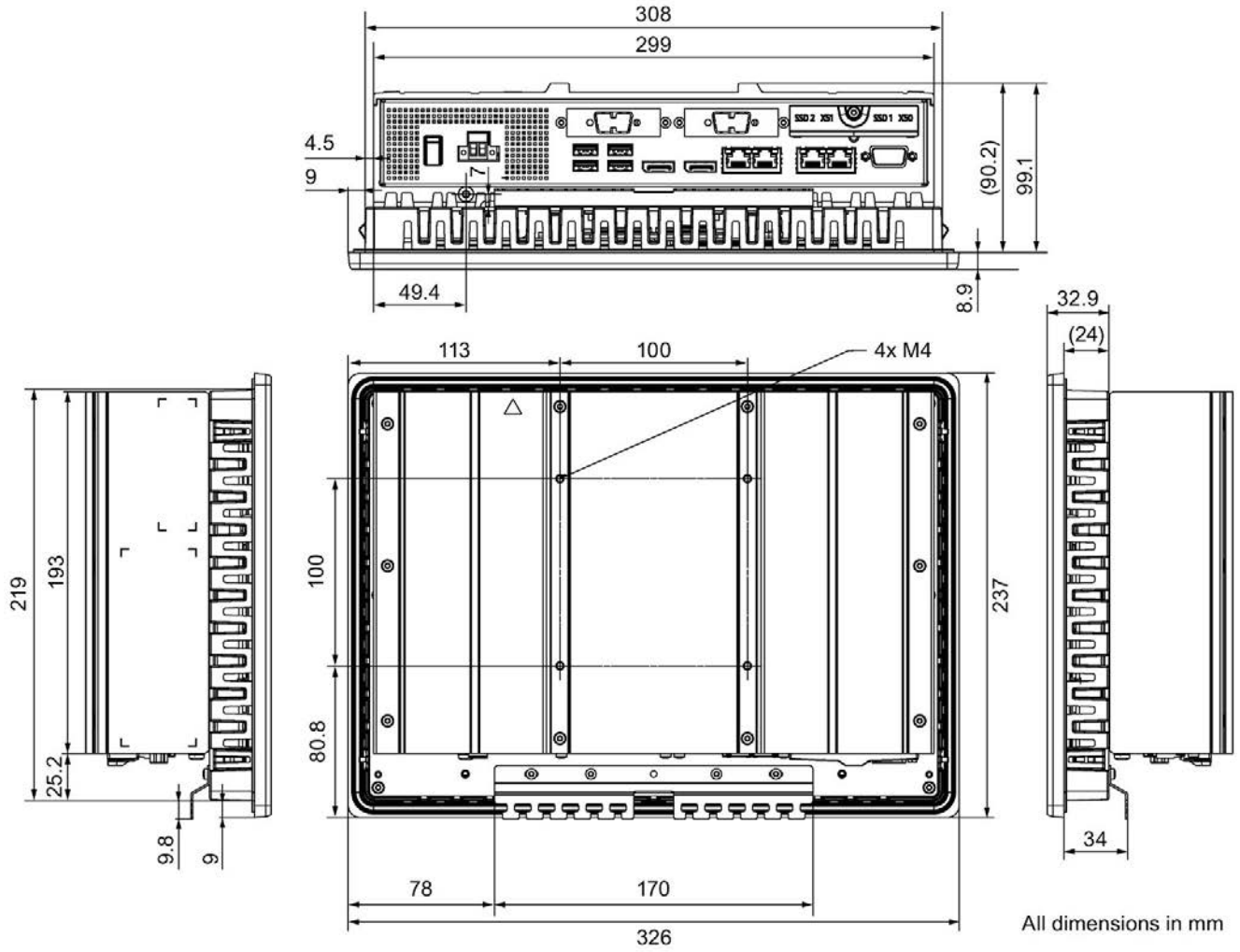
| Partition | Name | Size | File system |
|---|---|---|---|
| First | Boot | 260 MB | FAT32 |
| Second | MSR | 128 MB | None |
| Third | System | 160 GB | NTFS |
| Fourth | WinRE | 500 MB | NTFS |
| Fifth | Data | Remainder | NTFS |

# Dimension drawings

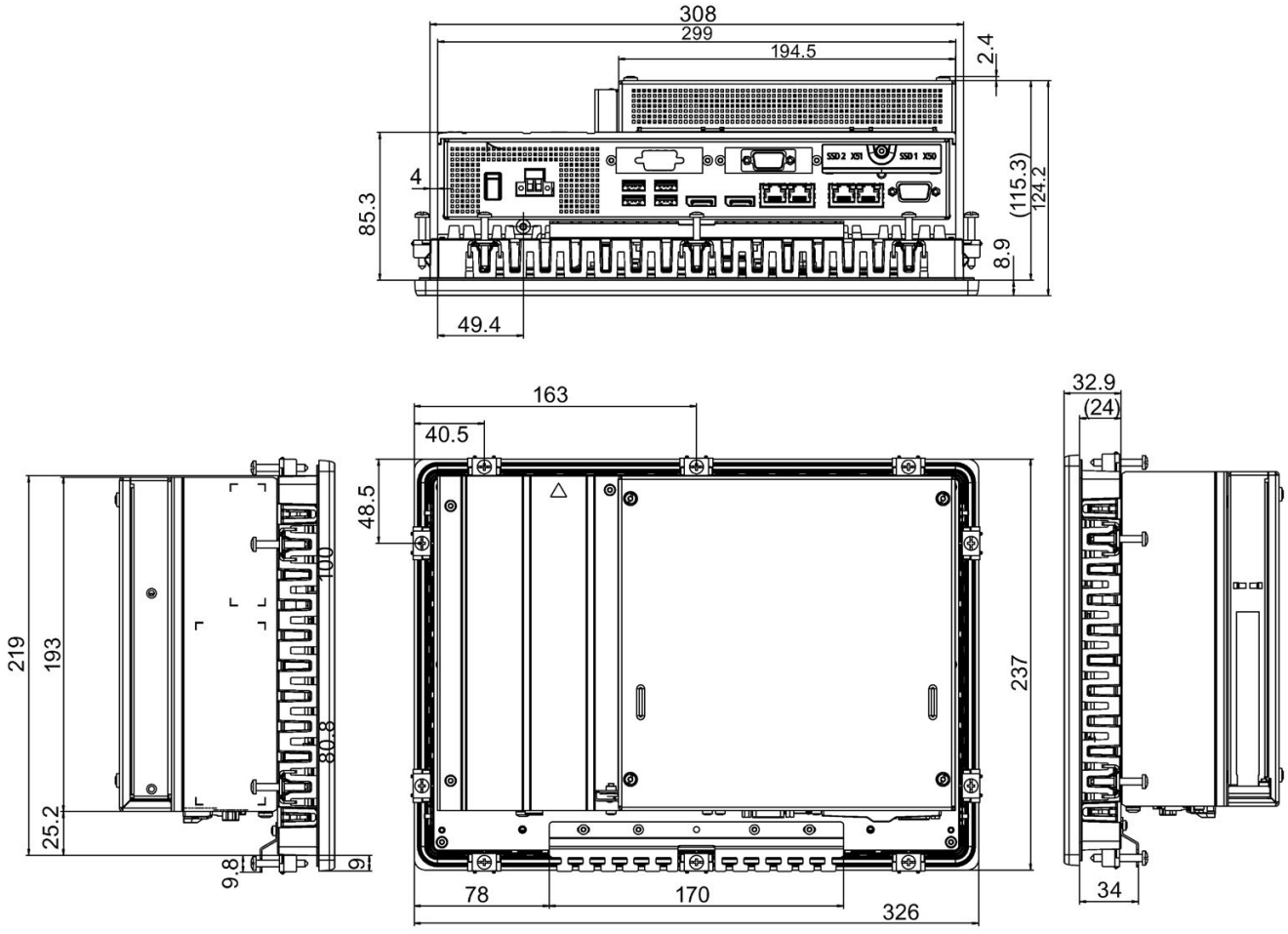
# 9

## 9.1 Dimension drawing of 12" device with capacitive multi-touch screen

**Device without expansion card**



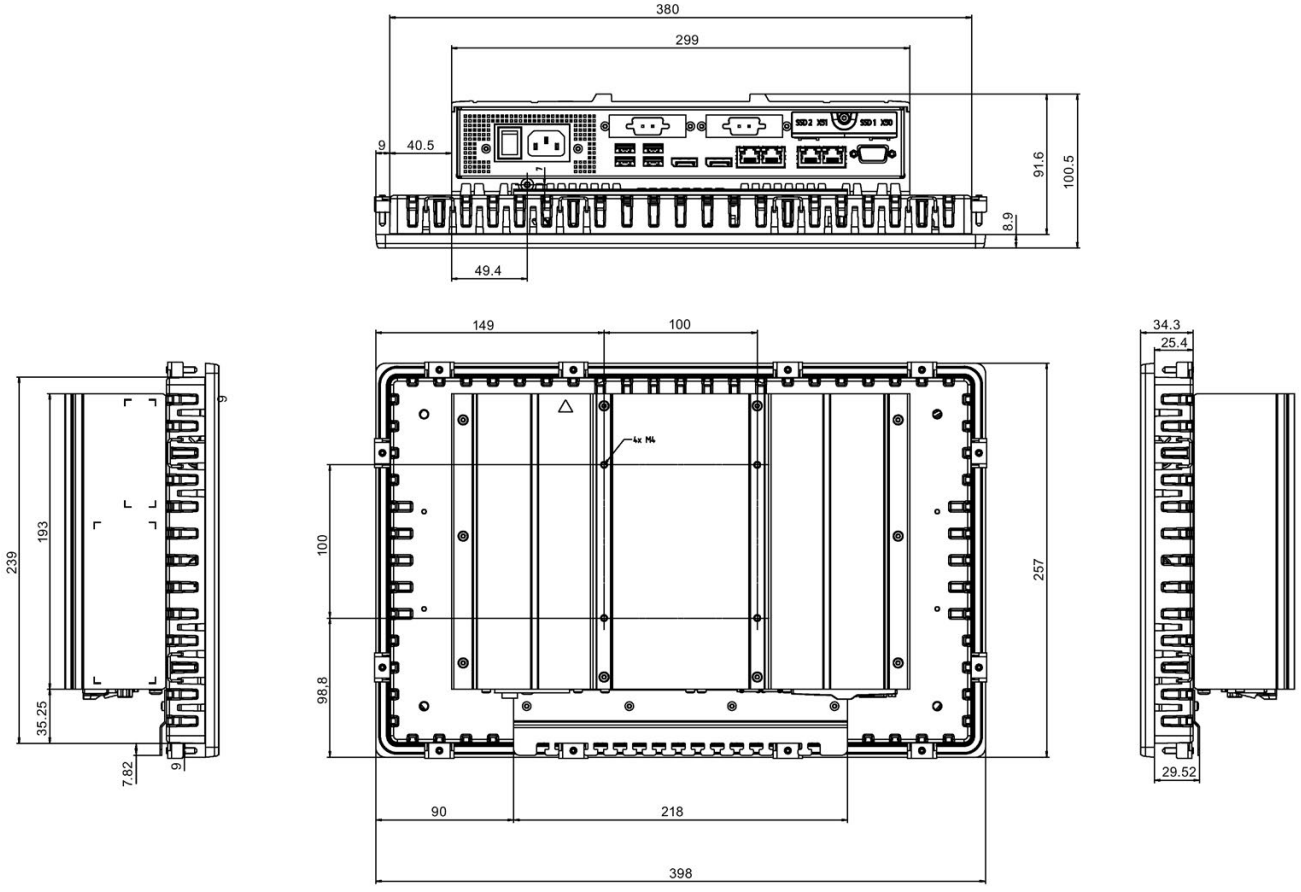
## Device with expansion card




All dimensions in mm

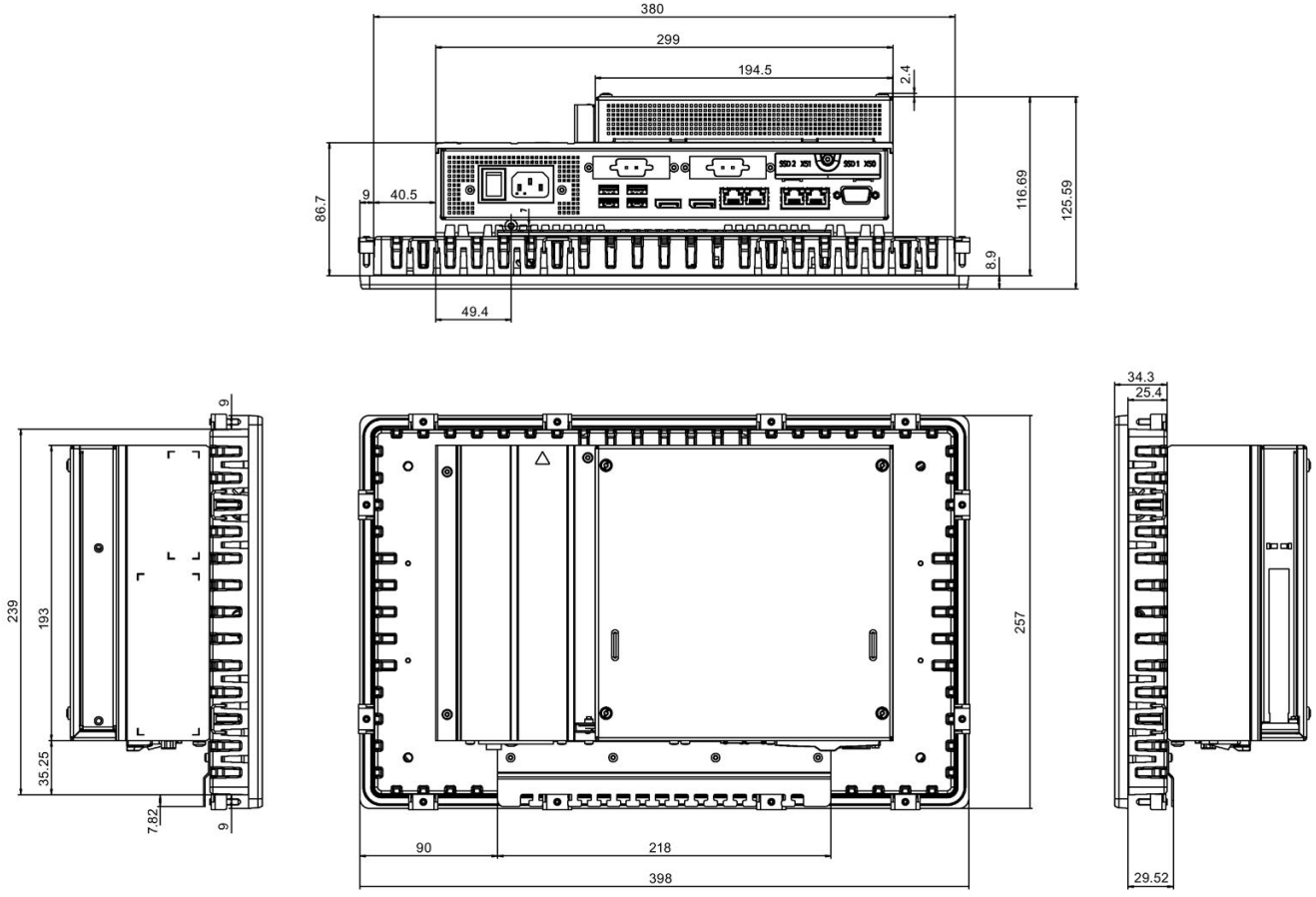
## 9.2 Dimension drawing of 15" device with capacitive multi-touch screen

### Device without expansion card




All dimensions in mm

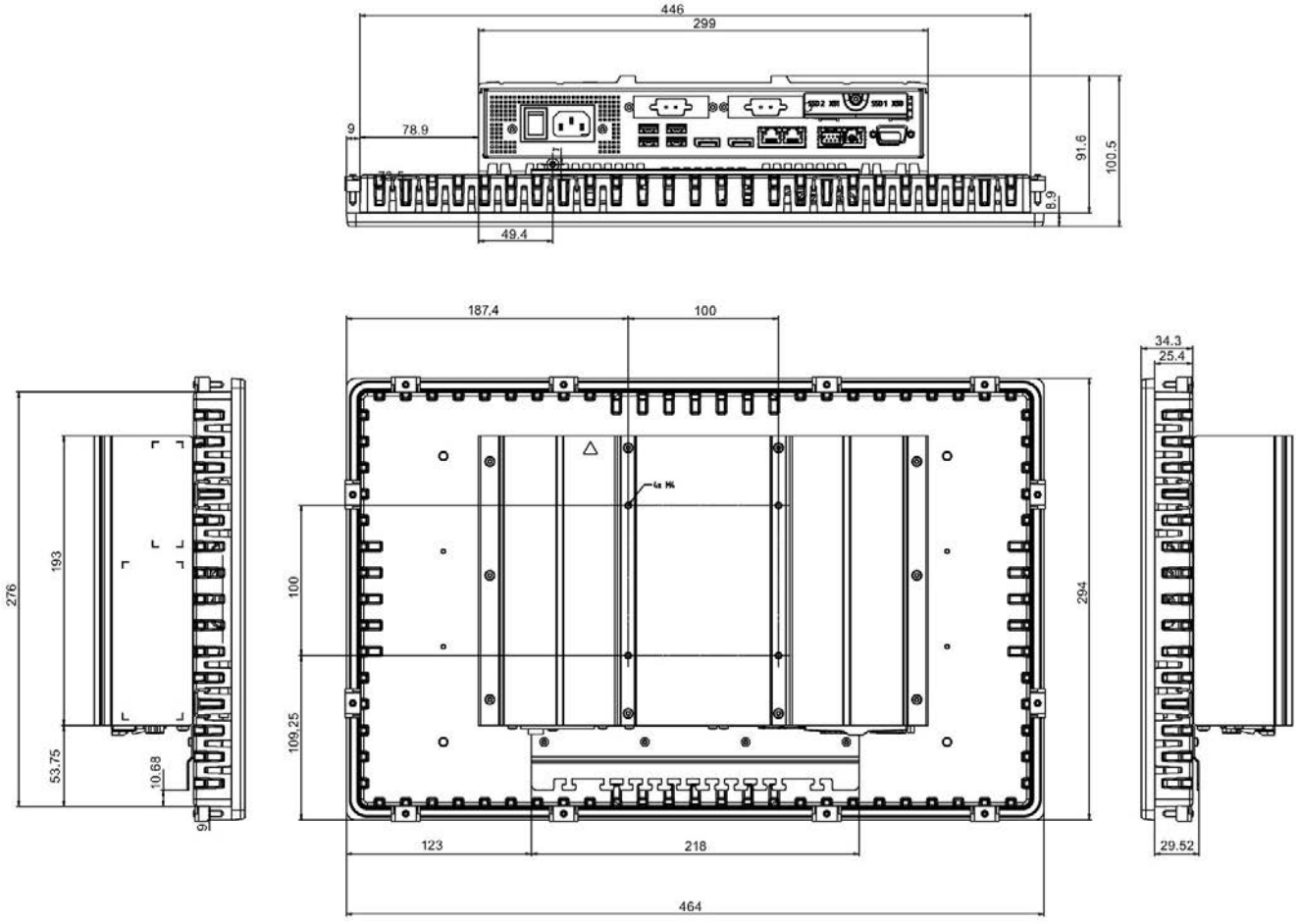
## Device with expansion card




All dimensions in mm

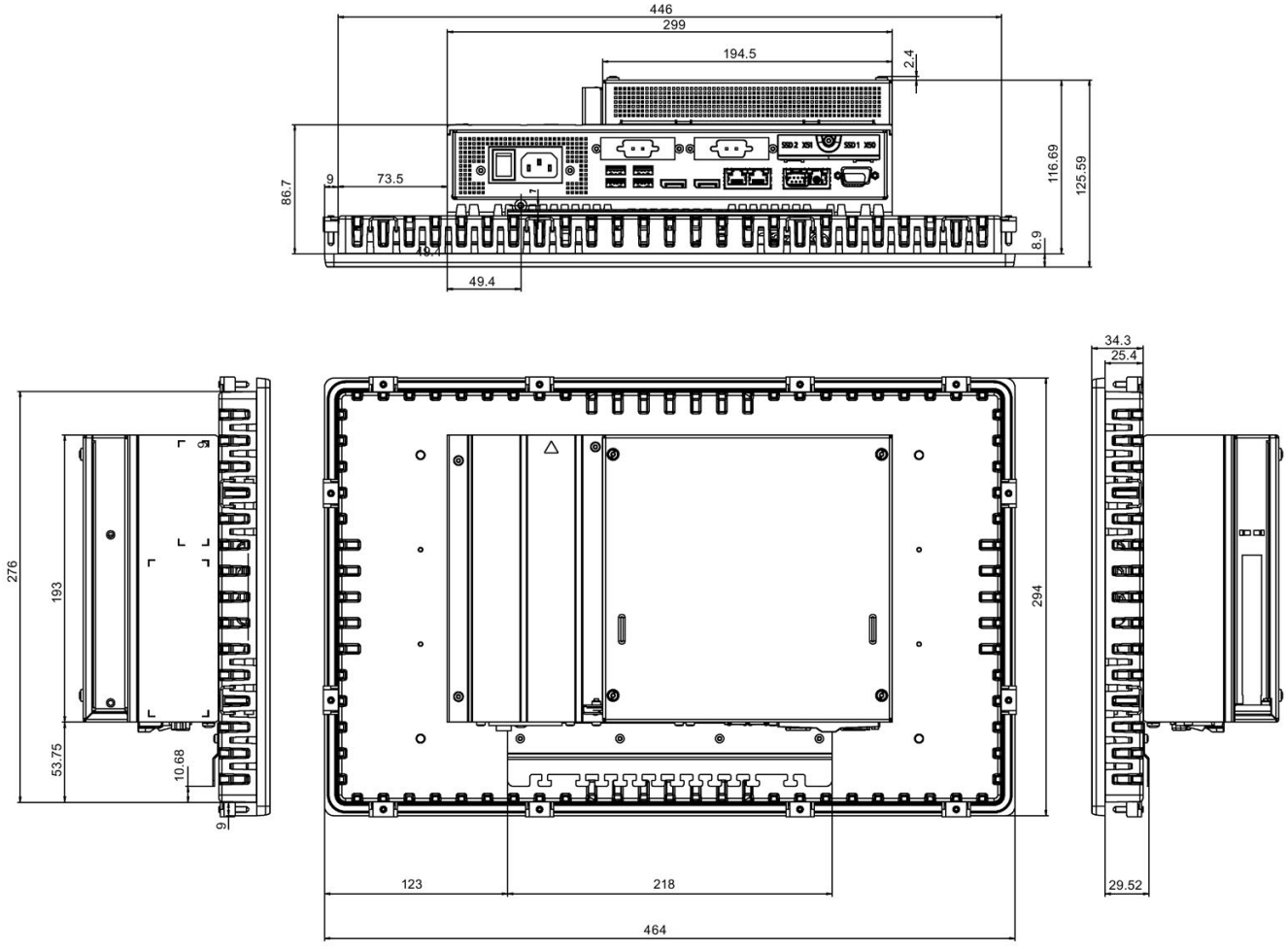
## 9.3 Dimension drawing of 19" device with capacitive multi-touch screen

### Device without expansion card




All dimensions in mm

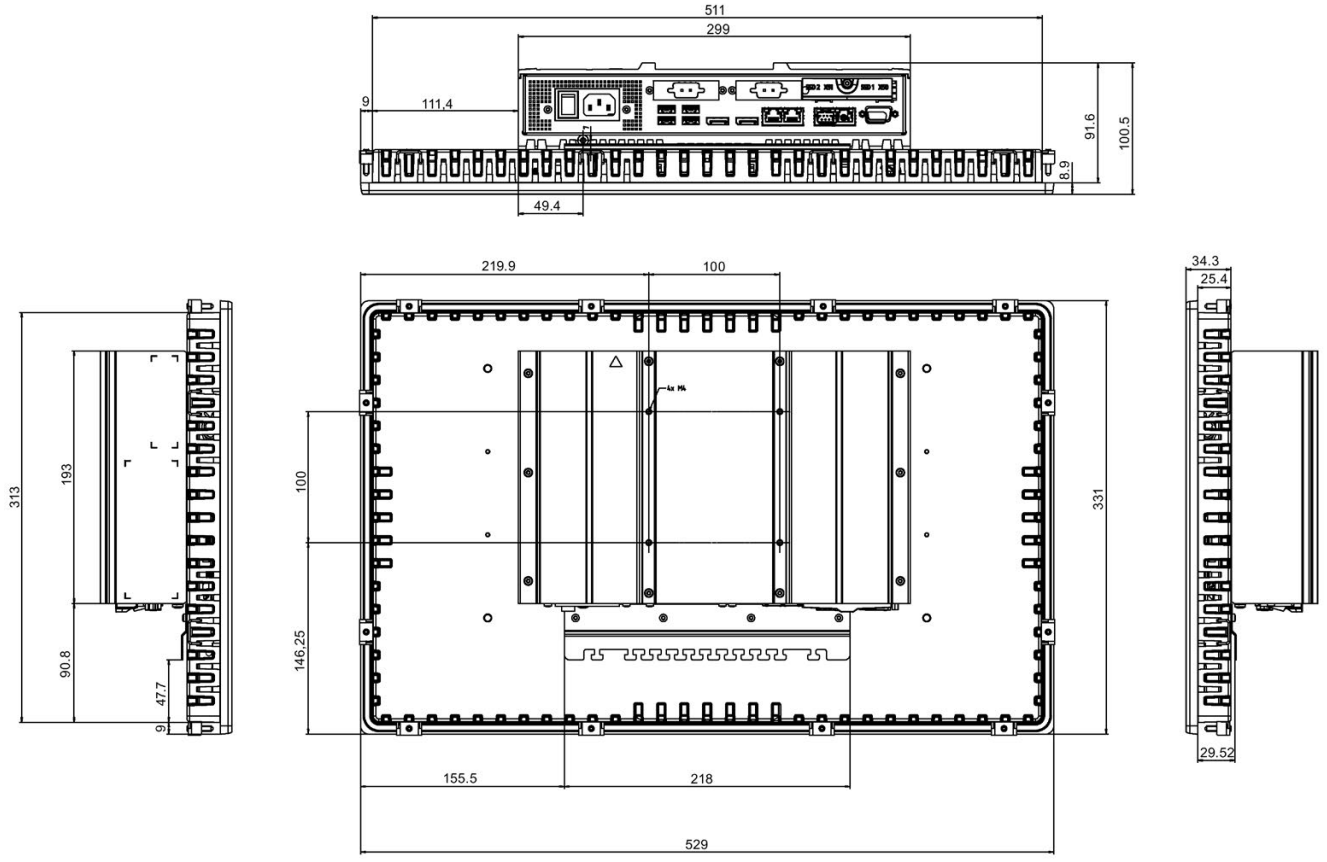
## Device with expansion card




All dimensions in mm

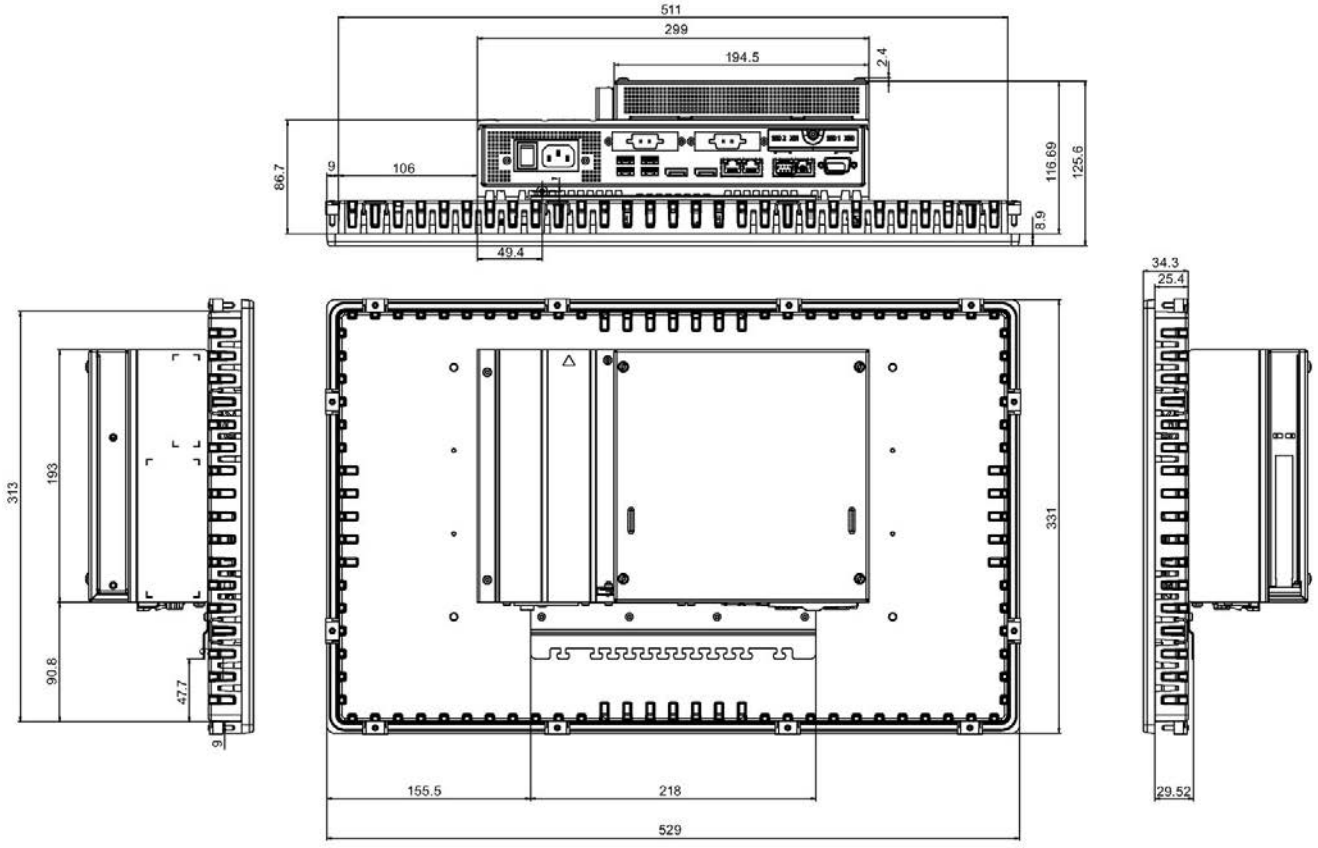
# 9.4 Dimension drawing of 22" device with capacitive multi-touch screen

### Device without expansion card




All dimensions in mm

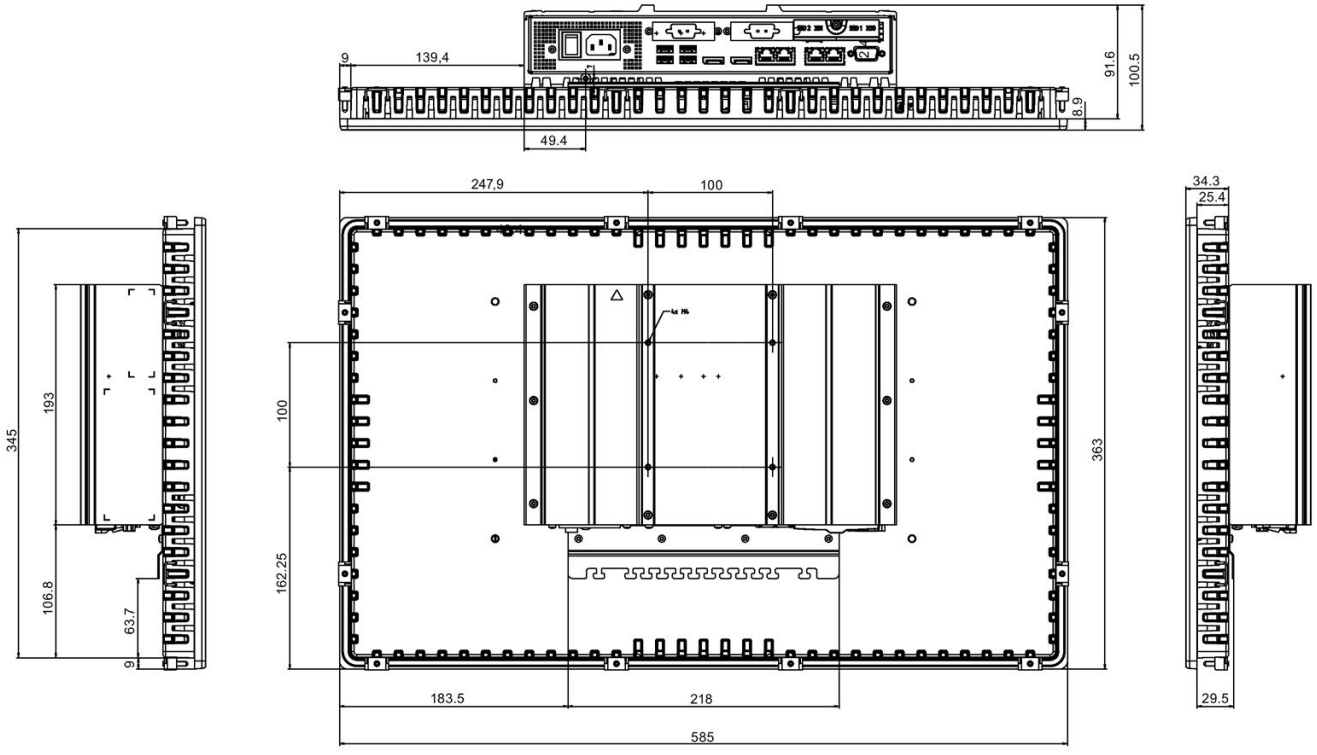
## Device with expansion card




All dimensions in mm

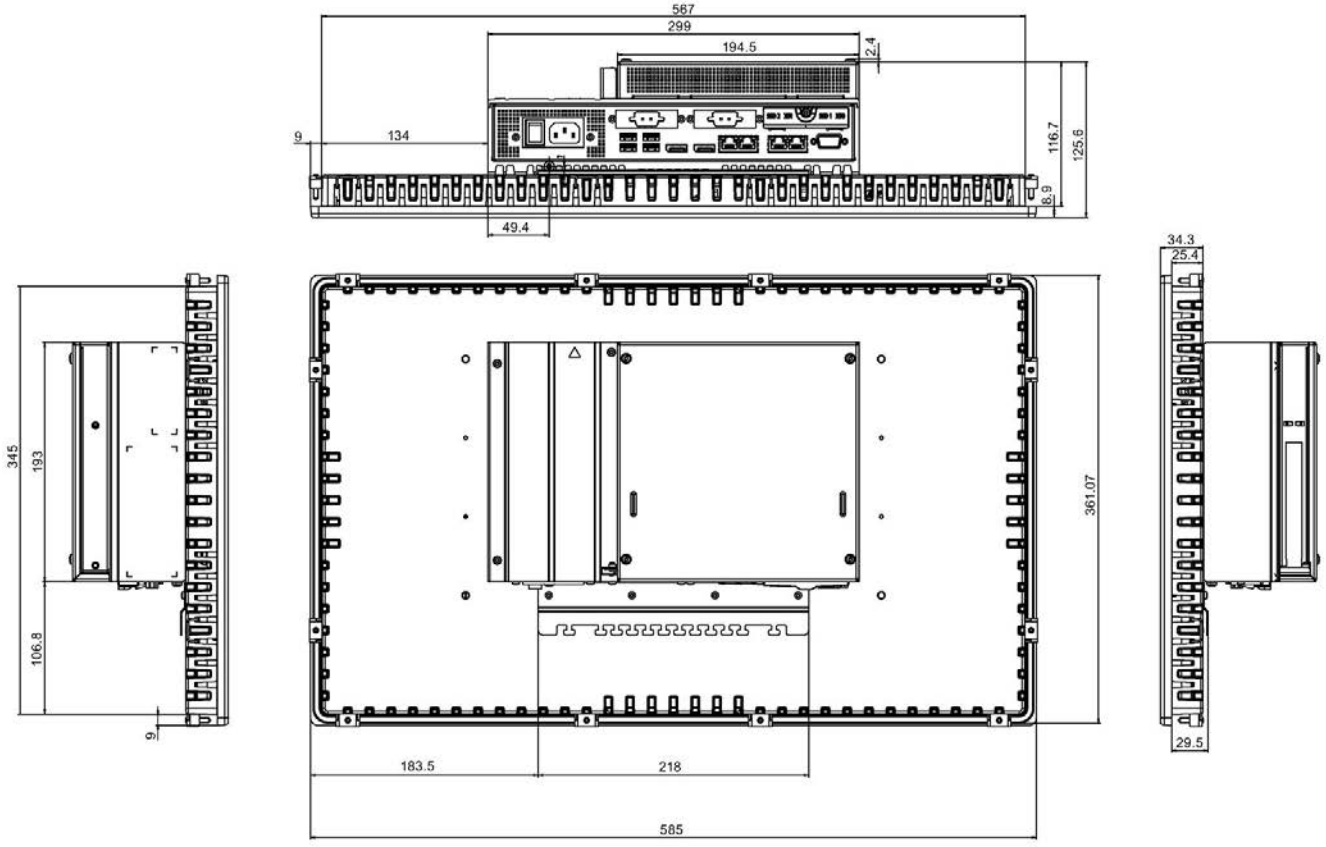
# 9.5 Dimension drawing of 24" device with capacitive multi-touch screen

### Device without expansion card



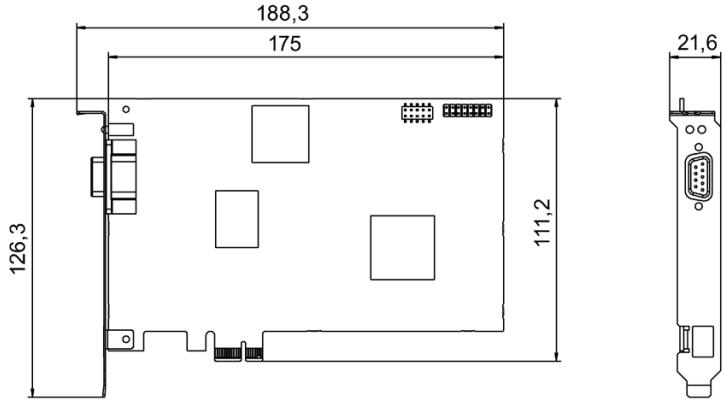

All dimensions in mm

**Device with expansion card**




All dimensions in mm

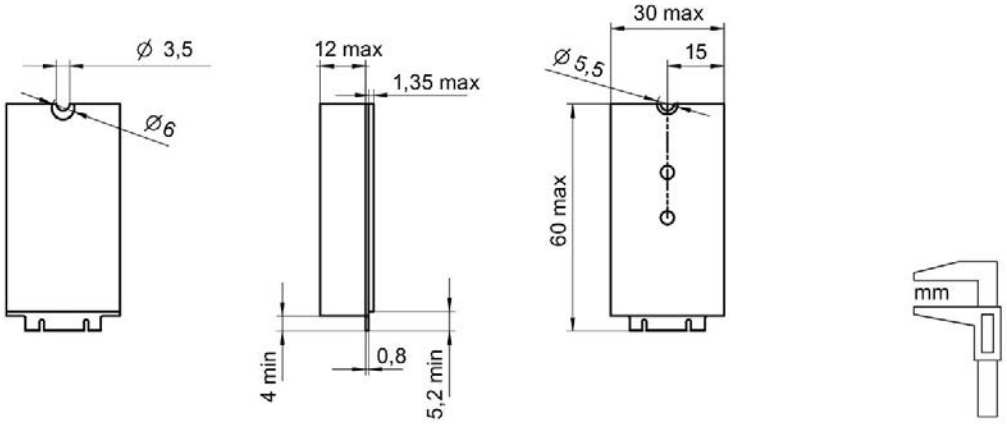
## 9.6 Dimension drawing of the expansion cards



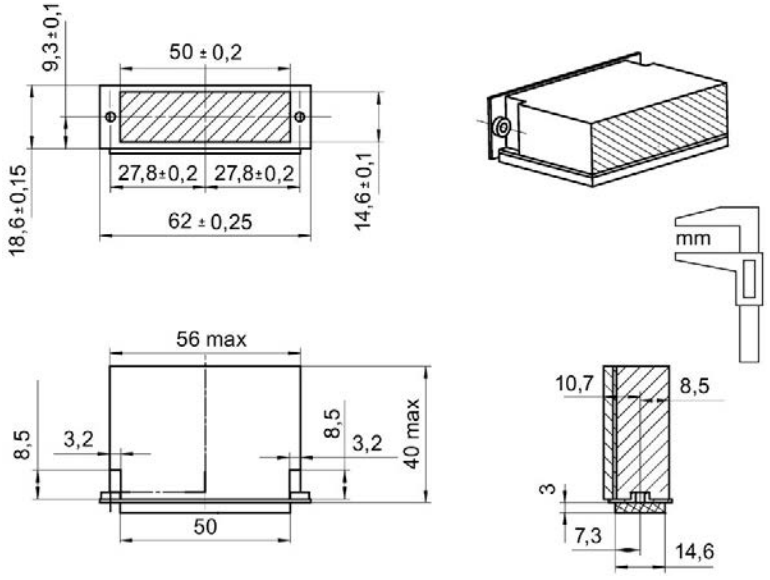

Alle Angaben in mm

## 9.7 Dimension drawing of expansion modules (M.2)

Maximum dimensions of expansion modules




Dimension drawing of the conditioner card



# Standards and approvals

# 10

## 10.1 Scope

**Note**

**Scope**

The possible approvals are described below. The approvals applicable to your device are indicated on the nameplate.

## 10.2 CE marking

CE

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 |
| The devices are compliant with the standards EN 61000-3-2 (Harmonics Current Emissions) and EN 61000-3-3 (Voltage Fluctuations and Flicker).[1)] | | |

  1) Applies to devices with AC voltage supply

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

  Conformance with this standard has been verified according to IEC/EN 61010-2-201[1)].

- 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: Panel PC certificates (http://support.automation.siemens.com/WW/view/en/10805572/134200).

## 10.3 UKCA marking



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

- Electrical Equipment (Safety) Regulations 2016 (Low-Voltage)
- Electromagnetic Compatibility Regulations 2016 (EMC)
- Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016 (Explosion Protection) [1]
- Regulations on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2012 (RoHS)

[1] : Marking on nameplate, if applicable

**UKCA Declaration of Conformity**

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

- Panel PC certificates (http://support.automation.siemens.com/WW/view/en/10805572/134200)

## 10.4 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).

### Software license agreements

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

## 10.5 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

## 10.6 FCC (USA)

| **USA** | |
|---|---|
| Federal Communications Commission<br>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 (mailto: amps.automation@siemens.com)

## 10.7 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. |

## 10.8 Australia / New Zealand

**AUSTRALIA / NEW ZEALAND**

This product meets the requirements of standard 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.

## 10.9 Eurasion Customs Union EAC

**Identification for Eurasion Customs Union**

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

## 10.10 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.

## 10.11 Taiwan

### Taiwan



This product meets the requirements of the CNS14336-1(099/09/30), generic standard CNS13438(095/06/01).

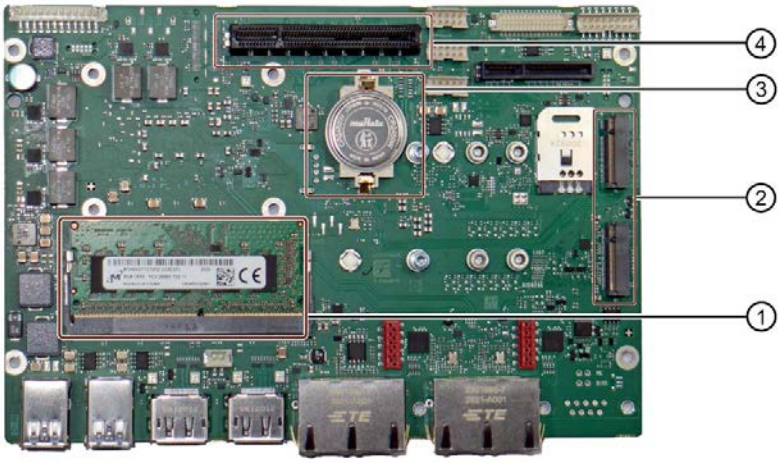
# Hardware description

# A

## A.1 Motherboard

### A.1.1 Layout of the motherboard

The motherboard consists of these main components: Processor and chip set, one slot for the memory module, internal and external interfaces and the flash block for the BIOS.

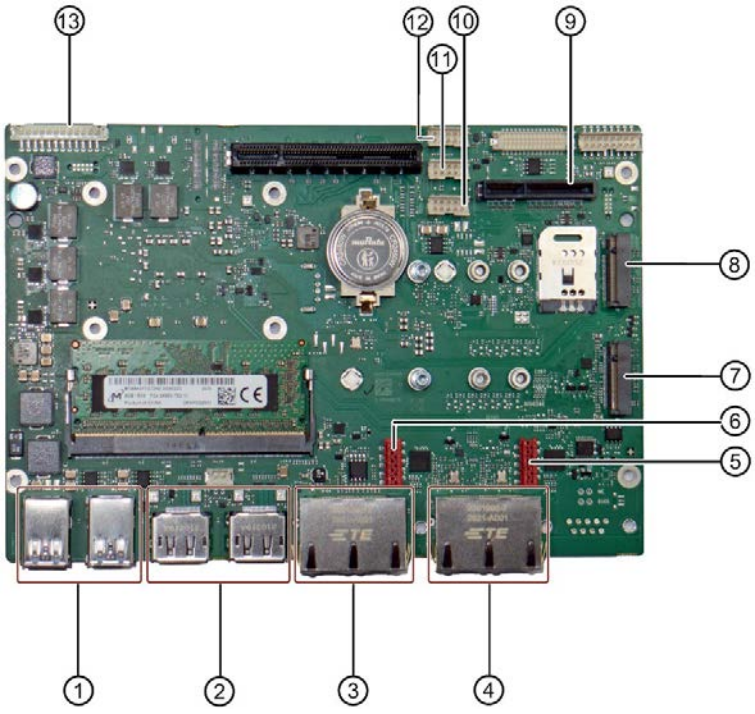



① Slot for memory module
② Slots for expansion modules (M.2)
③ Backup battery
④ Slot for the bus board

### Technical features of the motherboard

Technical features of the motherboard can be found under "Technical specifications of the motherboard (Page 94)".

## A.1.2 Position of the interfaces on the motherboard



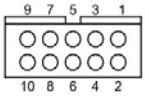

(1) 4 x USB (X60/X61/X62/X63)
(2) 2 x DPP (X70/X71)
(3) 2 × Ethernet (X1 P1 iAMT-capable/X2 P1)
(4) 2 × Ethernet (X3 P1/X4 P1)
(5) COM1 (X30)
(6) COM2 (X31)
(7) M.2 PCIe interface (X101)
(8) M.2 PCIe interface (X100)
(9) Port for SSD drive bay (X40)
(10) USB 2.0 (X64 Internal 1/X64 Internal 2)
(11) USB 2.0 (X600 Internal 3)
(12) USB 2.0 (X610 Internal 4/X610 Internal 5)
(13) Power supply (X10)

# A.2 Internal interfaces

## A.2.1 Pin assignment of the internal interfaces

| Interface | Position | Description |
|---|---|---|
| Memory | Internal | 1 SODIMM socket, 64-bit |
| Bus board | Internal | Socket for bus board, assigned with PCIe bus signals |
| Power supply | Internal | 12-pin connection plug for power supply |
| Backup battery | Internal | Power supply for backup battery, 2-pin socket |
| USB port | Internal | USB channel, 10-pin male connector |
| M.2 interface | Internal | M.2 Key B, assigned PCIe bus signals |
| Port for SSD drive bay | Internal | Socket for SSD drive bay, assigned PCIe bus signals |

## A.2.2 USB ports



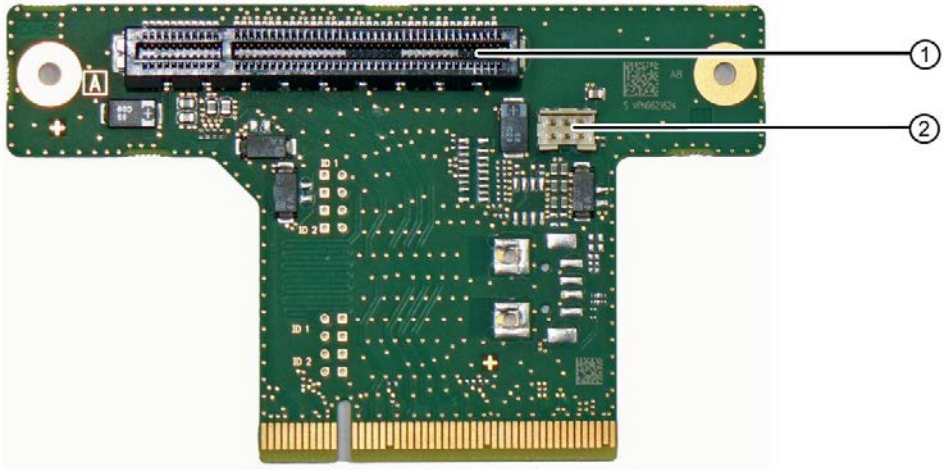

| Pin | Designation |
|---|---|
| 1 | VBUS_USB1 |
| 2 | VBUS_USB2 |
| 3 | USB1_D- |
| 4 | USB2_D- |
| 5 | USB1_D+ |
| 6 | USB2_D+ |
| 7 | GND |
| 8 | GND |
| 9 | GND |
| 10 | GND |

# A.3 Bus board

## A.3.1 Slot for expansion cards on the bus board

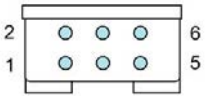
The bus board is designed as a link between the motherboard and the expansion cards. The bus board is available in the following version:

### Version with 1 slot




| | |
|---|---|
| ① | Slot X110 PCI Express x4 (mechanical x8) |
| ② | Power supply connection; see Pin assignment power supply connection for expansion cards (Page 117) |

## A.3.2 Pin assignment power supply connection for expansion cards




| Pin | Name | Meaning | Input/Output |
|---|---|---|---|
| 1 | GND | Ground | - |
| 2 | +12 V [1] | 12 V voltage | Output |
| 3 | GND | Ground | - |
| 4 | +5 V [1] | 5 V voltage | Output |
| 5 | GND | Ground | - |
| 6 | + 3.3 V [1] | 3.3 V voltage | Output |

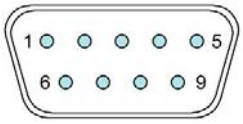
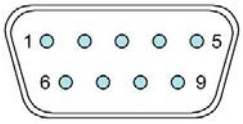
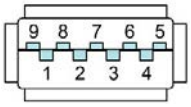
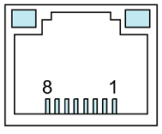
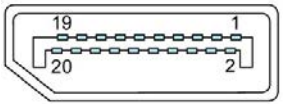
[1] max. permitted current: 1 A; with this current requirement, the total current requirement of the PCIe slot must not be exceeded.

# 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 SUB-D connector |   |
| COM2 | X31 | 9-pin SUB-D connector |   |
| USB 3.2 | X60, X61<br>X62, X63 | USB 3.2 Gen 2 socket type A |   |
| Ethernet 1, 2, 3 and 4 | X1 P1,<br>X2 P1,<br>X3 P1,<br>X4 P1 | RJ45 |   |
| DPP | X70, X71 | 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

### A.5.2.1 Overview of the internal module registers

The following addresses are used for the internal registers:

| I/O address (hex) | Input/output unit |
|---|---|
| 280 h | Basic address |
| Base address + offset 0 | GPIO port select register |
| Base address + offset 2 | GPIO data register |
| Base address + offset 5 | WDT control register |
| Base address + offset 6 | WDT counter register |
| Base address + offset 7 | WDT status register |

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

**See also**

Watchdog timer (WDT) register (read/write) (Page 121)

### A.5.2.2 Battery status register (read only)

The status of the CMOS battery (two levels) can be read out via the battery status register as follows.

**Note:** Always use read-modify-write operations so that reserved bits are not overwritten. This can lead to impairment of the functionality of the device.

#### Procedure

1. Write 06h into the GPIO port select register (280h) to select the relevant register (GPIO6).
2. To get information about the battery status, read the desired value from the GPIO6 data register (282h).

#### Meaning of the bits

| **Battery status register (read, address 282h)** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Bits** | | | | | | | | **Meaning of the bits** |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| | | | | | | | x | Reserved |
| | | | | | | x | | Reserved |
| | | | | | x | | | Reserved |
| | | | 0 | 0 | | | | CMOS battery capacity is still sufficient |
| | | | 0 | 1 | | | | CMOS battery capacity is exhausted (remaining capacity is still sufficient for approx. 1 month) |
| | | | 1 | 1 | | | | CMOS battery is empty or missing |
| | | x | | | | | | Reserved |
| | x | | | | | | | Reserved |
| x | | | | | | | | Reserved |

### A.5.2.3 Watchdog timer (WDT) register (read/write)

The procedures for operating the watchdog timer (WDT) are described below.

**Note:** Always use read-modify-write operations so that reserved bits are not overwritten. This can lead to impairment of the functionality of the device.

#### Enter countdown time and start timer

1. Write the desired value for the WDT Count Mode (minutes or seconds) into the WDT control register (285h).
2. Write the desired countdown time into the WDT counter register (286h).

The countdown starts. When the countdown reaches 0, the WDT expires. If the WDT has expired, the countdown will not restart until the WDT status "Expired" is reset.

#### Reset WDT countdown

1. Write the initial or new countdown time into the WDT counter register (286h).

The WDT starts counting down. When the countdown reaches 0, the WDT expires.

#### Stop WDT

1. Write 0 into the WDT counter register to stop the WDT completely.

#### Set behavior when WDT expires

1. Write the desired value for the WDT system reset (On or Off) into the GPIO2 data register (282h).
   - If On, the system restarts when the WDT expires. The WDT status is set to "Expired" and the "PC ON/WD" LED starts pulsing red.
   - If Off, the system will NOT reboot when the WDT expires. The WDT status is set to "Expired" and the "PC ON/WD" LED starts pulsing red.

#### Read WDT status

1. Read the current WDT status (active or expired) from the WDT status register (287h).

#### Reset WDT Status "Expired"

1. Write 0 into the WDT status register (287h) to switch the WDT to "Active" again.

This step resets the "PC ON/WD" LED from pulsing red to its normal state (lit green).

The WDT starts counting down. To prevent this behavior, stop the WDT before resetting the status to "Active".

### Meaning of the bits

| WDT control register (read/write, address 285h) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Bits** | | | | | | | | **Meaning of the bits** |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| | | | | | | | x | Reserved |
| | | | | | | x | | Reserved |
| | | | | | x | | | Reserved |
| | | | | 0 | | | | WDT count mode: in seconds |
| | | | | 1 | | | | WDT count mode: in minutes |
| | | | x | | | | | Reserved |
| | | x | | | | | | Reserved |
| | x | | | | | | | Reserved |
| x | | | | | | | | Reserved |

| WDT counter register (read/write, address 286h) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Bits** | | | | | | | | **Meaning of the bits** |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| 00h-FFh | | | | | | | | Countdown time |

| WDT status register (read/write, address 287h) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Bits** | | | | | | | | **Meaning of the bits** |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| | | | | | | | x | Reserved |
| | | | | | | x | | Reserved |
| | | | | | x | | | Reserved |
| | | | | x | | | | Reserved |
| | | | 0 | | | | | WDT status: Active |
| | | | 1 | | | | | WDT status: Expired |
| | | x | | | | | | Reserved |
| | x | | | | | | | Reserved |
| x | | | | | | | | Reserved |

## A.5.2.4 NVRAM address register

NVRAM occupies a 512 KB memory address range that can be read via PCI registers.

### Meaning of the bits

| NVRAM address register | | |
|---|---|---|
| PCI register address:<br>NVRAM base address register | PCI register content:<br>NVRAM memory address (default) | Length of the memory area |
| E300 0000 | Address is assigned dynamically (depending on device configuration) | 80000 h |

# 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)
- Support request form (https://www.siemens.com/supportrequest)
- After-sales information system for SIMATIC PC / PG (https://www.siemens.com/asis)
- SIMATIC Documentation Collection (https://www.siemens.com/simatic-tech-doku-portal)
- Your local representative (https://www.automation.siemens.com/aspa_app)
- Training center (https://siemens.com/sitrain)
- Industry Mall (https://mall.industry.siemens.com)

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

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

### Tools & downloads

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

After Sales Information System SIMATIC IPC/PG (https://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.<br>• 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.<br>• After transport in cold weather, wait approximately 12 hours before switching on the device. |
| Windows no longer boots | Settings in firmware/BIOS are not correct | • Check the settings in the firmware/BIOS 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.<br>• 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.<br>• 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. Call the firmware/BIOS configuration menu. To do this, press the "<Esc>" button during the boot process and then select "Setup Utility".<br>2. Set the date and time in the "Main" tab and save the changes. |
| Time and date are still incorrect, even after correct setting in the firmware/BIOS | The backup battery is dead. | Replace the backup battery. |
| USB device not responding. | USB ports are disabled in the firmware/BIOS | Use a different USB port or activate the port. |
| | Operating system does not support the USB port. | 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 |
|---|---|---|
| Computer does not boot or "Boot device not found" is displayed. | The boot medium is not approved | In the firmware/BIOS, set the boot priority under "Boot > Boot device" to "Enabled". |
| | The boot medium is not in first place of the boot priority in the firmware/BIOS | In the firmware/BIOS, change the boot priority under "Boot > Boot device". |
| | The boot data carrier is set up with GPT and UEFI boot is deactivated in the firmware/BIOS | Enable UEFI mode in the firmware/BIOS. |

## B.2.3 Problems when using expansion cards

| Problem | Cause | Remedy |
|---|---|---|
| The device crashes during startup. | • I/O addresses are assigned twice.<br>• Hardware interrupts and/or DMA channels are assigned twice<br>• Signal frequencies or signal levels are not adhered to<br>• Different pin assignment | Check your computer configuration:<br>• If the computer configuration corresponds to the delivery condition, contact your technical support team.<br>• 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. |
| | PCIe Gen1 expansion card does not behave according to specification. | 1. Remove the expansion card.<br>2. Set the respective setup parameter "PCIe Speed" permanently to "Gen1" in the "Advanced > PCI Express Configuration" menu, submenu "PCI Express Root Port #" of the BIOS Setup.<br>3. Set the respective setup parameter "PEG# - Gen X" permanently to "Gen1" in the "Advanced > Video Configuration" menu, submenu "Pci Expess Graphic" of the BIOS Setup.<br>4. Install the expansion card again. |

# Markings and symbols

C

## C.1 Overview

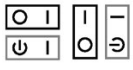
The following tables show all the symbols which may be found on your SIMATIC industrial PC, SIMATIC industrial monitor or SIMATIC Field PG in addition to the symbols which are explained in the operating instructions.

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

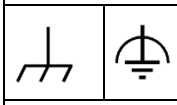
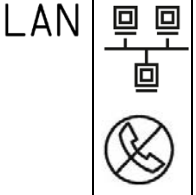
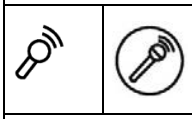
| Symbol | Meaning | | Symbol | Meaning |
|---|---|---|---|---|
|  | On/off switch, without electrical isolation | |  | On/off switch, without electrical isolation |

## 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 | |  | UKCA marking for Great Britain |
|  | Approval for India | |  | Disposal information, observe the local regulations. |
|  | Approval for Taiwan | | | |

## 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 |
|  | DisplayPort interface | |  | Smart Card Reader |
|  | DVI-D interface | |  | Line In |
|  | LAN interface, not approved for connecting WAN or telephone | |  | Line Out |
|  | Serial port | |  | Microphone input |
|  | USB port | |  | Universal Audio Jack |
|  | USB 2.0 high-speed port | |  | Headphone output |
|  | USB 3.0 super-speed port | | | |
|  | USB 3.1 SuperSpeedPlus interface | | | |

# List of abbreviations

D

## D.1 Abbreviations

| Abbreviation | Term | Meaning |
|---|---|---|
| AC | Alternating current | Alternating current |
| AHCI | Advanced Host Controller Interface | Standardized controller interface for SATA devices. |
| APIC | Advanced Programmable Interrupt Controller | Extended programmable interrupt controller |
| AWG | American Wire Gauge | US standard for the cable diameter |
| 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 |
| 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 |
| DMA | Direct Memory Access | Direct memory access |
| DPP / DP | DisplayPort | New powerful digital monitor port |
| DQS | Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagement mBH | |
| 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 | |
| GND | Ground | Chassis ground |
| HDD | Hard Disk Drive | Hard disk drive |
| HU | Height unit | |

| Abbreviation | Term | Meaning |
|---|---|---|
| I/O | Input/Output | Data input/output on computers |
| iAMT | Intel® Active Management Technology | |
| 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 |
| MUI | Multilanguage User Interface | Multilanguage operating system with Windows with language toggling; 5 languages: German, English, French, Spanish and Italian |
| 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 |
| 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. |
| PIC | Programmable Interrupt Controller | Programmable interrupt controller |
| PXE | Preboot Execution Environment | Software for running new PCs without hard disk data via the network |
| RAID | Redundant Array of Independent Disks | Redundant hard disk array |
| RAM | Random Access Memory | |
| 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 | |
| TPM | Trusted Platform Module | |
| UEFI | Unified Extensible Firmware Interface | |
| UL | Underwriters Laboratories Inc. | US organization for tests and certifications according to own or binational standards (with CSA / Canada) standards. |
| USB | Universal Serial Bus | |
| VGA | Video Graphics Array | Video adapter which meets industrial standard |
| WD | Watchdog | Program monitoring with error detection and alarming. |

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