SIEMENS

SIMATIC

Industrial PC
SIMATIC IPC BX-39A

Operating Instructions

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Legal information

Warning notice system

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

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

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

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified persons are those who, because of their training and experience, are familiar with the installation, assembly, commissioning, operation, decommissioning and disassembly of the product and can recognize risks and avoid possible hazards.

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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 BX-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 BX-39A.

History

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

Edition	Comment
07/2022	First edition
06/2024	Addition: • RAID1 system
02/2025	Update
07/2025	Addition: • Microsoft® Windows® 11 IoT Enterprise LTSC 2024

Cybersecurity information

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

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

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

Disclaimer for third-party software updates

This product includes third-party software. Siemens Aktiengesellschaft only provides a warranty for updates/patches of the third-party software, if these have been distributed as part of a Siemens software update service contract or officially released by Siemens Aktiengesellschaft. Otherwise, updates/patches are undertaken at your own risk. You can find more information about our Software Update Service offer on the Internet at Software Update Service (https://support.industry.siemens.com/cs/ww/en/view/109759444).

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Product description

1

1.1 Important instructions and manuals for operating the device

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

Documentation	Contents	Source
SIMATIC IPC Image & Partition Creator	Information on: • Backup and recovery of files, directories, drive partitions.	• Online at: SIMATIC IPC Image & Partition Creator (http://support.automation.siemens.com/WW/view/en/109780775)
SIMATIC NET	Industrial communication	• Online at: SIMATIC NET (http://w3.siemens.com/mcms/automation/en/industrial-communications/Pages/Default.aspx)
SIMATIC IPC Creating a bootable USB flash drive	Information on: • Creating a bootable USB flash drive for recovery of operating system, software and drivers	• Online at: SIMATIC IPC Creating a bootable USB flash drive (https://support.industry.siemens.com/cs/ww/en/view/109811224)

1.2 Product highlights

The SIMATIC IPC BX-39A is a powerful industrial Box 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 and installation options (DIN rail, wall and vertical mounting)
- Rugged enclosure concept for use at ambient temperatures of up to 55 °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 2 PCIe slots and 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)
- Front LED for efficient self-diagnostics and headless operation
- 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

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:

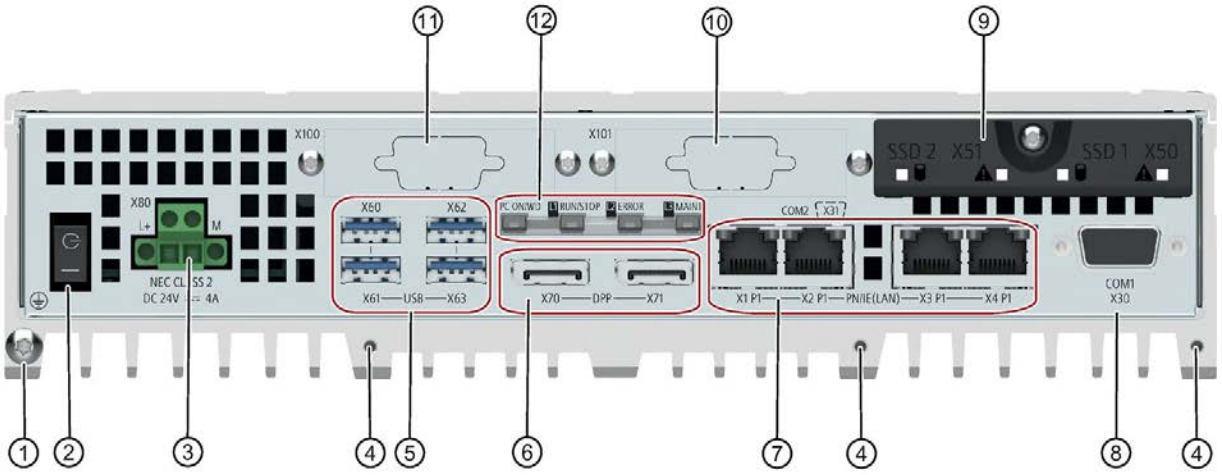
- Process and visualization applications
- Industrial image processing
- Quality assurance and monitoring tasks
- Measurement, control and rule-based tasks
- Data acquisition and management

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

1.4 External design of the device

1.4.1 Interfaces and operating elements

Device without expansion slots



①	Protective conductor	Connection for protective 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. • Position "ON", when the "_" symbol is pressed. • Position "OFF" is the delivery state.
③	24 V DC X80	Power supply connection
④	Position for fixing screws of the strain relief	
⑤	4 × USB X60/X61/X62/X63	USB 3.2 Gen 2 type A, high current, backward compatible
⑥	2 x DPP X70/X71	Connection for monitors with DisplayPort interface
⑦	4 × Ethernet X1 P1/X2 P1/X3 P1/X4 P1	Connections for Ethernet RJ45 for 10/100/1000 Mbps • Ethernet X1 P1 is iAMT-capable • Ethernet X2 P1, Ethernet X3 P1 and Ethernet X4 P1
⑧	COM1 X30	Serial interface 1 (V.24), 9-pin D-sub socket
⑨	2 x slot for SSD drive SSD1 X50/SSD2 X51	SSD drives in NVMe format, installed in SIMATIC IPC Slider

⑩	Opening for extension interface X101 or	Interfaces of external expansion modules (M.2 format)
	COM2 X31 (optional)	Serial interface 2 (V.24), 9-pin D-sub socket (optional)
⑪	Opening for extension interface X100	Interfaces of external expansion modules (M.2 format)
⑫	4 status LEDs	Status display of the operating state

Device with expansion slots

Other device variants (Page 45):

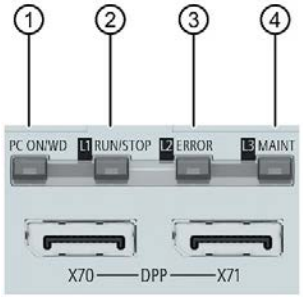
- with slot for one PCIe expansion card
- with slots for two PCIe expansion cards

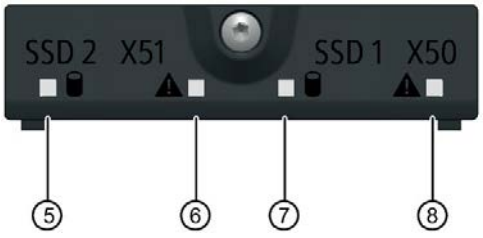
You can find more information about expansion cards under "Expansion cards (Page 62)".

1.4.2 Status displays

Status indicator device

The status indicator consists of multi-colored LEDs.



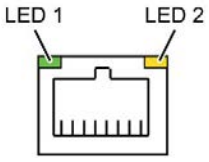


Position	Status indicator	Color	Description
①	PC ON/WD	Off	-
		Green	BIOS ready to boot, PC running
		Flashing green/yellow (1 Hz)	BIOS in POST, power switch on
		Yellow	Idle state
		Flashing red (1 Hz)	Watchdog status display: active

Position	Status indicator	Color	Description
②	RUN/STOP or L1	Off	-
		Green	Can be controlled by user program
		Yellow	Can be controlled by controller program (e.g. WinAC)
③	ERROR or L2	Off	-
		Red	-
		Flashing red	Can be controlled by user program or controller program (e.g. WinAC)
④	MAINT or L3	Off	-
		Yellow	-
		Red	Can be controlled by controller program (e.g. WinAC)
⑤	SSD2 activity	Off	-
		Green	Access to drive
⑦	SSD1 activity	Off	-
		Green	Access to drive
SDD alarm in connection with RAID and monitoring software:			
⑥ ⑧	SSD2 alarm 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 or RAID rebuild running, RAID not OK. 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. 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 51)".		

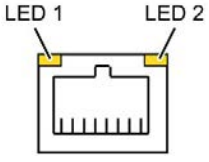
For additional information on controlling the LEDs or the NVRAM with a Windows operating system, please refer to the chapter "Buffer memory NVRAM (optional) (Page 57)". Example programs for controlling the LEDs under Windows operating systems are available on the Internet at the following address: Technical support (https://support.industry.siemens.com)

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

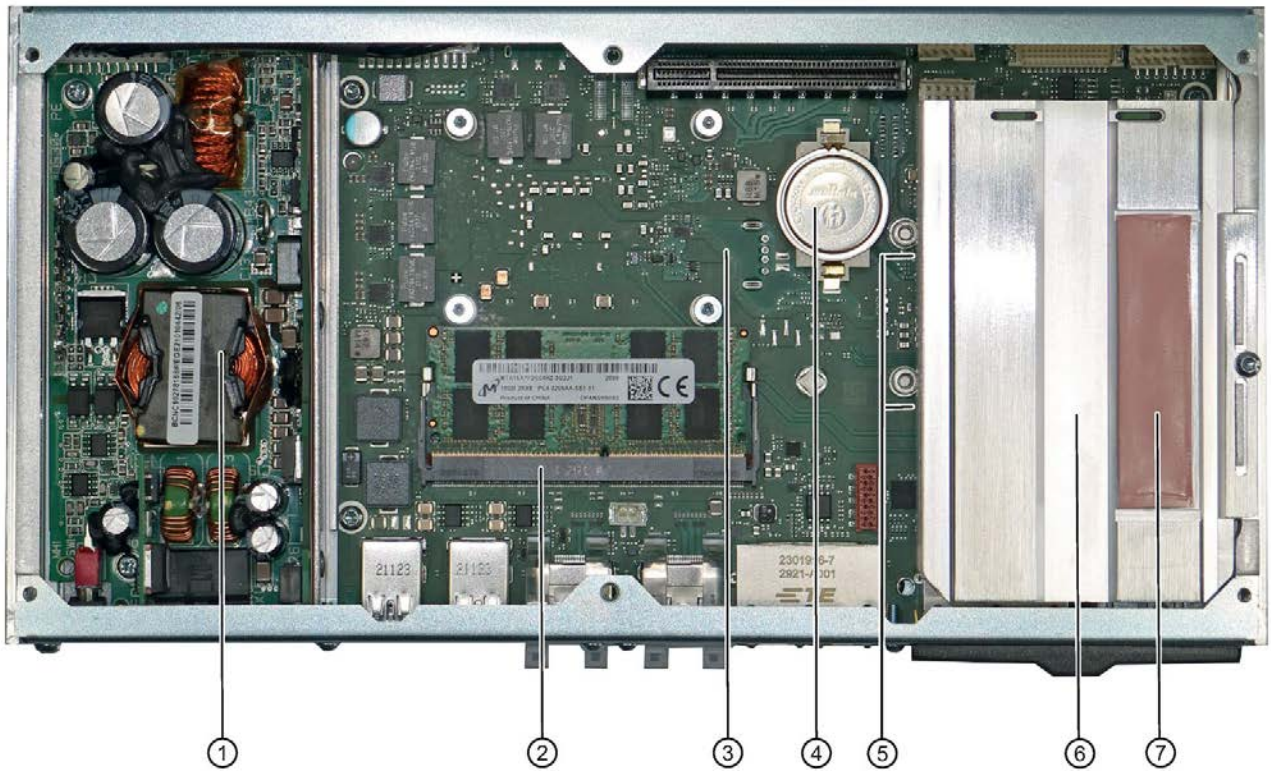


Status indicator	Status	Meaning of the status
LED 1	Off	10 Mbps or 100 Mbps
	Lit orange	1000 Mbps
LED 2	Off	No connection
	Lit orange	Connection exists
	Flashing orange	Activity

See also

RAID1 system (Page 50)

1.5 Internal design of the device



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 > Box PC> ..."
5. In the tree structure on the left, click on: SIMATIC IPC BX-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. 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.

Use in industrial environments

Note

Use in an industrial environment without additional protective measures

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

ESD directive

Electrostatic sensitive devices can be labeled with an appropriate symbol.



NOTICE

Electrostatic sensitive devices (ESD)

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

Take corresponding precautionary measures before you open the device.

2.2 Note on transport and storage

Damage caused by transportation and storage

NOTICE

Damage to the device during transport and storage

If a device is transported or stored without packaging, shocks, vibrations, pressure and moisture may impact the unprotected unit. Damaged packaging indicates that ambient conditions have already had a massive impact on the device and it may be damaged.

This may cause the device, machine or plant to malfunction.

- Keep the original packaging.
- Pack the device in the original packaging for transportation and storage.

WARNING

Electric shock and fire hazard due to damaged device

A damaged device can be under hazardous voltage and trigger a fire in the machine or plant. A damaged device has unpredictable properties and states.

Death or serious injury could occur.

- Avoid installing and commissioning a damaged device.
- Label the damaged device and keep it locked away. Send off the device for immediate repair.

Damage from condensation

NOTICE

Damage from condensation

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

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

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

2.3 Notes on mounting

Device in the control cabinet

DANGER

Electrocution risk when control cabinet is open

When you open the control cabinet, 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 100 mm to the area of the ventilation slots and do not cover the ventilation slots of the enclosure.

High frequency radiation

⚠ CAUTION

Immunity to RF interference

The device has an increased immunity to RF radiation according to the specifications on electromagnetic compatibility in the technical specifications.

High-frequency radiation 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 83)

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 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

- Box PC SIMATIC IPC BX-39A
- 1 DIN rail clip (optional, if ordered)
- 2 wall mounting brackets (optional, if ordered)
- 2 vertical mounting brackets (optional, if ordered)
- 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 9) or Technical specifications of the operating systems (Page 87).

Software

You will find information on the software for your device under: Accessories and spare parts (Page 18).

Printed documents

- Quick Install Guide SIMATIC IPC BX-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 21)".

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 26) 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 28).

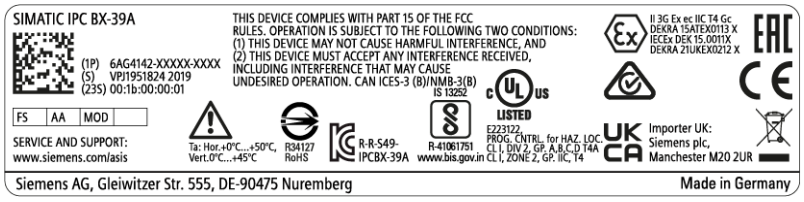
3.1.3 Identification data of the device

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

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

Nameplate

The following image shows the nameplate on the SIMATIC IPC BX-39A as an example.



COA label

The COA label (Certificate of Authenticity) is located on the rear 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:



3.2 Installing the device

3.2.1 Mounting types

Note

Ensure that the required minimum clearance to other components or enclosure panels is maintained.

With horizontal mounting position:

- Underneath at least 100 mm
- Above at least 50 mm
- At least 50 mm at the side

With vertical mounting position and portrait mounting:

- Underneath at least 50 mm
- Above at least 50 mm
- At least 50 mm at the side

Note

Observe the permitted temperature range for operation of the device in the respective mounting position as defined in section "Technical specifications (Page 79)".

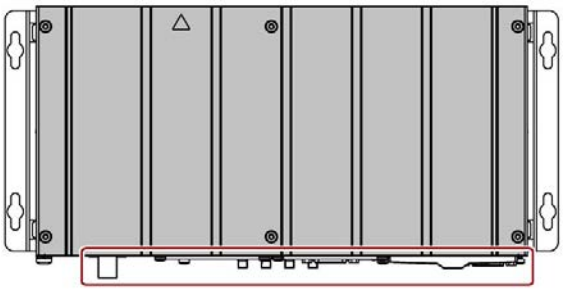
Horizontal mounting position

The horizontal mounting position is the preferred mounting position and is permissible for DIN rail or wall mounting:

Mounting onto DIN rail
The interfaces are at the bottom.

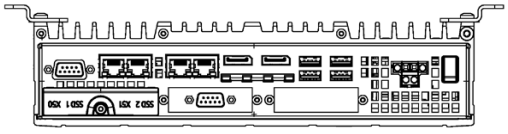


Wall mounting
The interfaces are at the bottom.



Suspended mounting position

The suspended mounting position is permissible for wall mounting. The figure shows the interfaces on the front:

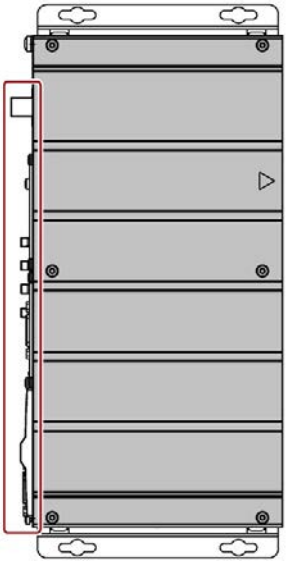


Vertical mounting position

The vertical mounting position is permissible for wall and portrait mounting:

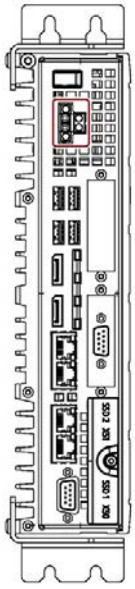
Wall mounting

The interfaces are at the left.



Vertical mounting

The interfaces are at the front. The power supply connection is at the top.



3.2.2 Securing device

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 22)
- Notes on ambient and environmental conditions (Page 22)

Securing the device

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 anchors and screws other than those specified below for mounting. The device can fall and may be damaged.

- Use only the specified anchors and screws.

Instructions for wall mounting

Use the following fasteners:

- Mounting onto DIN rail

Material	Hole diameter	Fastener
Metal, min. 2 mm thick	5 mm	• 2 x M4 screws • 2 x M4 nuts
Concrete	6 mm, 40 mm deep	• 4 x dowels, Ø 6 mm, 40 mm length • 4 x screws, Ø 4 mm, 40 mm length
Plasterboard, min. 13 mm thickness	14 mm	4 x toggle bolts, Ø 4 mm, 50 mm length

- Wall mounting

Material	Hole diameter	Fastener
Concrete	6 mm, 40 mm deep	• 4 x dowels, Ø 6 mm, 40 mm length • 4 x screws, Ø 4 mm, 40 mm length
Plasterboard, min. 13 mm thickness	14 mm	4 x toggle bolts, Ø 4 mm, 50 mm length

- Vertical mounting

Material	Hole diameter	Fastener
Concrete	6 mm, 40 mm deep 8 mm, 40 mm deep	• 4 x dowels, Ø 6 mm, 40 mm length • 4 x screws, Ø 4 mm, 40 mm length • Dowel, Ø 8 mm, 40 mm length • Screw, Ø 5 mm, 40 mm length
Plasterboard, min. 13 mm thickness	14 mm	Toggle bolt, Ø 4 mm, 50 mm length

3.2.3 Mounting onto DIN rail

Two types of DIN-rail clips are available for DIN-rail mounting:

- DIN rail clips made of aluminum (included in delivery if ordered with device)
- DIN rail clips made of plastic (optional, can be ordered as an accessory, Article No. 6ES7648-1AA22-0YQ0)

How to attach these DIN rail clips is described further below.

When using the plastic DIN rail clips, please take the reduced mechanical environmental conditions under "Ambient conditions (Page 83)" into account.

3.2.3.1 Attaching the aluminum DIN rail clips

Before you install the device onto a DIN rail, attach the DIN rail clip to the device.

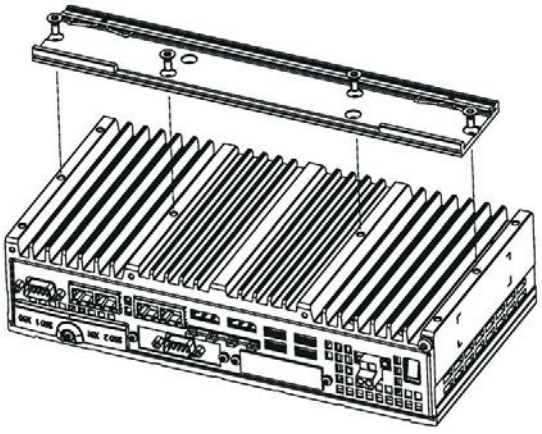
The fasteners and screws required are supplied with the device for the selected mounting option (as specified in order number).

Requirements

- 1 DIN rail clip
- 4 screws
- 1 T20 screwdriver

Procedure

1. Secure the DIN rail bracket with four screws with a tightening torque of 2.5 Nm.



3.2.3.2 DIN-rail mounting with aluminum DIN rail clips

Requirement

- DIN rail, 35 mm standard profile

  The DIN rail is installed at the installation site.

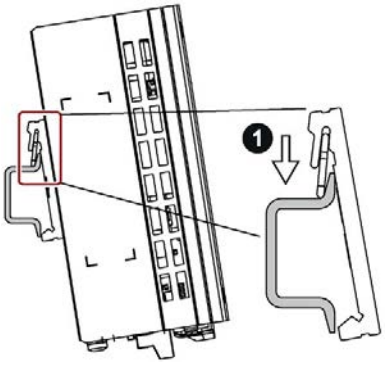
Note

Ensure that the wall or ceiling can hold four times the total weight of the device including DIN profile rail and additional expansion cards. See "Securing device (Page 32)".

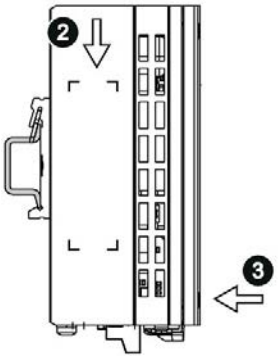
Procedure

Installation

1. Place the device with the DIN rail clip on the upper edge of the DIN rail at the position shown.



2. Push down the device. Once the DIN rail clip has slid over the bottom edge of the DIN rail, push the device towards the DIN rail. You will hear the device click into place.



Disassembly

1. Push the device **down** until it is released by the DIN rail clip.
2. Swing the device out of the DIN rail.
3. Lift the device up and off.

3.2.3.3 Attaching the plastic DIN rail clips

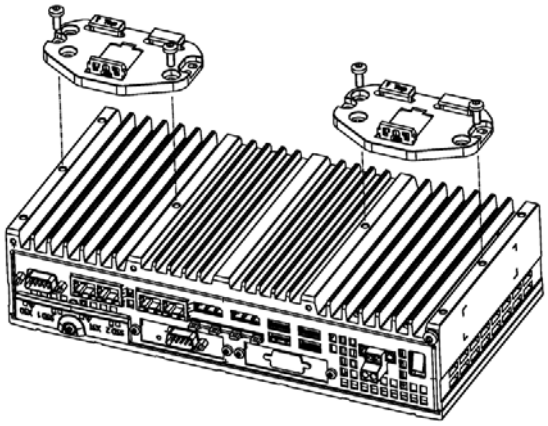
Before you install the device onto a DIN rail, attach the DIN rail clips to the device.

Requirement

- 2 plastic DIN rail clips
- 4 screws
- 1 T20 screwdriver

Procedure

1. Attach the two plastic DIN rail clips with two screws each to a tightening torque of 2.5 Nm.



3.2.3.4 DIN-rail mounting with plastic DIN rail clips

Requirement

- DIN rail, 35 mm standard profile

  The DIN rail is installed at the installation site.

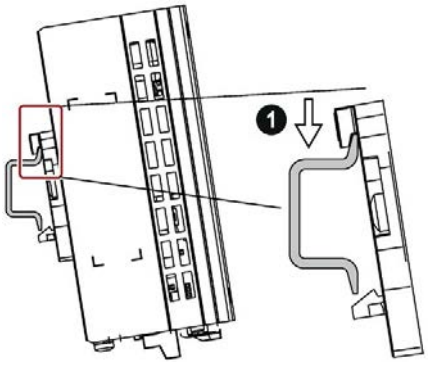
Note

Ensure that the wall or ceiling can hold four times the total weight of the device including DIN profile rail and additional expansion cards. See "Securing device (Page 32)".

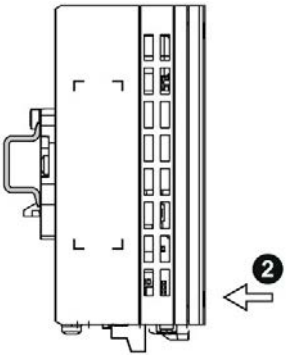
Procedure

Installation

1. Place the device with the DIN rail clips on the upper edge of the DIN rail at the position shown.



2. Press the device towards the DIN rail so that the DIN rail clips slide over the lower edge of the DIN rail. You will hear the device click into place.



Disassembly

1. Push the device **upwards** until the DIN rail clips release the device.
2. Swing the device out of the DIN rail.
3. Lift the device up and off.

3.2.4 Wall mounting

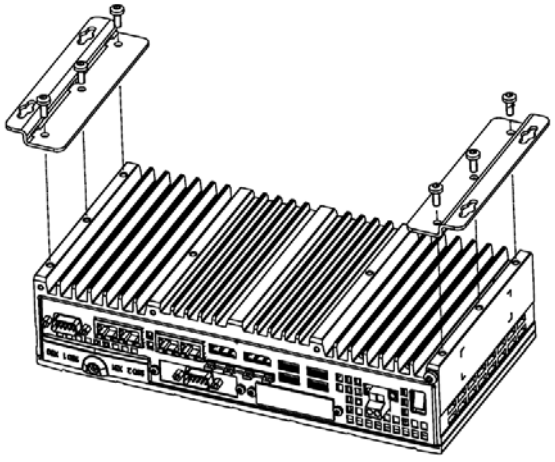
The fasteners and screws required are supplied with the device for the selected mounting option (as specified in order number).

Requirements

- 2 wall mounting brackets
- 6 screws
- 1 T20 screwdriver

Procedure

1. Secure the wall mounting brackets with three screws each and a tightening torque of 2.5 Nm.



3.2.5 Upright mounting

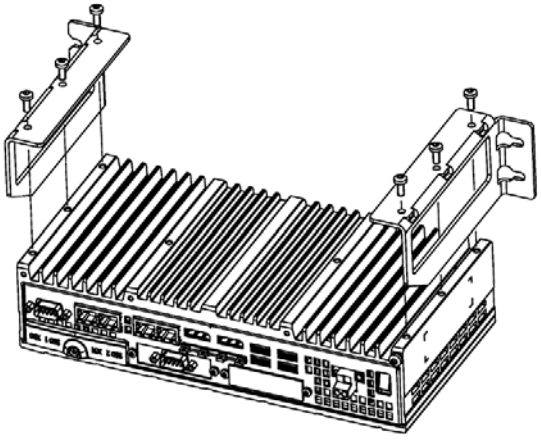
The fasteners and screws required are supplied with the device for the selected mounting option (as specified in order number).

Requirements

- 2 vertical mounting brackets
- 6 screws
- 1 T20 screwdriver

Procedure

1. Secure the portrait mounting brackets with three screws each and a tightening torque of 2.5 Nm.



3.3 Connecting the device

3.3.1 Connecting the protective conductor

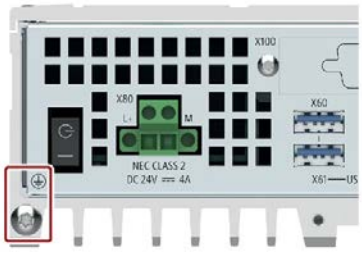
The protective conductor connection is needed to protect the device. The protective conductor discharges dangerous currents, triggering a surge protection switch. The protective conductor also improves the discharge of interference generated by external power cables, signal cables or cables for I/O devices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

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.

3.3.2 Connecting the power supply

3.3.2.1 Connecting the terminal

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 mm^2 and 2.5 mm^2.
- Only connect cores with a cross-section of ≥ 0.5 mm^2.
- 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

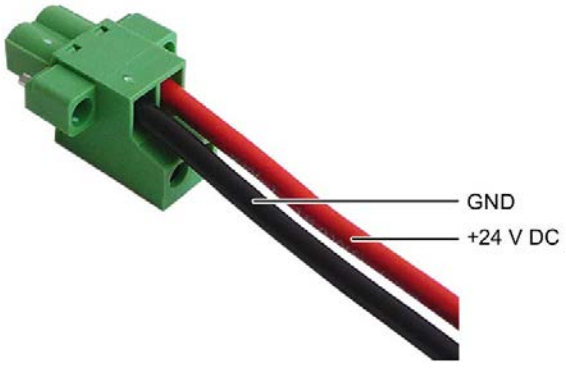
Procedure

NOTICE
Damage to the device Do not adjust the screws in the connection terminal when it is plugged into the device. The pressure of the screwdriver on the connection terminal and the socket can damage the device. • 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.



3.3.2.2 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. The power supply must fulfill the requirements of NEC Class 2 or Limited Energy according to IEC/UL/EN/DIN EN 61010-2-201.
- If the device is installed in an enclosure that complies with section 9.3.2. c) of IEC/UL/EN/DIN-EN 61010-1 and IEC/UL/EN/DIN-EN 61010-2-201, it can be supplied from a source "higher than NEC Class 2 / Limited Energy". The device is then classified as "OPEN EQUIPMENT".

Note

Reverse polarity protection

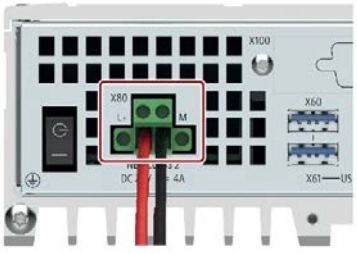
The 24 V DC power supply is protected against polarity reversal. If you mix up the 24 V DC connecting cables and ground, the device is not damaged but does not switch on. After the power supply has been connected correctly, the device will again be ready to operate.

Requirement

- The device has been installed.
- The protective conductor (Page 40) is connected.
- 1 wired terminal (Page 41).
- 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. Insert the terminal at the marked position.
2. Secure the terminal using the integrated screws.



3.3.3 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 24)".

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 operating elements (Page 13)".

2. Secure the cables with the strain relief.

   See: Securing the lines (Page 47)

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 50) ".

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

3.3.4 Connecting expansion cards

This section applies to devices with expansion cards.

The expansion card interface is protected by a cover. There are two holes in the cover for wiring.

⚠ 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.

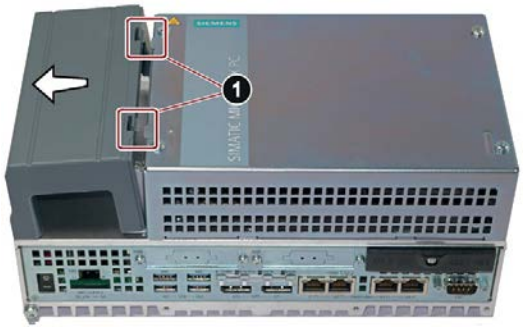
Requirements

- The device is switched off.

Procedure

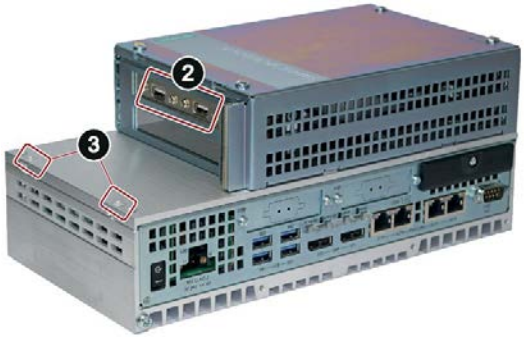
The procedure is described based on the example of a USB expansion card.

1. Open the cover by pushing the indicated latching hooks in the direction of the arrow. Open the cover in the direction of the arrow and lift it off. You can now access the expansion card interfaces.



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

3. Attach the cover at the points shown and close it. Make sure that the latching hooks snap into place so that the cover is secured.



3.3.5 Connecting the device to networks

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

Ethernet

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).

3.3.6 Securing the lines

The strain relief (see "Scope of delivery (Page 26)") is used to prevent accidental loosening of the interface cable from the device.

Requirements

- I/O devices are connected to the respective interfaces.
- 1 screwdriver of the type Torx T10
- 1 strain relief
- Cable ties (not included in the scope of delivery)
- 3 screws

Procedure

1. Fasten the strain relief at the designated points with the supplied oval head screws.



2. Pass the cable tie around the strain relief bar and secure the cables as shown.
3. 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 operating elements (Page 13)".

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 operating system documentation.

See also "Important instructions and manuals for operating the device (Page 9)" 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 "POWER" operating display is lit yellow.

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

Fully disconnecting the device from the line voltage

⚠ WARNING

Risk of electric shock

The On/Off 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 operating elements (Page 13)".

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.

- Operate the on/off switch to initiate a hardware reset, see "Interfaces and operating elements (Page 13)".

See also

General safety instructions (Page 19)

Operating the device

5

5.1 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 44)"

See also

Important instructions and manuals for operating the device (Page 9)

Service and support (Page 110)

Expansion cards (Page 62)

5.2 Drive configurations

5.2.1 RAID1 system

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

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

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

  Onboard RAID system (Page 51)

5.2.2 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 9)".

5.3 Onboard RAID system

5.3.1 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 14) on the front of the device
- "Intel® Optane™ Memory and Storage Management (Page 52)"

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 14) 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

5.3.2 Operating an onboard RAID system

5.3.2.1 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 51)".
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.

5.3.2.2 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 If a new drive is automatically integrated, the new drive is not checked for partition information or existing data. All partitions and data of the new drive are deleted without warning. • Insert only a brand new drive or a drive that is configured as a replacement drive.

1. Select "Start" > "Intel® Optane™ Memory and Storage Management".
2. Select the "Manage" 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 "M.2 NVMe SSD in the SIMATIC IPC Slider (Page 71)".

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:

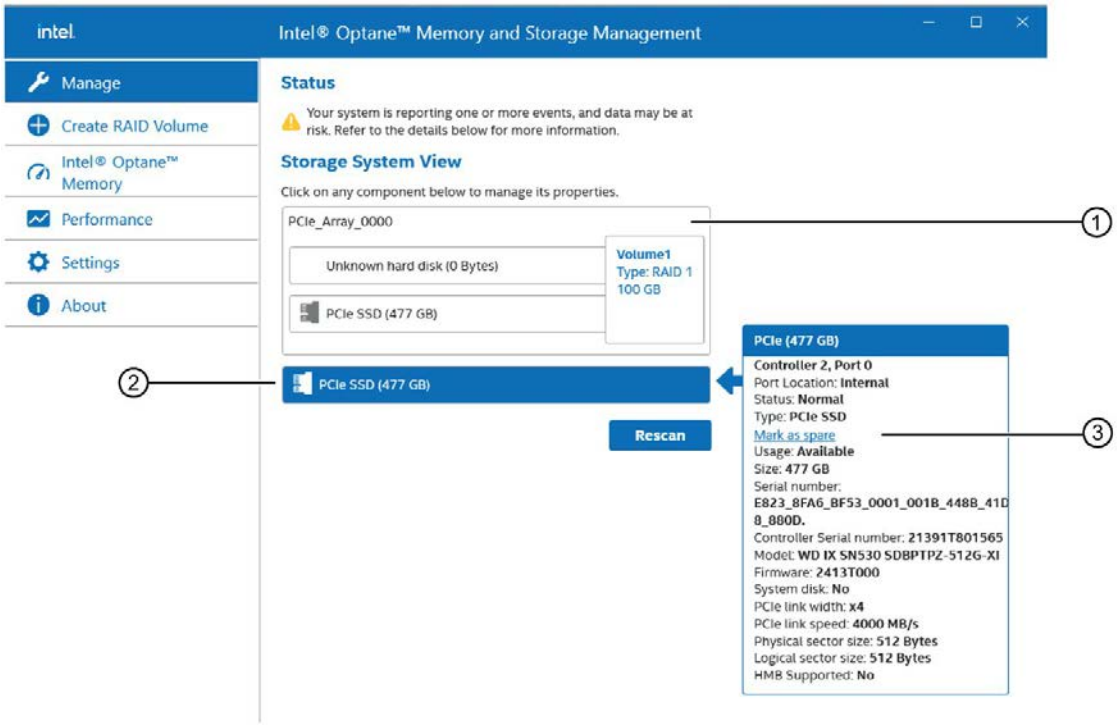
   ① The drives mounted in the onboard RAID system with the information that a drive is not yet mounted (Unknown hard disk).

   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 51)".



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 55)

5.3.3 Data synchronization in the RAID system

NOTICE
Danger of incorrect operations on machine and plant: delayed system reaction during data synchronization Data is synchronized if a drive fails. The system can respond with a delay depending on the size of the drive and system load. In extreme cases, the execution of keyboard, mouse or touch screen commands may be briefly delayed. The result may be faulty operations of the machine or plant. • Do not operate safety-critical functions during synchronization of a drive. Stable system statuses are only achieved after successful completion of synchronization.

Duration of data synchronization

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

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

5.4 Remote maintenance of the device

5.4.1 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. 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. 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 9)".

5.5 Trusted Platform Module (TPM)

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

NOTICE
Import restrictions for the Trusted Platform Module Use of the Trusted Platform Module is subject to legal restrictions in some countries and is not permitted there. • 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 9)".

5.6 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.

5.7 Operation without monitor and keyboard

The device can be operated without a monitor and keyboard. The device startup is guaranteed without these peripherals. A USB keyboard and mouse and a monitor can be connected later for diagnostics.

A digital DVI monitor or DisplayPort monitor is only activated retrospectively when the Windows operating system has booted completed.

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 25)".

⚠ 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 48)".
- 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 slots

⚠ 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 25)".

⚠ 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.
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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.

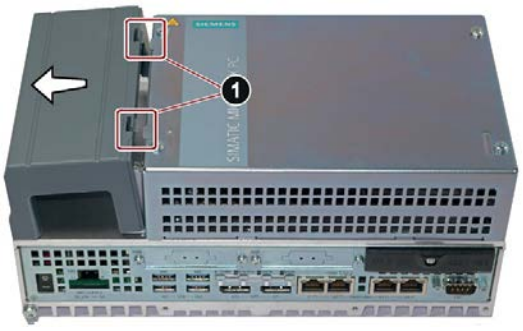
Take corresponding precautionary measures before you open the device.

Requirements

- The device is fully disconnected from the line voltage, see "Switching off the device (Page 48)".
- All connecting cables are unplugged.
- Screwdriver of type Torx T10

Procedure

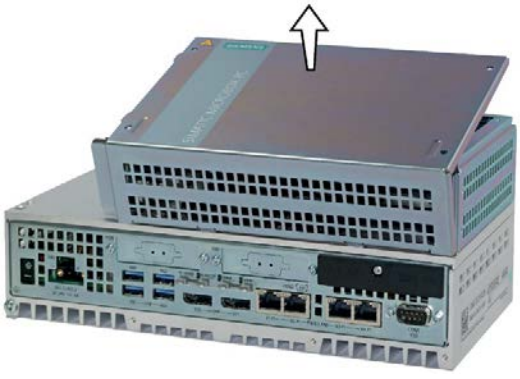
1. Open the cover by pushing the indicated latching hooks in the direction of the arrow. Open the cover in the direction of the arrow and lift it off.



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 85)")

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 93)".

See also

Expansion card slots on the bus board (Page 102)

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 93)". 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 "Expansion card slots on the bus board (Page 102)".

Device versions



Figure 6-1 Device version with one PCIe slot

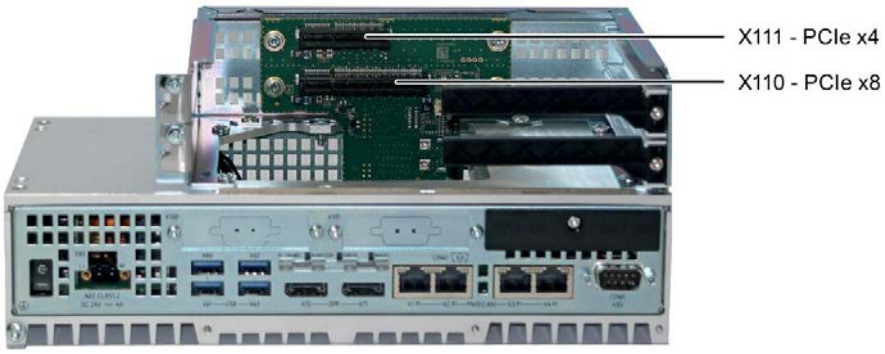


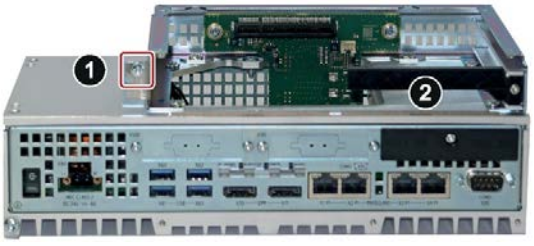
Figure 6-2 Device version with two PCIe slots

Requirements

- You are familiar with the information on expansion cards and the conditions of use of expansion cards, see "Usable expansion cards (Page 62)".
- The device is open, see important information regarding this under "Open device with expansion slots (Page 60)".
- If the PCIe card to be used has external interfaces, you can use the built-in slot plates to install the plug-in connectors. You can also use a slot plate with connector perforations.
- Screwdriver of type Torx T10

Procedure - Installation

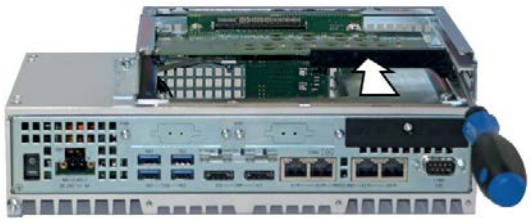
1. Remove the screw (1) in the blanking plate for the slot you require and remove the blanking plate.
2. Remove the retainer (2).



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 slots (Page 60)".

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 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 100)

Dimension drawing of expansion modules (M.2) (Page 93)

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 65)". 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 65)".

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 65)".
- The device is open, see important information regarding this under "Opening the Device (Page 58)" or "Open device with expansion slots (Page 60)".
- The M.2 NVMe SSDs in the SIMATIC IPC Slider have been removed, see "M.2 NVMe SSD in the SIMATIC IPC Slider (Page 71)".
- 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).

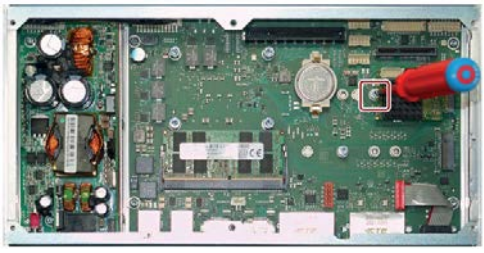
   Take care not to touch the contacts of the M.2 module when you do this.



4. Fasten the M.2 module with the screw that you removed in step 2.

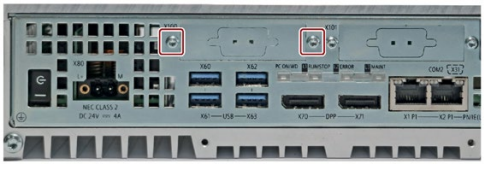
   Only use the original screws with the spacers.

   Note: Make sure that the M.2 module is between the head and the spacer of the screw.

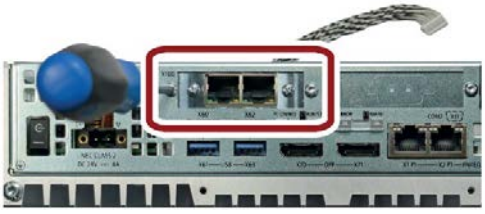


If the M.2 module includes a cable with an additional interface card that must be connected to the enclosure opening, you must also execute the following steps:

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 58)" or "Open device with expansion slots (Page 60)".

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 regarding this under "Opening the Device (Page 58)" or "Open device with expansion slots (Page 60)".

Procedure - Removal

1. Push down the module clips towards the outside.
   The memory module tilts forward.
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 When you remove the drive while data is being written to it, you may damage the drive and destroy data. • Only remove the SIMATIC IPC Slider from the device when the drive is inactive. • 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 18)".
- 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 48)".
- The device you wish to replace is inactive.
- Screwdrivers of type Torx T10 and T8

Procedure - Option 1

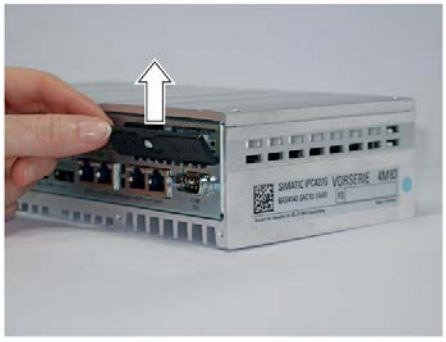
If you change a drive together with Slider, then only steps 1 to 3 and then steps 12 and 13 need to be performed.

Procedure - Option 2

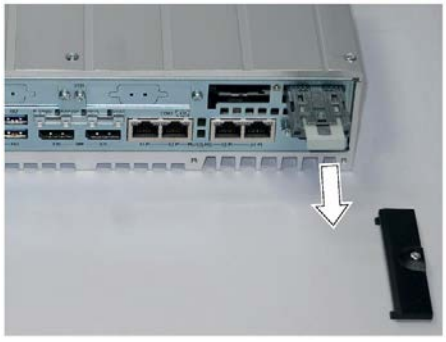
1. Loosen the screw of the removable Slider with the Torx T10 type screwdriver.



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



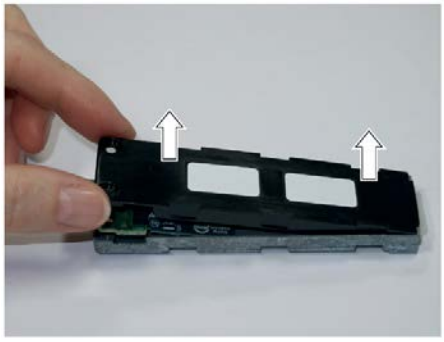
3. Pull out the Slider in the direction of the arrow using the lug.



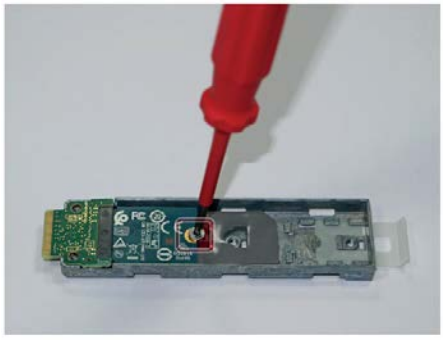
4. Place the Slider on a suitable surface.
5. Remove the marked screws with the screwdriver of type Torx T8.



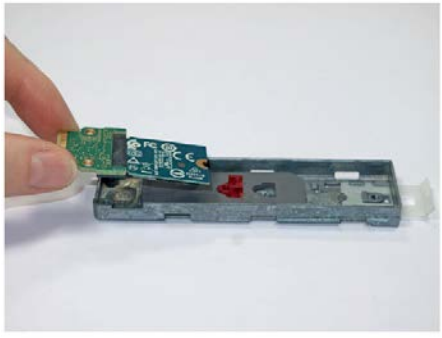
6. Remove the black plastic cover.



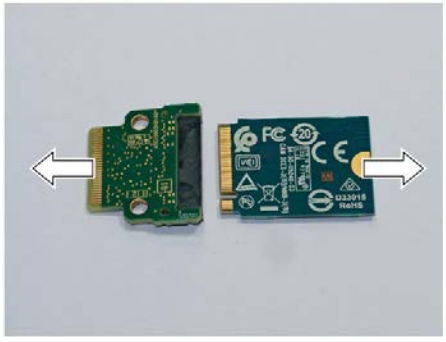
7. Remove the marked screw with the screwdriver of type Torx T8.



8. Remove the M.2 NVMe SSD from the Slider as shown.



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 25)".

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 Removing and installing hardware

7.3.1 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 75)".
- 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.

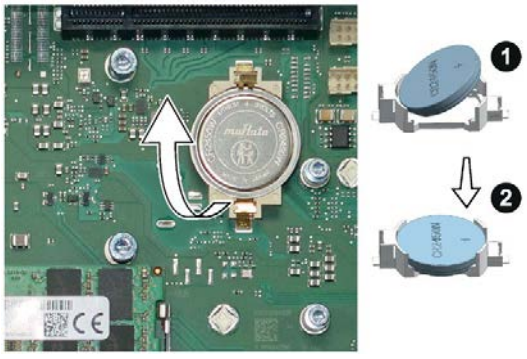
Requirement

- An original spare part, that is a back-up 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 9).
- The device is open, see important information regarding this under Opening the Device (Page 58).
- You have observed the local regulations relating to the disposal of used batteries.

Procedure

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



7.4 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 9)".

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 9)".

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.

7.5 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 9)".

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 101)".

7.6 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 9)".

7.7 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 61000-6-3 / IEC 61000-6-3, 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 79)".

Article number	6AG4142-.....-.... (for details, refer to the ordering documentation)
Dimensions Base device: Device with 2x expansion:	 262 x 133 x 63 (W × H × D in mm) 262 x 133 x 114 (W × H × D in mm)
Weight Base device: Device with 2x expansion:	 Approx. 2.3 kg Approx. 2.7 kg
Supply voltage DC [1]	Nominal 24 V DC (-20% / + 20%), SELV [1]
Input current DC	Continuous current up to 4 A
Short-term voltage interruption in accordance with Namur	Max. 20 ms (at 20.4 V) (max. 10 events per hour; recovery time of at least 1 s)
Max. power consumption	67.5 W (at 24 V)
Noise emission	< 40 dB(A) according to DIN 45635-1
Degree of protection	IP 20 according to IEC 60529 [2]
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 • EN 61010-2-201 • DIN EN 61010-2-201 • UL 61010-2-201 • CSA C22.2 No 61010-2-201

[1] 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 the standard IEC/UL/EN/DIN EN 61010-2-201. The power supply must fulfill the requirements of NEC Class 2 or Limited Energy according to IEC/UL/EN/DIN EN 61010-2-201 (see section "Connecting the 24 V DC power supply (Page 42)").

If the device is installed in an enclosure that complies with section 9.3.2. c) of IEC/UL/EN/DIN-EN 61010-1 and IEC/UL/EN/DIN-EN 61010-2-201, it can be supplied from a source "higher than NEC Class 2 / Limited Energy". The device is then classified as "OPEN EQUIPMENT".

[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. The total power for both PCIe slots must not exceed 12 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 Perfomance"	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 - additionally	0.5 A	12 W
NVMe SSDs in the SIMATIC IPC Slider - additional	0.25 A	5.9 W
M.2 slots - additionally	0.25 A	5.9 W
PCIe slots - additionally	0.58 A	14 W

8.3.2 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 Max. 9 A for further 5 ms 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 79)".

Interference emission	EN 61000-6-3, EN 61000-6-4, CAN/CSA CISPR32 Class B; 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 ± 1 kV according to IEC 61000-4-5; symmetrical surge ± 2 kV according to IEC 61000-4-5; asymmetrical surge
Noise immunity on signal lines	± 1 kV acc. to IEC 61000-4-4; burst; length < 30 m ± 2 kV acc. to IEC 61000-4-4; burst; length > 30 m ± 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 ± 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 • 3 V/m 2.7 – 6 GHz, 80% AM to IEC 61000-4-3 • 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 79)".

NOTICE
Temperature – during operation When operating with maximum expansion and maximum application load, the temperature in the PCIe expansion card area may increase up to 17 °C compared to the ambient temperature, depending on the device mounting position.

Climatic ambient conditions	
Temperature – Operation	**Horizontal mounting position:** Operation with one M.2 NVMe SSD • With up to 2 expansion cards (max. load 12 W): 0 to +50 °C [1)] • Without expansion cards: 0 to +55 °C [1)] Operation with two M.2 NVMe SSDs • With up to 2 expansion cards (max. load 12 W): 0 to +45 °C [1)] • Without expansion cards: 0 to +50 °C [1)] **Vertical / portrait mounting position:** Operation with one M.2 NVMe SSD • With up to 2 expansion cards (max. load 12 W): 0 to +45 °C [1)] • Without expansion cards: 0 to +50 °C [1)] Operation with two M.2 NVMe SSDs • With up to 2 expansion cards (max. load 12 W): 0 to +40 °C [1)] • Without expansion cards: 0 to +45 °C [1)] **Suspended mounting position:** Operation with one or two M.2 NVMe SSDs • Without expansion cards: 0 to +30 °C [1)] [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". If PLP NVMe SSD drives are used, the maximum ambient temperature must be reduced by 5 °C.
- Storage/transport	– 40 °C to + 70 °C
- Gradient	Max. 10 °C/h in operation, 20° C/h storage, no condensation
Relative humidity – Operation	Tested according to IEC 60068-2-78, IEC 60068-2-30 Temperature 30 °C, relative humidity 85%; 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 – Operation	1080 to 689 hPa (corresponds to an altitude of -1000 to 3000 m)
- Storage/transport	1080 to 660 hPa (corresponds to an altitude of -1000 to 3500 m)

Climatic ambient conditions	
Mechanical environmental conditions	
Vibration – Operation – Storage/transport	Tested according to DIN IEC 60068-2-6 5 to 9 Hz: 7 mm_{pp}, 9 to 500 Hz: 9.8 m/s^2 [2)] 5 to 9 Hz: 7 mm_{pp}, 9 to 500 Hz: 9.8 m/s^2
Shock resistance – Operation – Storage/transport	Tested to IEC 60068-2-27, IEC 60068-2-29 Half-sine 150 m/s^2, 11 ms [3)] Half-sine 250 m/s^2, 6 ms

2) If plastic DIN rail clips are used, the following values apply for vibration:
10 to 58 Hz: 0.075 mm_{pp}, 58 to 200 Hz: 5 m/s^2

3) If plastic DIN rail clips are used, the following values apply for shock resistance:
half-sine 50 m/s^2, 6 ms

8.6 Resistance to corrosive gas according to ISA-71.04

See the note in "Applicability of technical specifications (Page 79)".

The devices mentioned in the scope of validity meet the following requirements regarding corrosive gas resistance:

Corrosive gases as air pollutants Reactive gases H2S und SO2	ISA-71.04 Severity Level	G1, G2, G3 RH ≤ 75%, no condensation
	Test according to	IEC 60068-2-42 (SO2 10ppm)
		IEC 60068-2-43 (H2S 1ppm)

8.7 Technical specifications of the drives

See the note in "Applicability of technical specifications (Page 79)".

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

8.8 Technical specifications of the motherboard

See the note in "Applicability of technical specifications (Page 79)".

Chipset	Intel® RM590E
Processor	• Intel® Celeron® 6600HLE 2 cores/2 threads, 2.1 GHz, 8 MB cache, ECC, TCC • Intel® Xeon® W-11155MLE 4 cores/8 threads, 1.8 (3.1) GHz, 8 MB cache, ECC, TCC • Intel® Xeon® W-11555MLE 6 cores/12 threads, 1.9 (4.4) GHz, 12 MB cache, vPro (iAMT), ECC, TCC • 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 see ordering documents for features
Buffer memory	512 KB NVRAM
Expansion slots IPC BX-39A	Version • without expansion slots • with 1 expansion slot or • with 2 expansion slots
Maximum bandwidth of PCI slots	Slot 1: Rev. 4.0: 16 GT/s (1969 Mbps) bandwidth per lane Slot 2: Rev. 3.0: 8 GT/s (985 Mbps) bandwidth per lane
Max. permissible power loss per slot	Total power consumption (all voltages) must not exceed 8 W. The total power for both PCIe slots must not exceed 12 W.

Expansion card slots

Slots for expansion cards IPC BX-39A with **one** expansion slot (Bus board 1 x PCIe)	
Slot 1	PCI Express x4 (mechanical x8): Specification Rev. 4.0, length: Max. 175 mm
Expansion card slots IPC BX-39A with **two** expansion slots (Bus board 2 x PCIe)	
Slot 1	PCI Express x4 (mechanical x8): Specification Rev. 4.0, length: Max. 175 mm
Slot 2	PCI Express x1 (mechanical x4): Specification Rev. 3.0, length: Max. 175 mm

8.9 Technical specifications of graphic

See the note in "Applicability of technical specifications (Page 79)".

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

8.10 Technical specifications of the interfaces

Observe the information in "Applicability of technical specifications (Page 79)" 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 • 1 x Ethernet 1: Intel® Jacksonville i219-LM; AMT-capable [3, 4] • 1 x Ethernet 2: Intel® Springville i210-IT • 2 x Ethernet 3, 4: Intel® EC 1000S
	Wake on LAN, Remote Boot and the following Teaming modes are supported [5]: • Adapter Fault Tolerance (AFT) • Adaptive Load Balancing (ALB) • IEEE 802.3ad Dynamic Link Aggregation (DLA) • Static Link Aggregation (SLA) • Switch Fault Tolerance (SFT)
COM1, COM2 (optional)	RS232/RS422/RS485, 115 kbps max., 9-pin SUB-D, male
Free slots for expansion cards (see Bus board (Page 102))	

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 AMT.

4 When using AMT, the interface X1 P1 must be used for connection to remote maintenance.

5 Only possible with ports X1 P1 and X2 P1

8.11 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 9)

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:

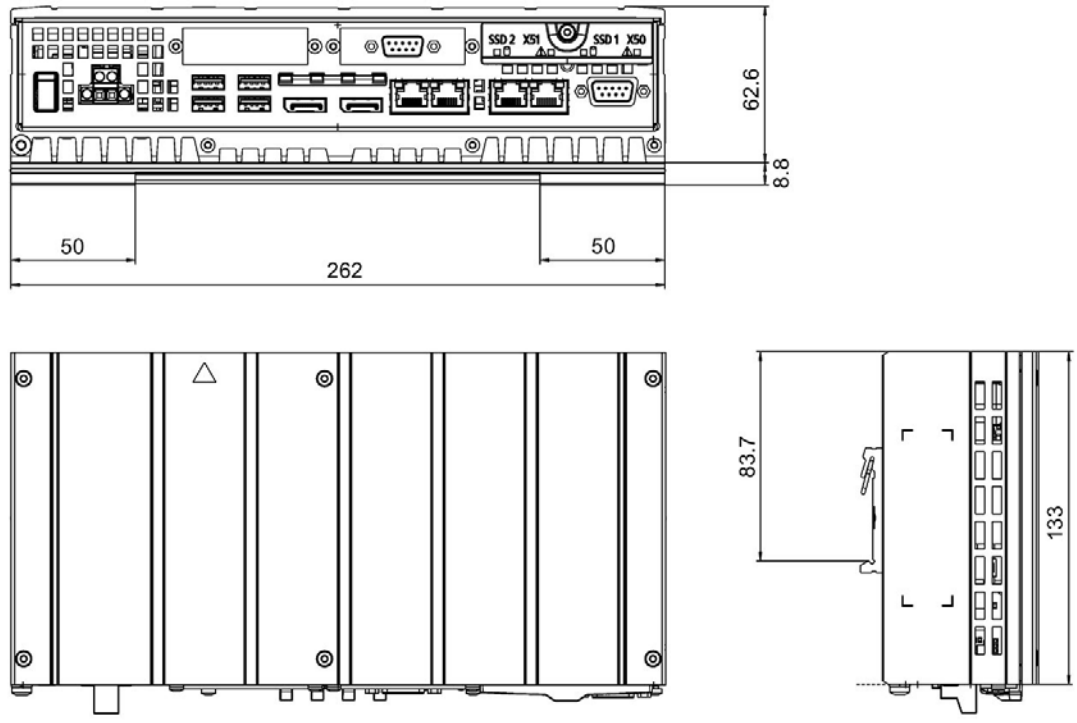
Partition	Name	Size	File system
First	Boot	260 MB	FAT32
Second	MSR	128 MB	None
Third	System	160 GB	NTFS
Fourth	WinRE	500 MB	NTFS
Fifth	Data	Remainder	NTFS

Dimension drawings

9

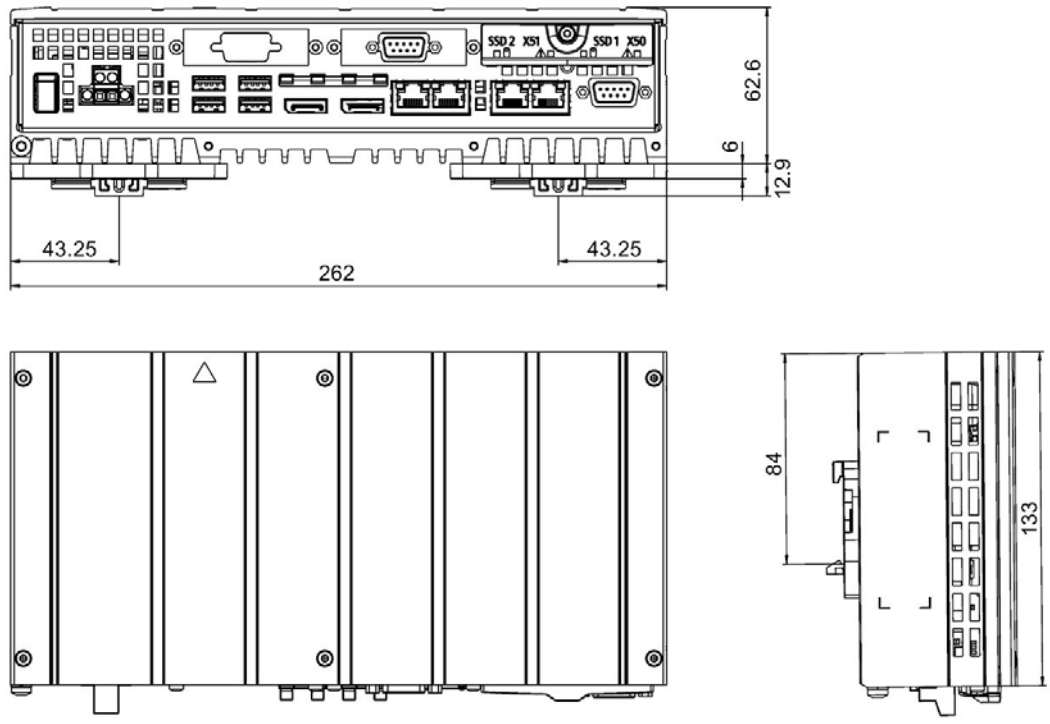
9.1 Dimension drawing - mounting on a DIN rail

With aluminum DIN rail clip



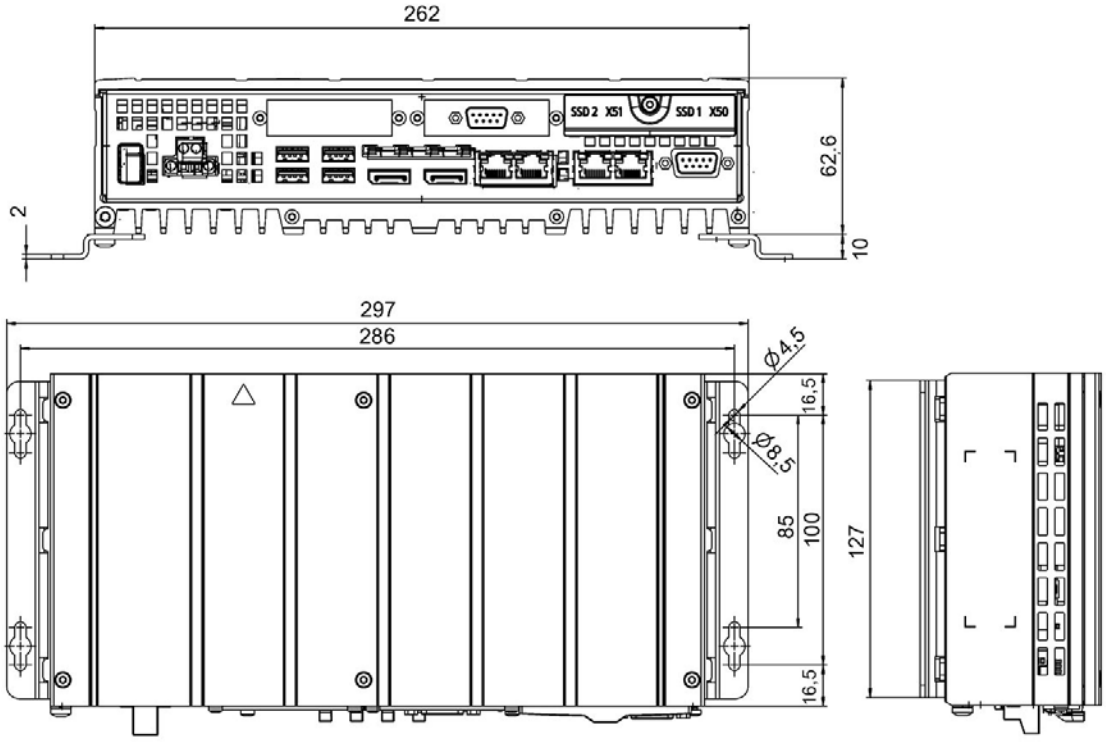
All dimensions in mm

With plastic DIN rail clip



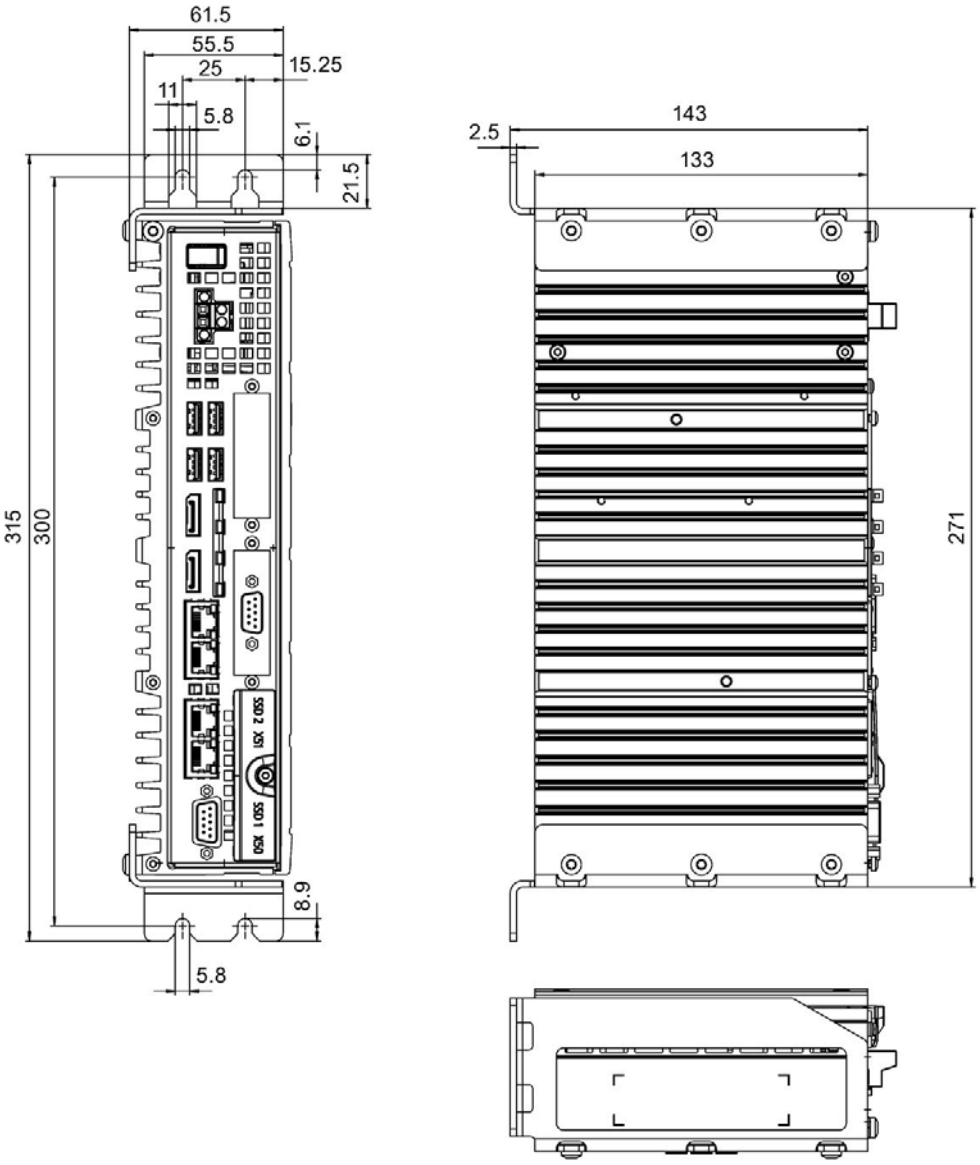
All dimensions in mm

9.2 Dimension drawing - wall-mounting



All dimensions in mm

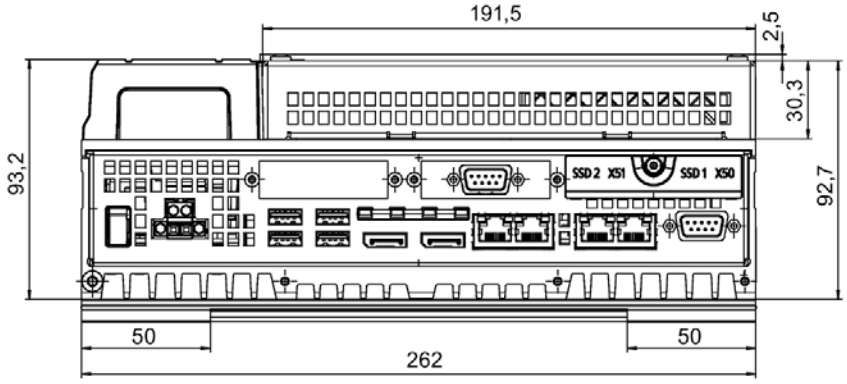
9.3 Dimension drawing - vertical mounting



All dimensions in mm

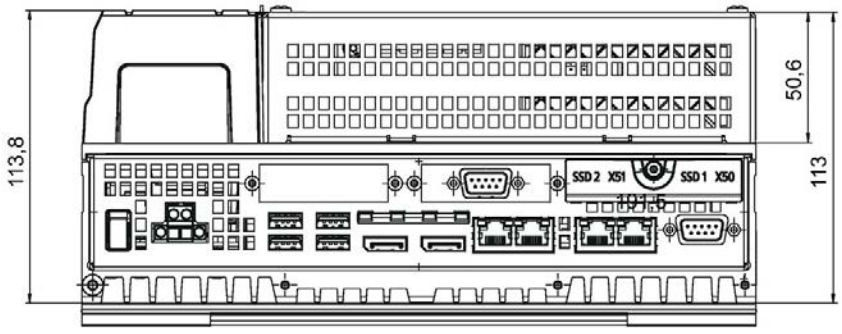
9.4 Dimension drawing - device with expansion slots

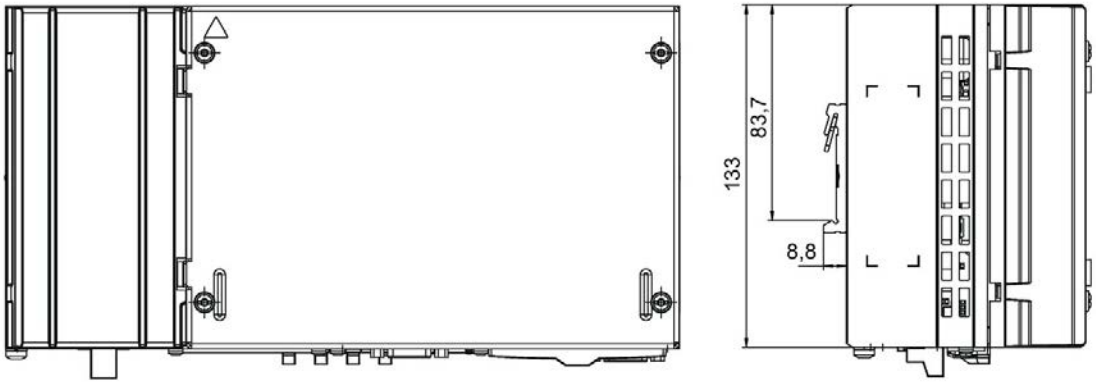
Device with one PCIe slot



Alle Angaben in mm

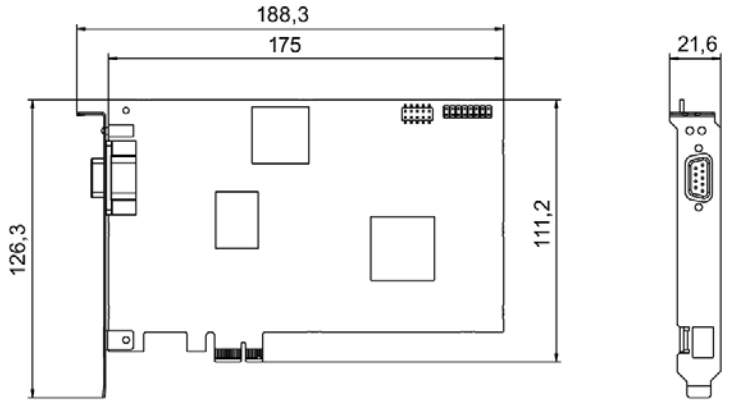
Device with two PCIe slots





Alle Angaben in mm

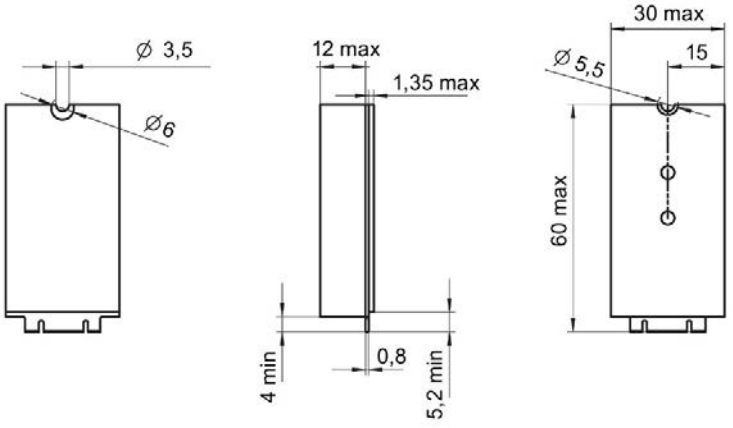
9.5 Dimension drawing of the expansion cards



Alle Angaben in mm

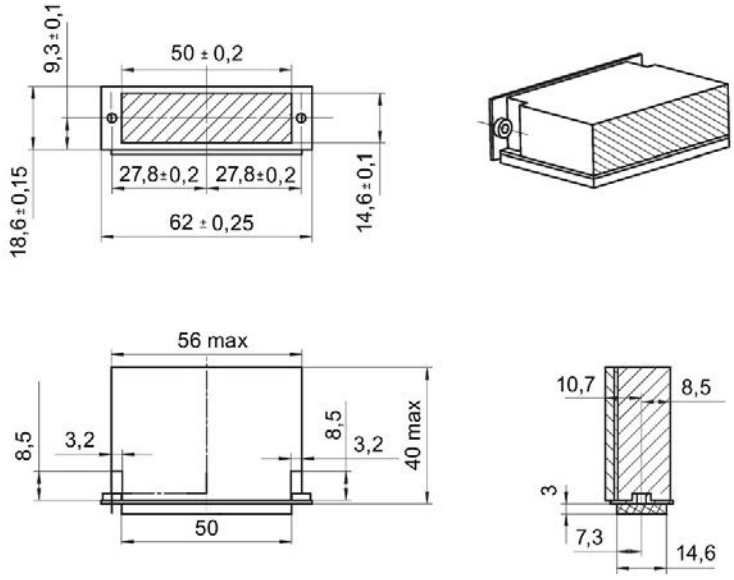
9.6 Dimension drawing of expansion modules (M.2)

Maximum dimensions of expansion modules



Alle Angaben in mm

Dimension drawing of the conditioner card



Alle Angaben in mm

Standards and approvals

10

Note

Scope

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

10.1 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
Residential and commercial areas and small businesses	EN 61000-6-3	EN 61000-6-1

- 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: Certificate Box PC (http://support.automation.siemens.com/WW/view/en/10805671/134200).

10.2 UKCA marking

UKCA marking



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

- Electromagnetic Compatibility Regulations 2016 (EMC)
- 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:

- Certificate Box PC (http://support.automation.siemens.com/WW/view/en/10805671/134200)

10.3 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.

10.4 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
- Underwriters Laboratories (UL) in accordance with Standard UL 62368-1 Third Edition, File E115352 (I.T.E.)
- Canadian National Standard CAN/CSA-C22.2 No. 62368-1:19 Third Edition

10.5 FCC (USA)

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

Responsible party for Supplier's Declaration of Conformity

Siemens Industry, Inc.

Digital Factory - Factory Automation

5300 Triangle Parkway, Suite 100

Norcross, GA 30092

USA

mailto: amps.automation@siemens.com (mailto: amps.automation@siemens.com)

10.6 Canada

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

10.7 Australia / New Zealand

AUSTRALIA / NEW ZEALAND



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

This product meets the requirements of the standard EN 61000-6-4 Generic standards - Emission standard for residential, commercial and light-industrial environments.

10.8 Eurasion Customs Union EAC

Identification for Eurasion Customs Union



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

10.9 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.

10.10 Taiwan

Taiwan



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

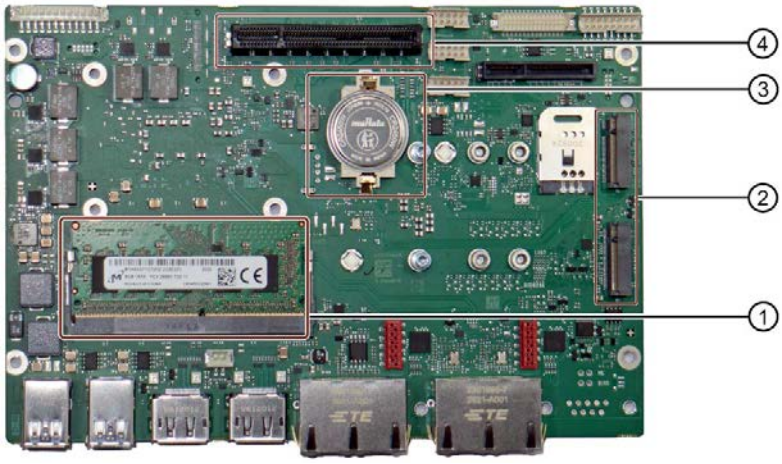
Hardware description

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.

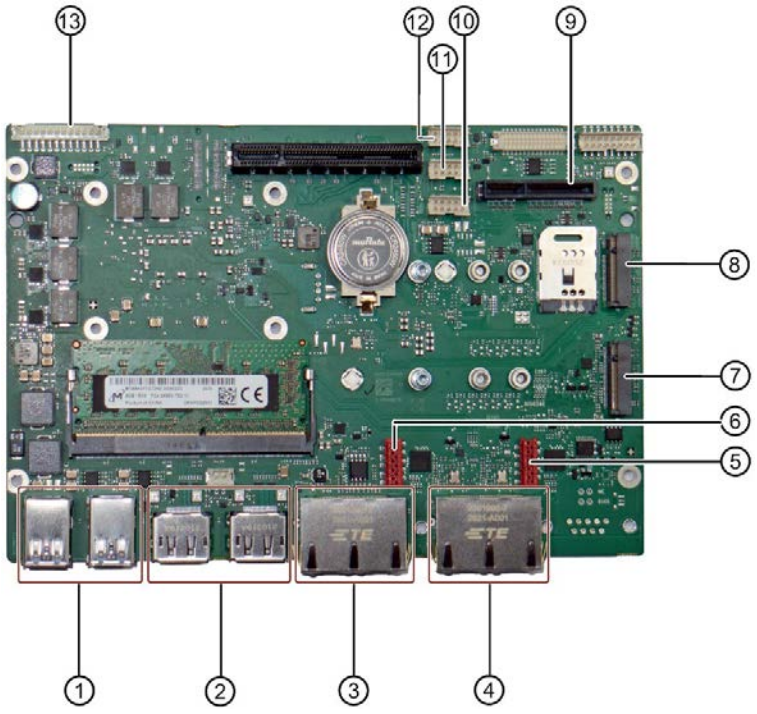


① Slot for memory module
② Slots for expansion modules (M.2)
③ Backup battery
④ Slot for the bus board

Technical features of the motherboard

Technical features of the motherboard can be found under "Technical specifications of the motherboard (Page 85)".

A.1.2 Position of the interfaces on the motherboard



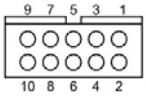
(1) 4 x USB (X60/X61/X62/X63)
(2) 2 x DPP (X70/X71)
(3) 2 × Ethernet (X1 P1 iAMT-capable/X2 P1)
(4) 2 × Ethernet (X3 P1/X4 P1)
(5) COM1 (X30)
(6) COM2 (X31)
(7) M.2 PCIe interface (X101)
(8) M.2 PCIe interface (X100)
(9) Port for SSD drive bay (X40)
(10) USB 2.0 (X64 Internal 1/X64 Internal 2)
(11) USB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



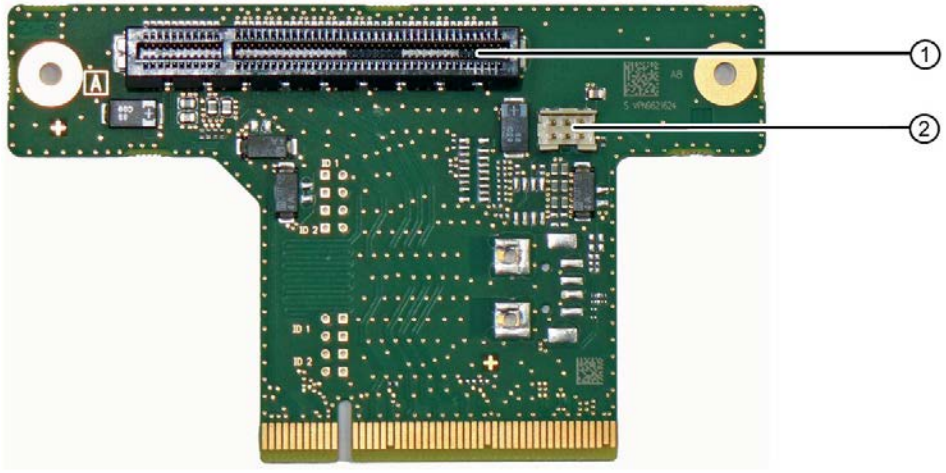
Pin	Designation
1	VBUS_USB1
2	VBUS_USB2
3	USB1_D-
4	USB2_D-
5	USB1_D+
6	USB2_D+
7	GND
8	GND
9	GND
10	GND

A.3 Bus board

A.3.1 Expansion card slots on the bus board

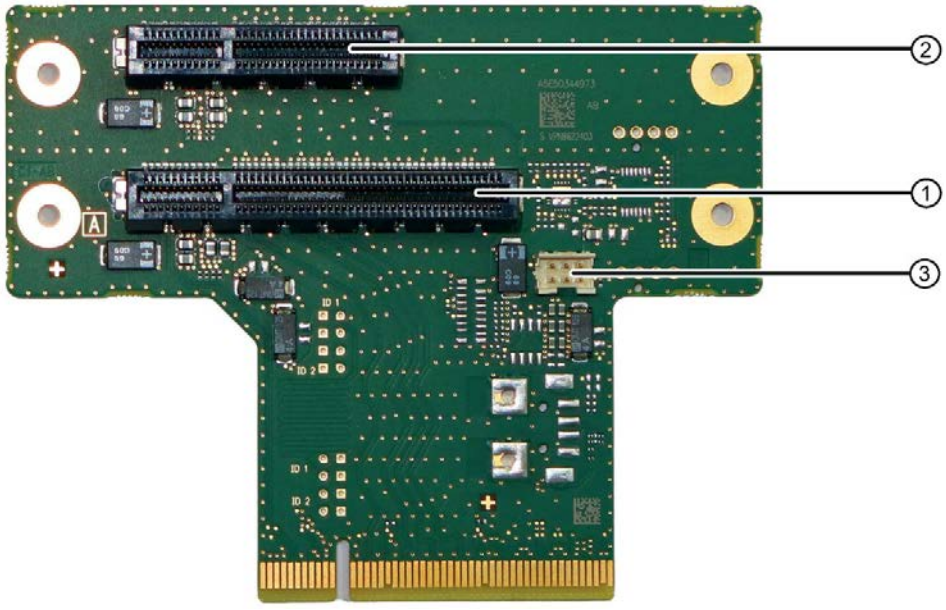
The bus board is designed as a link between the motherboard and the expansion cards. The bus board is available in the following designs:

Variant 1 (1 slot)



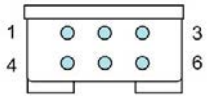
①	Slot X110 PCI Express x4 (mechanical x8)
②	Power supply connection; see Pin assignment power supply connection for expansion cards (Page 103)

Variant 2 (2 slots)



①	Slot X110 PCI Express x4 (mechanical x8)
②	Slot X111 PCI Express x1 (mechanical x4)
③	Power supply connection; see Pin assignment power supply connection for expansion cards (Page 103)

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

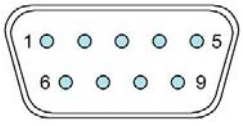
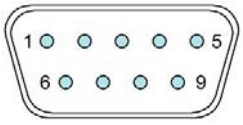
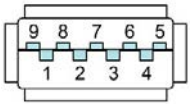
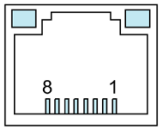
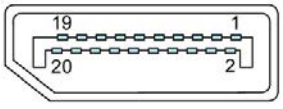
[1] max. permitted current: 1 A; with this power requirement, the total power requirement of the PCI slots must not be exceeded.

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	Con-nector	Description	Assignment
COM1	X30	9-pin SUB-D connector	
COM2	X31	9-pin SUB-D connector	
USB 3.2	X60, X61 X62, X63	USB 3.2 Gen 2 socket type A	
Ethernet 1, 2, 3 and 4	X1 P1, X2 P1, X3 P1, 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.

A.5.2.2 Output register user LED L1/L2/L3 (read/write)

The "PC ON/WD" LED indicates the progress of the device startup by pulsing yellow/green. Once the boot process is completed, the "PC ON/WD" LED continuously lights up green. The "PC ON/WD" LED cannot be influenced.

The status of the user LEDs L1/L2/L3 can be read and written 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 02h into the GPIO port select register (280h) to select the relevant register (GPIO2).
2. Read or write the desired value from or to the GPIO2 data register (282h) to control the user LEDs L1/L2/L3.

Meaning of the bits

User LED L1/L2/L3 register (read/write, address 282h)								
Bits								**Meaning of the bits**
7	6	5	4	3	2	1	0	
						1	1	LED L1 / Run/Stop dark (default)
						1	0	LED L1 / Run/Stop lit red
						0	1	LED L1 / Run/Stop lit green
						0	0	LED L1 / Run/Stop lit yellow
				1	1			LED L2 / Error dark (default)
				1	0			LED L2 / Error lit red
				0	1			LED L2 / Error lit green
				0	0			LED L2 / Error lit yellow
		1	1					LED L3 / Maint dark (default)
		1	0					LED L3 / Maint lit red
		0	1					LED L3 / Maint lit green
		0	0					LED L3 / Maint lit yellow
	x							Reserved
0								WDT system reset: On
1								WDT system reset: Off

A.5.2.3 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 sufficient for approx. one month)
			1	1				CMOS battery is empty or missing
		x						Reserved
	x							Reserved
x								Reserved

A.5.2.4 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.5.2.5 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: NVRAM base address register	PCI register content: 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. • Check to see if the on-off switch is in the correct position.
	Device is being operated outside the specified ambient. conditions	• Check the ambient conditions. • After transport in cold weather, wait approximately 12 hours before switching on the device.
Windows no longer boots	Settings in 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. • Check whether the monitor cable has been properly connected to the system unit and to the monitor.
		If the monitor screen still remains dark after you have performed these checks, please contact your technical support team.
The mouse pointer does not appear on the screen.	The mouse driver is not loaded.	Check whether the mouse driver is properly installed and available when you start the user program. Detailed information about the mouse driver is available in the corresponding documentation.
	The mouse is not connected.	• Check whether the mouse cord is properly connected to the system unit. • If you use an adapter or expansion for the mouse cable, also check these connectors.
		If the cursor still does not appear on the screen after you have performed these checks and actions, contact your technical support team.
Wrong time and/or date on the PC.		1. Call the firmware/BIOS configuration menu. To do this, press the "<Esc>" button during the boot process and then select "Setup Utility". 2. Set the date and time in the "Main" tab and save the changes.

Problem	Cause	Remedy
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. • Hardware interrupts and/or DMA channels are assigned twice • Signal frequencies or signal levels are not adhered to • Different pin assignment	Check your computer configuration: • If the computer configuration corresponds to the delivery condition, contact your technical support team. • In the case of a change in the configuration, restore the delivery condition. To do this, remove the expansion card and restart the device. If the error no longer occurs, the expansion card was the cause of the fault. Replace this with a Siemens expansion card or contact the supplier of the expansion card.
		If the device still crashes, contact your technical support team.
	PCIe Gen1 expansion card does not behave according to specification.	1. Remove the expansion card. 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. 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. 4. Install the expansion card again.

Markings and symbols

C

C.1 Overview

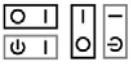
The following tables show all the symbols which may be found on your SIMATIC industrial PC, SIMATIC industrial monitor or SIMATIC Field PG in addition to the symbols which are explained in the operating instructions.

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

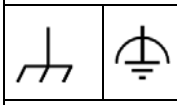
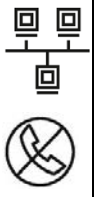
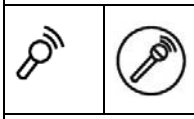
Symbol	Meaning		Symbol	Meaning
	On/off switch, without electrical isolation			On/off switch, without electrical isolation

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
DPP	DisplayPort interface			Smart Card Reader
	DVI-D interface			Line In
LAN 	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.

Index

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