SIEMENS

SIMATIC

Industrial PC
SIMATIC IPC RW-543A

Operating Instructions

03/2023
A5E52332059-AA

Legal information

Warning notice system

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

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

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

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

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

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

Qualified Personnel

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

Proper use of Siemens products

Note the following:

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

Trademarks

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

Disclaimer of Liability

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

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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, expansion of the SIMATIC IPC RW-543A and to maintain and repair the device. They are intended for the following qualified specialist personnel:

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

Basic knowledge required

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

Range of validity of these operating instructions

These operating instructions are valid for all supplied versions of the SIMATIC IPC RW-543A.

History

Currently released versions of these operating instructions:

Edition	Comment
03/2023	First edition

Table of contents

Product description

1

1.1 Important instructions and manuals for operating the device

Documentation	Contents	Source
Operating instructions	• Product description • Technical specifications • Installation of the device • Operation of the device • Installing and removing hardware • Dimension drawings	• Scan the QR code from product label to get the manual • Supplied data storage medium • 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	• Scan the QR code from product label to get the QIG • Supplied data storage medium
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)
Windows® operating system	Information on: • Commissioning the operating system • Restoring the operating system • Configuration of the operating system	• Supplied data storage medium • Online at: Microsoft® Windows® 10 (https://support.industry.siemens.com/cs/ww/en/view/109749498)

1.2 Product highlights

The SIMATIC IPC RW-543A is an industrial PC in 19" rack format design (4U). It is perfectly suited for PC applications with high-level industry functionality.

- Powerful processors up to Intel Core i9 (10th generation)
- No additional dust protection measures required thanks to filter mat and overpressure ventilation
- Robust all-metal enclosure
- Variety of interfaces
- Lockable front cover
- Prepared for mounting on telescopic rails

Note

The supplied device may differ in some details from the figures contained in this manual. Within some of the figures, one device is used to represent all devices.

SIMATIC IPC RW-543A configuration plan

Type	• 19" rack, 4 U
Mounting	• Support horizontal installation
Chipset	• Intel® Q470
CPU type	• Intel® Pentium® Gold G6400 Processor (4M Cache, 4.00 GHz) • Intel® Core™ i3-10100E Processor (6M Cache, up to 3.80 GHz) • Intel® Core™ i5-10500E Processor (12M Cache, up to 4.20 GHz) • Intel® Core™ i7-10700E Processor (16M Cache, up to 4.50 GHz) • Intel® Core™ i9-10900E Processor (20M Cache, up to 4.70 GHz)
Memory	• DDR4-2400/2666/2933MHz, 4 × Non-ECC U-DIMM Slot, up to 128GB
Drive bays	• 1 × 3.5" slot • 3 × 5.25" slot
Hard Disk Drive (HDD)	• 1 TB HDD

Solid State Drive (SSD)	• 256 GB SSD • 512 GB SSD
Power Supply	• 350 W • 500 W • 850 W
Operation System	• Windows 10 2021 LTSC (Long Term Servicing Channel) 64-bit • Without OS

1.3 Scope of application

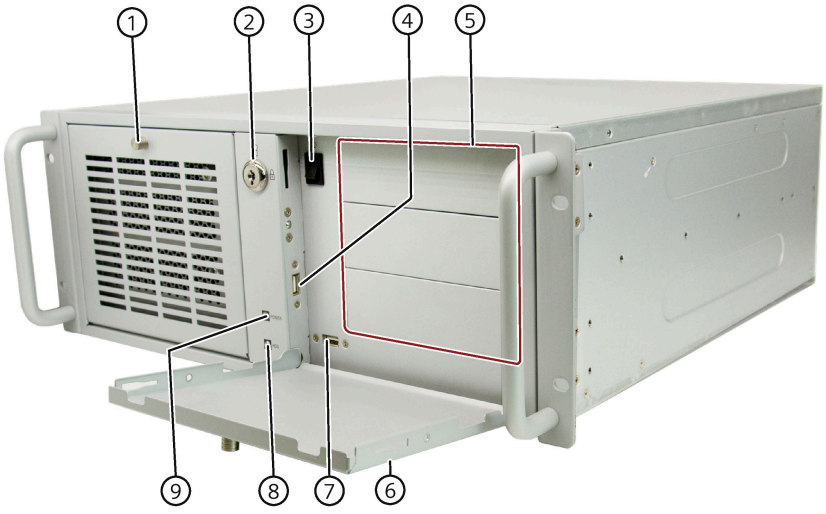
The SIMATIC IPC offers system integrators, cabinet designers, system engineers and machine designers a 19" rack PC platform for high-performance applications and IT applications on the control and cell level for:

- 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.

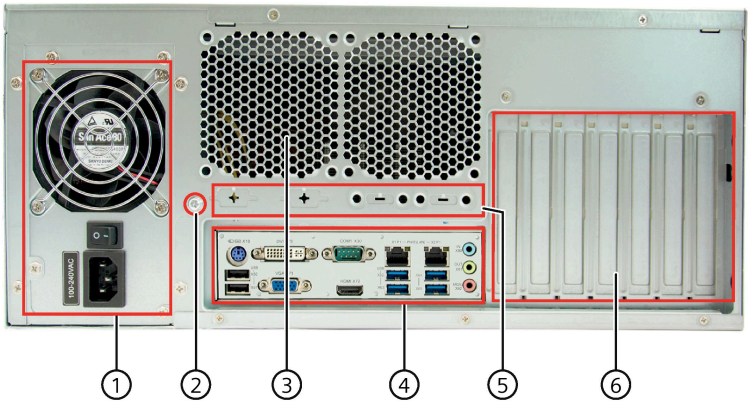
1.4 External design of the device

1.4.1 Front panel



① Front left door
② Lock
③ On/off button
④ Connection for USB 2.0 devices, compatible with USB 1.1
⑤ Drive bays 3 x 5.25"
⑥ Front right door
⑦ Connections for USB 2.0 devices, compatible with USB 1.1
⑧ HDD status display
⑨ Power status display

1.4.2 Rear of the device



① Power supply
② Function earth
③ Air outlet
④ Interfaces
⑤ Extensible interface
⑥ Expansion slots for:
- 2 × PCI
- 3 × PCIe x4
- 2 × PCIe x16

1.4.3 Drive cage

The drive cage is located behind the front door.

In drive cage, drives are permanently installed inside and cannot be accessed externally.

The drives are very well protected against vibration and oscillation ("vibration-damped drive cage") in this drive cage.

Drive bays

① Mounting location 1	Mounting location for 3.5" or 2.5" drive in a shock-proof/vibration-proof fixture or for 5.25" drive or components
② Mounting location 2	Mounting location for 3.5" or 2.5" drive in a shock-proof/vibration-proof fixture or for 5.25" drive or components
③ Mounting location 3	Mounting location for 3.5" or 2.5" drive in a shock-proof/vibration-proof fixture or for 5.25" drive or components

Components

(A) Cover
(B) Front right door

Additional information

Technical notes and information on the rated conditions are available in the section Installation options for drive (Page 55).

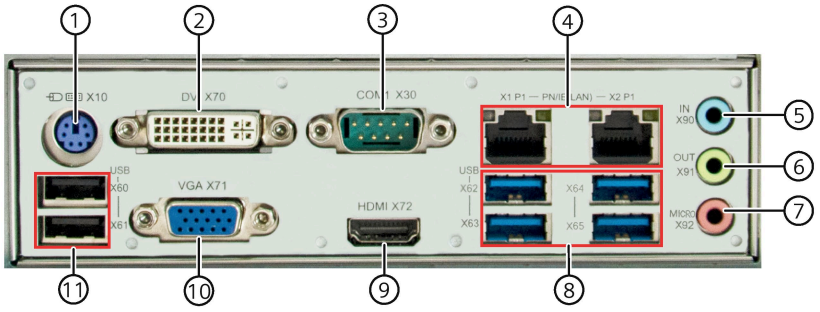
1.4.4 Interfaces and connections

1.4.4.1 Interfaces

Note

You can find the detailed information on interfaces under "External interfaces (Page 115)".

Interfaces at rear of device



①	PS/2 X10	PS/2 Connector (Keyboard & Mouse)
②	DVI X70	DVI-I 24+4P/F Connector (Support DVI-D)
③	COM X30	COM1 DB9/M Connector
④	LAN [1] RJ45 Connector X1P1/X2P1	RJ-45 Ethernet Port for 10/100/1000Mbps LAN, the MAC-Address is listed in Component label.
⑤	Line in (blue)	Connection for analog audio source, 3.5 mm phono jack
⑥	Line out (green)	Connection for active speakers or headset, 3.5 mm phono jack
⑦	Microphone (pink)	Connection for microphone, 3.5 mm phono jack
⑧	RJ45_USB2 (USB) [2] X62/X63/X64/X65	Dual USB3.0 TYPE-A Connector
⑨	HDMI X72	HDMI TYPE-A Connector
⑩	VGA X71	VGA DB15/F Connector
⑪	USB X60/X61	Dual USB2.0 TYPE-A Connector

1 See the pin assignment below.

2 Each of the USB port can be disabled/enabled separately by disabling/enabling its associated USB port in BIOS. On how to disable the USB port, see USB configuration in Advanced menu (Page 97).

1.4.4.2 Power supply connections

The following figure shows the power supply connector.

350 W and 500 W	850 W
	

1.4.5 Operator controls

⚠ WARNING

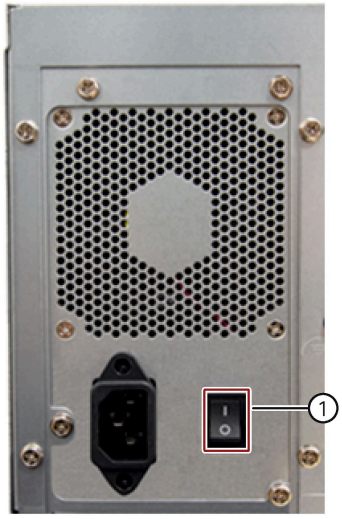
Risk of electric shock

The buttons and switches described in the following do not fully disconnect the device from the line voltage.

You also need to the notes and information under "Switching off the device (Page 44)".

On/Off switch

The following figure shows the location of the on/off switch.

350 W and 500 W	850 W
	

① On/Off switch

On/Off button

Note

The on/off button is only effective when the power supply is switched on via the on/off switch at the rear of the device.

Note

The PC switches on automatically after the power recovers when "Restore AC Power Loss" is active.

Depending on the "Restore AC Power Loss" setting in BIOS, the PC switches on automatically or you must press the on/off button on the front. The BIOS setting only becomes effective when the device is without mains voltage for at least 10 seconds.

Automatic startup may endanger the operation of the machine or plant, for example, after a power failure. Take this into account when designing the plant.

The following figure shows the position of the on/off button at the front of the device.

The on/off button ① has three functions:

- Switch on the PC, press the on/off button once shortly.
- Shut down the operating system and switch off PC, press the on/off button once shortly.[1]
- Switch off PC without shutting down the operating system, press for more than 4 seconds – hardware reset.

[1] You can set this operation as shut down or hibernate in operating system.

NOTICE
Data loss If the device is restarted by hardware reset, data in the main memory is deleted and the data on the hard disk drive may be lost. Perform a hardware reset only in the case of an emergency. Close all running programs. Make sure that there is no more read or write access to drives and I/O before performing the hardware reset.

1.4.6 Status displays

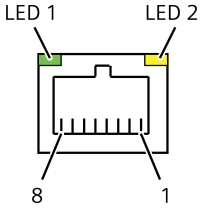
1.4.6.1 System status displays

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

Item	Status display	Meaning	LED	Description
①	POWER	Operating mode of the PC	Off	Hibernate, switched off or unplugged
			Green	PC in operation
②	HDD	Display for hard disk access	Off	No accessing
			Green flashing	Accessing data

1.4.6.2 Status display of the Ethernet interface

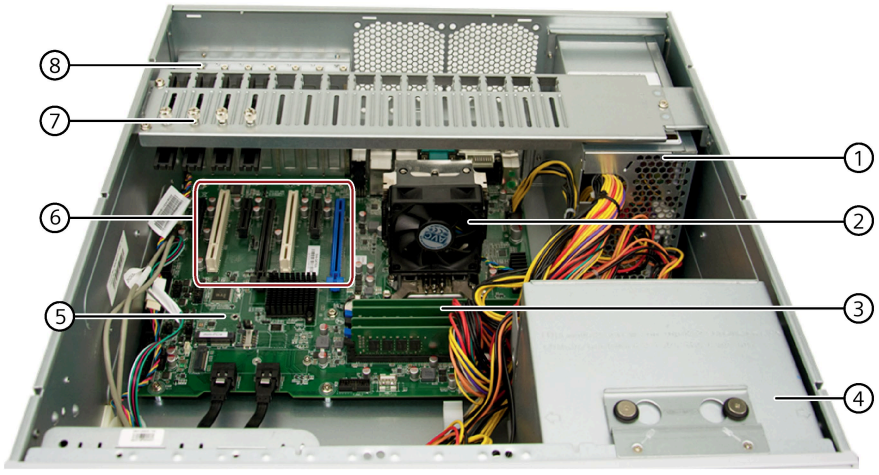
The Ethernet interfaces are numbered on the enclosure to identify them clearly.
The numbering by the operating system can differ.



Status display	Meaning	Status	Meaning of the status
LED 1	Data transmission rate	OFF	10 Mbps
		Green	100 Mbps
		Orange	1000 Mbps

LED 2	Connection status	OFF	• No cable connected • Physical link disconnects • Interface disabled
		Yellow	Active connected
		Yellow flashing	Data transfer active

1.5 Internal construction of the device



① Power supply
② Heat sink of the processor
③ Motherboard with slots for memory slots
④ Drive cage
⑤ Motherboard
⑥ Slots for expansion cards
⑦ Card holder for expansion cards
⑧ On the enclosure: Numbering of slots for expansion cards

Safety instructions 2

2.1 Security information

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

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

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

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

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

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

2.2 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 of physical injury

⚠ CAUTION

Risk of physical injury

The device is heavy. When the device falls down, it can be damaged and personal injury may result.

- Use the handles on the front panel to carry and lift the device.

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 mains.

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

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

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 from the lightning strikes.

Death or serious bodily injury can 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 and systems.

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.

ESD directive

Electrostatic sensitive devices can be labeled with an appropriate symbol.

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

2.3 Disclaimer for third-party software updates

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

2.4 Data protection

Siemens observes the data protection guidelines, especially the requirements regarding data minimization (privacy by design). This means the following for this SIMATIC product: The product does not process / save any personal information, but only technical functional data (e.g. time stamps). If the user links this data to other data (e.g. shift plans) or if the user saves personal information on the same medium (e.g. hard disk) and therefore creates a personal reference in the process, the user has to ensure meeting the guidelines regarding data protection.

2.5 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 might 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 IPC 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.

2.6 Notes on mounting

Enclosure

Note

The device meets the requirements for fire protection enclosures in accordance with IEC/EN/UL 61010-2-201. It can therefore be installed without an additional fire protection cover.

Rack mounting

Note

Rack-mount instructions

- Elevated operating temperature
  If installed in a closed or multi-unit rack, the operating ambient temperature may be greater than the room temperature. Install the device in an environment recommended by the manufacturer.
- Reduced air flow
  When installing the device in a rack, ensure that the air flow required for safe operation of the device is guaranteed.
- Mechanical load
  When mounting the equipment in the rack, ensure that a hazardous condition is not caused due to an uneven mechanical load.
- Circuit overload
  When connecting the devices to the power supply, observe the rated values specified on the nameplate of the devices.
- Reliable grounding
  Reliable grounding of rack-mounted equipment should be ensured.

Device in the control cabinet

⚠DANGER

Electrocution risk when control cabinet is open

When you open the control cabinet, there might be dangerous voltages at certain areas or components possibly caused by other devices.

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.

2.7 Notes on ambient and environmental conditions

Approvals

⚠WARNING

Voided approvals

If the following conditions are not met when installing the system, the UL 61010-2-201, EN 61010-2-201 approvals are voided and there is a risk of overheating and personal injury.

- You should observe the following information on ambient and environmental conditions.

Ambient and environmental conditions

NOTICE

Ambient conditions and chemical resistance

Unsuitable environmental conditions can cause faults or damage the device.

In the event of an infringement, the warranty/guarantee pursuant to IEC/EN/UL 61010-2-201 expires.

- Operate the device only in the 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.
- When the device is operated in severe environments which are subject to caustic vapors or gases, ensure sufficient clean air is provided.
- Clean the enclosure surface with a damp cloth 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 environments which are subject to caustic vapors or gases.
- Avoid extreme ambient conditions such as heat.
- Do not expose the device to direct sunlight or other powerful light sources.
- Install the device in a way that no danger is posed.
- Always maintain a minimum clearance of 50 mm to the area of the ventilation slots and do not cover the ventilation slots of the enclosure.

- Ensure that there is a distance of at least 50 cm at the back of the device, depending on wiring.
- You can install the device without an additional fire protection enclosure. It meets the requirements for fire protection enclosures in accordance with IEC/EN/UL 61010-2-201.
- The device conforms to IP 20 degree of protection on the front. Ensure that there is no splash water in the installation area.

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

Persons are injured and the plant is damaged.

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

2.8 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 IEC/EN 61000-6-2 and IEC/EN 61000-6-4.
- 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.

2.9 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 might overheat or cause a fire.

- Observe the safety and installation instructions for the expansion cards.
- Observe the max. permissible power consumption values.

NOTICE

Damage caused by device and system extensions

Device and system expansions might contain faults and affect the entire device, machine or plant. They can 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.

⚠ **WARNING**
爲避免電磁干擾， 本產品不應安裝或使用於住宅環境。

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

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

Installing and connecting the device

3

3.1 Preparing for mounting

3.1.1 Scope of delivery

Device and hardware for the device

- Rack PC SIMATIC IPC RW-543A
- Keys for front door: 2 keys
- Self-adhesive enclosure feet: 4 units

Supplied data storage medium

On the supplied data storage medium (read only) you will find:

- Software and tools to recover your ordered Microsoft® Windows® operating system
- Device drivers for installation in operating systems
- SIMATIC IPC RW-543A Quick Install Guide
- SIMATIC IPC RW-543A Operating Instructions
- Operating instructions for your ordered Microsoft® Windows® operating system on this device
- SIMATIC Box PC, SIMATIC Panel PC and SIMATIC Rack PC Original Operating Instructions

Operating system

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

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 83).

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 should observe the warnings in "Note on transport and storage (Page 24)".

Procedure

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

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

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

   Please inform the delivery service immediately if the package contents are incomplete or damaged or do not correspond with your order.

5. Please keep the documentation in a safe place. It is required for initial commissioning and is part of the device.
6. Record the Device identification data (Page 32).

3.1.3 Device identification data

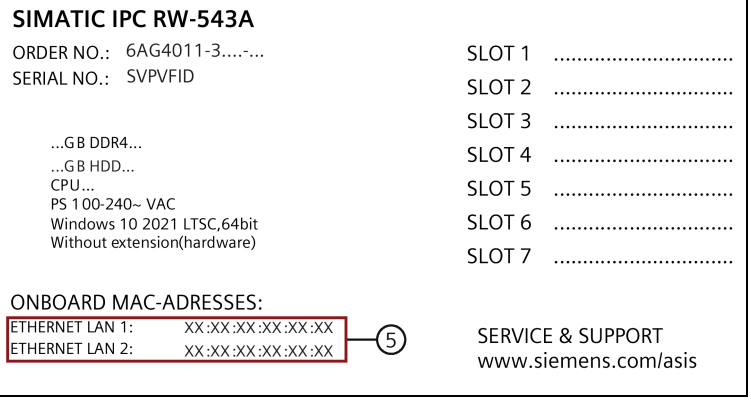
The device can be clearly identified with the help of this identification data in case of repairs or loss.

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

Product label and component label

The product label and component label are located on the inside of the front door.

Identification data	Where is it?
Order number	①
Serial number	②
Product version	③
Unified Siemens address for product liability	④
Ethernet address (MAC address)	⑤



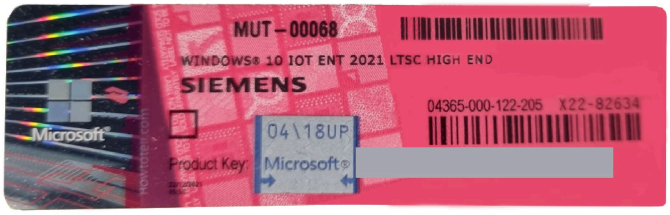
COA label

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

Note

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

Example of the COA label:



3.2 Mounting the device

3.2.1 Mounting types

Note

If the equipment is used in a manner not specified by the manufacture, the protection provided by the equipment might be impaired.

- The device is approved for indoor operation only.
- When the device is used in the area of Industrial Control Equipment in accordance with UL61010-2-201, the device is classified as "Open equipment".

  Open equipment must be installed within an enclosure which protects you from hazards, including mechanical hazards, electrical shock and spread of fire.
- Install the device only in one of the described permitted mounting positions.
- For installation of control cabinet, observe the country-specific regulations.
- Provide adequate volume in the switchgear cabinet for air circulation and heat transport. Keep at least 10 cm between the device and the switchgear cabinet.
- Do not cover the vent slots of the device.
- Ensure that the maximum air intake temperature, measured 5 cm before the air intake opening, does not exceed 40° C. The maximum air intake temperature must be accounted for especially when sizing closed switchgear cabinets.
- The minimum distance between the device and the housing is 10 cm on the air output end.
- Ensure that the installed device does not pose a danger, for example, hit someone by falling over.
- All the external circuit of the device must be SELV circuit.

Horizontal: Mounting on angle brackets

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

Horizontal: Mounting on telescopic rails

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

When telescopic rails are used for mounting, the device can be withdrawn fully from the cabinet or rack. Note the information in "Technical specifications of the telescopic rails (Page 82)".

Horizontal: Mounting on device base

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

3.2.2 Securing device

⚠ WARNING

Dangerous voltage and fire hazard

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

You should observe the installation and assembly notes under:

- Notes on mounting (Page 25)
- Notes on ambient and environmental conditions (Page 26)

⚠ DANGER

Electrocution risk when control cabinet is open

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

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

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

⚠ CAUTION

Risk of physical injury

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

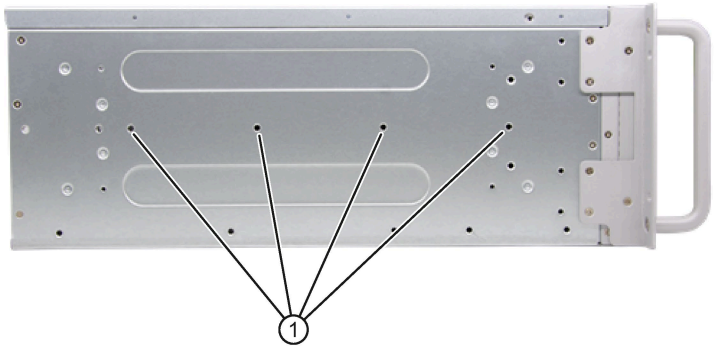
The device may fall down, injure people and get damaged.

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

Mounting holes

Detailed information on the position of the mounting holes for angle brackets or telescopic rails can be found here: Dimension drawing of the telescope rails (Page 88) and Technical specifications of the telescopic rails (Page 82).

The figure below shows the position of the mounting holes for angle brackets or telescopic rails.



① Threaded holes for 3A68-508APZZ3CEB 84H341300 telescopic rails from the company KING SLIDE WORKS CO., LTD or other telescopic rails match the dimensional and technical requirements.

3.3 Connecting the device

3.3.1 Country-specific information on supply voltage

Country-specific information

The power supply cable must conform to the safety regulations of the country in which the devices are installed and bear the marks required in each case.

This device must be equipped with a safety-tested power cord which may only be connected to a grounded shockproof power outlet. Use a flexible cable with the following features:

230 V supply voltage of the USA and Canada

- Type SJT with three conductors
- The connector must be compliant with NEMA 5-15.
- Conductor cross-section ≤ 18 AWG
- Cable length ≤ 4.5 m

120 V supply voltage of the USA and Canada

- Type SJT with three conductors
- The connector must be compliant with NEMA 5-15.
- Conductor cross-section ≤ 18 AWG
- Cable length ≤ 4.5 m

240 V supply voltage

- Type SJT with three conductors
- Conductor cross-section ≤ 18 AWG
- Cable length ≤ 4.5 m

100 V supply voltage

- Type SJT with three conductors
- Conductor cross-section ≤ 18 AWG
- Cable length ≤ 4.5 m

220V supply voltage

- Type RVV with three conductors
- conductor cross-section ≤ 18 AWG
- Cable length ≤ 4.5 m

3.3.2 Connecting the function earth

A connected function earth discharges electrical charges from the metal enclosure.

The function earth also improves the discharge of interference generated by external power cables, signal cables or cables for I/O modules to ground.

The connection for the function earth is labeled with the following symbol:

You can find information on the position of the functional earthing connection under "Rear of the device (Page 12)".

Requirement

- PH2 screwdriver
- Cable lug for M4
- Function earth with minimum cross-section of 2.5 mm^2 copper cable

Procedure

1. Clamp the cable lug on the function earth.
2. Firmly attach the cable lug to the function earth connection on the device using the M4 thread (see part labeled).
3. Connect the function earth to the protective conductor connection of the cabinet or the plant in which the device is installed.

3.3.3 Connecting the power supply

⚠WARNING

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

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

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

- The permissible rated voltage of the device must match the local supply voltage.
- Operate the device only in grounded power supply networks (TN networks in accordance with VDE 0100 Part 100 or IEC 60364-1).
- Operation in non-grounded or impedance-grounded networks is not permitted.

⚠WARNING

Risk of electric shock

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

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

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

Requirements

- You have observed the information under "Country-specific information on supply voltage (Page 37)".

Procedure

1. Turn the on/off switch off (position "0"). Information on the position of the on/off switch is available in "Operator controls (Page 15)".
2. Insert the power cable in the corresponding electrical socket. Information on the position of the socket is available in "Power supply connections (Page 15)".
3. Insert the power cable in the electrical socket.
4. Switch the on/off switch to on (position " | ").

3.3.4 Connecting I/O devices

⚠CAUTION

Fault caused by I/O devices

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

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

You should observe the warnings relating to the connection of I/O devices in "Information on I/O devices (Page 27)".

Procedure

Note

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

1. Connect the I/O devices to the respective interfaces. Information on the position of the interfaces is available in "Interfaces and connections (Page 14)".
2. Secure the cables (Page 41) with strain relief if needed.

Connecting audio devices

Depending on the function, a UAJ connector has 2-4 contact surfaces.

Depending on the function or standard, the assignment of the contacts varies.

The audio controller of the device recognizes the assignments of the contacts of the UAJ connector in accordance with the connected audio device and is automatically configured.

You can connect the following audio devices to the UAJ connection:

- Audio device with line out
- Audio device with line in
- Headphones
- Microphone
- Headset (with headphones and microphone) with the following standards:
  - OMTP: Standard for audio devices from Nokia, etc.
  - CTIA: Standard for audio devices from Apple®

3.3.5 Connecting device to networks

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

Ethernet

Wake on LAN and Remote Boot are supported.

You can use the integrated Ethernet interfaces (10/100/1000 Mbps) for communication and data exchange with automation devices, such as 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. Additional information is available under SIMATIC NET (https://new.siemens.com/global/en/products/automation/industrial-communication.html).

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 Dual monitor

You can operate on up to three monitors with the VGA, DVI and HDMI cables.

The output on the extended monitor can be the same as the main monitor or the extension desktop of the main monitor. You can configure it in windows screen and display setting.

Commissioning the device

4

4.1 Initial commissioning

For the configuration with operating system pre-installed, the operating system is set up automatically on the device after the initial switch on. The commissioning procedure in this chapter is only applicable to the IPCs with operating system.

For the configurations without operating system pre-installed, contact the operating system provider to install the operating system firstly.

NOTICE
Faulty installation If you change the default values in the BIOS setup or if you turn off the device during the installation, you disrupt the installation and the operating system is not installed correctly. The operating safety of the device and the plant is at risk. Do not switch off the device during the entire installation process. Do not change the default values in the BIOS setup.

Requirements

Ensure the following preparation work have been done before you start the commissioning:

- Peripheral equipments, keyboard, mouse and monitor are connected.
- The power supply is connected. (Page 39)

Note

The device can be supplied without an operating system. The following sections describe commissioning with an operating system.

Procedure

1. Press the on/off button.

   Press the on/off button at the front of the device behind the front panel door. Information on the position of the switch and button can be found at "Operator controls (Page 15)".

   The green POWER LED lights up. The module carries out a self-test.

2. Follow the instructions on the screen.

   ```
   Press <ESC> or <DELETE> to enter setup.
   ```

Note

Once the operating system has been set up, the device may restart.

Result

The interface of the operating system is displayed every time you turn on the device and after the startup routine.

4.2 Switching off the device

Shutting down the operating system

For active operating system:

- Shut down the operating system properly.

For inactive operating system

- Briefly press the on/off button. Information on the position of the button is available under "Operator controls (Page 15)".

Result

The "POWER" LED lights off.

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

Fully disconnecting the device from the line voltage

⚠ WARNING

Risk of electric shock

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

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

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

- Shut down the operating system and unplug the power plug from the rear of the device, see "Power supply connections (Page 15)".

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

Hardware reset

With the hardware reset, you can restart the device if it does not 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 data storage media might be lost. • The device might be damaged. Perform a hardware reset only in the case of an emergency.

Hardware reset with on/off button:

- Press the on/off button for more than 4 seconds.
  - The unit switches off.
  - Press the power button again to turn the device back on.

Information on the position of the buttons is available under "Operator controls (Page 15)".

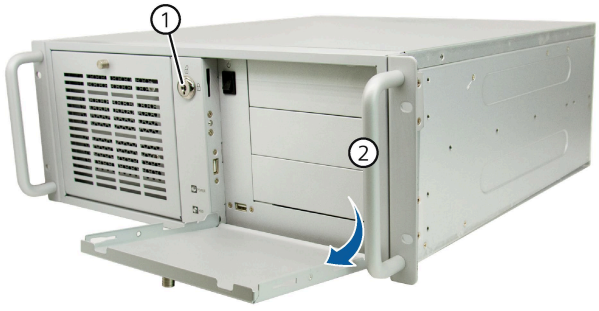
Operating the device

5

5.1 Opening the front door

Procedure

1. Unlock the front door with the key ①.
2. Open the front right door in the direction of the arrow.



5.2 Monitoring functions

You can monitor the following device functions:

Monitoring	Description	Status display and actions
Temperature monitoring	Monitor the temperature of CPU and motherboard.	• The onboard hardware monitor automatically detects and displays the CPU temperatures. • The onboard hardware monitor automatically detects and displays the motherboard temperatures.
Fan monitoring	Monitor the CPU FAN and chassis Fan.	Check the function in the Hardware Monitor Menu (Page 105) of BIOS: • CPU_FAN Mode: – [Automatic Mode]: CPU Fan speed change based on CPU temperature. – [Maximum Mode]: Uses Maximum speed • SYS_FAN1 Mode: – [Automatic Mode]: Chassis Fan speed change based on mother board temperature. – [Silent Mode]: Chassis Fan speed keep stable and no noise. – [Maximum Mode]: Uses Maximum speed • SYS_FAN2 Mode: – [Automatic Mode]: Chassis Fan speed change based on mother board temperature. – [Silent Mode]: Chassis Fan speed keep stable and no noise. – [Maximum Mode]: Uses Maximum speed

Expanding and assigning parameters to the device 6

6.1 Open the device

⚠WARNING

Risk due to unauthorized opening and improper repairs or expansions

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

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

For this reason, please observe the information in "Notes on device and system extensions (Page 28)".

⚠WARNING

Malfunctions and electric shock

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

The results are personal injuries and damage to the plant.

Take the following precautions:

- Always 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 that may be destroyed by electrostatic charges. This can result in malfunctions and damage to the machine or plant.

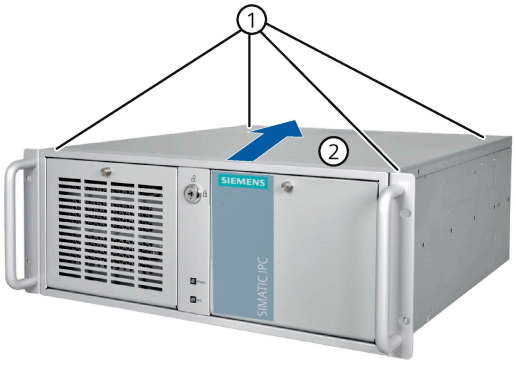
Take corresponding precautionary measures before you open the device.

Requirement

- The front door is open; see "Opening the front door (Page 47)".
- The device is fully disconnected from the line voltage, see "Switching off the device (Page 44)".
- All connection cables are unplugged.
- PH2 screwdriver

Procedure

1. Remove the retaining screws ①.



2. Move the cover in the direction as the arrow.
3. Lift the cover from the back and remove it.

6.2 Expansion cards

6.2.1 Usable expansion cards

Expansion cards that comply with the following standards are supported:

- PCI; Rev 2.3

  Expansion cards with 3.3 V and 5 V supply voltage can be operated
- PCIe; Gen. 1, Gen. 2, Gen. 3(supported for PCIe X4 slot and PCIe X16 slot)

Note

Expansion card specification

The dimensions of the cards cannot exceed the specified dimensions. If the height of the card exceeds the specified dimension, you may experience contact problems, malfunctions and difficulties with the assembly.

The permitted expansion card dimensions are specified in the section Dimension drawing of the expansion cards (Page 88).

The PCI card is limited to 5 V and universal board.

The total power consumption of the modules is not permitted to exceed 100W in total.

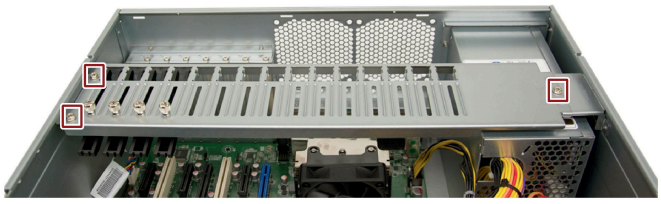
6.2.2 Installing expansion cards

Requirement

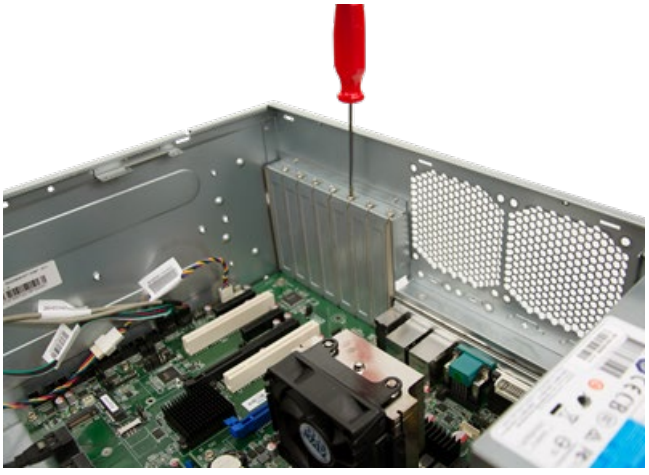
- You are familiar with the information on expansion cards and the conditions of use of expansion cards, see "Useable expansion cards (Page 51)".
- The device is open, see important information in "Open the device (Page 49)".

Procedure

1. Remove the retaining screw and remove the card holder.



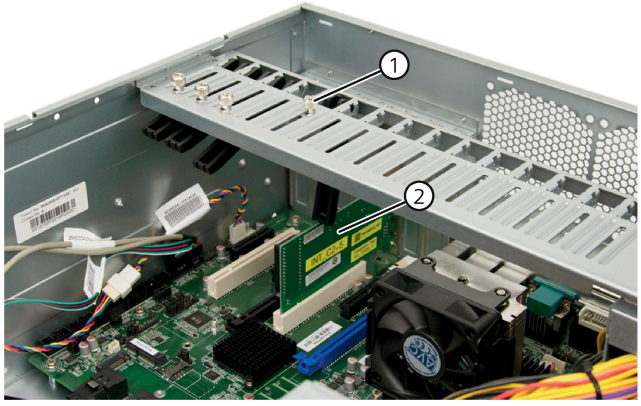
2. Remove the slot bracket of the slot for the expansion card.



3. Insert the expansion card into the slot.

4. Secure the expansion card with the designated screw.

5. Loosen the bracket by unscrewing its screw ① and place it ② on the expansion card.



6. Secure the bracket.
7. Close the device.

6.3 Memory modules

6.3.1 Usable memory modules

Dual channel memory

The motherboard provides four DDR4 memory sockets and supports dual channel technology. The memory capacity of the device can be upgraded to a maximum of 128 GB.

The table below shows the supported memory types of motherboard.

Module type	Module Size	Description
DDR4-SDRAM	4 GB	DDR4-2400/2666/2933MHz-UDIMM-288pin
DDR4-SDRAM	8 GB	DDR4-2400/2666/2933MHz-UDIMM-288pin
DDR4-SDRAM	16 GB	DDR4-2400/2666/2933MHz-UDIMM-288pin

6.3.2 Installing memory modules

Requirement

- You have noted the information on combination options and the conditions of use of memory modules under "Usable memory modules (Page 53)".
- The device is open, see important information in "Open the device (Page 49)".
- If necessary, the expansion cards may be removed for easier access to the memory modules, see "Changing the power supply (Page 67)".

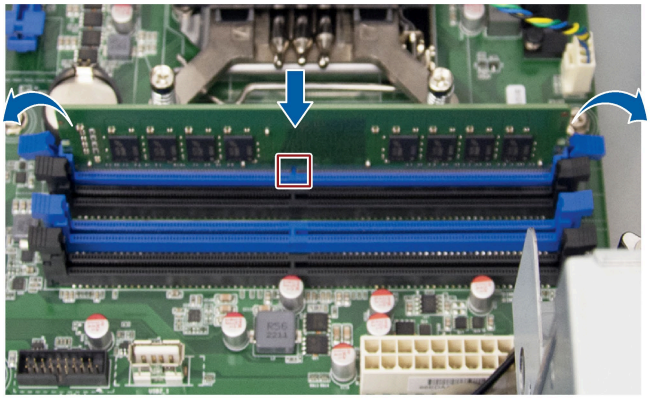
To install the memory module

⚠ WARNING

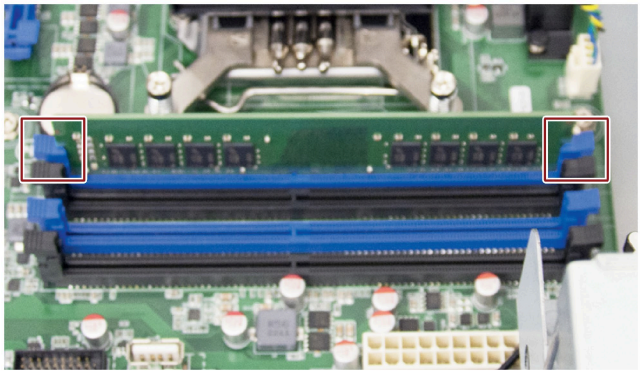
- Only install memory modules designed for the default motherboard.
- Recommend selecting
  memory modules with the same brand, capacity, speed, and chips if you use multiple Memory Modules.
- Unplug the power cord from the power outlet before installing Memory Module.
- A memory module can be installed only when the direction is correct. Switch the direction if the memory cannot able to be inserted into the memory socket.
- DDR2 and DDR3 memory modules are not compatible. Please
  make sure to install DDR4 Memory Module on this motherboard.

Follow the steps below to install memory module on motherboard memory sockets:

1. Press the retaining clips outward to unlock the memory socket.
2. Align a memory module on the socket. Note that the notch on the memory must match the alignment key on the memory socket.



3. Insert and press the memory module into the socket until the retaining clips snap back to the original place, and the memory module is seated properly.



6.4 Drives (HDD/SSD)

6.4.1 Installation options for drive

The drive modules are horizontal slot. The SSD and HDDs (with a 5.25" to 2.5" converter) can be installed in the slots.

Note

If the device is permanently installed, mounted on telescopic rails, it can only be subjected to the vibration stresses described below during operation.

The maximum permitted power loss of the expansion cards is 75 W.

You can install the HDD or SSD in the drive cage at various mounting locations.

You can find information on the mounting locations under:

- Drive cage (Page 13)

If HDD/SSDs are installed in one of the mounting locations, these may be exposed to the following vibration stresses during operation:

- For HDD:
  - 10 to 58 Hz: 0.015 mm
  - 58 to 200 Hz: 1.96 m/s^2
- For SSD:
  - 10 to 58 Hz: 0.0375 mm
  - 58 to 200 Hz: 4.9 m/s^2

Vibrations above 500 Hz are not permitted.

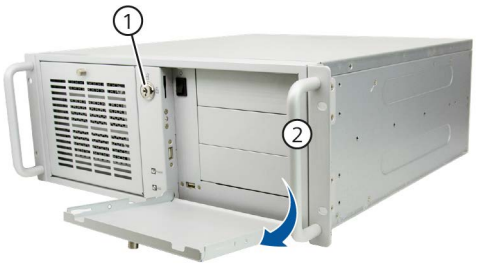
6.4.2 Removing the drive module

Requirement

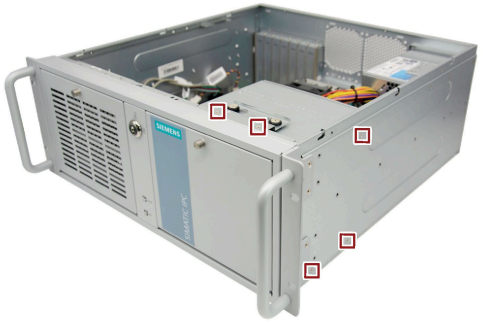
- The device is fully disconnected from the line voltage, see Switching off the device (Page 44).
- PH2 screwdriver

Procedure

1. Unlock the front door and open the right-front door.



2. Remove the top cover.
3. Disconnect the power supply and data cables.
4. Remove the highlighted five screws.



5. Lift the drive cage completely out of the device.

6.4.3 Installing the drive (HDD/SSD)

You can find information on the correct mounting location for 5.25" drives in a drive cage under "Installation options for drive (Page 55)".

Requirement

- An original spare part, i.e. an "Assembly Kit HDD/SDD for 5.25" tray" approved for this device.
- The device is fully disconnected from the line voltage, see "Switching off the device (Page 44)".
- The device is open, see important information in "Open the device (Page 49)".
- The drive bay is taken out of the chassis.
- PH2 screwdriver

Procedure

1. Remove the drive module (Page 56).
2. Secure the hard disk in the corresponding slot.

Note

- If you want to install a 2.5" hard disk drive or 3.5" hard disk drive, you need to install a corresponding converter in addition.
- Recommend installing the hard disk in the middle slot of the drive module.

3. Install the driver cage again.
4. Connect the power and data cables to the drive.
5. Install the drive bay according to the reverse steps of removing the drive bay.

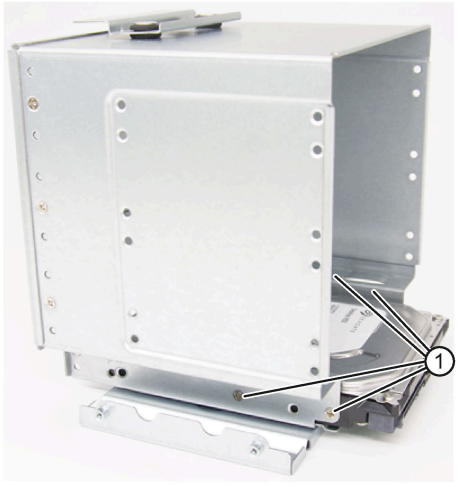
6.4.4 Removing and installing internal HDD/SSD

Requirement

- The device is fully disconnected from the line voltage, see "Switching off the device (Page 44)".
- The device is open, see important information in "Open the device (Page 49)".
- The drive bay is taken out of the chassis.

Procedure

Loosen the four screws ① on the drive bay plate and remove the hard disk from the drive bay.



Procedure for installing the hard disk drive

Place the hard disk onto the drive bay plate and secure the drive with four screws ①.

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 28)".

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
Drives	3 years
Backup battery	5 years
Fan	5 years
Filter pad	Depending on the degree of soiling

7.3 Removing and installing hardware

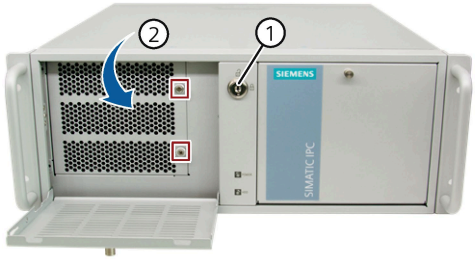
7.3.1 Replacing the filter

Requirement

- The device is fully disconnected from the line voltage, see "Switching off the device (Page 44)".
- The fan cover has been removed; see "Replacing the device fan (Page 63)".
- An original spare part, for example, a filter pad with the same type.

Procedure - Removing the filter

1. Unlock the front cover with the key ①.



2. Pull the handle in the direction of the arrow ② to open the left-front door.
3. Unscrew the marked screws.
4. Pull the marked screw to open the fan bracket.
5. Remove the filter in the direction of the arrow.

Procedure - Installing the filter

To install the filter, follow the steps for removing it in reverse order.

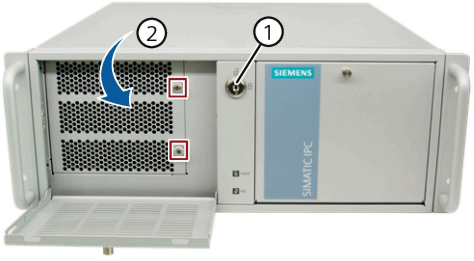
7.3.2 Replacing the device fan

Requirement

- The device is fully disconnected from the line voltage, see "Switching off the device (Page 44)".
- The front panel cover is open.
- A fan with the same type.
- PH2 screwdriver

Procedure - Removing the fan

1. Unlock the front cover with the key ①.



2. Pull the handle in the direction of the arrow ② to open the left-front door.
3. Unscrew the marked screws.
4. Pull the marked screws to open the fan bracket.

5. Remove the highlighted screws.
6. Remove the fan in the direction of the arrow.
7. Pull the fan plug from the connector.

Procedure - Installing the fan

To install the fan, follow the steps for removing it in reverse order. During installation, make sure that the arrow on the fan points away from the fan bracket.

7.3.3 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 61)".
- Replace the lithium battery only with an identical battery or types recommended by the manufacturer.
- Do not throw lithium batteries into fire, do not solder on the cell body, do not recharge, do not open, do not short-circuit, do not reverse polarity, do not heat above 100 °C and protect from direct sunlight, moisture and condensation.

Prior to replacement

⚠WARNING

Risk of explosion and release of harmful substances

An explosion or fire HAZARD could occur through fitting a battery of the wrong type.

Improper handling of lithium batteries also can result in an explosion of the batteries.

Explosion of the batteries and the released pollutants can cause severe physical injury. Aged batteries jeopardize the function of the device.

Note the following when handling lithium batteries:

- Replace the battery every 5 years.
- Replace the lithium battery only with the type recommended by the manufacturer. The new lithium battery must be certificated by UL and meet the following requirements:
  - Type: CR2032
  - Rated voltage: 3 VDC
  - Max abnormal charging current: 10 mA
- For any requirements on product maintenance, contact Siemens Technical support (Page 129).
- 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.

⚠WARNING

Risque d'explosion et d'émission de substances nocives

l'installation d'une pile ou d'un accumulateur de type inadéquat peut provoquer un DANGER d'explosion ou d'incendie.

Une manipulation non conforme des piles au lithium peut conduire à leur explosion.

L'explosion des piles et l'émission de polluants qui en résulte peuvent entraîner de graves lésions corporelles. Des piles usagées constituent un danger pour le fonctionnement de l'appareil.

Observez les remarques suivantes lorsque vous manipulez des piles au lithium :

- Remplacez la pile tous les 5 ans.
- Remplacez la pile au lithium uniquement par une pile du type recommandé par le constructeur. La nouvelle pile au lithium doit avoir une certification UL et satisfaire aux exigences suivantes :
  - Type : CR2032
  - Tension nominale : 3 V CC
  - Courant de charge anormal max. : 10 mA
- Pour toute demande concernant la maintenance du produit, contactez le support technique (Page 129) Siemens.
- Ne jetez pas au feu des piles au lithium, n'effectuez pas de soudage sur la pile, ne la rechargez pas, ne l'ouvrez pas, ne la court-circuitez pas, n'intervertissez pas les pôles, ne la chauffez pas à plus de 100 °C et protégez-la de l'ensoleillement direct, de l'humidité et de la condensation.

⚠WARNING

電池和蓄電池

- 置換可能影響安全防護的錯誤型式的電池（例：在某些鋰電池類型的情形下）：
- 電池丟入火焰或烤箱中， 或將電池作可能導致爆炸的機械擠壓或切割；
- 電池置於可能導致爆炸或可燃性液體或氣體洩露的高溫環境中；且
- 電池承受可能導致爆炸或可燃性液體或氣體洩露的極度低氣壓。

NOTICE

Disposal of batteries

Batteries do not belong in domestic garbage. The user is legally obliged to return used batteries.

Used batteries pollute the environment as special waste. You as a user are liable to prosecution if you do not properly dispose of batteries.

Observe the following when disposing of batteries:

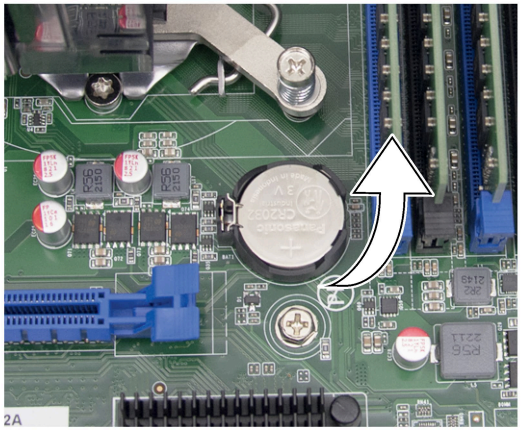
- Dispose of used batteries as hazardous waste in accordance with local regulations.
- You can return used batteries to public collection points and wherever batteries of the type in question are sold.
- Label the battery container "Used batteries".

Requirement

- An original spare part, for example, a backup battery with the same type
- Record the current configuration data in the BIOS setup. Note that the firmware settings as the configuration data of the device is deleted when the battery is replaced.
- The device is open, see important information in "Open the device (Page 49)".
- You have observed the local regulations relating to the disposal of used batteries.

Procedure

1. Remove the expansion cards, if necessary.
2. Remove the battery from socket.



3. Press the new battery into the socket applying slight pressure.
4. Close the device.
5. Reconfigure the BIOS setup.

Note

The configuration data of the device may be deleted when the battery is replaced. Record the current configuration data in the BIOS setup.

7.3.4 Changing the power supply

Requirement

- The device is fully disconnected from the line voltage, see "Switching off the device (Page 44)".
- The device is open, see important information in "Open the device (Page 49)".
- An original spare part, for example, a power supply with the same type.
- PH2 screwdriver

Procedure

1. Disconnect the cables from the drives and the motherboard.
2. Remove the cable ties securing the power cables in the enclosure.
3. Remove the four fixing screws that are marked in the following figure.

4. Pull the power supply upward and out of the housing.
5. Install the new power supply.
6. Fasten the power supply with the screws shown.
7. Connect the cables to the drives and the motherboard.
8. Use cable ties to reattach the power supply cables to the enclosure.
9. Close the device.
10. Check the safe state of the device.
11. Switch on the power supply.

7.3.5 Replacing the processor

Requirement

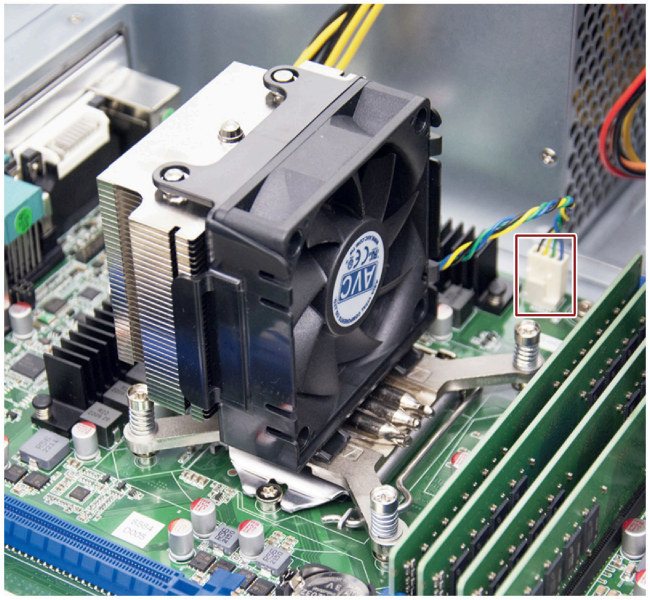
- The device is fully disconnected from the line voltage, see "Switching off the device (Page 44)".
- The device is open, see important information in "Open the device (Page 49)".
- An original spare part, for example, a processor with the same type.

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

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

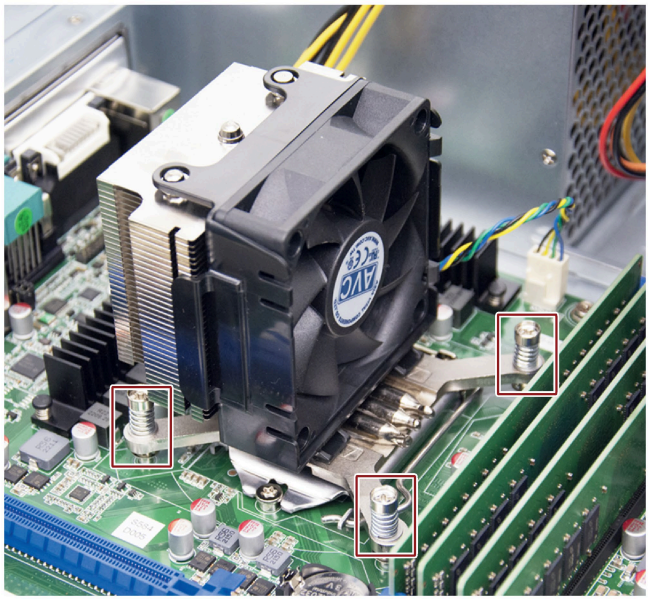
Procedure

1. Unlatch the fan rack on the heat sink and remove it.
2. Remove the highlighted fan connector.



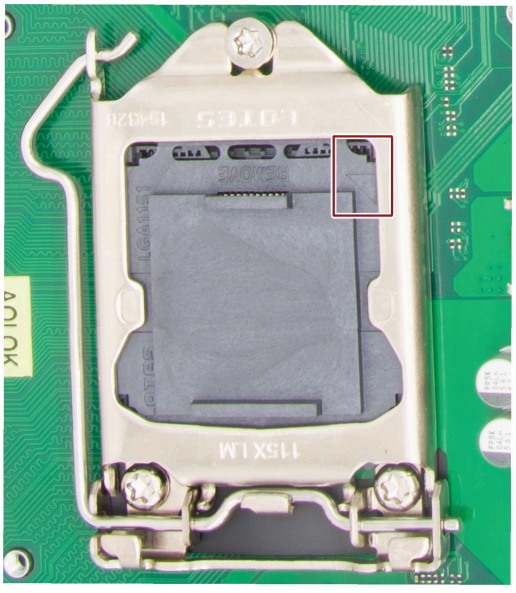
3. Remove the highlighted screws.

   The fourth screw is hidden by the heat sink in the figure.



4. Remove the heat sink.
5. Unlock the socket and lift the socket cover.
6. Remove the processor.
7. Install the new processor on the socket, as shown in the figure.

   When installing the CPU, make sure you aligned the highlighted arrow on the processor with pin 1 in the CPU socket.



Processor type and clock frequency

If you use a processor of a different type, perform the BIOS update firstly. During the BIOS update, the microcode matching the processor is loaded. Contact the SIEMENS support to update the BIOS if you changed a different processor.

Note

Damage to the processor due to high clock frequency

If the installed processor is operated with a higher clock frequency than permitted, it can be destroyed or cause data loss.

Operate the processor only at a clock frequency that is equal to or less than the permitted clock frequency.

7.3.6 Replacing the motherboard

Requirement

- The device is fully disconnected from the line voltage, see "Switching off the device (Page 44)".
- The device is open, see important information in "Open the device (Page 49)".
- An original spare part, that is a motherboard of the same type.

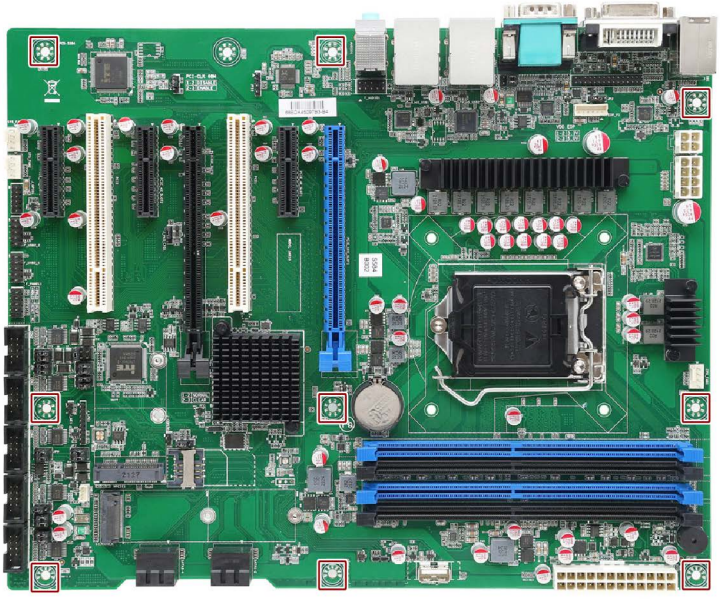
  The motherboard as spare part is supplied without processor and memory modules.
- Note that the firmware settings as the configuration data of the device is deleted when the motherboard is replaced.

  You can find information on this in the detailed firmware/BIOS description, see BIOS description (Page 93).
- Screwdriver T10 for fixing screws of the motherboard

Procedure

1. Remove the unnecessary modules from the slots, for example, the expansion card.
2. Note the assignment of all cables to the motherboard.

3. Disconnect all cables from the motherboard.
4. Remove the nine screws indicated in the following figure.



7.4 Installing operating system, software and drivers

Information on installation of the operating system is available on the Internet:

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

7.4.1 Installing software and drivers

Requirements

- Windows 10 operating system is installed in your IPC.
- You need to connect a mouse, a monitor and a keyboard to your PC.
- You also need the supplied USB stick to your PC.

Drivers list

The following drivers need to be installed on your device:

Operating system	Drivers needed
Windows 10	• Step 1: Intel(R) Chipset Device Software • Step 2: Intel(R) Management Engine • Step 3: Intel(R) Network Connections Software • Step 4: Intel(R) UHD Graphics Driver • Step 5: Realtek High Definition Audio Driver

Procedure

1. Insert the provided USB stick into the device.
2. Start the "Documentation and Drivers" suite from the USB flash drive by executing the "START_DocuAndDrivers.CMD" file.
3. Install the desired software and drivers.
4. Follow the below steps and click the icon  to install the required driver.

Note

For a new installation of Windows operating systems, the chipset driver must be installed before all other drivers, if required.

Step 1: install the chipset driver

1. Click **Step 1: Intel(R) Chipset Device Software.**
2. Click  to install the chipset driver.
3. Click **Next** to continue.
4. Click **Accept** to accept the license agreement.
5. Click **Install** to allow the computer to start the installation.

   The installation starts.
6. Click **Finish.**

   The chipset installation is completed.

Step 2: install the Management Engine driver

1. Click **Step 2: Install: Intel(R)** Management Engine**.**
2. Click  to install the Management Engine driver.
3. Click **Yes** to confirm the user account control question.
4. Click **Next** to continue.

5. Select the radio button before "**I accept the terms in the License Agreement**", and click **Next** to accept license agreement.
6. Select destination folder and click **Next** to start the driver installation.
7. Click **Finish**.

   The installation is completed.

Step 3: install the Network Connection Software

1. Click **Step 3: Intel(R) Network Connections Software.**
2. Click  to install the LAN driver.
3. Click the **Install Drivers and Software** button in the pop-up window.
4. Click **Yes** to confirm the user account control question.
5. Click **Next** to continue.
6. Select the radio button before "**I accept the terms in the license agreement**", and click **Next** to accept license agreement.
7. Set the setup option as you like and click **Next**.
8. Click **Install** to start the driver installation.
9. Click **Finish**.

   The installation is completed.

Step 4: install the UHD Graphic driver

1. Click **Step 4: Intel(R) UHD Graphics Driver**.
2. Click  to install the Graphic driver.
3. Click **Yes** to confirm the user account control question.
4. Click **Begin installation** to continue.
5. Click **I agree** to confirm the *Readme File Information* and move on.
6. Click **Start** to continue installation.
7. Then click **Optional reboot** or **Finish** to restart the computer for the changes to take effect.

Step 5: install the Audio driver

1. Click **Step 5: Realtek High Definition Audio Driver.**
2. Click  to install the Audio driver.
3. Click **Yes** to confirm the user account control question.
4. Click **Next** to continue.
5. Select the radio button next to "**Yes, I want to restart my computer now**." and click **Finish** to restart the computer for the changes to take effect.

7.5 Recycling and disposal

Due to their low level of pollutants, the devices described in these operating instructions can be recycled. Contact a certified disposal service company for environmentally sound recycling and disposal of your old devices.

7.6 Beep code

Beeps	Description
1 short beep	Memory training success
Beep loop	Memory error

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 fan cover and filter pad are installed.
- The device is closed.
- The connected I/O devices meet the requirements for the respective area of application (interference emission according to EN 61000-6-4 / IEC 61000-6-4, immunity to interference according to EN 61000-6-2 / IEC 61000-6-2).

8.2 General technical specifications

See the note in "Applicability of technical specifications (Page 75)".

Article number	6AG4011-3....-...1 (for details, refer to the ordering documentation)
Dimensions	481 × 176 × 509 (W × H × D in mm)
	Detailed dimensional specifications can be found in "Dimension drawings (Page 87)".
Weight	13.3 up to 17 kg; depending on the equipment
Power Supply	• Input Rating: – 350 W: 100 V AC to 240 V AC; 6A to 3A; 47-63Hz – 500 W: 100 V AC to 240 V AC; 8A to 4A; 47-63Hz – 850 W: 100 V AC to 240 V AC; 12A to 6A; 47-63Hz • Rated output power: – 350 W: (+3.3 V & +5 V≤105 W) – 500 W: (+3.3 V & +5 V≤105 W) – 850 W (+3.3 V & +5 V≤200 W)

Power consumption	• 350 W: – Typical load (100%, 350 W) at 82% efficiency – Typical load (50%, 175 W) at 85% efficiency – Light load (20%, 70 W) at 82% efficiency • 500 W: – Typical load (100%, 500 W) at 82% efficiency – Typical load (50%, 250 W) at 85% efficiency – Light load (20%, 100 W) at 82% efficiency • 850 W: – Typical load (100%, 850 W) at 87% efficiency – Typical load (50%, 425 W) at 90% efficiency – Light load (20%, 170 W) at 87% efficiency
Current output (DC)	• 350 W: – +5 V/16 A, +3.3 V/9 A 105 W permitted in total – +12 V1/17 A, +12 V2/17 A – -12 V/0.3 A, +5 VSB/2.5 A The total sum of all voltages is max. 350 W • 500 W: – +5 V/16 A, +3.3 V/19A 105 W permitted in total – +12 V1/20 A, +12 V2/20 A – -12 V/0.3 A, +5 VSB/2.5 A The total sum of all voltages is max. 500 W • 850 W: – +5 V/35 A, +3.3 V/20 A 200 W permitted in total – +12 V/70 A, -12 V/0.3 A – +5 VSB/3.0 A The total sum of all voltages is max. 850 W
Noise emission	< 55 dB (A)
Degree of protection	• IP 20 for all enclosure according to IEC 60529
Safety	
Protection class	Protection class I compliant with IEC 61140
Degree of pollution	Device is designed for environments with pollution degree 2
Transient overvoltage	Device is designed for connection to supply with overvoltage category II (transient overvoltages up to 2500 V)
Safety regulations	• IEC/EN/UL 61010-1 • IEC/EN/UL 61010-2-201 • IEC/EN/UL 62368 • CAN/CSA-C22.2 No. 61010-1 • CAN/CSA-C22.2 No. 61010-2-201

[1] Only with protected installation, see "Notes on ambient and environmental conditions (Page 26)"

8.3 Current/power requirements and power supply

8.3.1 Power requirements of the components

Component	**Voltage**					
	+5 V	**+3.3 V**	**+12 V1**	**+12 V2(CPU)**	**-12 V**	**5 V aux**
motherboard with processor and heat sink	2.1 A	1.5 A	0.2 A	6.08 A	0.1 A	0.34 A
Front fan			0.5 A			
Basic system [1]	2.1 A	1.5 A	0.7 A	6.08 A	0.1 A	0.34 A
Expansions						
Hard disk drive SATA [1]	1.2 A		1.6 A			
Whole equipment	3.3 A	1.5 A	2.3 A	6.08 A	0.1 A	0.34 A
Total power consumption [2], permitted	260 W					

1 Depends on the selected device configuration.
2 Based on the maximum heat dissipation test. This value included external USB load 32W.

8.3.2 Technical specifications of basic power supply

Output voltage for 350 W power supply module

Voltage	**Maximum current**	**Voltage stability**
+3.3 V	19 A	± 5%
+5 V	16 A	± 5%
–12 V1	17 A	± 5%
+12 V2	17 A [1]	± 5%
–12 V	0.3 A [1]	± 10%
+5 VSB	2.5 A	± 5%

1 The total output of +3.3 V and +5 V voltage must be ≤ 105 W.

Output voltage for 500 W power supply module

Voltage	Maximum current	Voltage stability
+3.3 V	19 A	± 5%
+5 V	16 A	± 5%
−12 V1	20 A	± 5%
+12 V2	20 A [1]	± 5%
−12 V	0.3 A [1]	± 10%
+5 VSB	2.5 A	± 5%

[1] The total output of +3.3 V and +5 V voltage must be ≤ 105 W.

Output voltage for 850 W power supply module

Voltage	Maximum current	Voltage stability
+3.3 V	20 A	± 5%
+5 V	35 A	± 5%
+12 V	70 A [1]	± 5%
−12 V	0.3 A [1]	± 10%
+5 VSB	3.0 A	± 5%

[1] The continuous maximum total output power must be ≤ 850 W.

- For +12 V DC: Maximum output power 70 A (840W)
- For +3.3 V and +5 V DC: Maximum combined output power must be ≤ 200 W.

8.4 Electromagnetic compatibility

See the note in "Applicability of technical specifications (Page 75)".

Interference emission	EN 61000-6-4 CAN/CSA CISPR32:17 Class A, EN 55032 Class A; FCC Class A; EN 61000-3-2 class D, EN 61000-3-3
Emitted interference	Conducted Emission (AC): IEC 61000-6-4 + A1, IEC 61131-2 • 0.15 to 0.5 MHz: 79 dB (µV) QP, 66 dB (µV) A • 0.5 to 30 MHz: 73 dB (µV) QP, 60 dB (µV) A Conducted Emission (Telecommunications/network): IEC 61000-6-4 + A1 • 0.15 to 0.5 MHz: 97 dB (µV) - 87 dB (µV) QP, 84 dB(µV) – 74 dB(µV) A • 0.5 to 30 MHz: 87 dB (µV) QP, 74 dB (µV) A Radiation Emission: IEC 61000-6-4, CISPR 32:17 [1] • 30 to 230 MHz: 40 dB(µV/m) QP (10 m distance) • 230 to 1000 MHz: 47 dB (µV/m) QP (10 m distance) • 1 to 3 GHz: 76 dB (µV/m) P; 56 dB (µV/m) A (3 m distance) • 3 to 6 GHz: 80 dB (µV/m) P; 60 dB (µV/m) A (3 m distance) Harmonic currents: EN 61000-3-2 class D Voltage fluctuation and flicker: EN 61000-3-3
Noise immunity on supply lines	± 2 kV; according to IEC 61000-4-4; burst ± 1 kV line-to-line; according to IEC 61000-4-5; surge ± 2 kV line-to-earth; according to IEC 61000-4-5; surge
Noise immunity on signal lines	± 2 kV; according to IEC 61000-4-4; burst; length > 30 m ± 1 kV ; according to IEC 61000-4-4; burst; length < 30 m ± 2 kV shielding-to-earth; according to IEC 61000-4-5; surge; length > 30 m
Immunity to discharges of static electricity	± 4 kV contact discharge (according to IEC 61000-4-2) ± 8 kV atmospheric discharge; (according to IEC 61000-4-2)
Immunity to RF interference	Radiation Immunity (according to IEC 61000-4-3) • 10 V/m; 80 up to 1000 MHz 80% AM (1 kHz) • 3 V/m; 1.4 to 2 GHz 80% AM (1 kHz) • 3 V/m; 2 to 6 GHz 80% AM (1 kHz) Conducted Immunity (according to IEC 61000-4-6) • 150 kHz to 80 MHz: 10 V, 80% AM (1 kHz)
Magnetic field	30 A/m; 50 Hz; 60 Hz (according to IEC 61000-4-8)

[1] : With a clamp filter(Ferrite Core with Case) on the DVI-D cable near the DVI-D port of the IPC RW-543A, you need to meet the following requirements:

- The impendence of the clamp filter need to be at least 200 ohm at 100MHz to 1000MHz.
- The aperture of the clamp filter and inner diameter of DVI-D cable should be as close as possible.

8.5 Ambient conditions

See the note in "Applicability of technical specifications (Page 75)".

Climatic ambient conditions	
Temperature	Tested according to IEC 60068-2-2; IEC 60068-2-1; IEC 60068-2-14
Operation	+5 °C to +40 °C Gradient: ≤ 10 K/h; no condensation
Storage/transport	–20 °C to +60 °C Gradient: ≤ 20 K/h; no condensation
Relative humidity	Tested according to IEC 60068-2-78; IEC 60068-2-30
Operation	5% to 85%; no condensation Gradient: ≤ 10 K/h; no condensation
Storage/transport	5% to 95%; no condensation Gradient: ≤ 20 K/h; no condensation
Atmospheric pressure	
Operation	1013 to 795 hPa, corresponds to an altitude of 0 m to 2000 m
Storage/transport	1013 to 660 hPa, Corresponds to an altitude of 0 m to 3500 m
Mechanical ambient conditions	
Vibration	Tested according to IEC 60068-2-6;
Operation	With HDD: 10-58 Hz: 0.015mm; 58-200 Hz:1.96 m/s2; 10 cycles With SSD: 10-58 Hz: 0.0375mm; 58-200 Hz:4.9 m/s2; 10 cycles
Storage/transport	5 to 8.4 Hz, amplitude 3.5 mm; 8.4 to 500 Hz: 9.8 m/s2
Resistance to shock	Tested in accordance with IEC 60068-2-27
Operation	With HDD: Half-sine: 9.81 m/s2, 20 ms, 3 shocks per axis With SSD: Half-sine: 150 m/s2, 11 ms, 3 shocks per axis
Storage/transport	Half-sine; 250 m/s^2; 6 ms; 1000 shocks per axis
Special features	
Quality assurance	In accordance with ISO 9001
Altitude of operation (m)	Up to 2000 m

8.6 Technical specifications of the drives

See the note in "Applicability of technical specifications (Page 75)".

Information on the drives is available in your order documents.

Drive	Maximum number of drives	Types of drive
HDD	2 (depends on the selected configuration)	• 3.5" SATA, 6 GB/s; 1 TB
SSD	1	• 256 GB • 512 GB

8.7 Technical specifications of the motherboard

See the note in "Applicability of technical specifications (Page 75)".

Chipset	Intel® Q470 Chipset PCH
Processor	• Intel® 10th Generation Core / Pentium Desktop CPU, LGA1200
Slots for memory modules	4 x Non-ECC UDIMM slots for DDR4 2400/2666/2933MHz, up to 128GB
Main memory	4 up to 128 GB, DDR4 SDRAM PC4-3200T
Power consumption per PCIe slot with x4 expansion card, maximum permitted	• 3.3 V / 3 A • 12 V / 2.1 A • 3.3 V_{aux} / 0.4 A
Power consumption per PCIe slot with x16 expansion cards, max. permissible	• 3.3 V / 3 A • 12 V / 5.5 A • 3.3 V_{aux} / 0.4 A
Max.permitted power consumption per PCI slot (5V,32-bit)	5V, 5A or 3.3 V, 7A; 12V 0.5A; 3.3 Vaux 0.4A
PCI modules with exclusive 5 V supply	≤ 25 W
Power loss per slot with max. ambient air temperature 40 °C, permissible	≤ 25 W
Power loss of all PCI and PCIe slots with max. ambient air temperature 40 °C, permissible	≤ 100 W In sum, the current for 3.3 V_{aux} may not exceed 1.2 A.

8.8 Technical specifications of graphic

See the note in "Applicability of technical specifications (Page 75)".

Graphic controller	Intel® HD Graphics, 3D engine (integrated in processor)
Graphics memory	Dynamic Video Memory Technology, uses 32 MB and 1.7 GB RAM in main memory
Resolutions/frequencies/colors	• HDMI up to 4096 x 2160@30Hz • VGA up to 1920 x 1200@60Hz • DVI-D up to 1920 x 1200@60Hz

8.9 Technical specifications of the interfaces

Observe the information in "Applicability of technical specifications (Page 75)" and use only original connections of the I/O to be connected.

COM	On the rear panel: • 1 × RS232 (DB9/M) On the motherboard: • 3 × RS232 (9-pin header) • 1 × RS232/RS422/RS485 (9-pin header) • 1 × RS232/RS485 (9-pin header)
Digital Monitor	Connection of each digital monitor • 1 × HDMI • 1 × DVI-D
Analog Monitor	Connection of an analog monitor • 1 × VGA
Keyboard	Connection through PS/2 or USB port
Mouse	Connection through PS/2 or USB port
USB	On the rear panel: • 4 × USB 3.2 Gen1 • 2 × USB 2.0 On the front panel: • 2 × USB 2.0 (500 mA) On the motherboard: • 1 × USB 2.0 vertical • 2 × USB 2.0
Ethernet	2 × Ethernet interface (RJ45, 10/100/1000 Mbps) Wake on LAN, remote boot supported.
Audio	Realtek® ALC662, 5.1 channels, high definition audio codec. • Micro • Line In • Line Out

8.10 Technical specifications of the telescopic rails

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

8.11 Technical specifications of the operating systems

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

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

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

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

In the delivery state, Windows® 10 boot in UEFI mode.

The following table lists the partitioning for data storage media ≥ 256 GB in GPT mode:

Partition	Name	Size	File system
First	Boot	260 MB	FAT32
Second	System	160 GB	NTFS, not compressed
Third	Data	Remainder	NTFS, not compressed

8.12 Directives and declarations

8.12.1 Electromagnetic compatibility, Industrial and Residential Areas

Electromagnetic compatibility

This product meets the requirements of EC Directive 2014/30/EU "Electromagnetic Compatibility".

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

Scope of application	Requirements for	
	Interference emission	Immunity to interference
Industrial area	EN 61000-6-4:2007 +A1:2011	EN 61000-6-2:2005

8.12.2 ESD guideline

What does ESD mean?

An electronic module is equipped with highly integrated components. Due to their design, electronic components are highly sensitive to overvoltage and thus to the discharge of static electricity. Such electronic components or modules are labeled as electrostatic sensitive devices.

The following abbreviations are commonly used for electrostatic sensitive devices:

- ESD – Electrostatic sensitive device
- ESD – Electrostatic Sensitive Device as a common international designation

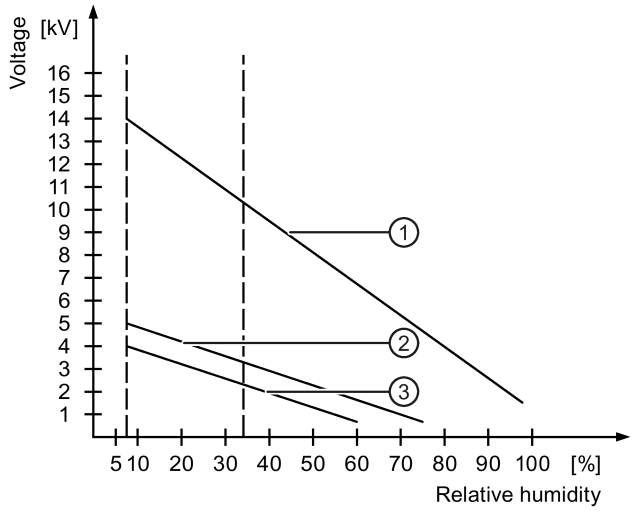
Electrostatic sensitive devices can be labeled with an appropriate symbol.

NOTICE
Damage to ESD from touch Electrostatic sensitive devices, ESD, can be destroyed by voltages which are far below the human perception limit. If you touch a component or electrical connections of a module without discharging any electrostatic energy, these voltages may arise. The damage to a module by an overvoltage can often not be immediately detected and only becomes evident after an extended period of operation. The consequences are incalculable and range from unforeseeable malfunctions to a total failure of the machine or system. Avoid touching components directly. Make sure that persons, the workstation and the packaging are properly grounded.

Charge

Every person without a conductive connection to the electrical potential of his/her surroundings can be electrostatically charged.

The material with which an electrostatically-charged person comes into contact is of particular significance. The figure shows the maximum electrostatic voltages with which a person is charged, depending on humidity and material. These values conform to the specifications of IEC 61000-4-2.



① Synthetic materials
② Wool
③ Antistatic materials such as wood or concrete

NOTICE
Grounding measures There is no equipotential bonding without grounding. An electrostatic charge is not discharged and may damage the ESD. Protect yourself against discharge of static electricity. When working with electrostatic sensitive devices, make sure that the person and the workplace are properly grounded.

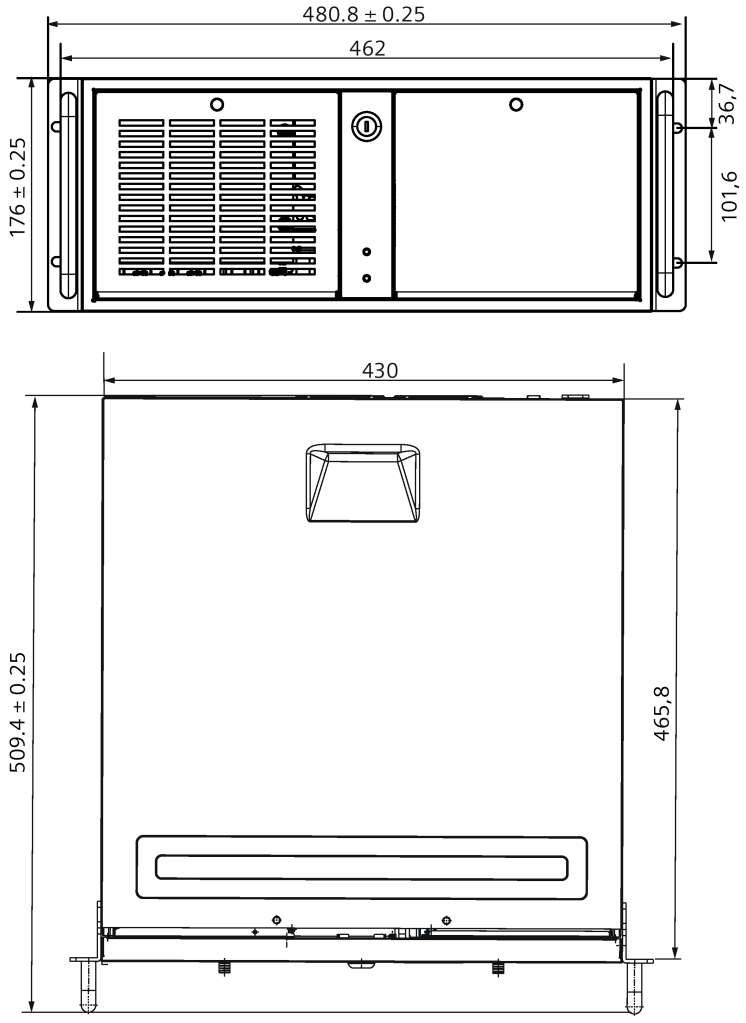
Protective measures against discharge of static electricity

- Disconnect the power supply before you install or remove modules which are sensitive to ESD.
- Pay attention to good grounding:

  When handling electrostatical sensitive devices, make sure that persons, the workstation and devices, tools and packaging used are properly grounded. This way you avoid static discharge.
- Avoid direct contact:
  - As a general rule, do not touch electrostatic sensitive devices, except in the case of unavoidable maintenance work.
  - Hold the modules at their edge so that you do not touch the connector pins or conductor paths. This way, the discharge energy does not reach and damage the sensitive components.
  - Discharge your body electrostatically by touching grounded metallic parts before you take a measurement at a module. Always use grounded measuring instruments.

Dimension drawings

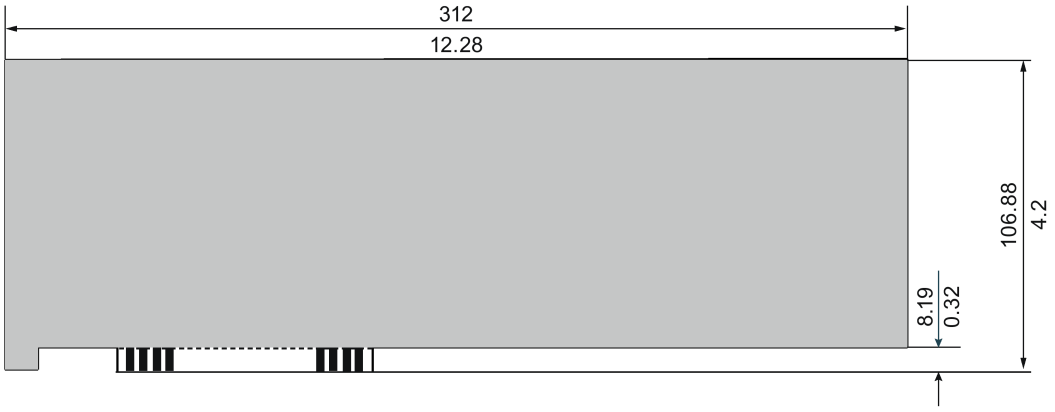
Front view and top view



All dimensions in mm.

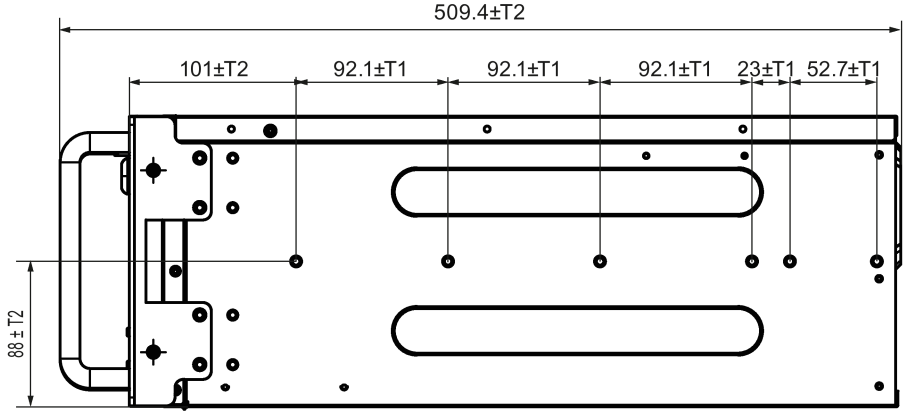
9.1 Dimension drawing of the expansion cards

Long PCI card, PCIe card



9.2 Dimension drawing of the telescope rails

Dimensions for bore holes for telescopic rails



Dimensions: mm
T1=Tolerances of ± (0.1mm)/(0.004") T2=Tolerances of ± (0.3mm)/(0.01")

Standards and approvals

10

Note

Applicability

The following shows the approvals that may be available. For the device itself, it is certificated as shown on the product label and package label.

CE

EMC Directive:

2014/30/EU Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility; Official Journal of the EU L96, 29/03/2014, p. 79–106

Low Voltage Directive:

2014/35/EU Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits; Official Journal of the EU L96, 29/03/2014, p. 357–374

RoHS Directive:

2011/65/EU Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment; Official Journal of the EU L174, 1/07/2011, p.88–110

EMC	EN 61000-3-2:2006 + A1:2009 + A2:2009, EN 61000-3-3:2013, EN 61000-6-4:2007 + A1:2011, EN 61000-6-2:2005
LVD	EN 61010-2-201:2013
RoHS	EN IEC 63000:2018

ISO 9001 certificate

The Siemens quality management system for all production processes (development, production and sales) meets the requirements of ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018.

Certificate registration no. 01 100 1430201, 01 104 1430201 and 01 113 1430201.

Software license agreements

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

UL approval

The following approvals are available for the device:

- Underwriters Laboratories (UL) in accordance with Standard UL61010-1 and UL61010-2-201 (IND.CONT.EQ), File E472609
- Canadian National Standard CAN/CSA No.61010-1-12 and CAN/CSA C22.2 No.61010-2-201

FCC and Canada

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.

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

Responsible party for Supplier's Declaration of Conformity

Siemens Industry, Inc.

Digital Factory - Factory Automation

5300 Triangle Parkway, Suite 100

Norcross, GA 30092

USA

Mail to: (amps.automation@siemens.com)

AUSTRALIA / NEW ZEALAND

This product meets the requirements of the standard IEC/EN 61000-6-4 and AS/NZS 61000.6.4; Generic standards - Emission standard for industrial environments.

This product meets the requirements of the standard IEC/EN 61000-6-4 and AS/NZS 61000.6.4; Generic standards - Emission standard for industrial environments.

Identification for Eurasian Customs Union

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

Korea Certificate

This product meets the requirements of Korean certification.

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

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

BIS

IS 13252
R-41150410
www.bis.gov.in

This product meets the requirements of India certification.

BSMI

This product meets the requirements of CNS14336-1(099/09/30), CNS15936(105) generic standard.

Table 10- 1 限用物質含有情況標示聲明

設備名稱：Industrial PC, Equipment name　型號（型式）：IPC RW-543A Type designation (Type)						
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium(Cr^{+6})	多溴聯苯 Polybrominated biphenyls(PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
外殼	○	○	○	○	○	○
電路板	○	○	○	○	○	○
固態硬碟	-	○	○	○	○	○
線材	○	○	○	○	○	○

備考 1. "超出 0.1 wt %"及"超出 0.01 wt %" 係指限用物質之百分比含量超出百分比含量基準值。

Note 1: "Exceeding 0.1 wt %" and "exceeding 0.01 wt %" indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考 2. "○" 係指該項限用物質之百分比含量未超出百分比含量基準值。

Note 2: "○" indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考 3. "－" 係指該項限用物質為排除項目。

Note 3: The "–" indicates that the restricted substance corresponds to the exemption.

Responsible party for Supplier's Declaration of Conformity

西門子股份有限公司

臺北市 11503 南港區園區街 3 號 8 樓

電子郵件信箱: (Adscs.taiwan@siemens.com)

UKCA

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

- Electrical Equipment (Safety) Regulations 2016 (Low-Voltage)
- Electromagnetic Compatibility Regulations 2016 (EMC)
- Regulations on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2012 (RoHS).

UK Declarations of Conformity for the respective authorities are available from:

Siemens AG
Digital Industries
Factory Automation
DI FA TI COS TT
P.O. Box 1963
D-92209 Amberg

The UK Declaration of Conformity is also available for download from the Siemens Industry Online Support website under the keyword "Declaration of Conformity".

WEEE label (European Union)

Disposal instructions, observe the local regulations and the section "Recycling and disposal (Page 74) ".

BIOS description

11

11.1 BIOS getting started

BIOS setup utility: Aptio TSE

The BIOS is developed on AMI based code. AMI provides Aptio™ Text Setup Environment (TSE), a test-based basic input and output system as BIOS setup utility. The purpose of Aptio™ TSE is to empower the user with complete system control at boot.

Getting BIOS setup

To enter BIOS Setup at startup:

1. Power on the device.
2. Press **ESC** key on your keyboard during the Power - On - Self - Test (POST) when the SIEMENS logo is shown on screen.

   The Aptio™ TSE main BIOS setup menu is displayed.

   You can access the other setup screens from the main BIOS setup menu, such as 'Advanced' menu.

Note

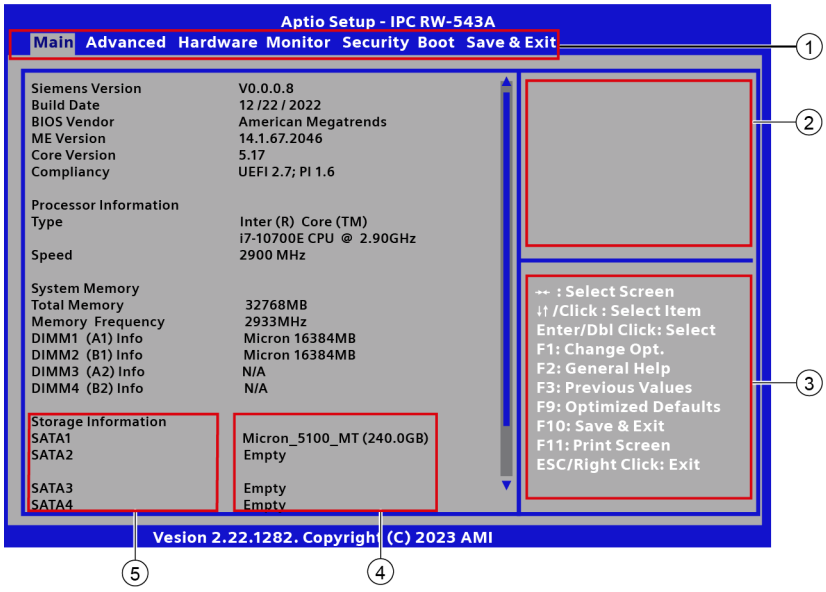
During the startup, if **ESC** is not pressed, POST continues its routines.

If the timing is missed for entering BIOS setup during POST, a system reset is required by one of following methods:

- Press **CTRL** + **ALT** + **DELETE** simultaneously.
- Press the power button to turn off system then turn it on.

BIOS setup menu

The Aptio™ TSE BIOS setup menu is the homepage of the BIOS setup. Each BIOS setup menu option is described in this manual.



① Menu bar
② Function description fields
③ Navigation keys
④ Configuration fields
⑤ Menu items

Menu bar

The menu bar is on the top of the screen and has the following main items:

- Main: For changing the basic system configuration
- Advanced: For changing the advanced system settings.
- Hardware Monitor: For displaying the system temperature, power status, and changing the fan settings.
- Boot: For changing the system boot configuration.
- Security: For setting the administrator or user password, configure trusted devices or set secure boot.
- Save & Exit: For selecting the exit options and loading default settings.

Function description fields

Function description fields are at the top right corner of the menu screen and a brief description of the selected item.

Navigation key

The Aptio™ TSE keyboard-based navigation can be accomplished using a combination of the keys, for example, function keys, **Enter**, **ESC**, **ARROW** keys. Function description for navigation keys is listed below.

Press	To
→ ← : Select Screen	Menu Bar and select a BIOS setup page, for example, the Main menu.
↑ ↓/Click : Select Item	Select a BIOS setup item or sub page.
Enter/Dbl Click : Select	Select an option to edit its value or access a sub menu.
F1 : Change Opt.	Change the field value of a particular setup item, for example, date, time.
F2 : General Help	Display the general help window.
F3: Previous Values	Enable user to load previous values in BIOS setup Menu.
F9: Optimized Defaults	Enable user to load optimized default values in BIOS Setup Menu.
F10: Save & Exit	Enable user to save the current configuration and exit BIOS Setup Menu.
F11: Print Screen	Enable user to print screen.
ESC/Right Click: Exit	The <ESC> Key or Right Click allows you to discard any change have made and exit BIOS setup menu.

Configuration fields

Configuration fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it and press **Enter** to display a list of options.

Menu items

Menu items are system parameters in each page and vary according to different menu pages.

11.2 Main menu

The Main menu

The Main menu provides you an overview of the basic system information, and allows you to set the system date and time.

Note

Take the BIOS version installed on your IPC as standard.

BIOS information

BIOS Information contains the following items:

Item	Description
Siemens Version	Show the BIOS release version information.
Build Date	Show the BIOS release date information.
BIOS Vendor	Show the BIOS vendor information.
ME Version	Show the ME version information.
Core Version	Show the core version information.
Compliancy	Show the compliancy information.

System Date

You can follow the steps to set the system date information.

1. Use arrow key to select the data.
2. Navigate to the month, day and year and type in the value as you need. Press **Enter** to jump to next filed.
3. Press **F10** key and save the change.

System Time

You can follow the steps to set the system time.

1. Use arrow key to select the data.
2. Navigate to the hour, minute and second and type in the value as you need. Press **Enter** to jump to next filed.
3. Press **F10** key and save the change.

Note

Enter the time in the 24-hour format. For example, you should enter 06:30:00 for 6:30 AM.

Secure Boot

System parameters		Function description	Configuration options	Default setting
Secure Boot		Set the secure boot. Platform key (PK) is enrolled and the system is in user mode. The mode change requires platform reset.	• [Enabled] • [Disabled]	[Disabled]
Secure Boot Mode		Select the Boot Mode: • [Standard]: A standard mode. • [Custom]: In this mode, Secure Boot policy variables can be configured by a physically present user without full authentication.	• [Standard] • [Custom]	[Custom]
Key Management	Factory Key Provision	Install factory default secure boot keys after the platform reset and while the system is in Setup mode.	• [Enabled] • [Disabled]	[Disabled]
	Device Guard Ready	Secure Boot Defaults.	None	None
	Secure Boot variable			

11.3 Advanced menu

Advanced menu

The **Advanced** menu allows you to change the settings for the CPU and other system devices.

Note

Be cautious when changing the settings of the Advanced menu. Incorrect field value can cause the system to malfunction.

CPU Configuration

In the CPU configuration page, you can check and configure the CPU-related information that the BIOS automatically detect.

System parameters	Function description	Configuration options	Default setting
Turbo Mode	Enable or disable the processor Turbo Mode.	• [Enabled] • [Disabled]	[Enabled]
Intel (VMX) Virtualization Technology	Enable or disable the intel virtualization technology. • [Enabled]: A VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. • [Disabled]: Disable this function.	• [Enabled] • [Disabled]	[Enabled]

System parameters	Function description	Configuration options	Default setting
Active Processor Cores	Select the number of CPU cores to activate in each processor package. Note: Some of the CPU types can support more than one cores.	• [All] • [1]	[All]
Intel(R) SpeedStep(tm)	Allows more than two frequency ranges to be supported.	• [Enabled] • [Disabled]	[Enabled]
Intel(R) Speed Shift Technology	Enable or disable the Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.	• [Enabled] • [Disabled]	[Enabled]
Hyper-Threading	Enable or disable Hyper-Threading Technology.	• [Enabled] • [Disabled]	[Enabled]
CPU AES	Enable or disable AES (Advanced Encryption Standard).	• [Enabled] • [Disabled]	[Enabled]
CPU C states	Enable or disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.	• [Enabled] • [Disabled]	[Disabled]

Chipset Configuration

In the Chipset Configuration page, you can change the platform settings.

System parameters	Function description	Configuration options	Default setting
Graphics Configuration			
• **Primary Display** [1]	Select the Primary Display from IGFX/PEG/PCI Graphics device or select SG for switchable Gfx.	• [Auto] • [CPU Graphics] • [PCIE 16X slots] • [PCIE 4X slots]	[CPU Graphics]
• **Internal Graphics**	Keep IGFX enabled based on the setup options.	• [Auto] • [Disabled] • [Enabled]	[Auto]
HD Audio Configuration			
• **HD Audio**	Control Detection of the HD-Audio device. • [Enabled]: HDA will be unconditionally enabled. • [Disabled]: HDA will be unconditionally disabled.	• [Enabled] • [Disabled]	[Enabled]
High Precision Timer	Enable or disable the High Precision Event Timer.	• [Enabled] • [Disabled]	[Enabled]

[1] Refer to the following table to select the correct configuration options for Primary Display when you connect external graphic cards.

SATA And RST Configuration

When you enter the BIOS Setup, the BIOS automatically detects the presence of SATA devices. If no SATA device is installed to the corresponding SATA port, the SATA Port items show Empty.

System parameters	Function description	Configuration options	Default setting
M.2 NVMe	Enable or disable control the PCI ExpressRoot Port.	• [Enabled] • [Disabled]	[Enabled]
SATA Controller(s)	Enable or disable the SATA port SATA6G_1.	• [Enabled] • [Disabled]	[Enabled]
SATA Mode Selection	Determines how SATA controller(s) operate.	• [AHCI] • [Intel RST With Intel Optane System Acceleration]	[AHCI]
The following options show only when "SATA Mode Selection" = "[Intel RST With Intel Optane System Acceleration]".			
• **RST**	SATA Interrupt Selection	• [MSIX] • [MSI] • [Legacy]	[MSIX]
SATA1~4 Port	Enable or disable the SATA1 Port 1~4.	• [Enabled] • [Disabled]	[Enabled]
M.2 SATA Port	Enable or disable the M.2 SATA Port.	• [Enabled] • [Disabled]	[Enabled]

PCI Express Configuration

In the PCI Express Configuration page, you can configure the onboard devices.

System parameters	Function description	Configuration options	Default setting
PCIE_16X_SLOT1	Enable or disable the PCIE_16X_SLOT1.	• [Enabled] • [Disabled]	[Enabled]
PCIE_16X_SLOT1 Speed	Configure PEG 0:1:0 Max Speed.	• [Auto] • [Gen1] • [Gen2] • [Gen3]	[Auto]
PCIE_16X_SLOT2 (MaxWidth 8x)	Enable or disable the PCIE_16X_SLOT2.	• [Enabled] • [Disabled]	[Enabled]

System parameters	Function description	Configuration options	Default setting
PCIE_16X_SLOT2 Speed	Configure PEG 0:1:1 Max Speed.	• [Auto] • [Gen1] • [Gen2] • [Gen3]	[Auto]
PCIE_16X Detect Non-Compliance Device	Detect Non-Compliance PCI Express Device in PCIE_16X	• [Enabled] • [Disabled]	[Disabled]
PCIE_4X_SLOT1	Control the PCI Express Root Port.	• [Enabled] • [Disabled]	[Enabled]
The following options show only when "PCIE_4X_SLOT1" = Enabled.			
• **PCIe Speed**	Configure PCIe Speed.	• [Auto] • [Gen1] • [Gen2] • [Gen3]	[Auto]
• **Detect Non-Compliance Device**	Detect Non-Compliance PCI Express Device in PCIE_4X_SLOT1.	• [Enabled] • [Disabled]	[Disabled]
PCIE_4X_SLOT2	Control the PCI Express Root Port.	• [Enabled] • [Disabled]	[Enabled]
The following options show only when "PCIE_4X_SLOT2" = Enabled.			
• **PCIe Speed**	Configure PCIe Speed.	• [Auto] • [Gen1] • [Gen2] • [Gen3]	[Auto]
• **Detect Non-Compliance Device**	Detect Non-Compliance PCI Express Device in PCIE_4X_SLOT2.	• [Enabled] • [Disabled]	[Disabled]
PCIE_4X_SLOT3	Control the PCI Express Root Port.	• [Enabled] • [Disabled]	[Enabled]
The following options show only when "PCIE_4X_SLOT3" = Enabled.			
• **PCIe Speed**	Configure PCIe Speed.	• [Auto] • [Gen1] • [Gen2] • [Gen3]	[Auto]
• **Detect Non-Compliance Device**	Detect Non-Compliance PCI Express Device in PCIE_4X_SLOT3.	• [Enabled] • [Disabled]	[Disabled]
PCI1&PCI2 SLOTS	Control the PCI Slots.	• [Enabled] • [Disabled]	[Enabled]

System parameters	Function description	Configuration options	Default setting
The following options show only when "PCI1&PCI2 SLOTS" = Enabled.			
• **PCI Speed**	Configure PCI Speed.	• [Auto] • [Gen1] • [Gen2] • [Gen3]	[Auto]
• **Detect Non-Compliance Device**	Detect Non-Compliance PCI Express Device in PCI1&PCI2 SLOTS.	• [Enabled] • [Disabled]	[Disabled]
MiniPCIE	Control the MiniPCIE.	• [Enabled] • [Disabled]	[Enabled]
The following options show only when "MiniPCIE" = Enabled.			
• **PCIe Speed**	Configure PCIe Speed.	• [Auto] • [Gen1] • [Gen2] • [Gen3]	[Auto]
• **Detect Non-Compliance Device**	Detect Non-Compliance PCI Express Device in MiniPCIE.	• [Enabled] • [Disabled]	[Disabled]

PCH-FW Configuration

This page displays the information of the connected M.2 devices.

System parameters	Function description	Configuration options	Default setting
ME State	The state of management engine(ME).	• [Enabled] • [Disabled]	[Enabled]
The following options show only when "ME State" = Enabled.			
Firmware Update Configuration	Configure Management Engine Technology Parameters.		
• **Me FW Image Re-Flash**	Enable or disable Me FW Image Re-Flash function.	• [Enabled] • [Disabled]	[Disabled]
• **FW Update**	Enable or disable Me FW update function.	• [Enabled] • [Disabled]	[Enabled]

ACPI Settings

In the ACPI Settings page, you can change the system ACPI parameters.

System parameters	Function description	Configuration options	Default setting
Restore AC Power Loss	Restore the AC power loss. Specify what state to go to when power is re-applied after a power failure(G3 state). • [Power On]: The system goes into on state after an AC power loss. • [Power Off]: The system goes into off state after an AC power loss. • [Last State]: The system goes into either off or on state, whatever the system state was before the AC power loss.	• [Power On] • [Power Off] • [Last State]	[Last State]
Resume from PCIe/LAN X1P1	Enable or disable resume from PCIe/LAN X1P1.	• [Enabled] • [Disabled]	[Disabled]
Resume from LAN X2P1	Enable or disable integrated LAN to wake the system.	• [Enabled] • [Disabled]	[Disabled]
Resume from S5 via PS2	Enable or disable resume from S5 state via PS2.	• [Enabled] • [Disabled]	[Disabled]
Enable Hibernation	Enable or disable system ability to Hibernate(OS/S4 Sleep state). This option may not be effective with some operating systems.	• [Enabled] • [Disabled]	[Enabled]
Wake system from S5	Configure system wake on alarm event.	• [Disabled] • [Daily Time] • [Weekly Time] • [Monthly Time]	[Disabled]

Serial Port Configuration

In the Serial Port Configuration page, you can set the serial port configuration.

System parameters	Function description	Configuration options	Default setting
COM1 • **Serial Port**	Enable or disable the serial port (COM) 1.	• [Enabled] • [Disabled]	[Enabled]
COM2 • **Serial Port**	Enable or disable the serial port (COM) 2.	• [Enabled] • [Disabled]	[Enabled]
COM3 • **Serial Port**	Enable or disable the serial port (COM) 3.	• [Enabled] • [Disabled]	[Enabled]
COM4 • **Serial Port**	Enable or disable the serial port (COM) 4.	• [Enabled] • [Disabled]	[Enabled]

System parameters	Function description	Configuration options	Default setting
COM5 • **Serial Port**	Enable or disable the serial port (COM) 5.	• [Enabled] • [Disabled]	[Enabled]
COM6 • **Serial Port**	Enable or disable the serial port (COM) 6.	• [Enabled] • [Disabled]	[Enabled]

USB Configuration

In the USB Configuration page, you can change the USB related features.

System parameters	Function description	Configuration options	Default setting
USB Port Per-Port Control	Enable or disable the USB ports individually.	• [Select Per-Pin] • [Disabled]	[Select Per-Pin]
Legacy USB Support	Enable or disable the Legacy USB Support. • [Enabled]: Enables the support for USB devices on legacy operating systems (OS). • [Disabled]: The USB devices can be used only for EFI applications. • [Auto]: The system detects the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.	• [Enabled] • [Disabled] • [Auto]	[Enabled]
XHCI Hand-off	Enable or disable the XHCI Hand-off.	• [Enabled] • [Disabled]	[Disabled]
The following options show only when "USB Port Per-Port Control = [Select Per-Pin]".			
USB X60	Enable or disable the USB X60.	• [Enabled] • [Disabled]	[Enabled]
USB X61	Enable or disable the USB X61.	• [Enabled] • [Disabled]	[Enabled]
USB X62	Enable or disable the USB X62.	• [Enabled] • [Disabled]	[Enabled]
USB X63	Enable or disable the USB X63.	• [Enabled] • [Disabled]	[Enabled]
USB X64	Enable or disable the USB X64.	• [Enabled] • [Disabled]	[Enabled]
USB X65	Enable or disable the USB X65.	• [Enabled] • [Disabled]	[Enabled]
Internal USB2_1	Enable or disable the Internal USB2_1.	• [Enabled] • [Disabled]	[Enabled]

System parameters	Function description	Configuration options	Default setting
Internal F_USB2_1_1	Enable or disable the Internal F_USB2_1_1.	• [Enabled] • [Disabled]	[Enabled]
Internal F_USB2_1_2	Enable or disable the Internal F_USB2_1_2.	• [Enabled] • [Disabled]	[Enabled]
Internal F_USB2_2_1	Enable or disable the Internal F_USB2_2_1.	• [Enabled] • [Disabled]	[Enabled]
Internal F_USB2_2_2	Enable or disable the Internal F_USB2_2_2.	• [Enabled] • [Disabled]	[Enabled]
Internal MiniPCIE	Enable or disable the Internal MiniPCIE.	• [Enabled] • [Disabled]	[Enabled]

Network Stack Configuration

In the Network Stack Configuration page, you can configure network stack.

System parameters	Function description	Configuration options	Default setting
Network Stack	Enable or disable the UEFI Network Stack.	• [Enabled] • [Disabled]	[Disabled]
The following options show only when "Network Stack = [Enabled]".			
Ipv4 PXE Support	Enable or disable the Ipv4 PXE Boot Support.	• [Enabled] • [Disabled]	[Disabled]
Ipv6 PXE Support	Enable or disable the Ipv6 PXE Boot Support.	• [Enabled] • [Disabled]	[Disabled]
LAN X1P1	Enable or disable the LAN X1P1 Controller.	• [Enabled] • [Disabled]	[Enabled]
LAN X1P1 PXE BOOT	Enable or disable the LAN X1P1 PXE BOOT.	• [Enabled] • [Disabled]	[Disabled]
LAN X2P1	Enable or disable the LAN X2P1 Controller.	• [Enabled] • [Disabled]	[Enabled]
LAN X2P1 PXE BOOT	Enable or disable the LAN X2P1 PXE BOOT.	• [Enabled] • [Disabled]	[Disabled]
Add-on PCIE LAN card PXE Boot	Enable or disable the Add-on PCIE LAN card PXE Boot.	• [Enabled] • [Disabled]	[Disabled]

11.4 Hardware Monitor menu

Hardware Monitor menu

The Hardware Monitor menu displays the system temperature/power status, and allows you to change the fan settings.

System parameters	Function description	Configuration options	Default setting
Pc Health Status			
CPU Temperature	The onboard hardware monitor automatically detects and displays the CPU temperature.	None	None
System temperature	The onboard hardware monitor automatically detects and displays the system temperature.	None	None
CPU / SYS Fan Speed	The onboard hardware monitor automatically detects and displays the CPU / System fan speeds in rotations per minute (RPM).	None	None
VCC_CPU, VCC_DDR, +12V,+5V, +3.3V	The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.	None	None
CPU_FAN1 Mode	Control the CPU fan. • [Maximum Mode]: Uses Maximum speed. • [Automatic Mode]: CPU Fan speed change based on CPU temperature.	• [Maximum Mode] • [Automatic Mode]	[Automatic Mode]
SYS_FAN1 Mode	Control the system fan1. • [Maximum Mode]: Uses Maximum speed. • [Automatic Mode]: CPU Fan speed change based on CPU temperature. • [Silent Mode]: A lower sound mode.	• [Maximum Mode] • [Automatic Mode] • [Silent Mode]	[Automatic Mode]
SYS_FAN2 Mode	Control the system fan2. • [Maximum Mode]: Uses Maximum speed. • [Automatic Mode]: CPU Fan speed change based on CPU temperature. • [Silent Mode]: A lower sound mode.	• [Maximum Mode] • [Automatic Mode] • [Silent Mode]	[Automatic Mode]

11.5 Security menu

Security menu

NOTICE
Risk of unauthorized modification for BIOS setting
Everyone can access BIOS and change its setting if you don't set a password for BIOS.
Modifying the BIOS setting arbitrarily may interfere with device function.
Set passwords for administrator and user to avoid unauthorized access and modification to BIOS.

Security menu provides both Administrator and User password. If you want use both of these two passwords, the Administrator password must be set firstly. The Administrator and User passwords activate two different levels of password security.

After the passwords are set, you must enter a password every time when you enter BIOS.

Select **Security** item in BIOS Setup screen to enter Security menu.

Administrator Password

This option allows you to set an administrator password level password for BIOS.

If you have set an administrator password, Siemens recommends that you enter the administrator password for accessing the BIOS.

To set an administrator password:

1. Select **Administrator Password** item with the arrow keys and press **Enter** key.
2. Enter a password (The password of at least three characters in length and can be up to 20 characters long and case-sensitive) in the **Create New Password** box, and then press **Enter**.
3. Enter your password again in the **Confirm New Password** box, and then click **OK.**

To change an administrator password:

1. Select **Administrator Password** item with the arrow keys and press **Enter** key.
2. Enter the current password in the **Enter Current Password** box, and then press **Enter**.
3. Enter a new password in the **Create New Password** box, and then press **Enter**.
4. Enter your password again in the **Confirm New Password** box, and then click **OK.**

User Password

User password is displayed if you have set the Administrator Password.

This option allows you to set a user level password for BIOS.

If you have set a user password, you must enter the user password for accessing the BIOS.

To set a user password:

1. Select **User Password** with the arrow keys and press **Enter** key.
2. Enter a password (The password of at least three characters in length and can be up to 20 characters long and case-sensitive) in the **Create New Password** box, and then press **Enter**.
3. Enter your password again in the **Confirm New Password** box, and then click **OK.**

To change a user password:

1. Select **User Password** with the arrow keys and press **Enter** key.
2. Enter the current password in the **Enter Current Password** box, and then press **Enter**.
3. Enter a new password in the **Create New Password** box, and then press **Enter**.
4. Enter your password again in the **Confirm New Password** box, and then click **OK.**

To clear the user password:

Follow the same steps as in changing a user password, but click **OK** when prompted to create/confirm the password.

Note

Record the new password when the password is changed. If you forget the password, you can contact Siemens Technical support.

Trusted Computing

This option allows you to configure trusted devices:

System parameters	Function description	Configuration options	Default setting
Security Device Support	When you set the boot mode to UEFI in Boot menu, you can set this item to enable or disable BIOS support for security device.	• [Enabled] • [Disabled]	[Disabled]
The following options show only when TPM device is installed successfully, and "Security Device Support = Enabled". The following options depend on TPM device. For example:			
SHA-1 PCR Bank	Enable or disable SHA-1 PCR Bank.	• [Enabled] • [Disabled]	[Enabled]
SHA256 PCR Bank	Enable or disable SHA256 PCR Bank.	• [Enabled] • [Disabled]	[Enabled]
Pending Operation	Schedule an operation for the security device. Note: Your computer will reboot during restart in order to change state of security device.	• [None] • [TPM Clear]	[None]
Platform Hierarchy	Enable or disable platform hierarchy.	• [Enabled] • [Disabled]	[Enabled]

System parameters	Function description	Configuration options	Default setting
Storage Hierarchy	Enable or disable storage hierarchy.	• [Enabled] • [Disabled]	[Enabled]
Endorsement Hierarchy	Enable or disable endorsement hierarchy.	• [Enabled] • [Disabled]	[Enabled]
TPM2.0 UEFI Spec Version	Select the TCG2 Spec Version Support: TCG_1-2: the compatible mode for Win8/Win10. TCG_2: Support new TCG2 protocol and event format for Win10 or later.	• [TCG_1-2] • [TCG_2]	[TCG_2]
Physical Presence Spec Version	Select the PPI Spec version 1.2 or 1.3.	• [1.2] • [1.3]	[1.3]

11.6 Boot menu

Boot menu

The Boot menu allows you to change the system boot options.

Boot Configuration

In the Boot Configuration page, you can modify the boot up screen between POST message and SIEMENS logo.

System parameters	Function description	Configuration options	Default setting
Fast Boot	Change the boot speed. • [Enabled]: Select to accelerate the boot speed. • [Disabled]: Select to go back to normal boot.	• [Enabled] • [Disabled]	[Disabled]
Quiet Boot	Enable or disable the Quiet Boot option.	• [Enabled] • [Disabled]	[Enabled]
HDD Boot	Enable or disable the HDD Boot option.	• [Enabled] • [Disabled]	[Enabled]
USB Boot	Enable or disable the USB Boot option.	• [Enabled] • [Disabled]	[Disabled]
NVMe Boot	Enable or disable the NVMe Boot option.	• [Enabled] • [Disabled]	[Disabled]

System parameters		Function description	Configuration options	Default setting
Boot mode select		Select the devices boot-up mode according to the devices specification and different operating systems.	• [UEFI]	[UEFI]
Fixed BOOT order Priorities	Boot Option #1	Set the system boot order.	• [UEFI Hard Disk] • [UEFI NVME] • [UEFI USB Device] • [UEFI Network] • [Disabled]	[UEFI Hard Disk]
	Boot Option #2			[UEFI NVME]
	Boot Option #3			[UEFI USB Device]
	Boot Option #4			[UEFI Network]

UEFI Hard Disk Drive BBS Priorities

In the UEFI Hard Disk Drive BBS Priorities page, you can modify the boot up screen between POST message and SIEMENS logo.

The actual system parameter depends on the above configuration option for Fixed BOOT order Priorities. The following option is just an example.

System parameters	Function description	Configuration options	Default setting
Boot Option #1	Set the system boot order.	• [Windows Boot Manager] • [Disabled]	[Windows Boot Manager]

11.7 Save & Exit menu

Save & Exit menu

The **Save & Exit** menu allows you to load the optimal default values for the BIOS items, and save or discard your changes to the BIOS items.

System parameters	Function description
Save Changes and Exit	Save current changes and exit.
Discard Changes and Exit	Revert to the previous save and exit.
Save Changes and Reset	Save current changes and reset the device. After the system is rebooted, the new system configurations take effect.
Discard Changes and Reset	Reboot the system without saving the changes.
Save Changes	Save current changes.
Discard Changes	Revert to the previous save.
Restore Defaults	Restore/load default values for all setup options.
Save as User Defaults	This option saves current configuration as User Defaults.
Restore User Defaults	This option restores User Defaults to all setup options.

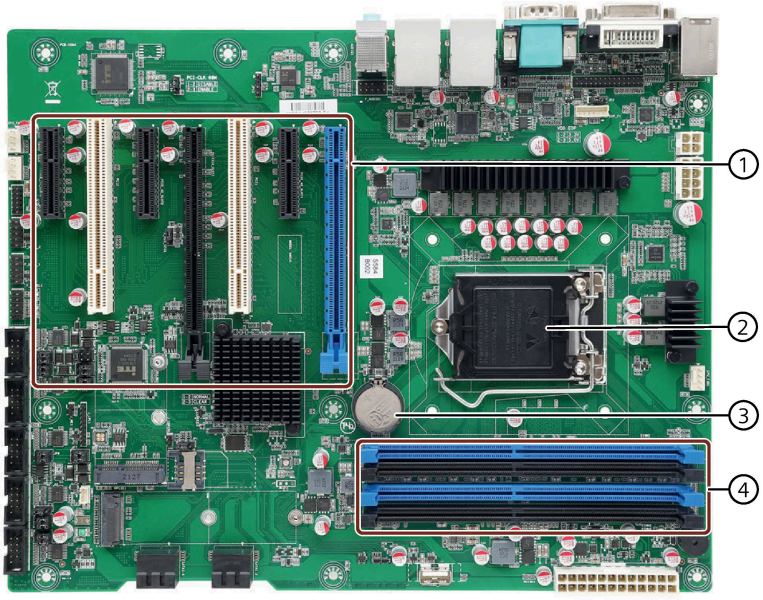
Hardware description

A

A.1 Motherboard

A.1.1 Layout of the motherboard

The motherboard consists of these main components: processor and chipset, six slots for PCIe modules, two slots for memory modules, internal and external interfaces, Flash BIOS and the backup battery.

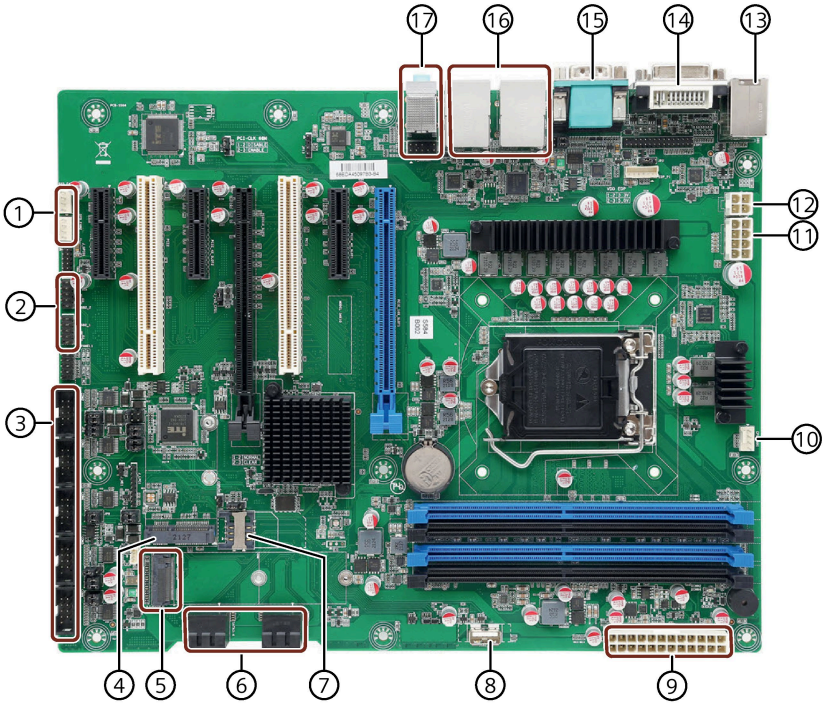


① Slots for PCIe/PCI modules
② Slot for CPU Fan and processor
③ Backup battery
④ Slots for memory modules

Technical features of the motherboard

Technical features of the motherboard can be found under "Technical specifications of the motherboard (Page 81)".

A.1.2 Position of the interfaces on the motherboard



① System fan header
② Front USB 2.0 pin header
③ COM2/3/4/5/6 Header
④ Mini PCI-E Slot (WIFI+4G/3G)
⑤ M.2 (NGFF) Key-M Slot (PCIe x4 NVMe/SATA SSD, 2242/2280)
⑥ SATA3.0 7P Upright Connector1-2/3-4
⑦ Full-Size SIM Card Slot
⑧ USB2.0 Internal Vertical TYPE-A Connector
⑨ ATX 24P Power Input Connector
⑩ CPU Fan pin header
⑪ ATX 8P CPU Power Input Connector
⑫ ATX 4P CPU Power Input Connector
⑬ PS/2 Connector (Keyboard & Mouse)
Dual USB2.0 TYPE-A Connector
⑭ DVI-I 24+4P/F Connector (Support DVI-D)
VGA DB15/F Connector
⑮ COM1 DB9/M Connector
HDMI TYPE-A Connector
⑯ LAN
Dual USB3.0 TYPE-A Connector2
⑰ Microphone
Line OUT
Line IN

A.1.3 Jumpers

⚠WARNING

Electrostatic sensitive devices (ESD)

The motherboard contains electronic components which can be destroyed by electrostatic charges. This can result it in malfunctions and damage to the machine or plant.

Always completely disconnect to the power cord from your motherboard when you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage the sensitive electronic components.

Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.

⚠WARNING

Improper operations on the motherboard may result in substantial damage to the motherboard or endanger the operator

- Do not remove or ruin the motherboard serial number labels.
  These labels and the serial numbers are required for warranty validation.
- Wear electrostatic discharge (ESD) wrist strap or gloves when handling or touching the motherboard.
- When handling the motherboard, avoid to touch any metal leads or connectors.
- Always unplug the AC power cord from the power outlet before you installing or removing the motherboard.
- Place the motherboard on an anti-static pad or in a electrostatic shielding container during the operation.
- Turn off the power supply before you removing the power supply cable from the motherboard.
- Before turning on the power supply, check if the input voltage setting follows the local voltage standard.
- Before operating the motherboard, make sure that the cables and the power connectors of all the attached hardware components are connected. Turning on the power before you connect them, the motherboard and the system components may get damaged and injure operator.
- Make sure you securely attached the hardware components to the motherboard connectors/ slots/ sockets.
- The screws are not allowed to connect with motherboard circuit or components. The motherboard can be damaged by this action.
- Do not leave the screws or the metal components on the motherboard or inside of the chassis.

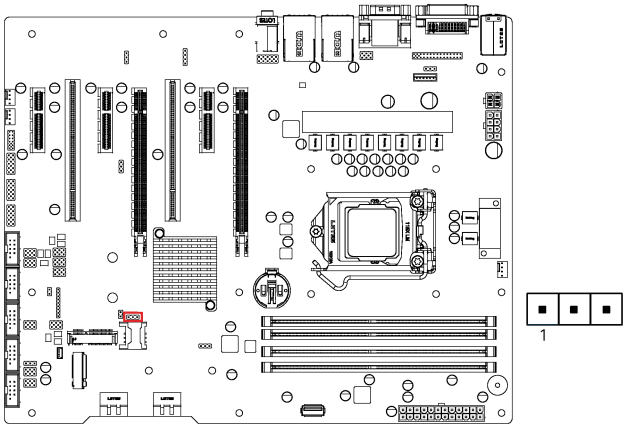
Setting Jumpers

The board has a number of jumpers that allow you to configure your system to suit your appli cation. A jumper is a kind of electric switch. Through setting jumpers, you can configure your card to match the needs of your application.

A jumper
consists of two metal pins and a small metal clip (often protected by a plastic cover). To connect the pins, lid the pin with the clip. To disconnect a jumper, remove the clip.

A pair of needle nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for you application, contact your local distributor or sales representative before you make any change.

Clear CMOS



CMOS Clear Jumper	
Pin setting	**Function**
1-2(Default)	Normal
2-3	Clear CMOS

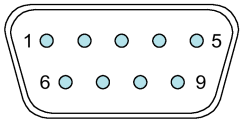
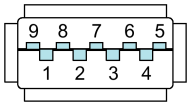
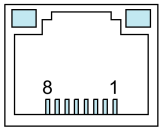
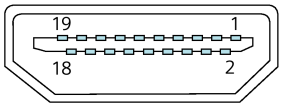
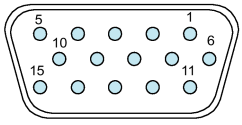
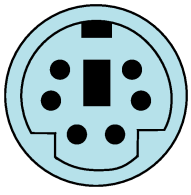
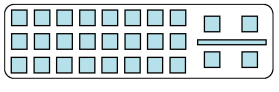
NOTICE
Set the jumper back to protected mode after clearing CMOS.

A.2 External interfaces

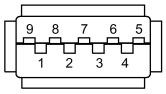
Note

Interface specification

The data of all external interfaces listed below correspond to the respective interface specifications and the intended use.

Interface	Connector	Description	Assignment
COM X30	COM1	9-pin standard plug	
USB X60-X65	PS/2_USB1, RJ45_USB1, RJ45_USB2	USB3 Port 0, 1; USB2 Port 0, 1 interface side	
LAN X1P1 and X2P1	LAN1_U31G1_12, LAN2_U31G1_34	RJ45	
HDMI X72	HDMI1	HDMI Type A	
Audio	AUDIO1	3.5 mm jack 1. Line-In 2. Line-Out 3. Mic-In	
VGA	DVI VGA1	Connection of an analog monitor	
PS/2 X10	PS/2_USB1	PS/2 Connector (Keyboard and Mouse)	
DVI	DVI X70	DVI-I 24+4P/F Connector (Support DVI-D)	

A.2.1 USB 3.0 port

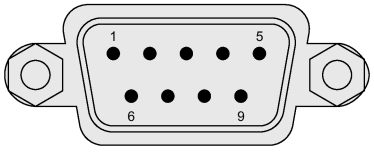


Pin	Short name	Meaning	Input / output
1	VBUS	+ 5 V (fused)	Output
2	D-	Data channel USB2	Input / output
3	D+	Data channel USB2	Input / output
4	GND	Ground	–
5	RX-	Data channel USB3	Input
6	RX+	Data channel USB3	Input
7	GND	Ground	–
8	TX-	Data channel USB3	Output
9	TX+	Data channel USB3	Output

A.2.2 USB 2.0 port

Pin	Short description	Meaning
1	USB_P5V_fused (O)	+5 V, fused
2	USB_D0M (I/O)	Data–
3	USB_D0P (I/O)	Data+
4	USB_GND	GND

A.2.3 Serial interface



RS232

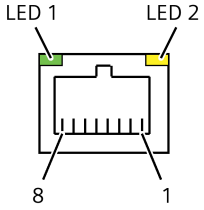
Pin assignment RS232

Pin	Short description	Meaning
1	DCD	Data carrier detect (I)
2	RxD	Received data (I)

Pin	Short description	Meaning
3	TxD	Transmitted data (O)
4	DTR	Data terminal ready (O)
5	M	Ground
6	DSR	Data set ready (I)
7	RTS	Request to send (O)
8	CTS	Clear to send (I)
9	RI	Incoming call (I)

A.2.4 Ethernet

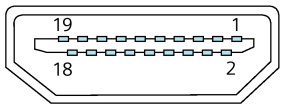
Ethernet RJ45 interface



Pin no.	Short description	Meaning	Input / output
1	BI_DA+	Bi-directional data A+	Input/output
2	BI_DA-	Bi-directional data A-	Input/output
3	BI_DB+	Bi-directional data B+	Input/output
4	BI_DC+	Bi-directional data C+	Input/output
5	BI_DC-	Bi-directional data C-	Input/output
6	BI_DB-	Bi-directional data B-	Input/output
7	BI_DD+	Bi-directional data D+	Input/output
8	BI_DD-	Bi-directional data D-	Input/output
S		Shield	–
	LED 1	• Off: 10 Mbps • Green: 100 Mbps • Orange: 1000 Mbps	–
	LED 2	• Off: Stop • Yellow: Active connected • Yellow flashing: Data transfer active	–

The Ethernet interface supports MDXI (auto crossover) for all transmission rates.

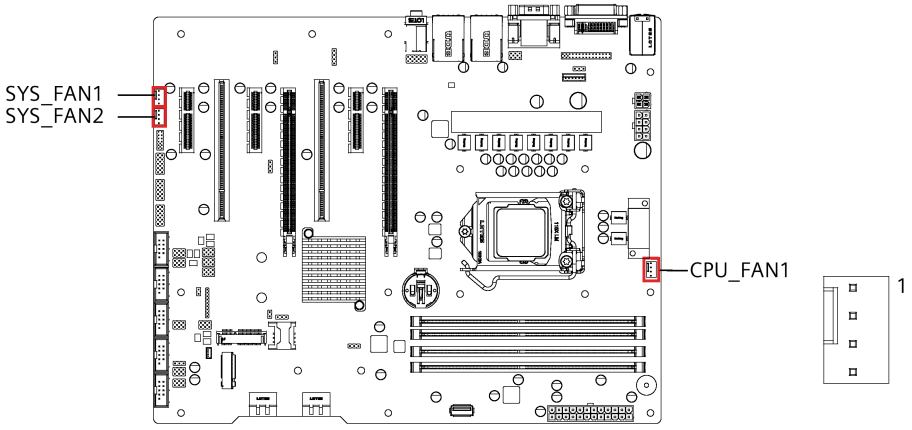
A.2.5 HDMI

HDMI interface			
			
Pin no.	**Signal**	**Pin no.**	**Signal**
1	TMDS data 2+	11	TMDS clock shield
2	TMDS data 2 shield	12	TMDS clock-
3	TMDS data 2-	13	CEC
4	TMDS data 1+	14	No connected
5	TMDS data 1 shield	15	DDC clock
6	TMDS data 1-	16	DDC data
7	TMDS data 0+	17	GND
8	TMDS data 0 shield	18	+5V power
9	TMDS data 0-	19	Hot plug detect
10	TMDS clock+		

A.3 Internal Connector

A.3.1 Fan connector

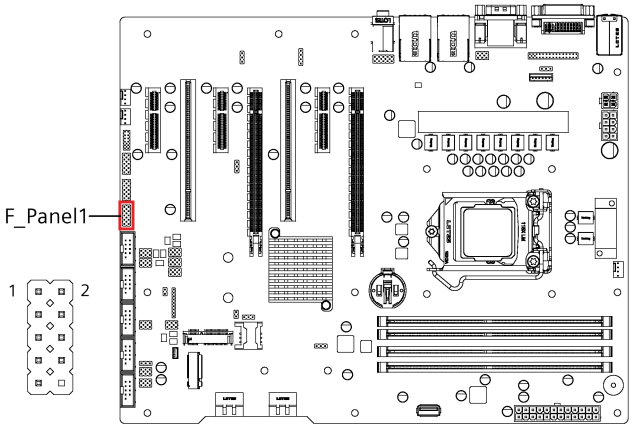
The pin assignment in the table below applies to all fan connectors on motherboard.



FAN Header	
Pin setting	**Function**
1	GND
2	+12V
3	FAN Speed Detection
4	FAN Speed Control

A.3.2 Front panel connector

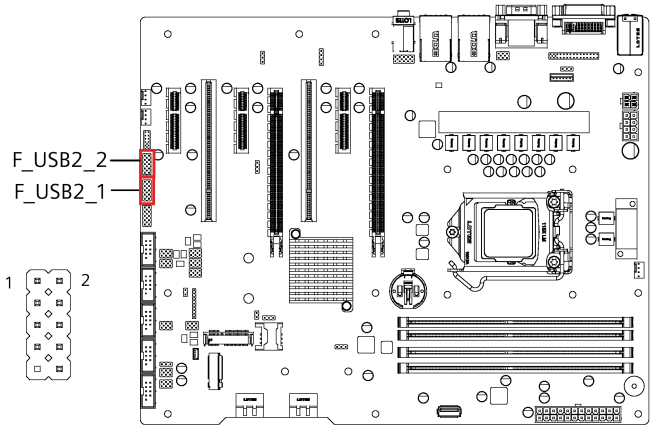
The front panel connector is used to connect cable to Chassis Front Panel, and provide HDD LED, Power LED, Power Button and Reset Button functions.



Front Panel Header			
Pin	**Definition**	**Pin**	**Definition**
1	HDD 3.3V LED+	2	POWER 3.3V LED+
3	HDD 3.3V LED-	4	POWER 3.3V LED-
5	RESET-	6	POWER+
7	RESET+	8	POWER-
9	N/C		

A.3.3 Internal USB 2.0 connector

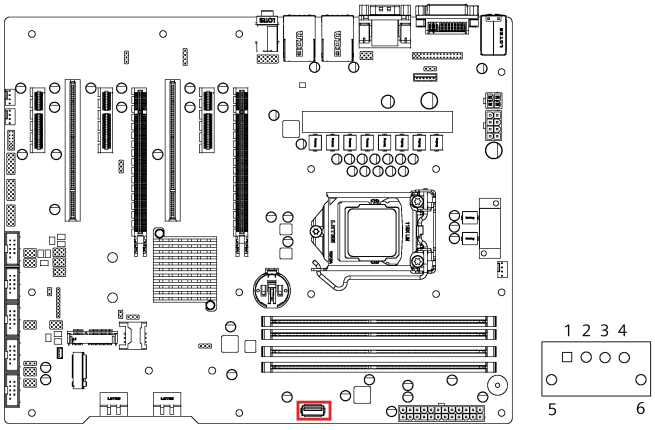
Internal USB 2.0 Connectors provides front USB 2.0 Header which require appropriate cable to support.



F_USB2_1					F_USB2_2			
Pin	**Definition**	**Pin**	**Definition**		**Pin**	**Definition**	**Pin**	**Definition**
1	+ 5V	2	+ 5V		1	+ 5V	2	+ 5V
3	USB2_12-	4	USB2_13-		3	USB2_7-	4	USB2_8-
5	USB2_12+	6	USB2_13+		5	USB2_7+	6	USB2_8+
7	GND	8	GND		7	GND	8	GND
9		10	N/C		9		10	N/C

A.3.4 Internal USB 2.0 Vertical Connector

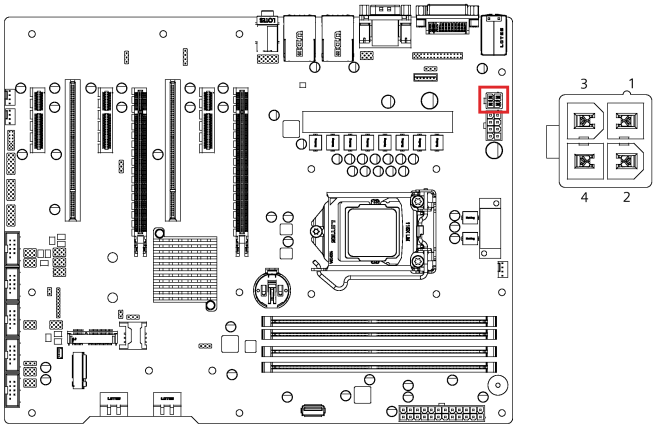
Internal USB 2.0 Vertical Connector provides two Type-A USB 2.0 Ports.



USB 2.0 Vertical Connector			
Pin	**Definition**	**Pin**	**Definition**
1	+5V	4	GND
2	S_USB_PN10	5	GND
3	S_USB_PP10	6	GND

A.3.5 ATX Power 4-pin connector

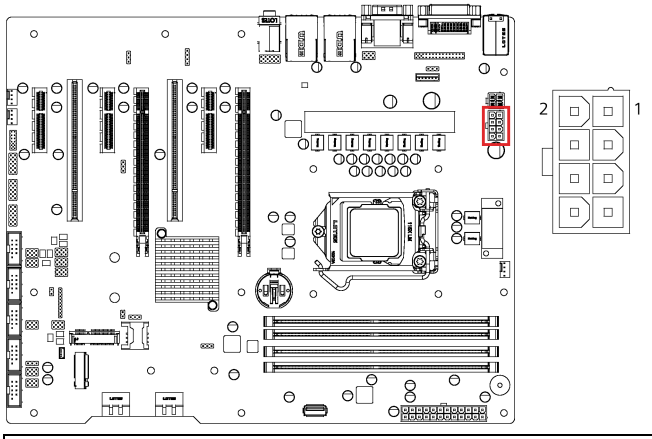
ATX Power 4-Pin Connector is for ATX PSU plug. Make sure you insert the ATX PSU plug on motherboard in the right orientation, otherwise the plug cannot be inserted.



ATX 4-Pin Power Input Connector	
Pin	**Definition**
1	GND
2	GND
3	+12V
4	+12V

A.3.6 ATX power 8-pin connector

ATX Power 8-Pin Connector is for ATX PSU plug. Make sure you insert the ATX PSU plug on motherboard in the right orientation, otherwise the plug cannot be inserted.



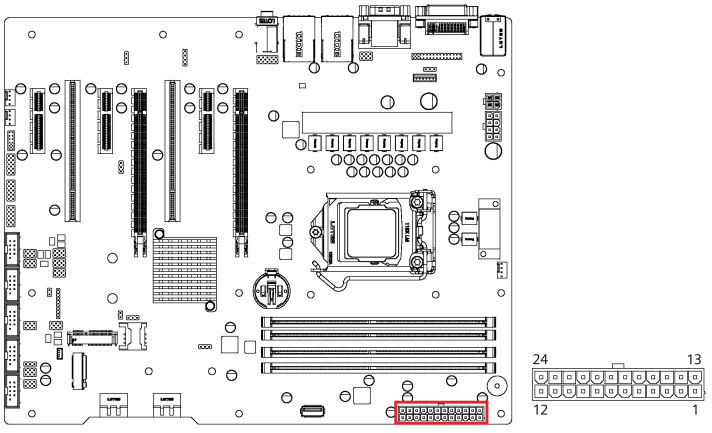
ATX 8-Pin Power Input Connector			
Pin	**Definition**	**Pin**	**Definition**
1	GND	5	GND
2	+12V	6	+12V
3	GND	7	GND
4	+12V	8	+12V

A.3.7 ATX power 24-pin connector

ATX Power 24-Pin connector is for ATX PSU plug. Make sure you insert the ATX PSU plug on motherboard in the right orientation, otherwise the plug cannot be inserted.

Note

ATX Power 24-Pin connector must be connected, otherwise the system cannot be turned on.

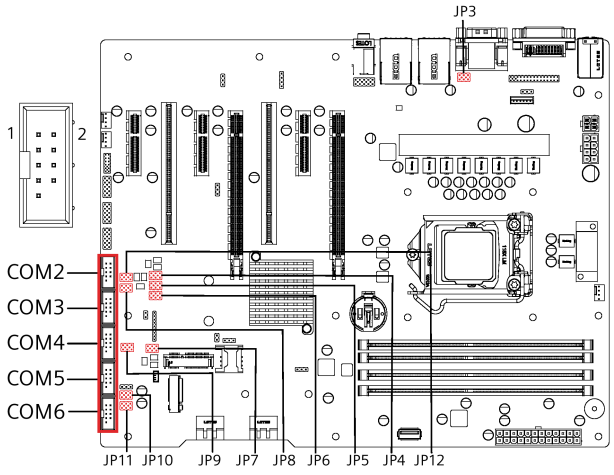


ATX 24-Pin Power Input Connector			
Pin	**Definition**	**Pin**	**Definition**
1	+3.3V	13	+3.3V
2	+3.3V	14	+12V
3	GND	15	GND
4	+5V	16	PSON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PG	20	RSVD
9	+5V standby	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

A.3.8 Internal COM Connector

Internal COM Connectors provides five ports which require appropriate cable to support:

- COM2/5/6 support RS232
- COM3 supports RS232/RS422/RS485
- COM4 supports RS232/RS485



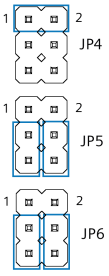
RS232		
Pin	**Short description**	**Meaning**
1	DCD	Data carrier detect (I)
2	DSR	Data set ready (I)
3	RxD	Received data (I)
4	RTS	Request to send (O)
5	TxD	Transmitted data (O)
6	CTS	Clear to send (I)
7	DTR	Data terminal ready (O)
8	RI	Incoming call (I)
9	M	Ground

RS422		
Pin	**Short description**	**Meaning**
1	TX-	Transmit data - (O) for full-duplex mode
2	nc	
3	TX+	Transmit data + (O) for full-duplex mode
4	nc	
5	RX+	Receive data + (I) for full-duplex mode
6	nc	
7	RX-	Receive data - (I) for full-duplex mode
8	nc	
9	M	Ground

RS485		
Pin	**Short description**	**Meaning**
1	Data-	Transmit / receive data - (I/O) for half-duplex mode
2	nc	
3	Data+	Transmit / receive data+ (I/O) for half-duplex mode
4	nc	

RS485		
Pin	**Short description**	**Meaning**
5	nc	
6	nc	
7	nc	
8	nc	
9	M	Ground

	JP3 (COM1 DCD/RI Select Jumper 3*2 Pin 2.54mm)	
Graphic	**Pin setting**	**Function**
	1-3, 2-4	COM1_PIN1: + 5V COM1_PIN8: + 12V
	3-5, 4-6(Default)	COM1_PIN1: DCD COM1_PIN8: RI

	JP6/JP5/JP4 (COM3 RS232/422/485 Select Jumpers 3*2 Pin 2.54mm)	
Graphic	**Pin setting**	**Function**
	JP4 (1-2, Default) JP5 (3-5, 4-6, Default) JP6 (3-5, 4-6, Default)	COM3: RS232 (COM3_PIN1: DCD COM3_PIN3: RXD COM3_PIN5: TXD COM3_PIN7: DTR)
	JP4 (3-4) JP5 (1-3, 2-4) JP6 (1-3, 2-4)	COM3: RS422 (COM3_PIN1: RS422_TX- COM3_PIN3: RS422_TX+ COM3_PIN5: RS422_RX+ COM3_PIN7: RS422_RX-)
	JP4 (5-6) JP5(1-3, 2-4) JP6 (No Effect)	COM3: RS485 (COM3_PIN1: RS485- COM3_PIN3: RS485+)

	JP7 (COM4 RS232/485 Select Jumper 3*2 Pin 2.54mm)	
Graphic	**Pin setting**	**Function**
	1-3, 2-4	COM4: RS485 (COM4_PIN1: RS485- COM4_PIN3: RS485+)
	3-5, 4-6(Default)	COM4: RS232 (COM4_PIN1: DCD COM4_PIN3: RXD)

	JP8 (COM3 DCD/RI Select Jumper 3*2 Pin 2.54mm)	
Graphic	**Pin setting**	**Function**
	1-3, 2-4	COM3_PIN1: + 5V COM3_PIN8: + 12V
	3-5, 4-6(Default)	COM3_PIN1: DCD COM3_PIN8: RI

	JP9 (COM4 DCD/RI Select Jumper 3*2 Pin 2.54mm)	
Graphic	**Pin setting**	**Function**
	1-3, 2-4	COM4_PIN1: + 5V COM4_PIN8: + 12V
	3-5, 4-6(Default)	COM4_PIN1: DCD COM4_PIN8: RI

	JP10 (COM5 DCD/RI Select Jumper 3*2 Pin 2.54mm)	
Graphic	**Pin setting**	**Function**
	1-3, 2-4	COM5_PIN1: + 5V COM5_PIN8: + 12V
	3-5, 4-6(Default)	COM5_PIN1: DCD COM5_PIN8: RI

	JP11 (COM6 DCD/RI Select Jumper 3*2 Pin 2.54mm)	
Graphic	**Pin setting**	**Function**
	1-3, 2-4	COM6_PIN1: + 5V COM6_PIN8: + 12V
	3-5, 4-6(Default)	COM6_PIN1: DCD COM6_PIN8: RI

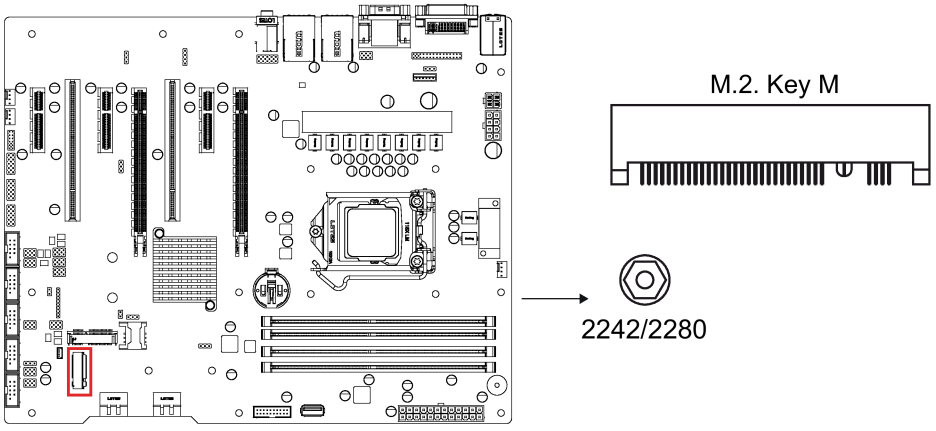
	JP12 (COM2 DCD/RI Select Jumper 3*2 Pin 2.54mm)	
Graphic	**Pin setting**	**Function**
	1-3, 2-4	COM2_PIN1: + 5V COM2_PIN8: + 12V
	3-5, 4-6(Default)	COM2_PIN1: DCD COM2_PIN8: RI

A.3.9 M.2 Key M slot

This socket allows you to install an M.2 module.

Note

This slot supports PCIe x4 NVMe/ SATA SSD Auto Detect, 2242/2280 storage devices.

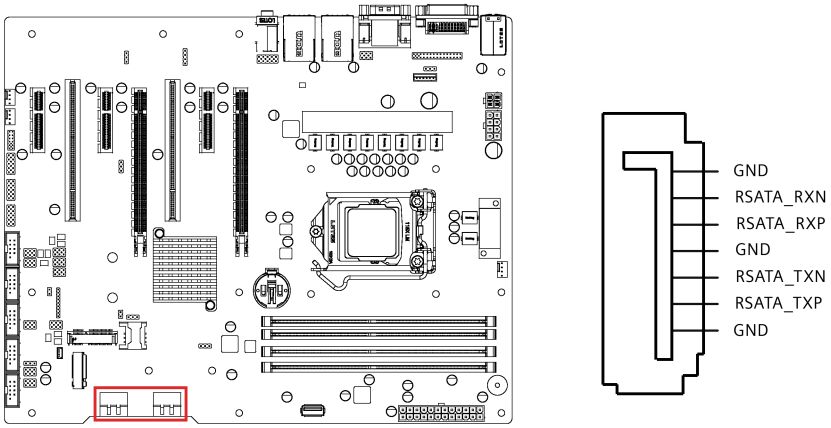


A.3.10 DDR4 Memory sockets

The motherboard provides four memory sockets, which support four pieces of 288-pin DDR4 Memory Modules. Refer to the chapter Installing memory module (Page 54) for detailed installation instruction.

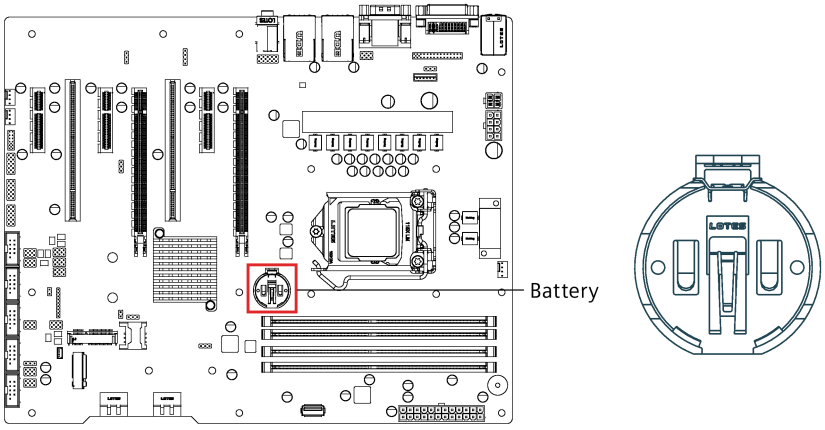
A.3.11 SATA 6.0 Gbps Port Connectors

The motherboard provides four pieces of 7-pin SATA Port Connectors, which support SATA devices through the connection of SATA Cable.



A.3.12 Battery socket

The Battery Socket on the motherboard is for CR2032 Battery used for COMS data retention.



Technical support

B

B.1 Service and support

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

- Technical support

  (https://support.industry.siemens.com/cs/start?lc=en-WW)
- Support request form
  (https://support.industry.siemens.com/cs/my/src)
- After Sales Information System SIMATIC IPC/PG

  (http://www.siemens.com/asis)
- SIMATIC Documentation Collection
  (https://support.industry.siemens.com/cs/us/en/view/109744171)
- Your local representative

  (http://w3.siemens.com/aspa_app/)
- Training center

  (https://www.sitrain-learning.siemens.com/PLG/?AppLang=en)
- Industry Mall

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

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

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

Tools & downloads

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

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

B.2 Troubleshooting

B.2.1 Problems with device functions

Problem	Cause	Remedy
The device is not operational	No power supply	• Check the power supply, the power cable and the power plug. • Check to see if the on-off switch is in the correct position.
	Device is being operated outside the specified ambient conditions	• Check the ambient conditions. • After transport in cold weather do not turn the power on until after a waiting period of approximately 12 hours.
The monitor remains dark	The monitor is switched off	Switch on the monitor.
	The monitor is in "power save" mode	Press any key on the keyboard.
	The brightness button has been set to dark	Increase brightness using the brightness button. Detailed information can be found in the operating manual for the monitor.
	The power cord or the monitor cable is not connected.	• Check if the power cord is properly connected to the monitor and to the system unit or to the grounded shockproof power outlet. • Check to make sure the monitor cable is properly connected to the system unit and the monitor.
		Contact your technical support team if the screen still remains dark after all these controls and measures.
The mouse pointer does not appear on the screen	The mouse driver is not loaded	Check whether the mouse driver is properly installed and available when you start the user program. Detailed information about the mouse driver is available in the corresponding documentation.
	Mouse not connected	• Check to make sure that the mouse cable is properly connected to the system unit. • If you use an adapter or extension cable for the mouse cable make sure to check these connections as well.
		Contact your technical support team if the mouse pointer still does not appear on the screen after these controls and measures.
Time and/or date of the PC is not correct		1. Open the firmware configuration menu. To do this, press the <ESC> key or <Delete> key during the boot operation. 2. Set the date and the time in the "Main" tab.
Time and date are wrong even after correctly setting them in the firmware (BIOS)	The backup battery is dead.	Replace the backup battery.

Problem	Cause	Remedy
USB device not responding	USB ports are deactivated in the firmware (BIOS)	Use a different USB port or activate the port.
	Operating system does not support XHCI	Activate the firmware setting "PS/2 Emulation" in the firmware (BIOS) under "Advanced > USB Configuration".
	USB-2.0/3.0 device connected although USB-2.0/3.0 is deactivated	Activate the USB.
	Operating system does not support the USB interfaces	• Activate the firmware setting "Legacy USB Support" in the firmware (BIOS) under "Advanced > USB Configuration". • For other devices, you need the USB device drivers for the required operating system.
"chkdsk" is not functioning	EWF (Enhanced Write Filter) has been activated. The "chkdsk" command is not supported if the EWF has been activated.	Deactivate the EWF or use an alternative method to "chkdsk".

B.2.2 Problems when booting the device

Problem	Cause	Remedy
After changing the hard disk, "None" is indicated for the relevant SATA port.	System is booted without functioning drive.	Reboot the system with a functioning hard disk.
Computer does not boot or "Boot device not found" is displayed.	The boot medium is not approved	Set the boot priority to "Enabled" in the firmware (BIOS) under "Boot > Boot device".
	The boot device is not in first place of the boot priority in the BIOS setup	Change the boot priority in the firmware (BIOS) under "Boot > Boot device".
The startup of a Windows operating system located on a GPT data storage medium is aborted with the following error message: "Status: 0xc0000225 Info: The boot selection failed because a required device is inaccessible"	The settings in the boot loader file "BCD" are incorrect or damaged.	Restore the Windows® operating system. You can find the files and descriptions needed for this on the supplied data storage medium.

B.2.3 Problems when using expansion cards

Problem	Cause	Remedy
The device crashes during startup	• Redundant I/O addresses • Redundant hardware interrupts and/or DMA channels • Signal frequencies or signal levels are not adhered to • Different pin assignment	Check your computer configuration: • If the computer configuration corresponds to the delivery state, contact your technical support team. • In the case of a change in the configuration, restore the delivery state. To do this, remove the expansion card and restart the device. If the error no longer occurs, the expansion card was the cause of the fault. Replace this with a Siemens expansion card or contact the supplier of the expansion card.
		If the device still crashes, contact your technical support team.
	Insufficient output of an external power supply, e.g. UPS	Use a powerful power supply.
The device does not start up or switches off immediately	A counter voltage is fed into the device by connected or installed expansion cards	Clarify the following with the supplier of the component: • The component can be operated without an external power supply. • The component can be reconfigured so that it only uses the external power supply or that of the device.

Markings and symbols

C

C.1 Overview

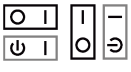
The following tables show all the symbols which may be found on your SIMATIC industrial PC, SIMATIC industrial monitor or SIMATIC Field PG in addition to the symbols which are explained in the operating instructions.

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

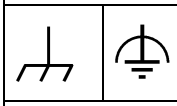
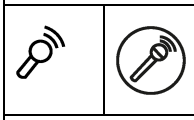
Symbol	Meaning		Symbol	Meaning
	On/off switch, without electrical isolation			Eject CD/DVD
	On/off switch, without electrical isolation			

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 RCM Certification			Marking for the Eurasian Customs Union
	Approved for China CCC Certification			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 Certification (KC)
	Test mark of the Underwriters Laboratories			Disposal information, observe the local regulations.
	Approval for India BIS Certification			

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

Abbreviation	Term	Meaning
AC	Alternating current	Alternating current
AHCI	Advanced Host Controller Interface	Standardized controller interface for SATA devices. This is supported in Microsoft Windows XP as of SP1 and IAA driver.
APIC	Advanced Programmable Interrupt Controller	Extended programmable interrupt controller
AWG	American Wire Gauge	US standard for the cable diameter
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 authentication	Microsoft Windows Product Key
COM	Communications Port	Term for the serial interface
CP	Communication Processor	Communication computer
CPU	Central Processing Unit	CPU
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
DRAM	Dynamic Random Access Memory	
DMA	Direct Memory Access	Direct memory access
DOS	Disk Operating System	Operating system without GUI
DPP	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
ECP	Extended capability port	Extended parallel port
EFI	Extensible Firmware Interface	
ESD	Components sensitive to electrostatic charge	
EN	European standard	
HDD	Hard Disk Drive	Hard disk drive
HU	Height unit	
I/O	Input/Output	Data input/output on computers
iAMT	Intel® Active Management Technology	
IEC	International Electrotechnical Commission	
IP	Ingress Protection	Degree of protection

Abbreviation	Term	Meaning
IRQ	Interrupt Request	Interrupt request
LPT	Line Printer	Printer port
mDPP	mini DisplayPort	Digital monitor interface
MUI	Multilanguage User Interface	Language localization in Windows
NEMA	National Electrical Manufacturers Association	Syndicate of manufacturers of electrical components in the USA
NTFS	New Technology File System	Secure file system for Windows versions (2000, XP, 7)
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.
PFC	Power Factor Correction	Harmonic suppression for operation on public networks.
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 drive array
SATA	Serial Advanced Technology Attachment	
SDRAM	Synchronous DRAM	
SMART	Self Monitoring Analysis and Reporting Technology	Hard disk error diagnostics program
SJT	Service [Grade] Junior (Hard Service) Thermoplastic	PVC armored cable
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	
V.24		ITU-T standardized recommendation for data transfer via serial ports
VCC		Positive supply voltage of integrated circuits
VEST	Video Electronics Standards Association	
VGA	Video Graphics Array	Video adapter which meets industrial standard
WD	Watchdog	Program monitoring with error detection and alarming.

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