SIEMENS

SIMATIC

Industrial PC SIMATIC IPC527G

Operating Instructions

08/2022

A5E45491226-AE

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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Ⓟ 08/2022 Subject to change

Preface

These operating instructions contain all the information you need for commissioning and operation of the SIMATIC IPC527G.

It is intended both for programming and testing personnel who commission the device and connect it with other units (automation systems, programming devices), as well as for service and maintenance personnel who install add-ons or carry out fault/error analyses.

Basic knowledge requirements

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

Validity of the operating instructions

These operating instructions are valid for all versions of the SIMATIC IPC527G.

Scope of this documentation

The documentation for the SIMATIC IPC527G consists of:

- Quick Install Guide SIMATIC IPC527G
- SIMATIC IPC527G Operating Instructions in English and Chinese

The PDF version of the documentation is supplied with the device on the "Documentation and Drivers" USB stick.

Conventions

The terms "PC" and "device" are sometimes used to refer to the SIMATIC IPC527G in this documentation.

In these operating instructions, the abbreviation "Windows 7" denotes the term "Windows 7 Ultimate".

History

The following editions of these operating instructions have been published:

Edition	Comment
03/2019	• First edition
07/2019	• Add options for SSD configuration. • Add Windows 10 operating system information.
12/2019	• Add the dimension drawing of the half-length PCI or PCIe expansion card. • Add the expansion card slots information in the Technical data.
03/2021	• Add the option 2 for riser card module
08/2022	• Add UKCA certification

Table of contents

Overview

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1.1 Product description

SIMATIC IPC527G is a compact PC with industrial functionality.

- Compact design
- Expandability (expansion card slots)
- Scalability
- Rugged
- Various interfaces

1.1.1 Configuration plan

Mounting	The device supports the following four mounting types: • Desk mounting • Wall mounting • Book mounting • Tower mounting
Chipset	• Intel® H110
Processor	• Intel® Pentium® Processor G4400 (3M Cache, 3.30 GHz) • Intel® Core™ i5-6500 Processor (6M Cache, up to 3.60 GHz) • Intel® Core™ i7-6700 Processor (8M Cache, up to 4.00 GHz)
Main memory	Memory expansion up to 16 GB with the following memory modules (without ECC), support of 32 GB (2 × 16GB) possible: • 4G DDR4 SDRAM • 8G DDR4 SDRAM • 16G DDR4 SDRAM
Possible of extendability	• 1 × PCIe ×16 slot; • 1 × PCIe ×16 slot, 1 × PCIe × 1 slot, 2 × PCI slot (with the option 1 riser card). • 1 × PCIe ×16 slot, 1 × PCIe × 4 slot, 2 × PCIe × 1 slot (with the option 2 riser card).
Graphics	• Integrated Graphic Controller • 1 × VGA(DB-15) + 1 × DP(DDI) • VGA support max to 1920 × 1200 pixels • DP support max to 4K
Power supply	100 VAC to 240 VAC (-10%, +10%)
Drives and storage media	
Hard Disk Drive (HDD), optional	1 TB, 2.5" HDD SATA
Solid State Drive (SSD), optional	• 128 GB, 2.5" SSD SATA • 256 GB, 2.5" SSD SATA • 512 GB, 2.5" SSD SATA
M.2 Solid State Driver	M.2 2242 Key B slot
USB stick	Can be connected externally through USB port and internally
Interfaces	
Ethernet	• 2 × RJ45 Ethernet 10/100/1000 Mbps • 2 × RJ45 Ethernet 10/100/1000 Mbps + 1 × RJ45 Ethernet 10/100/1000 Mbp (1 PCIe slot occupied)
COM	• 2 × RS232 /RS422 /RS485 • 2 × RS232 /RS422 /RS485 + 2 × RS232
USB (external)	• 4 × USB 3.0 (900mA) • 4 × USB 3.0 (900mA) + 2 × USB 2.0 (500mA)
USB (internal)	1 × USB 2.0 vertical (500 mA) for internal USB stick/dongle
VGA	Connection of an analog monitor

DP	Connection of a digital monitor
DIO (Digital Input Output)	• Without • DB9 connector, Digital Input (5V TTL) and Output (5V 12mA)
M.2	2242 Key B (SATA 3.0)
Keyboard, mouse	Connection through USB port
Operating systems	
Operation Systems	• Without • Windows 7 Ultimate 32-bit (MUI), SP1 [1] • Windows 7 Ultimate 64-bit (MUI), SP1 [1] • Windows 10 IoT Enterprise 2016 LTSB (Long Time Service Branch) 64-bit (MUI) [1] • Windows 10 IoT Enterprise 2019 LTSC (Long Term Servicing Channel) 64-bit (MUI) [1]

[1] MUI: Multi-language user interface; More language packages are available on the USB stick. You can install them according to your request.

1.2 Structure of the devices

1.2.1 Views of the basic device

Front view

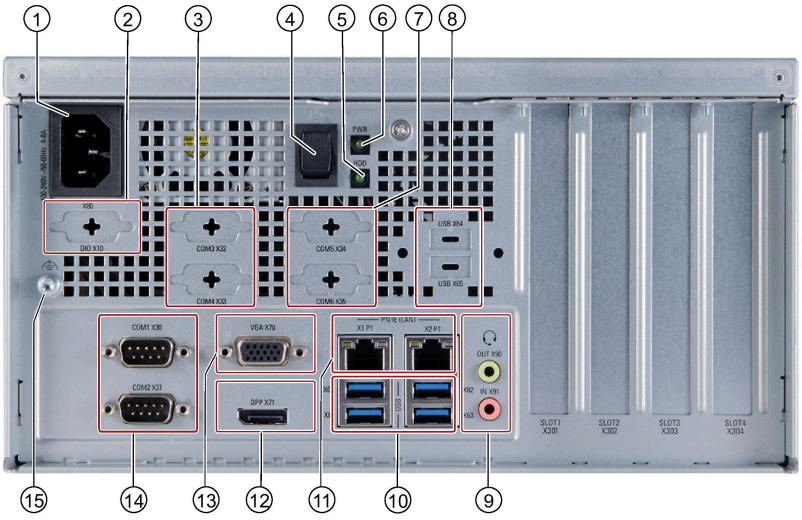
The following picture shows the front view of IPC527G.

① Function earth
② Ports

Rear view

① Mounting bracket
② Air inlet

1.2.2 Interfaces of the basic device



① 100-240 VAC X80	Power supply connection
② DIO X10	DIO port
③ COM3/4 X32/X33	Serial interface, 9-pin RS232
④ Power button	Switch of the power supply
⑤ HDD LED	Display for hard disk access
⑥ PWR LED	PC operating status display
⑦ COM5/6 X34/X35	Reserved
⑧ USB X64 and USB X65	USB 2.0
⑨ Line Out port (lime) X90	Connection for headphone or speaker
Microphone port (pink) X91	Connection for microphone
⑩ 4 × USB X60/X61/X62/X63	USB 3.1 Gen 1 (up to 5Gbps) ports
⑪ 2 × Ethernet X1P1/X2P1	RJ45 Ethernet connection for 10/100/1000 Mbps
⑫ DPP X71	DisplayPort connection for digital monitor
⑬ VGA X70	Connection for monitor with Video Graphics Adapter (VGA) interface
⑭ COM1/2 X30/X31	Serial interface, 9-pin RS232 /RS422 /RS485
⑮ Function earth	Connection for function earth

1.2.3 Status displays

Display	Meaning	LED	Description
PWR	PC operating status display	Off	Hibernate, switched off or unplugged
		Green	PC is in operation.
		Green flashing	standby
HDD	Display for hard disk access	Off	No access
		Green flashing	Accessing data

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 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.

2.3 General safety instructions

WARNING

Life-threatening voltages are present with an open control cabinet

When you install the device in a control cabinet, some areas or components in the open control cabinet may be carrying life-threatening voltages.

If you touch these areas or components, you may be killed by electric shock.

Switch off the power supply to the cabinet before opening it.

System expansions

NOTICE

Damage through system expansions

Device and system expansions may be faulty and can affect the entire machine or plant.

The installation of expansions can damage the device, machine or plant. Device and system expansions may violate safety rules and regulations regarding radio interference suppression. If you install or exchange system expansions and damage your device, the warranty becomes void.

Note the following for system expansions:

- Only install system expansion devices designed for this device. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.
- Observe the information on electromagnetic compatibility (Page 60).

WARNING

Risk of fire through expansion cards

Expansion cards generate additional heat. The device may overheat and cause a fire.

Please note the following:

- Observe the safety and installation instructions for the expansion cards.
- If in doubt, install the device in an enclosure that is compliant with sections 4.6 and 4.7.3 of the IEC/UL/EN/DIN-EN 60950-1 standard.

NOTICE

Open Equipment

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.

Battery

WARNING

Risk of explosion and release of harmful substances

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

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

Note the following when handling lithium batteries:

- Replace used batteries in good time; see the section "Replacing the backup battery (Page 50)" in the operating instructions.
- Replace the lithium battery only with the type recommended by the manufacturer (type: CR2032).
- For any requirements on product maintenance, contact Siemens Technical support (Page 109).
- 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.

Strong high-frequency radiation

NOTICE

Observe immunity to RF radiation

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

Radiation exposure in excess of the specified immunity limits can impair device functions, result in malfunctions and therefore injuries or damages.

Read the information on immunity to RF radiation in the technical specifications.

ESD Guideline

Electrostatic sensitive devices can be labeled with an appropriate symbol.

NOTICE
Electrostatic sensitive devices (ESD) When you touch electrostatic sensitive components, you can destroy them through voltages that are far below the human perception threshold. If you work with components that can be destroyed by electrostatic discharge, observe the ESD Guideline (Page 60).

2.4 Notes on use

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.

Note

Use in an industrial environment without additional protective measures

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

Installing and connecting the device

3

3.1 Preparing for installation

3.1.1 Checking the delivery package

Procedure

1. When accepting a delivery, check the packaging for visible transport damage.
2. 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.
3. Unpack the device at its installation location.
4. Keep the original packaging in case you have to transport the unit again.
5. Check the contents of the packaging and any accessories you ordered for completeness and damage.

Note

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. A damaged packaging indicates that ambient conditions have already had an impact on the device.

The device might be damaged.

Do not dispose of the original packaging. Pack the device during transportation and storage.

6. If the contents of the packaging are incomplete, damaged or do not match your order, inform the responsible delivery service immediately.

⚠ 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.

Make sure that the damaged device is not installed and put into operation. Label the damaged device and keep it locked away. Send off the device for immediate repair.

NOTICE

Damage from condensation

If the device is subjected to low temperatures or extreme fluctuations in temperature during transportation, for example in cold weather, moisture could build up on or inside the device.

Moisture causes a short circuit in electrical circuits and damages the device.

In order to prevent damage to the device, proceed as follows:

- 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.

7. Keep the enclosed documentation in a safe place. You need the documentation when you commission the device for the first time or meet other problems in the later work.
8. Record the identification data of the device.

3.1.2 Identification data of the device

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

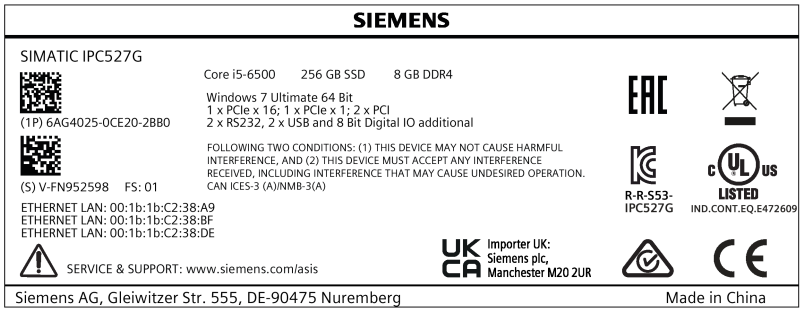
Enter the identification data in the following table:

Identification date	Source	Value
Serial number	Product label	S VP ...
Order number of the device	Product label	6AG4025-0...
Production version	Product label	FS

Identification date	Source	Value
Microsoft Windows Product Key Certificate of Authenticity (COA)	Back of the device	Only devices with preinstalled Windows operating systems have COA labels
Ethernet address 1 (MAC)	Product label	
Ethernet address 2 (MAC)		
Ethernet address 3 (MAC) (Optional)		

Product label

The following image shows the product label on the SIMATIC IPC527G as an example.



Note

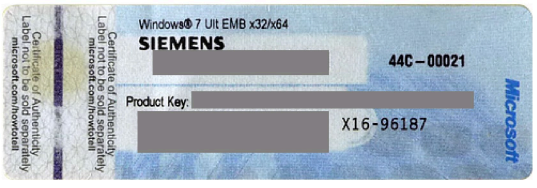
Replacement device without storage media

When you order a replacement device, remove all the storage media from your device, for example HDD. Insert the storage media into the replacement device.

COA label

Microsoft Windows "Product Key" on the "Certificate Of Authenticity" (COA):
The COA label is only attached to the rear of the device containing a preinstalled and activated Windows operating system.

- COA label of a device with Windows operating system



3.1.3 Permitted mounting positions

CAUTION

Points to note with expansion cards

Expansion cards may impose restrictions on the installation location (fire-proof enclosure) and permitted mounting positions (see General technical specifications (Page 64)). If the device has been fitted with expansion cards, please observe the safety and installation instructions for the expansion cards in the corresponding documentation.

If in doubt, install the device in an enclosure that is compliant with IEC/UL/EN/DIN-EN 60950-1, sections 4.6 and 4.7.3.

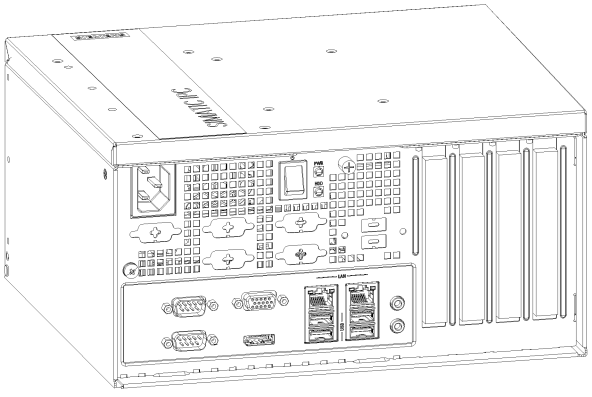
Note

The device is approved for indoor operation only.

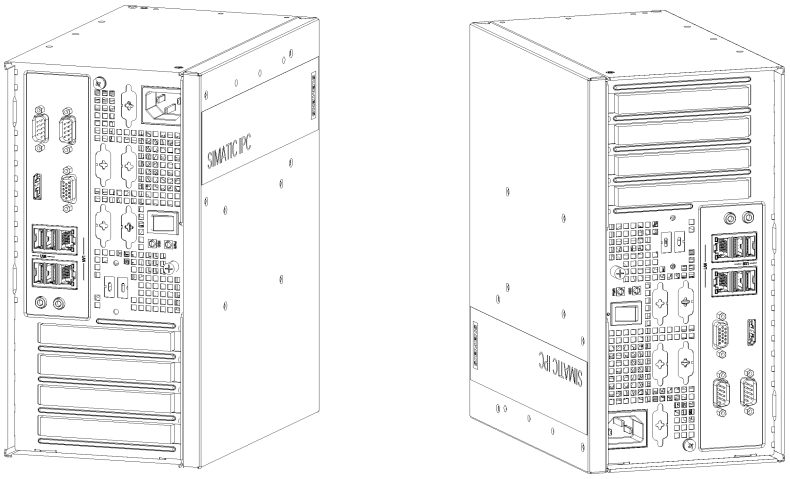
Ensure that the required minimum clearance of 100 mm to the area of the ventilation slots.

The following mounting positions are permitted:

Desk mounting position



Vertical mounting position



For these two vertical mounting positions, you can use the following mounting types:

- Wall mounting
- Book mounting
- Tower mounting

Take into account the permitted temperature range for operation that depends on the mounting position in accordance with the "Environmental conditions (Page 68)" section.

3.2 Mounting the device

3.2.1 Mounting instructions

Note

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

Note the following:

- 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.
- All the external circuit of the device must be SELV circuit.

- The device together with its AC power supply fulfils the requirements for fire protected enclosures according to EN 60950-1. Therefore it can be installed without any additional fire protective covering.
- Always maintain a minimum clearance of 100 mm to the area of the ventilation slots.
- This device is designed for use in a normal industrial environment. Without additional protective measures (such as the provision of clean air), SIMATIC Box PCs may not be operated in harsh environments that are subject to caustic vapors or gases.

Fasten securely

NOTICE

Insufficient load carrying capacity

If the mounting surface for wall and vertical mounting does not have sufficient load carrying capability, the device may fall down and be damaged.

Ensure that the mounting surface on the wall can bear four times the total weight of the device, including fixing elements.

NOTICE

Incorrect fixing elements

If you use anchors and screws other than those specified below for wall and vertical mounting, safe mounting is not guaranteed. The device can fall and may be damaged.

Use only the anchors and screws specified in the following table.

Use the following fasteners for the permitted mounting positions:

Material	Hole diameter	Fixing element
Concrete	6 mm diameter, 50 mm depth	Dowel, 6 mm diameter, 40 mm long Screws, 4-5 mm diameter, 40 mm long
Plasterboard, min. 13 mm thick	14 mm diameter	Tilting dowel: 4 mm diameter, at least 50 mm long
Metal, min. 2 mm thick	5 mm diameter	Metal screws: 4 mm diameter, at least 15 mm long

WARNING

Personal injuries or material damage in the case of insufficient load-bearing capacity of wall

The device could fall if the wall to which it is mounted has insufficient load-bearing capacity. This can result in personal injuries or material damage.

Ensure that the wall is capable of bearing four times the total weight of the device (including the brackets and expansion modules). The total weight of the device is approximately 5 kg.

3.2.2 Desk mounting

Desk mounting is suitable for horizontal mounting of the device.

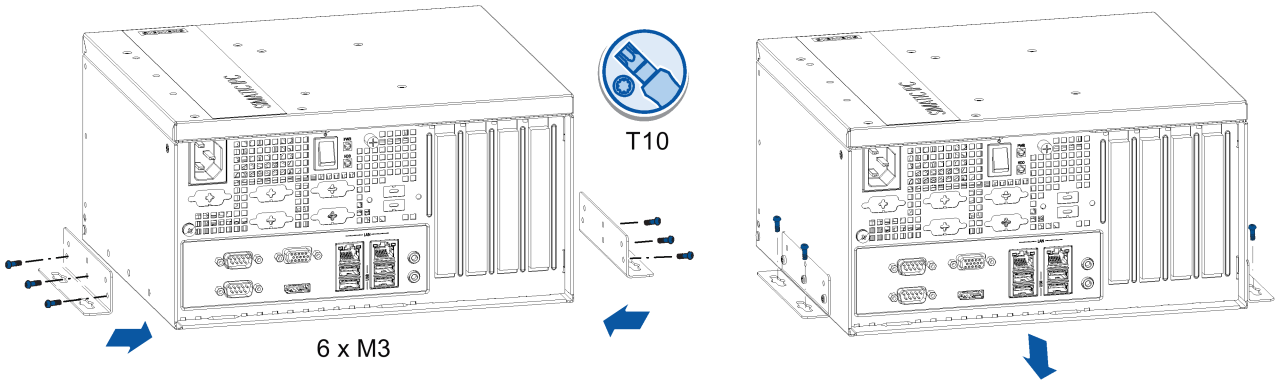
Requirement

- Two mounting brackets
- A T10 screwdriver
- 6 × M3 screws from deliver package
- Another four screws for mounting to a horizontal shelf

Procedure for mounting

Secure each mounting bracket with 3 × M3 screws to the device. The maximum penetration depth is 5 mm.

Use the marked threaded holes.



3.2.3 Wall mounting

Wall mounting is one of the vertical mounting types.

Requirement

- Two mounting brackets
- A T10 screwdriver
- 6 × M3 screws from deliver package
- Another four screws for mounting to the wall

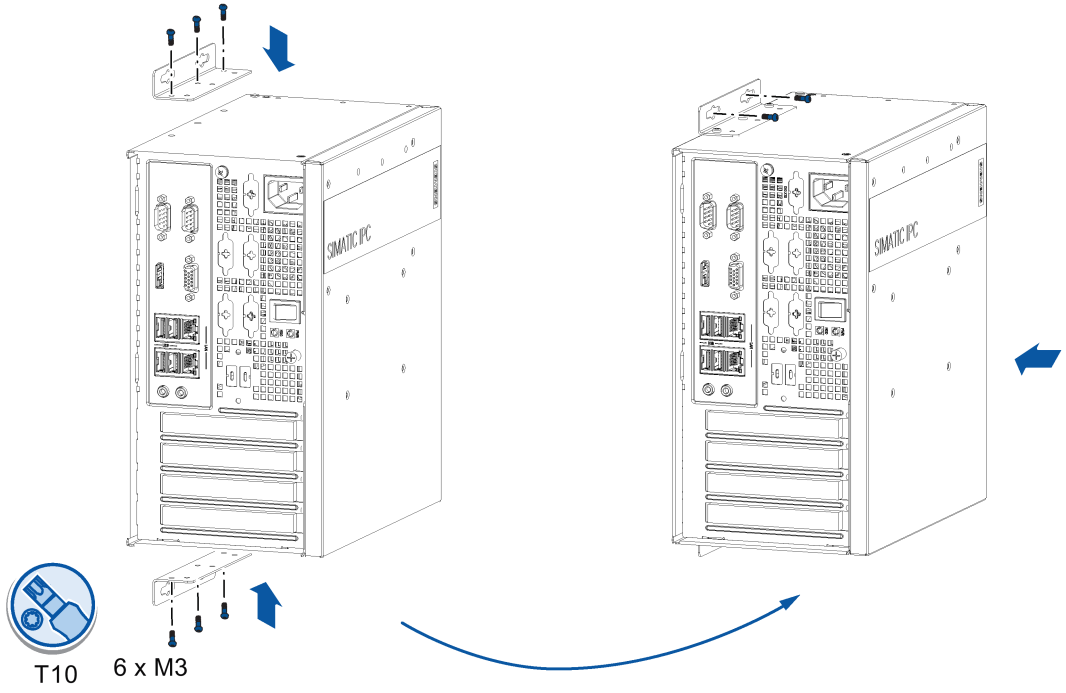
Procedure for mounting

Secure each mounting bracket with 3 × M3 screws to the device. The maximum penetration depth is 5 mm.

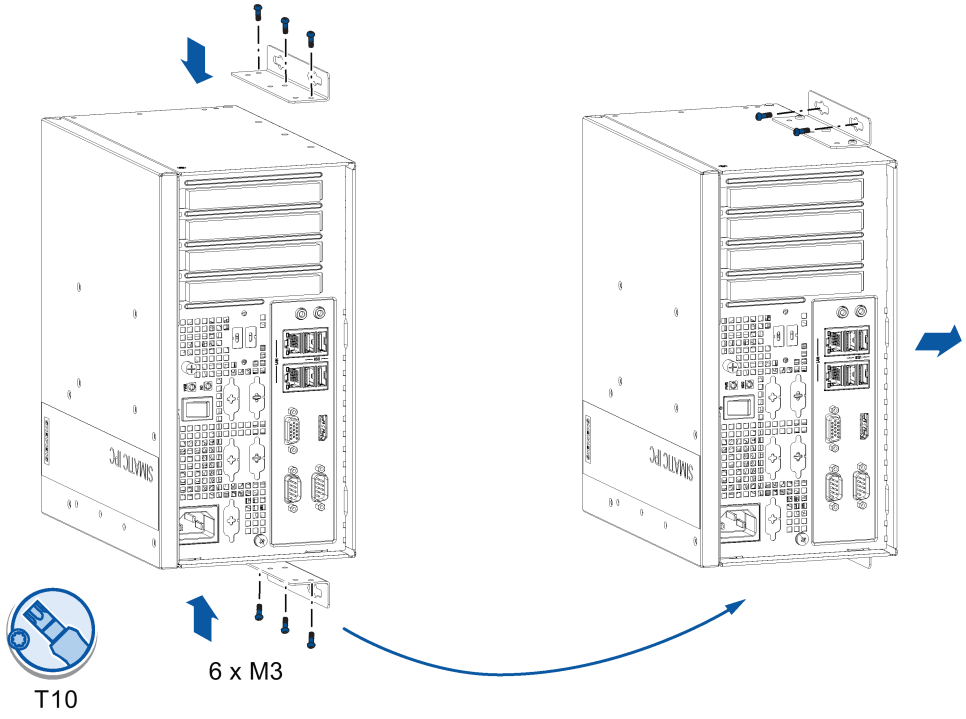
Use the marked threaded holes.

The wall mounting has two mounting positions:

- The interfaces are at the left.



- The interfaces are at the right.



3.2.4 Book mounting

Book mounting is also suitable for vertical mounting of the device.

Requirement

- Two mounting brackets
- A T10 screwdriver
- 6 × M3 screws from deliver package
- Another four screws for mounting to the wall

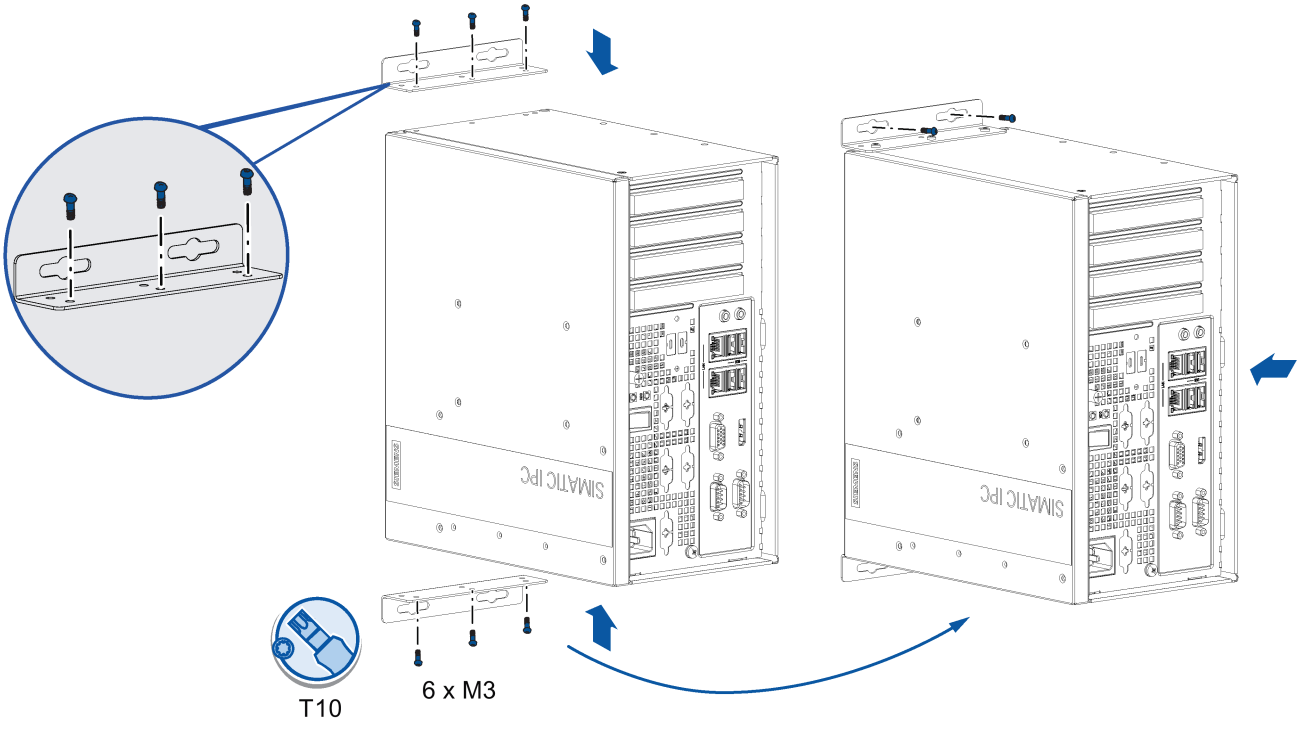
Procedure for mounting

Secure each mounting bracket with 3 × M3 screws to the device. The maximum penetration depth is 5 mm.

Use the marked threaded holes.

The book mounting has two mounting positions:

- The interfaces are at the front. Mount the device as the following image.



Note

In order to reserve some space for the ventilation, select the slot near the outside to secure the screw.

- The interfaces are also at the front. Rotate the device as shown in the above image horizontally by 180 degrees to mount the device.

3.2.5 Tower mounting

Tower mounting is one of the vertical mounting types and it is a space-saving installation of the device.

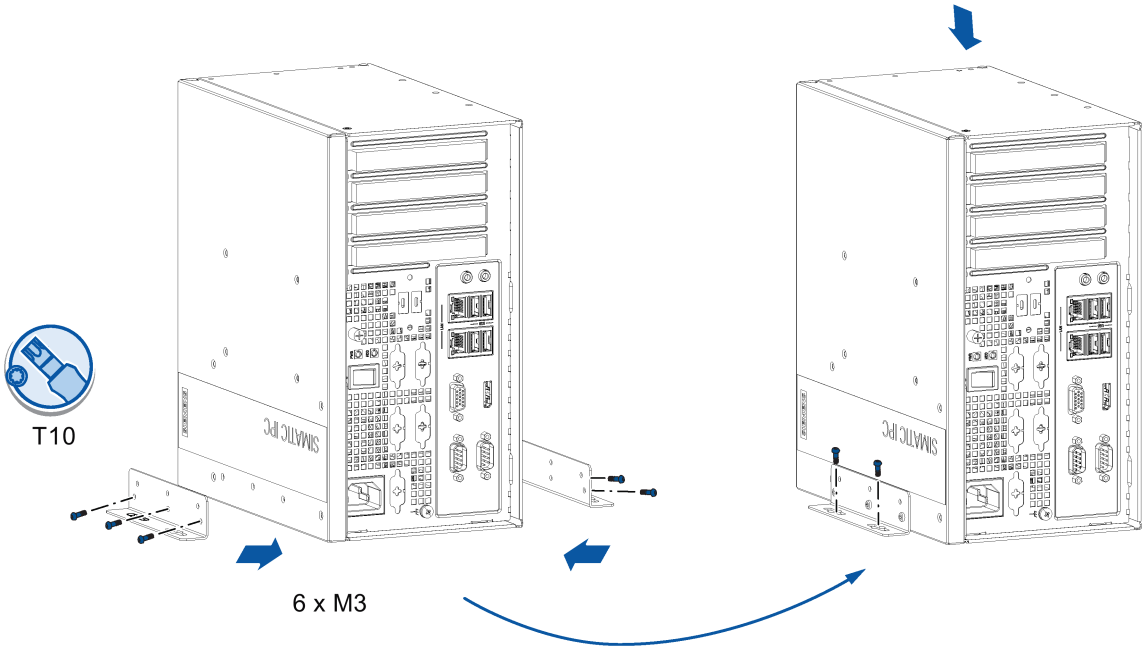
Requirement

- Two mounting brackets
- A T10 screwdriver
- 6 × M3 screws from deliver package
- Another four screws for mounting to a horizontal shelf

Procedure for mounting

Secure each mounting bracket with 3 × M3 screws to the device. The maximum penetration depth is 5 mm.

Use the marked threaded holes.



3.3 Connecting the device

3.3.1 Notes on connecting

⚠ WARNING

Risk of fire and electric shock

The on/off switch does not isolate the device from the power supply. Risk of electric shock if the device is opened incorrectly or defective. There is also a risk of fire if the device or connecting lines are damaged. Death or serious bodily injury can result.

You should therefore protect the device as follows:

- Always pull out the power plug when you are not using the device or if the device is defective. The power plug must be freely accessible.
- Use a central power isolating switch for cabinet installation.

⚠ WARNING

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 can be caused by lightning.

Take the following precautions:

- Disconnect the device from the power supply in good time when a thunderstorm is approaching.
- Do not touch mains cables and data transmission cables during a thunderstorm.
- Keep a sufficient distance from electric cables, distributors, systems, etc.

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:

⚠ WARNING

Electric shock and risk of fire

High voltage may be present in a defective device, which can cause fire or an electric shock if touched. Death and serious bodily injury can result.

- Connect the device to the function earth before you put it into operation.
- The function earth terminal on the device must be connected to the function earth of the control cabinet or system in which the device is installed.
- Never operate the device without function earth.
- If a device is defective, remove it from operation without delay and label it accordingly.

Requirement

- T20 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

Note before you connect the device

⚠ WARNING

Injuries 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 too high or too low.

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

Note the following information regarding the power supply system:

- The permitted nominal voltage of the device must correspond to the local mains voltage.
- Do not operate the device in non-grounded or impedance-grounded networks (IT networks).
- Operate the device only in grounded power networks (TN networks in accordance with IEC 60364-1).

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

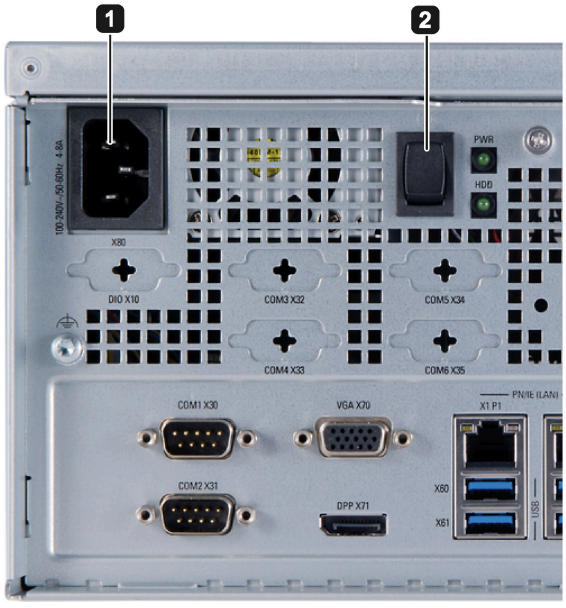
100 V supply voltage

- 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

Connecting the power supply



1. Connect the power cable to socket ①.
2. Insert the power cable in the electrical socket.
3. Press the power button ②.

3.3.4 Connect device to networks

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

Ethernet

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

You need a suitable software to use this functionality: STEP 7, WinCC, SIMATIC NET.

Industrial Ethernet

You can establish a network between the device and other computers via Industrial Ethernet. The on-board LAN interfaces are twisted-pair TP interfaces that support data transmission rates of 10/100/1000 Mbps.

Note

You need a category 6 Ethernet cable for operation at 1000 Mbps.

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. Information on this can be found on the SIMATIC NET Manual Collection CD. The software package and the documentation are not included in the product package.

Additional information

You can find additional information on the Internet at:

Technical support (https://support.industry.siemens.com/cs/?lc=en-WW)

Commissioning the device and device functions 4

4.1 General information on commissioning

Requirement

- The device is connected to the power supply.
- The function earth is connected.
- The connection cables are plugged in correctly.
- The following hardware is available for initial commissioning:
  - One USB keyboard
  - One USB mouse
  - A monitor/display

4.2 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.

Note

If you install Windows 7 not by SIMATIC IPC527G USB stick, you need to do the following two steps:

1. Get the xHCI (USB) driver from the supplied USB stick.
2. Refer to "Walkthrough: Create a Windows RE Image (https://technet.microsoft.com/en-us/library/dd744525(v=ws.10).aspx)" to mount USB driver into the Windows Recovery Environment(RE).

Procedure

1. Press the on/off switch.

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

2. Follow the instructions on the screen.

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

3. Make the region and language settings.

   If you want your system language to be international, select English. For information on changing the region and language settings at a later point in time, refer to the section Installing the software (Page 52).

Note

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

Result

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

4.3 Switching off the device

Shutting down the operating system

For Windows operating systems:

- Select "Start" > "Shut down"

  or

- Briefly press the on/off switch (unless otherwise configured in the power options). Information on the position of the button is available in the section "Interfaces of the basic device (Page 13)".

For non-Windows operating systems:

- Force to press the on/off switch for more than four seconds.

The operating system is shut down. The "POWER" LED goes out. The device is switched off but not fully disconnected from the mains voltage.

Fully disconnecting the device from mains voltage

⚠ WARNING

Risk of fire and electric shock

The on/off switch do not fully disconnect the device from the mains. If the device is switched off with the on/off switch, there remains a risk of electric shock and fire hazard, for example, if the device or connection cables are damaged or if the device is used improperly.

Always fully disconnect the device from the mains voltage as described below before performing work on the device or when the device will not be used over an extended period of time.

If the device was not mounted in a control cabinet:

- Shut down the operating system and pull the power plug on the rear of the device.

If the device was mounted in a control cabinet:

- Shut down the operating system and switch the AC circuit breaker to "Off".

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

Hardware reset

You can perform a hardware reset to switch off the device when the operating system no longer responds to input from the keyboard or mouse. The operating system is not safely shut down in this case.

NOTICE

Risk of data loss

The device is restarted in the case of a hardware reset. Data in the main memory can be deleted. Data on the drive may be lost. The device may be damaged.

Perform a hardware reset only in the case of an emergency.

For all operating systems:

- Press the on/off switch for more than four seconds.

4.4 Windows Security Center

Warning from the Windows Security Center

A warning from the Windows Security Center is displayed the first time you switch on your device. The Security Center checks the status of the device in regard to the three important security aspects listed below. If a problem is detected (an outdated antivirus program, for example), the Security Center issues a warning and makes recommendations on how you can better protect the device.

- **Firewall**: The Windows Firewall adds protection to the device by blocking network or Internet access to the device by unauthorized users. Windows checks if the device is protected by a software firewall.
  The firewall is enabled by default in the delivery state.
- **Antivirus software**: Antivirus programs add protection to the device by searching for and eliminating viruses and other security threats. Windows checks if a full-range, up-to-date antivirus program is running on the device.
  No antivirus software is installed in the delivery state.
- **Automatic updates**: Using the Automatic Update feature allows Windows to regularly search for the latest critical updates for the device and to install them automatically. This feature is disabled in the delivery state.
- **Real-time protection (Windows 7 only):** Windows Defender displays warnings if spyware or possibly unwanted software is installed or executed on the computer. You will also receive a warning if programs attempt to modify important Windows settings.

Configure the Security Center according to your requirements.

Expanding and assigning parameters to the device 5

5.1 Open the device

NOTICE
Malfunctions and electric shock caused by improper expansion installation Improper expansion installation jeopardize operational reliability and 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 repair.

⚠ CAUTION
Electrostatic sensitive devices (ESD) The device contains electronic components which are destroyed by electrostatic charges. This can result in malfunctions and damage to the machine or plant. Make sure that you take precautionary measures before you open the device.

Requirement

- The device is disconnected from the power supply.
- All connecting cables on the device are unplugged.
- The device has been removed from the control cabinet.
- A PH2 screwdriver

Procedure - opening the device

1 Loose the marked retaining screw.

2 Lift up the cover.

Procedure - closing the device

To close the device, carry out the steps for opening the device in the reverse order.

5.2 Expansion card

⚠ WARNING

Risk of fire through expansion cards

Expansion cards generate additional heat. The device may overheat and cause a fire.

Please note the following:

- Observe the safety and installation instructions for the expansion cards.
- If in doubt, install the device in an enclosure that is compliant with requirements to sections 4.6 and 4.7.3 of the EN 60950-1:2006 and IEC/UL/EN/DIN-EN 60950-1 standards.

Expansion cards that comply with the following standards are supported:

- PCI; Rev 2.3

  Expansion cards with 5 V supply voltage can be operated.
- PCIe; Gen. 1, Gen. 2, Gen. 3

Requirement

- The device is opened.
- A T10 screwdriver

Procedure - Installing the expansion card

1. Remove the marked retaining screws and remove the slot cover plate for the expansion card.

2. Insert the expansion card into the slot.

3. Secure the expansion card with the screw you removed in step 1 .

Procedure - Removing the expansion card

Follow the above steps in reverse order to remove the expansion card.

5.3 Riser card

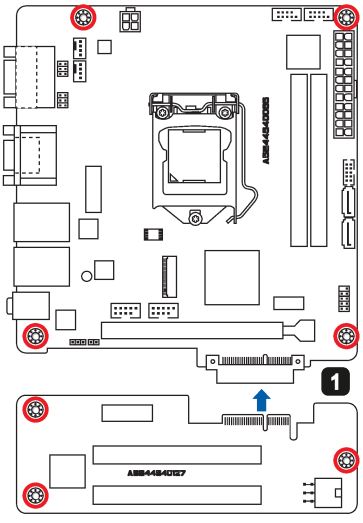
There are two options of riser cards for your requirements:

- The option 1 riser card:
  - 1 PCIe ×1 slot
  - 2 PCI slot
- The option 2 riser card:
  - 1 PCIe ×4 slot
  - 2 PCIe ×1 slot

Requirement

- The device is opened.
- Disconnect all the cables on the motherboard.
- A T10 screwdriver

Procedure - Installing the riser card



1. Align the golden finger on the riser card with the PCIe x 4 slot on your motherboard, and then press firmly until the riser card is completely seated on the slot.
2. Secure the riser card to the chassis with marked screws.

Procedure - Removing the riser card

Follow the above steps in reverse order to remove the riser card.

5.4 Memory module

Dual channel memory

The motherboard provides two DDR4 memory sockets and supports dual channel technology. The memory capacity of the device can be upgraded to a maximum of 2 × 16 GB. You can use approximately 3.2 GB of this memory in a 32-bit operating system and much more in a 64-bit operating system.

The table below shows the supported memory types of motherboard.

Module type	Module Size	Description
DDR4-SDRAM	16GB	DDR4 2048M × 64 SODIMM 260pin
DDR4-SDRAM	8GB	DDR4 1024M × 64 SODIMM 260pin
DDR4-SDRAM	4GB	DDR4 512M × 64 SODIMM 260pin

Requirement

- The device is disconnected from the power supply.
- All connecting cables on the device are unplugged.

NOTICE

Electrostatic discharge

The electronic components on the PCBs are highly sensitive to electrostatic discharge. Always take appropriate precautionary measures when handling these components. Refer to the ESD directives on handling electrostatic sensitive components.

Note

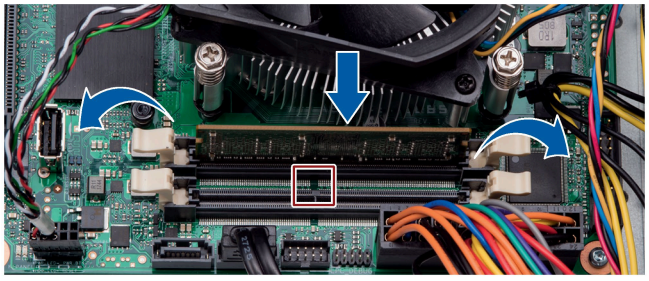
Siemens strongly recommends that you use only memory modules approved by Siemens. Siemens disclaims any liability for impairment of functions caused by the use of third-party memory modules.

To install the memory module

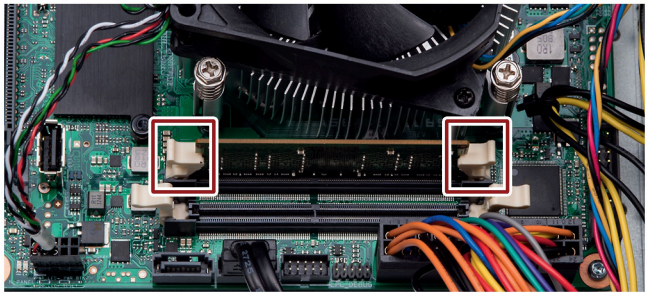
⚠ WARNING

- Only install memory modules designed for the default motherboard.
- Recommend to select 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 so the notch on memory matches the alignment key on 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.

5.5 Disk drive

Read the information in section "Repair information (Page 47)".

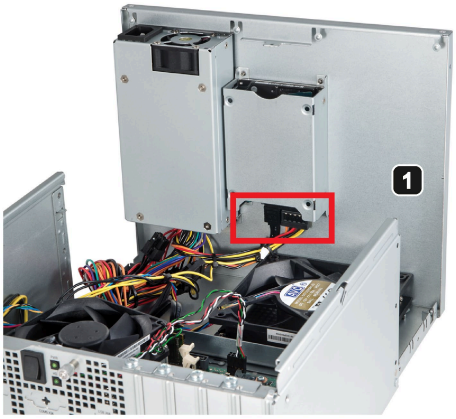
The device provides two slots for disk drive, and you can install any of two disk drives in the drive bay.

Disk Drive	Capacity range	Type
Hard Disk Drive (HDD)	500 GB to 2TB	2 × 2.5" HDD SATA
Solid State Drive (SSD)	64 GB to 1TB	2 × 2.5" SSD SATA

Requirement

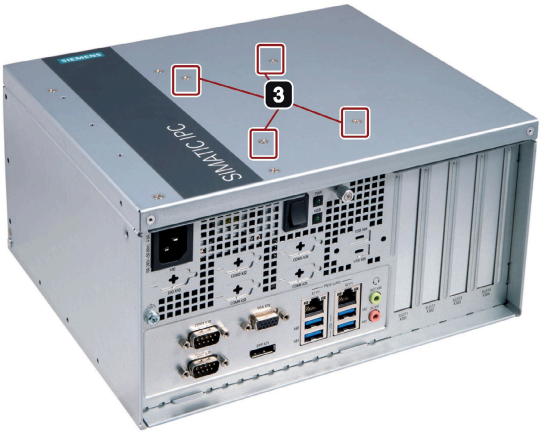
- The device is open.
- A PH2 screwdriver

Procedure - Removing the disk drive



1. Pull out the connection plug.

2. Lay down the device's rear panel including the drive.



3. Remove the indicated screws.
4. Take out the HDD or SSD.

Procedure - Installing the disk drive

Follow the steps in reverse order to install the disk drive.

Maintaining and repairing the device

6

6.1 Maintenance

To maintain high system availability, we recommend the preventative replacement of those PC components that are subject to wear in accordance with the intervals for replacement indicated in the table below.

Component	Replacement interval:
HDD/SSD drive	3 years
CMOS backup battery	5 years
Fan	3 years

6.2 Repair information

Carrying out repairs

Only qualified personnel are permitted to repair the device.

⚠ WARNING

Unauthorized opening and improper repairs on the device may result in substantial damage to equipment or endanger the user.

- Always disconnect the power plug before you open the device.
- Only install system expansion devices designed for this device. If you install other expansion devices, you may damage the device or violate the safety requirements and regulations on RF suppression. Contact your technical support team or where you purchased your PC to find out which system expansion devices may be installed.

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

⚠ CAUTION

Electrostatic sensitive devices (ESD)

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

Make sure you take precautionary measures even when you open the device, for example, when opening device doors, device covers or the housing cover. For more information, refer to the chapter "ESD Guideline (Page 60)"

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). The installation instructions for expansion components in the associated documentation must be observed.

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.

Tools

Tools to open the device, see section "Open the device (Page 39)". You can make repairs on the device with the following tools:

- T20 screwdriver for function earth connection
- PH2 screwdriver for all of the remaining screws

6.3 Installing and removing hardware

6.3.1 Replacing the device fan

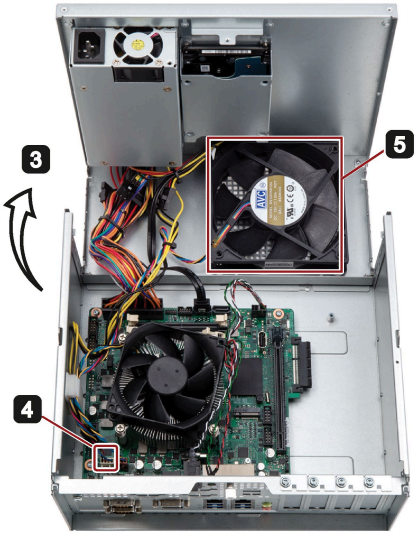
Requirement

- The device is opened.
- A PH2 screwdriver

Procedure - removing

1. Remove the retaining screw.

2. Unscrew the marked screws on the enclosure.



3. Lift up the cover.
4. Pull out the fan plug ④.
5. Take the fan ⑤ out of the device.

Note

Install only a fan of the same type.

The wind should blow into the chassis after the fan is installed. Make sure that you install the fan in the right direction.

Procedure - installation

Follow the steps for removing the fan in reverse order to install the new fan.

6.3.2 Replacing the backup battery

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 109).
- 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 109) 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.

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.

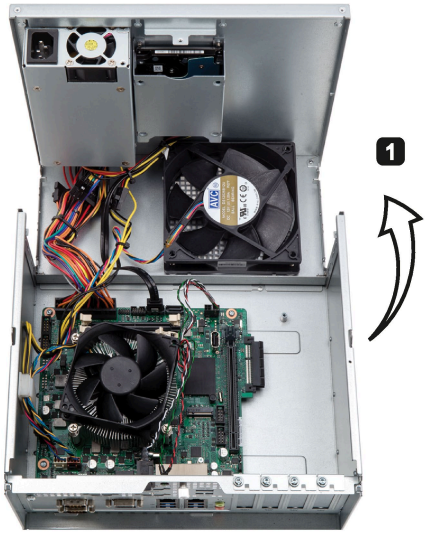
Please observe the following when disposing of batteries:

- 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".

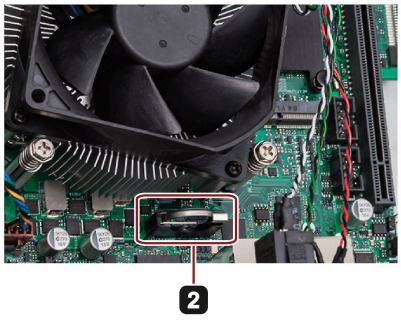
Requirement

- The device is disconnected from the power supply.
- The device is opened.

Procedure



1. Lay the cover on the desk.



2. Move the marked clip to one side, and then take out the battery to replace with a new one.

3. Reset the BIOS setup.

6.4 Installing the software

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

- Microsoft® Windows® 7 (https://support.industry.siemens.com/cs/ww/en/view/109764660)
- Microsoft® Windows® 10 (https://support.industry.siemens.com/cs/ww/en/view/109749498)

Note

- Before installing Windows 10, set the "Boot mode select" as **UEFI** in BIOS. On how to set the boot mode, refer to Boot menu (Page 92).
- The Trusted Platform Module (TPM) function is not supported in Windows 10 operating system.

6.4.1 Installing the drivers

Requirements

- Windows 7 operating system or 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 drivers need to be installed on Windows 7 and Windows 10 are different:

Operating system	Drivers needed
Windows 7	• Step1: Intel(R) Chipset Device Software • Step2: Microsoft .Net Framework • Step3: Intel(R) Management Engine • Step4: Intel(R) USB3.0/3.1 eXtensible Host Controller Driver • Step5: Intel AHCI Driver • Step6: Intel(R) Network Connections Driver • Step7: Intel(R) Graphics Driver • Step8: Realtek High Decfinition Audio Driver • Step9: Nuvoton SIO COMMPort Driver
Windows 10	• Step1: Intel(R) Chipset Device Software • Step2: Intel(R) Management Engine • Step3: Intel AHCI Driver * • Step4: Intel(R) Network Connections Driver • Step5: Intel(R) Graphics Driver • Step6: Realtek High Decfinition Audio Driver • Step7: Nuvoton SIO COMMPort Driver * : For "Windows 10 IoT Enterprise 2019 LTSC" operating system, you do not need to install the Intel AHCI driver.

Procedure

1. Connect the supplied USB stick to the USB port.
2. Start the program "START_DocuAndDrivers".
3. Select "Drivers" in the index.
4. Select the device and operating system.
5. Select the required driver.
6. 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 **Step1: 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 **Yes** to confirm the user account control question.
7. Click **Finish.**

   The chipset installation is completed.

Step 2: install the NetFX driver

1. Click **Step2: Microsoft .Net Framework.**
2. Click  to install the NetFX driver.
3. Click **Yes** to confirm the user account control question.
4. Click **Next** to continue.
5. Select the radio button before "**I have read and accept the license terms**", and click **Install** to allow the computer to start the installation.
6. Click **Finish**.

   The installation is completed.

Step 3: install the Management Engine driver

1. Click **Step3: Intel(R) Management Engine.**
2. Follow the prompt steps to install the Hotfix firstly and restart the computer.
3. And then click  to install the Management Engine driver.
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. Select destination folder and click **Next** to start the driver installation.
8. Click **Finish**.

   The installation is completed.

Step 4: install the USB driver

1. Click **Step4: Intel(R) USB3.0/3.1 eXtensible Host Controller Driver**.
2. Click  to install the USB3.0/3.1 driver.
3. Click **Yes** to confirm the user account control question.
4. Click **Next** to continue.
5. Click **Yes** to accept license agreement.
6. Click **Next** to start the driver installation.
7. Click **Finish**.

   The installation is completed.

Step 5: install the AHCI driver

1. Click **Step5: Intel AHCI Driver.**
2. Click  to install the AHCI driver.
3. After you can see **"PASS**" in the command prompt window, press any key to finish the installation.

Step 6: install the Network Connection driver

1. Click **Step6: Intel(R) Network Connections Driver.**
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 7: install the Graphic driver

1. Click **Step7: Intel(R) Graphics Driver**.
2. Click  to install the Graphic driver.
3. Click **Yes** to confirm the user account control question.
4. Click **Next** to continue.
5. Click **Yes** to accept license agreement.
6. Click **Next** to confirm the *Readme File Information* and move on.

   The installation starts.
7. Click **Next** to continue.
8. 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.

Step 8: install the Audio driver

1. Click **Step8: Realtek High Decfinition 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. Click **Install** to continue the installation.
6. Select the radio button next to "**Yes, I want to restart my computer now**." and click **OK** to restart the computer for the changes to take effect.

Step 9: install the SIO driver

1. Click **Step9: Nuvoton SIO COMMPort Driver**.
2. Follow the prompt to install the Hotfix firstly and restart the computer.
3. And then click  to install the Super IO driver.
4. Click **Yes** to confirm the user account control question.
5. Click **Yes** to continue.
6. Click **Install** to continue the installation.
7. Select the radio button next to "**Yes, I want to restart my computer now**." and click **OK** to restart the computer for the changes to take effect.

6.5 Recycling and disposal

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

Technical specifications

7

7.1 Certificates and approvals

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.

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.

CE marking

CE

2004/108/EC Directive of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility (until 19.04.2016)

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 (from 20.04.2016)

Low Voltage Directive:

2006/95/EC Directive of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (until 19.04.2016)

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 (from 20.04.2016)

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; EN 61131-2:2007

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 Canadian	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)

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

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.

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 56) ".

7.2 Directives and declarations

7.2.1 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

7.2.2 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.

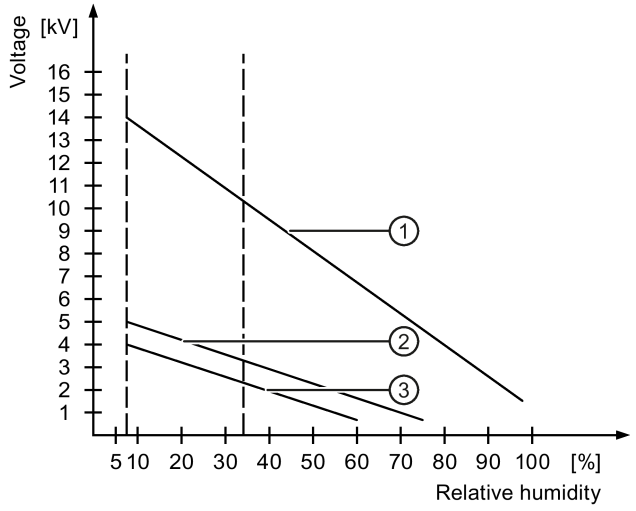
The damage to a module by an overvoltage can often not be immediately detected and only becomes evident after an extended period of operation. The consequences are incalculable and range from unforeseeable malfunctions to a total failure of the machine or system.

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.

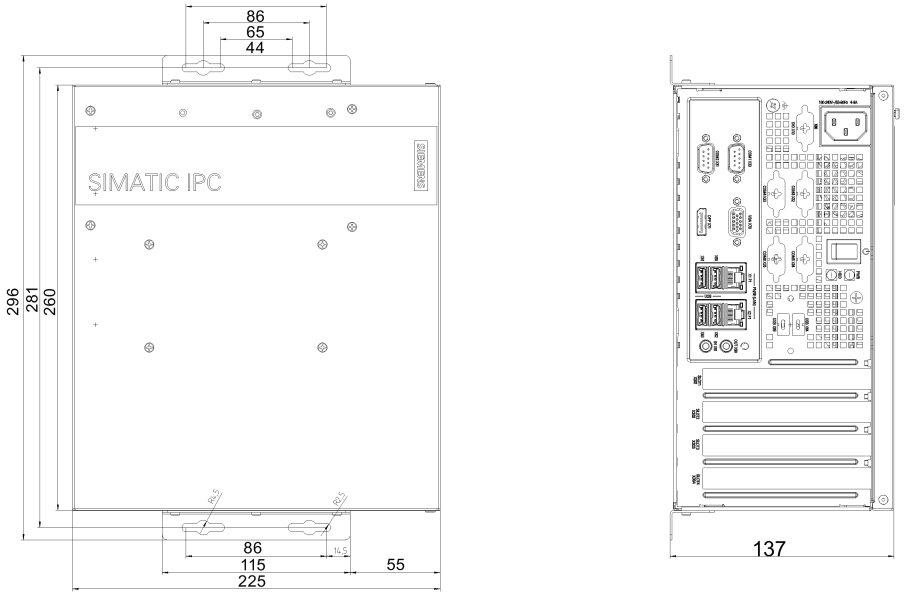
Protective measures against discharge of static electricity

- 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 before you take a measurement at a module. Do so by touching grounded metallic parts. Always use grounded measuring instruments.

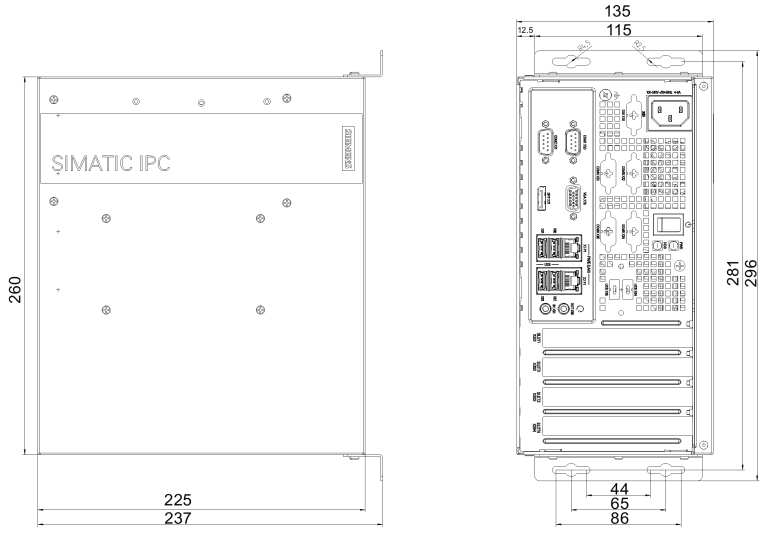
7.3 Dimension drawings

Desk mounting and Wall mounting (for the interfaces are at the left and right)



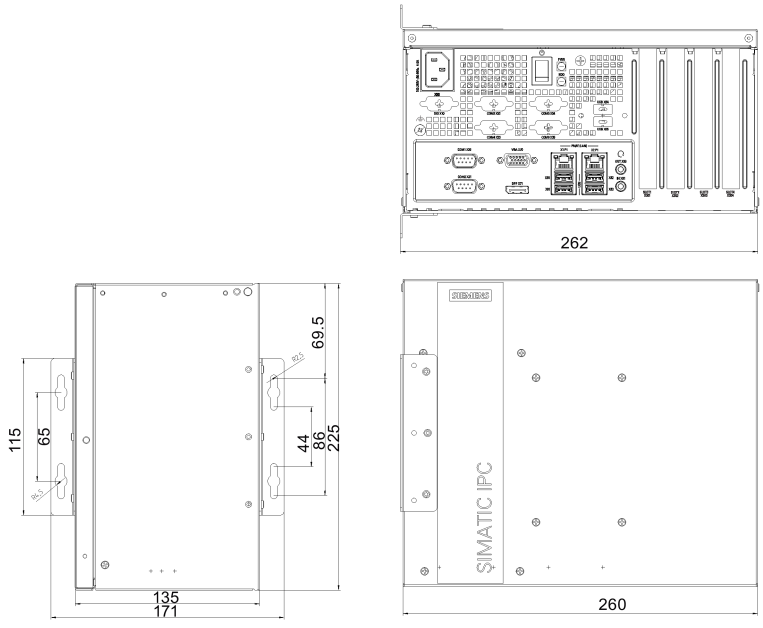
all dimensions in mm

Book mounting (for the interfaces are at the front)



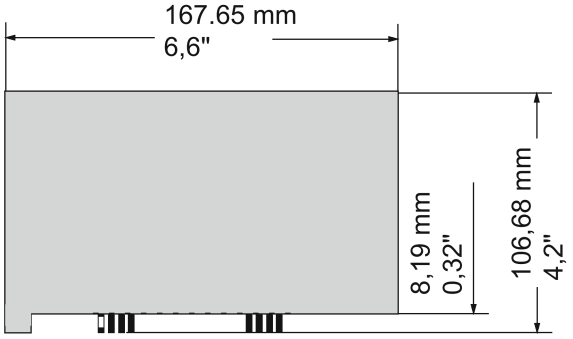
all dimensions in mm

Tower mounting



all dimensions in mm

Half-length PCI or PCIe expansion card



7.4 Technical data

7.4.1 General technical specifications

General technical specifications

Weight with hard disk drive, without mounting brackets	Approx. 5.0 kg
Power supply	• 100 VAC to 240 VAC (-10%, +10%); 4 A to 8 A • Frequency: 50 to 60 Hz • Rated output power: 350W (+5 V & +3.3 V≤91 W)
Power consumption (DC)	• Full load (100%, 350 W) at 82% efficiency • Typical load (50%, 175 W) at 85% efficiency • Light load (20%, 70 W) at 82% efficiency
Noise emission	< 55 dB(A) according to DIN 45635-1
Degree of protection	IP20 in accordance with IEC 60529
Protection class	Protection class I in accordance with IEC 61140
Overvoltage Category	II
Quality assurance	In accordance with ISO 9001

Electromagnetic compatibility

Radiation Emission (Enclosure port) in accordance with IEC 61000-6-3 + A1/ EN61000-6-4+A1	• 30 to 230 MHz: 40 dB(µV/m) Quasi-peak (10 m distance) • 230 to 1000 MHz: 47 dB (µV/m) Quasi-peak (10 m distance) • 1 to 3 GHz: 76 dB (µV/m) Peak; 56 dB (µV/m) Average (3 m distance) • 3 to 6 GHz: 80 dB (µV/m) Peak; 60 dB (µV/m) Average (3 m distance)
Immunity with regard to conducted interference on the supply lines	• ± 2 kV / 5 kHz / 100 kHz in accordance with IEC 61000-4-4; Burst • ± 1kV line to line, ±2 kV line to earth in accordance with IEC 61000-4-5; Surge
Noise immunity on signal lines	Burst: • ± 1 kV / 5 kHz / 100 kHz in accordance with IEC 61000-4-4; Length of signal port extension cable < 30 m; • ± 2 kV / 5 kHz / 100 kHz in accordance with IEC 61000-4-4; Length of signal port extension cable ≥ 30 m Surge: • ± 2kV shielding-to-earth in accordance with IEC 61000-4-5; Length of signal port extension cable ≥ 30 m
Immunity to discharges of static electricity	± 6 kV contact discharge in accordance with IEC 61000-4-2 ± 8 kV air discharge in accordance with IEC 61000-4-2
Immunity to RF interference	Radiation Immunity (according to IEC 61000-6-2) • 80 MHz to 1000 MHz 10 V/m, 80 % AM (1 kHz) • 1.4 GHz to 2 GHz 3 V/m, 80 % AM (1 kHz) • 2 GHz to 6 GHz 3 V/m, 80 % AM (1 kHz) Conducted Immunity (according to IEC 61000-4-6) • 150 kHz to 80MHz: 10 V, 80% AM (1kHz)
Conducted Emission (Low voltage DC mains port), in accordance with IEC 61000-6-4 + A1	• 0.15 to 0.5 MHz / 79 dB (µV) Q, 66 dB (µV) M • 0.5 to 30 MHz / 73 dB (µV) Q, 60 dB (µV) M
Conducted Emission(Telecommunications/Network Port), in accordance with IEC 61000-6-4 + A1	0,15 to 0,5 MHz: 97 dB(µV) to 87 dB(µV) Q 84 dB(µV) to 74 dB(µV) M
	0,5 MHz to 30 MHz: 87 dB(µV) Q / 74 dB(µV) M
Immunity to magnetic fields	30 A/m, 50/60 Hz according to IEC 61000-4-8

Main circuit board

Processor	• Intel® Pentium® Processor G4400 (3M Cache, 3.30 GHz) • Intel® Core™ i5-6500 Processor (6M Cache, up to 3.60 GHz) • Intel® Core™ i7-6700 Processor (8M Cache, up to 4.00 GHz)
Main memory	Memory expansion up to 32 GB with the following memory modules (without ECC): • 4G DDR4 SDRAM • 8G DDR4 SDRAM • 16G DDR4 SDRAM
Expansion slots and interfaces	Motherboard : • 1 M.2 SATA interface • 1 PCIe ×16 slot
	Riser card: • The option 1 riser card: – 1 PCIe ×1 slot – 2 PCI slot • The option 2 riser card: – 1 PCIe ×4 slot – 2 PCIe ×1 slot
Max. permitted totally power loss for PCI slot	≤ 25 W
Max. permitted power loss over all slots	≤ 45 W In total, the 3.3 Vaux current of 1.2 A must not be exceeded.

Expansion card slots

Slots for expansion cards IPC527G (without riser card module)		
Slot1	PCI express x16: Specification Rev.3.0, length: Max 167.65mm	
Slots for expansion cards IPC527G (with riser card module)		
Slots for expansion cards	**The option 1 riser card**	**The option 2 riser card**
Slot1	PCI express x16: Specification Rev.3.0, length: Max 167.65mm	PCI express x 16: Specification Rev.3.0, length: Max 167.65mm
Slot2	PCI express x1: Specification Rev.2.0, length: Max 167.65mm	PCI express x 4: Specification Rev.2.0, length: Max 167.65mm
Slot3	PCI: Specification Rev.2.3, length: Max 167.65mm	PCI express x 1: Specification Rev.2.0, length: Max 167.65mm
Slot4	PCI: Specification Rev.2.3, length: Max 167.65mm	PCI express x 1: Specification Rev.2.0, length: Max 167.65mm

Drive, memory medium

Hard disk drive, optional	1 TB HDD, support of 2 × 2.5" HDD SATA, 500 GB to 2TB
Solid State Drive, optional	• 128 GB, 2.5" SSD SATA • 256 GB, 2.5" SSD SATA • 512 GB, 2.5" SSD SATA Support of 2 × 2.5" SSD SATA, 64 GB to 1TB
M.2 Solid State Driver, optional	Support of 32 to 256GB, M.2 2242 SSD
Floppy and CD-ROM drive	External, can be connected via USB port [1]
USB stick	External, can be connected via USB port

[1] Only to device USB port, not via USB hub.

Graphics

Graphics controller	Integrated Graphic Controller
Resolution, graphics memory	• At least support 2 channels: 1 × VGA(DB-15) + 1 × DP(DDI) • VGA support max to 1920 × 1200 pixels • DP support max to 4K

Ports

Ethernet	2 × Gigabit Ethernet interface (two RJ45) electrically isolated, Wake on LAN, Remote Boot and teaming are supported: • X1P1: Intel i210AT • X2P1: Intel i210AT 1 × Gigabit Ethernet interface (RJ45) optional (through PCIe card): • Intel i210 T1
COM1/2	RS232 /RS422 /RS485 [1] (optional), max. 115 Kbps, D-sub connector, 9-pin
COM3/4 (On motherboard)	RS232, max. 115 Kbps, D-sub connector, 9-pin (extension from internal pin header)
USB	• 2 × USB 2.0 (500mA) (extension from internal pin header) • 4 × USB 3.0 (900mA)
USB (On motherboard)	1 x USB 2.0 vertical (500 mA)
VGA	Connection of an analog monitor
DP	Connection of a digital monitor
DIO (Digital Input Output)	DB9 connector (extension from internal pin header) Digital Input (5V TTL) and Output (5V 12mA)
Keyboard, mouse	Connection via USB port

[1] In BIOS Setup, you can configure support for RS232/ RS422/ RS485 for COM1 and COM2 ports.

7.4.2 Environmental conditions

Climatic ambient conditions

For permitted mounting positions, see section Preparing for installation (Page 19).

Temperature, tested in accordance with IEC 60068-2-1, IEC 60068-2-2 and IEC 60068-2-14	
Operation, PCIe load max. 45 W, USB load max. 20 W, M.2 card load max. 3 W:	• 0 °C to +40 °C applies to device for all permitted mounting positions for HDD configuration • 0 °C to +45 °C applies to device for horizontal mounting positions for SSD configuration
Operation, PCIe load max. 35 W, USB load max. 20 W, M.2 card load max. 3 W:	• 0 °C to +45 °C applies to device for vertical mounting position for SSD configuration
Temperature during storage/transport	-20 °C to +60 °C
Gradient	• Operation: Max. 10 °C/h • Storage: 20 °C/h, no condensation
Relative humidity, tested in accordance with IEC 60068-2-78, IEC 60068-2-30	
Operation	5% to 85%, no condensation Gradient ≤ 10°C/h
Storage/transport	5% to 90%, no condensation Gradient ≤ 20°C/h
Atmospheric pressure	
Operation	1140 to 795 hPa, corresponds to an altitude of -1000 to 2000 m
Storage/transport	1140 to 660 hPa, corresponds to an altitude of -1000 to 3500 m
Altitude of operation (m)	Up to 2000 m
Pollution Degree	2

Mechanical ambient conditions

Vibration resistance, tested in accordance with IEC 60068-2-6	
Operation	With HDD : • 10 to 58 Hz: 0.015 mm • 58 to 200 Hz: 1.96 m/s² With SSD : • 10 to 58 Hz: 0.0375 mm • 58 to 200 Hz: 4.9 m/s²
Storage/transport	• 5 to 8.4 Hz: 3.5 mm • 8.4 to 500 Hz: 9.8 m/s²
Shock resistance, tested in accordance with IEC 60068-2-27	

Operation	• With HDD: 9.81 m/s², 20 ms • With SSD: 150 m/s², 11 ms
Storage/transport	• 250 m/s², 6 ms

7.4.3 Power demand of the components

Maximum power consumption of the auxiliary components

Component	**Voltage**				
	+12 V	**+5 V**	**+3.3 V1**	**-12 V**	**5 V Aux**
Motherboard with processor and heat sink	5.7 A	5.6 A	0.8 A	0.1 A	0.3 A
System fan	0.5 A	N.A	N.A	N.A	N.A
Basic system [1]	6.2 A	5.6 A	1.0 A	0.1 A	0.5 A
Expansions					
Hard disk drive SATA [1]	N.A	1.2 A	N.A	N.A	N.A
M.2	N.A	N.A	1.4 A	N.A	N.A
Single lines of current (max. permitted) [2]	25 A	15 A	15 A	0.3 A	2 A
Total power consumption, permitted	165 W				
Efficiency of the power supply [1]	AC power supply: approx. 85% (230 V AC/120 V AC) with typical load (50%) and 82% (230 V AC/120 V AC) with full (100%) or light load (20%)				

[1] Depends on the selected device configuration.

[2] The max. permitted accumulated power of the +5 V and + 3.3 V is 91 W.

7.4.4 Basic power supply

Voltage	**Max. current**	**Voltage stability**
+12 V	25A	± 5 %
-12 V	0.3A	± 10 %
+5 V	15A	± 5 %
+3.3 V	15A	± 5 %
+5 VSB	2A	± 5 %

Note

- Total output power of +5 V and +3.3 V should be less than 91Watts.
- DC output power should be less than 350Watts.
- When AC input below 115 V, DC output power should derate 20% load at 50 ℃.

7.4.5 Power cable

WARNING

Risk of electric shock when using a power connection without earth connection

Using a mains cable without proper earth connection can result in personal injury or even death by electric shock. A mains cable is not included with IPC527G. Make sure the cable you use provides a proper earth connection.

It is highly recommended that you use a mains cable from SIEMENS.

Plug type	Region	MLFB
Grounded continental European plug	Germany, Denmark, Netherlands, Spain, Belgium, Austria, Finland	6ES7 900-0AA00-0XA0
Grounded British plug	United Kingdom	6ES7 900-0BA00-0XA0
Grounded Swiss plug	Switzerland	6ES7 900-0CA00-0XA0
Grounded North American and Japanese plug	America	6ES7 900-0DA00-0XA0
Grounded Italian plug	Italy	6ES7 900-0EA00-0XA0
Grounded Chinese plug	China	6ES7 900-0FA00-0XA0

7.5 Hardware descriptions

7.5.1 Technical features of the motherboard

Component / port	Description	Parameters
Chipset	Intel® H110	Intel® H110
CPU	Intel Processor	• Intel® Pentium® Processor G4400 (3M Cache, 3.30 GHz) • Intel® Core™ i5-6500 Processor (6M Cache, up to 3.60 GHz) • Intel® Core™ i7-6700 Processor (8M Cache, up to 4.00 GHz)
Memory	DDR4 SDRAM	Memory expansion up to 32 GB with the following memory modules (without ECC): • 4G DDR4 SDRAM • 8G DDR4 SDRAM • 16G DDR4 SDRAM
Graphics	Integrated graphics	up to 512 MB graphics memory taken dynamically from RAM

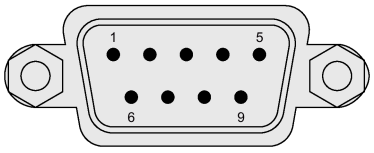
7.5.2 External interfaces

7.5.2.1 Overview of external interfaces

Interface	Position	Description
COM	External	9-pin D-sub: • 2 × RS232 • 2 × RS232/ RS422/ RS485
USB [1]	External	• 4 × USB 3.0 • 2 × USB 2.0 (optional)
Ethernet	External	• 2 × RJ45 Ethernet 10/100/1000 Mbps • 1 × RJ45 Ethernet 10/100/1000 Mbp (optional, 1 PCIe slot occupied)
DisplayPort	External	• 1 × DP • 1 × VGA
DIO (Digital Input Output)	External	DB9 connector Digital Input (5V TTL) and Output (5V 12mA)

[1] Only four of these USB ports may be operated simultaneously in high current mode, max. 10 W.

7.5.2.2 Serial interface



RS232
RS422
RS485

Pin assignment RS232

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

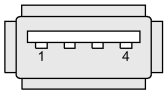
Pin assignment RS422

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

Pin assignment RS485

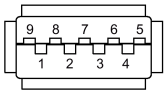
Pin	Short description	Meaning
1	Data-	Transmit / receive data - (I/O) for half-duplex mode
2	Data+	Transmit / receive data+ (I/O) for half-duplex mode
3	nc	
4	nc	
5	M	Signal ground
6	nc	
7	nc	
8	nc	
9	nc	

7.5.2.3 USB 2.0 port



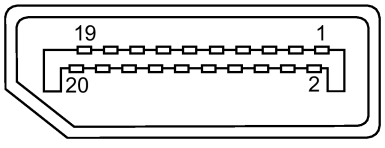
Pin	Short description	Meaning
1	USB_P5V_fused (O)	+5 V, fused
2	USB_D0M (I/O)	Data–
3	USB_D0P (I/O)	Data+
4	USB_GND	GND

7.5.2.4 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

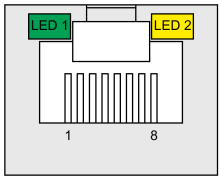
7.5.2.5 DisplayPort



Pin	Short name	Meaning	Input / output
1	ML_Lane0+	DP data 0+	Output
2	GND	Ground	-
3	ML_Lane0-	DP data 0-	Output
4	ML_Lane1+	DP data 1+	Output
5	GND	Ground	-
6	ML_Lane1-	DP data 1-	Output
7	ML_Lane2+	DP data 2+	Output
8	GND	Ground	-

Pin	Short name	Meaning	Input / output
9	ML_Lane2-	DP data 2-	Output
10	ML_Lane3+	DP data 3+	Output
11	GND	Ground	-
12	ML_Lane3-	DP data 3-	Output
13	CONFIG1 CAD	Cable Adapter Detect	Input
14	CONFIG2	Ground (PullDown)	-
15	AUX_CH+	Auxiliary channel+	Bidirectional
16	GND	Ground	-
17	AUX_CH-	Auxiliary channel-	Bidirectional
18	HPD	Hot Plug Detect	Input
19	GND	Ground	-
20	DP_PWR	+3.3V (fused)	Output

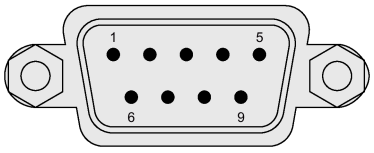
7.5.2.6 Ethernet port



Pin	Short description	Meaning
1	BI_DA+	Bidirectional data A+, input/output
2	BI_DA–	Bidirectional data A–, input/output
3	BI_DB+	Bidirectional data B+, input/output
4	BI_DC+	Bidirectional data C+, input/output
5	BI_DC–	Bidirectional data C–, input/output
6	BI_DB–	Bidirectional data B–, input/output
7	BI_DD+	Bidirectional data D+, input/output
8	BI_DD–	Bidirectional data D–, input/output

LED	Short description	Meaning
1	LED 1	Off: Port is Not Active Lit orange: Port is Active, but No Data Activity Blinking: Port is Active and there is Data Activity
2	LED 2	Off: 10Mbps Lit red: 100Mbps Lit green: 1Gbps

7.5.2.7 DIO port



Digital Input (5V TTL) and Output (5V 12mA)

Pin assignment DIO

Pin	Short description	Meaning
1	DIO_1	Digital Input or Output #1
2	DIO_2	Digital Input or Output #2
3	DIO_3	Digital Input or Output #3
4	DIO_4	Digital Input or Output #4
5	DIO_5	Digital Input or Output #5
6	DIO_6	Digital Input or Output #6
7	DIO_7	Digital Input or Output #7
8	DIO_8	Digital Input or Output #8
9	GND	Ground

Configure DIO pin

You can configure the state of each DIO pin as [Input] mode or [Output] mode in the **Dynamic Digital IO** page of Advanced menu (Page 83) in BIOS.

If you need further support on configuring DIO, contact Siemens Technical Support (Page 109).

7.5.3 Internal interfaces

7.5.3.1 Overview of internal interfaces

Interface	Position	Connector	Description
M.2	Internal	M.2 2242 Key B (SATA 3.0)	SATA
USB 2.0	Internal	USB 2.0 vertical	1 × USB 2.0 vertical (500 mA) for internal USB stick/dongle

7.5.3.2 M.2 interface

Pin no.	Signal	Signal	Pin no.
76	NP_NC1	SIDE1	78
2	3.3VAUX1	PRESENCE_IND(GND)	1
4	3.3VAUX2	GND1	3
6	FULL_CARD_POWER_OFF#(O)(0/1.8V)	GND2	5
8	W_DISABLE#1(O)(0/3.3V)	USB_D+	7
10	LED#1/DAS/DSS#(1)(OD)	USB_D-	9
20	AUDIO0(0/1.8V)	GND3	11
22	AUDIO1(0/1.8V)	WWAN/SSD_IND(GND_WWAN/OC_SSD)	21
24	AUDIO2(0/1.8V)	RESERVED(FUTURE_EXPANSION)1	23
26	AUDIO3(0/1.8V)	RESERVED(FUTURE_EXPANSION)2	25
28	UIM_RFU(I/O)	GND4	27
30	UIM_RESET(I)	PERN1/USB3.0_RX-/SSIC_RXN	29
32	UIM_CLK(I)	PERP1/USB3.0_RX+/SSIC_RXP	31
34	UIM_DATA(IO)	GND5	33
36	UIM_PWR(I)	PETN1/USB3.0_TX-/SSIC_TXN	35
38	DEVSLP(O)(0/3.3V)	PETP1/USB3.0_TX+/SSIC_TXP	37
40	GNSS0(0/1.8V)	GND6	39
42	GNSS1(0/1.8V)	PERN0/SATA_B+	41
44	GNSS2(0/1.8V)	PERP0/SATA_B-	43
46	GNSS3(0/1.8V)	GND7	45
48	GNSS4(0/1.8V)	PETN0/SATA_A-	47
50	PERST#(O)(0/3.3V)	PETP0/SATA_A+	49
52	CLKREQ#(IO)(0/3.3V)	GND8	51
54	PEWAKE#(IO)(0/3.3V)	REFCLKN	53
56	NC1	REFCLKP	55
58	NC2	GND9	57
60	COEX3(I/O)(0/1.8V)	ANTCTL0(I)(0/1.8V)	59
62	COEX_RXD(I)(0/1.8V)	ANTCTL1(I)(0/1.8V)	61
64	COEX_TXD(O)(0/1.8V)	ANTCTL2(I)(0/1.8V)	63
66	SIM_DETECT(O)	ANTCTL3(I)(0/1.8V)	65
68	SUSCLK(32KHZ)(O)(0/3.3V)	RESET#(O)(0/1.8V)	67
70	3.3VAUX3	PEDET(OC_PCIE/GND_SATA)	69
72	3.3VAUX4	GND10	71
74	3.3VAUX5	GND11	73
77	NP_NC2	USB3.0IND(OC_USB3.0/GND_OTHER	75
		SIDF2	79

7.5.4 Currently allocated system resources

All system resources (hardware addresses, memory utilization, interrupt assignment, DMA channels) are assigned dynamically by the Windows operating system, depending on the hardware equipment, drivers and connected external devices. You can view the current allocation of system resources or possible conflicts in the Control Panel.

Procedure

To view the system resources, proceed as follows:

1. In the Windows Start menu, select "Start -> Run".
2. Enter "msinfo32" in the command prompt and confirm your entry with "OK".

7.6 BIOS description

7.6.1 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 **DELETE** or **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' or 'Chipset' menus.

Note

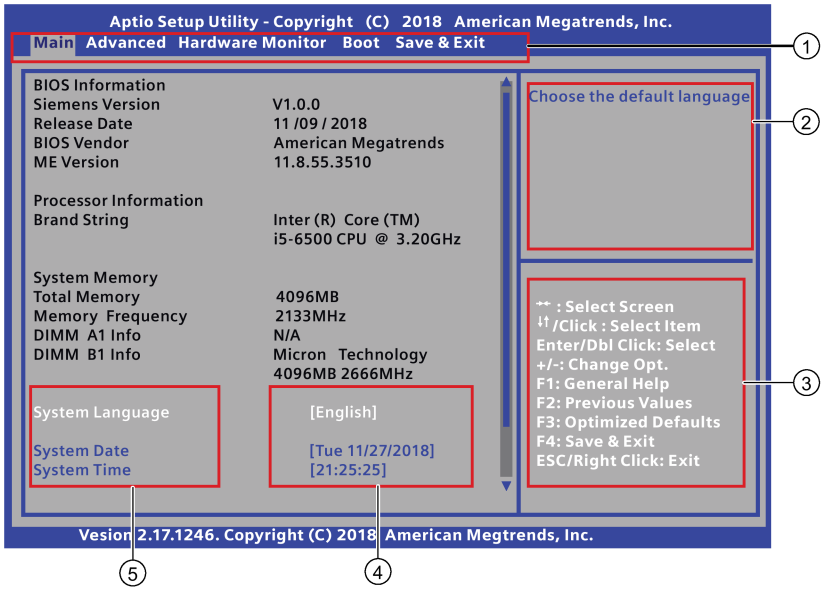
During the startup, if **DELETE** or **ESC** is not pressed, POST continues its routines.

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.
- 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.
+ / - : Change Opt.	Change the field value of a particular setup item, for example, date, time.
F1 : General Help	Display the general help window.
F2: Previous Values	Enable user to load previous values in BIOS setup Menu.
F3: Optimized Defaults	Enable user to load optimized default values in BIOS Setup Menu.
F4: Save & Exit	Enable user to save the current configuration and exit BIOS Setup Menu.
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.

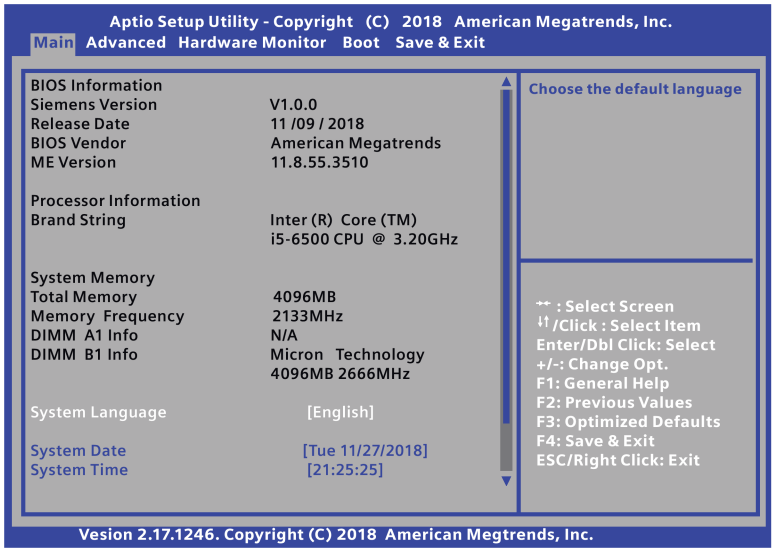
Menu items

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

7.6.2 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, time, language, and security settings.



Note

Take the BIOS version installed on your IPC as standard.

BIOS information

BIOS Information contains the following four items:

Item	Description
Siemens Version	Show the BIOS release version information.
Release Date	Show the BIOS release date information.
BIOS Vendor	Show the BIOS vendor information.
ME Version	Show the ME version information.

System Language

You can only choose the BIOS language version: [English].

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 **F4** 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 **F4** 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.

Security

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. Modify the BIOS setting arbitrarily may interfere with device function. Set passwords for administrator and user. In this way to avoid unauthorized access and modification to BIOS.

The Password menu allows you to change the Administrator Password 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.

Administrator Password

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

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

If you have set a user password, you must enter the user password for accessing the system. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

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. After you clear the password, the **User Password** item on top of the screen shows **Not Installed**.

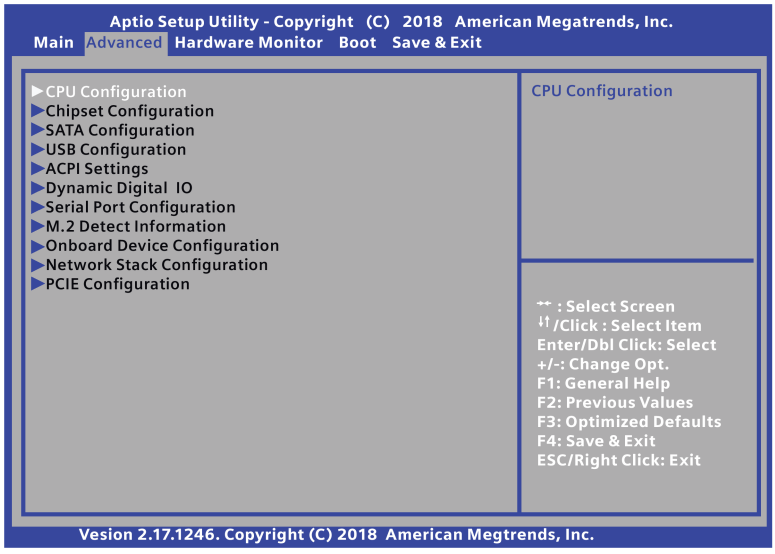
Note

Record the new password when the password is changed. If you forget the password, you can contact Siemens Technical support (Page 109).

7.6.3 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
Intel 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]
Turbo Mode	Enable or disable the processor Turbo Mode.	• [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 only have [All] and [1] options.	• [All] • [1] • [2] • [3]	[All]
EIST	Enable or disable Enhanced Intel SpeedStep® Technology.	• [Enabled] • [Disabled]	[Enabled]

Chipset Configuration

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

System parameters	Function description	Configuration options	Default setting
Primary Display [1]	Select the Primary Display from iGPU/PCIE Graphics device.	• [Auto] • [CPU Graphics] • [PEG]	[CPU Graphics]
iGPU Multi-Monitor	Enable or disable the iGPU Multi-Monitor. • [Enabled]: To empower both integrated and discrete graphics. The iGPU shared system memory size will be fixed at 64MB. • [Disabled]: Disable this function.	• [Enabled] • [Disabled]	[Disabled]
IGD Minimum Memory	Select DVMT 5.0 Pre_Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.	• [32M] [64M] [96M] ~ [1024M]	[128M]
Audio Controller	Enable or disable the Azalia HD audio controller.	• [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.

System parameters		BIOS			Power On process			Windows operating system		
iGPU Multi-Monitor	**Primary Display**	**I-VGA**	**I-DP**	**PEG**	**I-VGA**	**I-DP**	**PEG**	**I-VGA**	**I-DP**	**PEG**
[Enabled]	[CPU Graphics]	✓	✓	×	✓	✓	×	✓	✓	✓
[Disabled]	[Auto]	×	×	✓	×	×	✓	×	×	✓
	[CPU Graphics]	✓	✓	×	✓	✓	×	✓	✓	✓
	[PEG]	×	×	✓	×	×	✓	×	×	✓

SATA 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
SATA6G_1(Gray)	Enable or disable the SATA ports.	• [Enabled] • [Disabled]	[Enabled]
SATA6G_1 Hot Plug	Enable or disable the SATA Hot Plug Support.	• [Enabled] • [Disabled]	[Disabled]
SATA6G_2(Gray)	Enable or disable the SATA ports.	• [Enabled] • [Disabled]	[Enabled]
SATA6G_2 Hot Plug	Enable or disable the SATA Hot Plug Support.	• [Enabled] • [Disabled]	[Disabled]

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. • LAN1_U31G1_1 (x60) • LAN1_U31G1_2 (x61) • LAN2_U31G1_3 (x62) • LAN2_U31G1_4 (x63) • USB5~9	• [Enabled] • [Disabled]	[Enabled]
Legacy USB Support	Enable or disable the SATA Hot Plug Support. • [Enabled]: Enables the support for USB devices on legacy operating systems (OS). • [Disabled]: The USB devices can be used only for the BIOS setup program. • [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]

ACPI Settings

In the ACPI Settings page, you can change the ACPI settings.

System parameters	Function description	Configuration options	Default setting
Restore AC Power Loss	Restore the AC power loss. • [Always On]: The system goes into on state after an AC power loss. • [Always 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.	• [Always On] • [Always Off] • [Last State]	[Last State]
Resume from PCI	Enable or disable wake on function of PCI devices.	• [Enabled] • [Disabled]	[Disabled]
Resume from PCI-E/LAN	Enable or disable the wake-on-LAN function of the onboard LAN controller or the PCIE LAN cards.	• [Enabled] • [Disabled]	[Disabled]
Resume from USB in S5 State	Enable or disable Resume from USB in S5 state.	• [Enabled] • [Disabled]	[Disabled]

Dynamic Digital IO

In the Dynamic Digital IO page, you can configure Digital IO (DIO0~DIO7) settings.

There are two configuration options: [Input] and [Output], and the default setting is [Input].

Serial Port Configuration

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

System parameters		Function description	Configuration options	Default setting
Serial Port 1 Configuration	Serial Port 1	Enable or disable the serial port (COM) 1.	• [Enabled] • [Disabled]	[Enabled]
	Change Settings	When you set the Serial Port 1 to [Enabled] and allows you to select the Serial Port base address.	• [Auto] • [IO=3F8h; IRQ=4] • [IO=3F8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=2F8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=3E8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=2E8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;]	[Auto]

System parameters		Function description	Configuration options	Default setting
	Device Mode	Select the Serial Port operating mode.	• [RS232] • [RS422] • [RS485]	[RS232]
Serial Port 2 Configuration	Serial Port 2	Enable or disable the serial port (COM) 2.	• [Enabled] • [Disabled]	[Enabled]
	Change Settings	When you set the Serial Port 2 to [Enabled] and allows you to select the Serial Port base address.	• [Auto] • [IO=2F8h; IRQ=3] • [IO=3F8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=2F8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=3E8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=2E8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;]	[Auto]
	Device Mode	Select the Serial Port operating mode.	• [RS232] • [RS422] • [RS485]	[RS232]
Serial Port 3 Configuration	Serial Port 3	Enable or disable the serial port (COM) 3.	• [Enabled] • [Disabled]	[Enabled]
	Change Settings	When you set the Serial Port 3 to [Enabled] and allows you to select the Serial Port base address.	• [Auto] • [IO=3E8h; IRQ=7] • [IO=3E8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=2E8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=2F0h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=2E0h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;]	[Auto]

System parameters		Function description	Configuration options	Default setting
Serial Port 4 Configuration	Serial Port 4	Enable or disable the serial port (COM) 4.	• [Enabled] • [Disabled]	[Enabled]
	Change Settings	When you set the Serial Port 4 to [Enabled] and allows you to select the Serial Port base address.	• [Auto] • [IO=2E8h; IRQ=7] • [IO=3E8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=2E8h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=2F0h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;] • [IO=2E0h; IRQ=3, 4, 5, 6, 7, 8, 9, 10, 11, 12;]	[Auto]

M.2 Detect Information

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

Onboard Device Configuration

In the Onboard Device Configuration page, you can configure the onboard devices.

System parameters	Function description	Configuration options	Default setting
INTEL LAN1 Controller	Enable or disable the INTEL LAN1.	• [Enabled] • [Disabled]	[Enabled]
INTEL LAN1 PXE OPROM	Enable or disable the INTEL LAN1 PXE OPROM.	• [Enabled] • [Disabled]	Windows 7 OS: [Disabled] Windows 10 OS: [Enabled]
INTEL LAN2 Controller	Enable or disable the INTEL LAN2.	• [Enabled] • [Disabled]	[Enabled]
INTEL LAN2 PXE OPROM	Enable or disable the INTEL LAN2 PXE OPROM.	• [Enabled] • [Disabled]	Windows 7 OS: [Disabled] Windows 10 OS: [Enabled]
Add-on PCIE LAN Card PXE Boot	Enable or disable the Add-on PCIE LAN Card PXE Boot.	• [Enabled] • [Disabled]	[Disabled]
Charging USB device in Power State S5	Enable or disable the charging USB devices even when the system is in Power State S5.	• [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]
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]

PCIE Configuration

In the PCIE Configuration page, you can configure the onboard devices.

System parameters	Function description	Configuration options	Default setting
PCIEX16	Enable or disable the PCIEX16.	• [Enabled] • [Disabled]	[Enabled]
PCIEX16 Speed	Configure PCIEX16 speed.	• [Auto] • [Gen1] • [Gen2] • [Gen3]	[Auto]
PCIEX16 Non-Compliance mode	Detect Non-Compliance PCI Express Device in PCIEX16.	• [Enabled] • [Disabled]	[Disabled]
PCIE Lane Configuration [1]	Configure PCIEX4 Lane Allocation	• [1x2 2x1 Port] [2] • [1x4 Port]	[1x4 Port]
PCIEX4_1	Enable or disable the PCIEX4_1.	• [Enabled] • [Disabled]	[Enabled]
PCIEX4_1 Speed	Configure PCIEX4_1 speed.	• [Auto] • [Gen1] • [Gen2]	[Auto]
PCIEX4_1 Non-Compliance mode	Detect Non-Compliance PCI Express Device in PCIEX4_1.	• [Enabled] • [Disabled]	[Disabled]

[1] : This item shows only when you install the option 2 riser card.

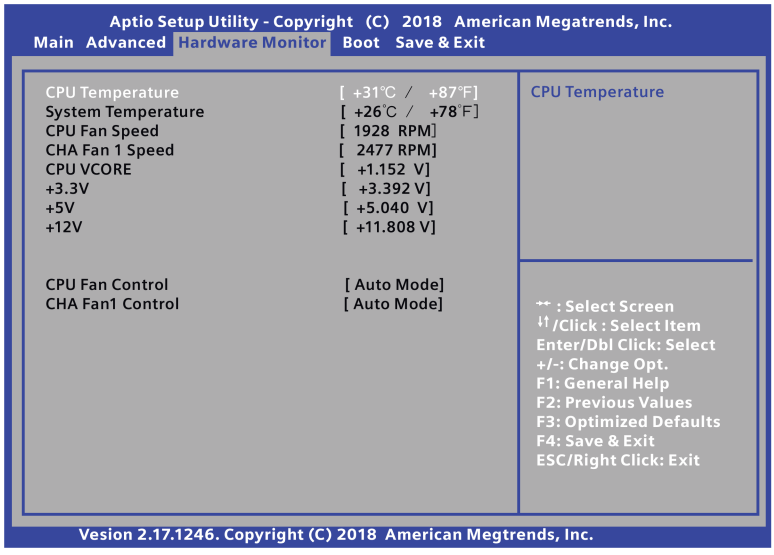
[2] : If you set the item "PCIE Lane Configuration" as "1x2 2x1 Port", the following items shows:

System parameters	Function description	Configuration options	Default setting
PCIEX1_1	Enable or disable the PCIEX1_1.	• [Enabled] • [Disabled]	[Enabled]
PCIEX1_1 Speed	Configure PCIEX1_1 speed.	• [Auto] • [Gen1] • [Gen2]	[Auto]
PCIEX1_1 Non-Compliance mode	Detect Non-Compliance PCI Express Device in PCIEX1_1.	• [Enabled] • [Disabled]	[Disabled]
PCIEX1_2	Enable or disable the PCIEX1_2.	• [Enabled] • [Disabled]	[Enabled]
PCIEX1_2 Speed	Configure PCIEX1_2 speed.	• [Auto] • [Gen1] • [Gen2]	[Auto]
PCIEX1_2 Non-Compliance mode	Detect Non-Compliance PCI Express Device in PCIEX1_2.	• [Enabled] • [Disabled]	[Disabled]

7.6.4 Hardware Monitor menu

Hardware Monitor menu

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

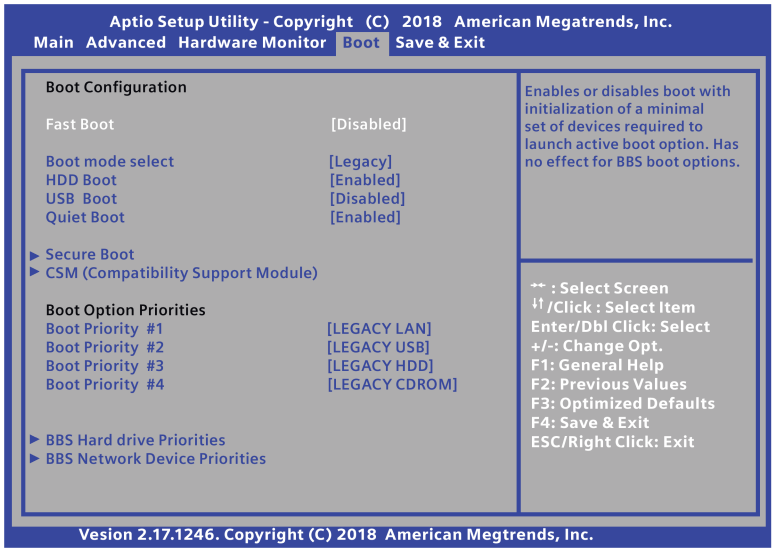


System parameters	Function description	Configuration options	Default setting
CPU / System Temperature	The onboard hardware monitor automatically detects and displays the CPU / system temperatures. Select [Ignore] if you do not need to display the detected temperature, select [Ignore] .	• [xxx°C/xxx°F] • [Ignore]	[xxx°C/xxx°F]
CPU / CHA Fan Speed	The onboard hardware monitor automatically detects and displays the CPU / chassis fan speeds in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows N/A. Select [Ignore] if you do not need to display the detected speed.	• [xxxx RPM] • [Ignore] • [N/A]	[N/A]
CPU VCORE, +3.3V, +5V, +12V	The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. Select [Ignore] if you do not want to detect this item.	• [Actual Value]	[Actual Value]
CPU Fan Control	Control the CPU fan. • [Disabled Mode]: The CPU fan runs at full speed. • [Auto Mode]: The CPU fan speed changes automatically according to the CPU temperature.	• [Disabled Mode] • [Auto Mode]	[Auto Mode]
CHA Fan1 Control	Control the chassis fan. • [Auto Mode]: The chassis fan speed changes automatically according to the motherboard temperature. • [Silent Mode]: The chassis fan runs at low speed with less noise. • [Disabled Mode]: The chassis fan runs at full speed.	• [Auto Mode] • [Silent Mode] • [Disabled Mode]	[Auto Mode]

7.6.5 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]
	If you select [Enable], the **Next Boot after AC Power Loss** item appears. • [Normal Boot]: Returns to normal boot on the next boot after AC power loss. • [Fast Boot]: Accelerates the boot speed on the next boot after AC power loss.	• [Normal Boot] • [Fast Boot]	[Normal Boot]
Boot mode select	Select the devices boot-up mode according to the devices specification and different operating systems. Devices with the selected mode will appear in the boot priority list.	• [UEFI + Legacy] • [Legacy] • [UEFI]	Windows 7 OS: [Legacy] Windows 10 OS: [UEFI]
HDD Boot	Select the boot mode of HDD.	• [Enabled] • [Disabled]	[Enabled]

System parameters		Function description	Configuration options	Default setting
USB Boot		Select the boot mode of USB.	• [Enabled] • [Disabled]	[Disabled]
Quiet Boot		Change some configurations for the boot. • [Enabled]: Show the logo during POST. • [Disabled]: Hide the logo during POST.	• [Enabled] • [Disabled]	[Enabled]
Secure Boot	OS Type	Configure the Windows secure boot settings and manage the secure boot keys. • [Windows UEFI mode]: Execute the Microsoft secure boot check. Only select this option when booting on Windows UEFI mode or other Microsoft secure boot compliant operating systems. • [Other OS]: Select this option to get the optimized functions when booting on Windows non-UEFI mode and Microsoft operating systems.	• [Windows UEFI mode] • [Other OS]	Windows 7 OS: [Other OS] Windows 10 OS: [Windows UEFI mode]
	Key Management	Manage the secure boot keys.		

CSM (Compatibility Support Module)

This item can configure the CSM.

System parameters	Function description	Configuration options	Default setting
Launch CSM	Enable or disable the CSM.	• [Enabled] • [Disabled]	Windows 7 OS: [Enabled] Windows 10 OS: [Disabled]
Boot mode select	Select the devices boot-up mode by the devices specification. Devices with the selected mode will appear in the boot priority list.	• [Legacy] • [Legacy only]	[Legacy]
Boot from Network Devices	Select the type of the onboard LAN controllers and installed LAN cards. Network devices will run the selected type during the system boot. • [Ignore]: Accelerate the boot up time without running network devices during POST(power-on self-test).	• [Ignore] • [Legacy only] • [UEFI driver first]	[Legacy only]
Boot from Storage Devices	Storage devices will run the selected type first during the system boot. It is recommended to select either Legacy only or UEFI drivers first by the devices specification for a better stability. • [Ignore]: Accelerate the boot up time without running storage devices during POST(power-on self-test).	• [Ignore] • [Legacy only] • [UEFI driver first]	[Legacy only]
Boot from PCI-E Expansion Devices	PCI-E Expansion devices will run the selected type first during the system boot.	• [Legacy only] • [UEFI driver first]	[Legacy only]

Boot Option Priorities

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

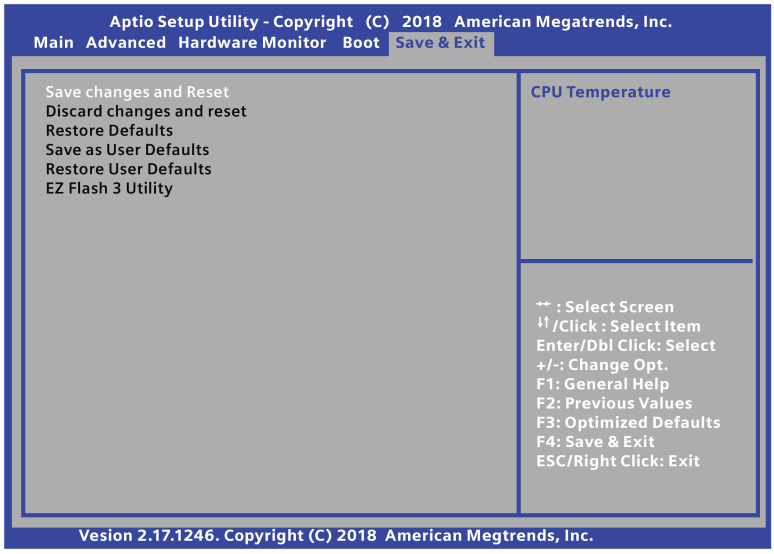
Note

- Select the boot device during system startup, and press <F10> when SIEMENS Logo appears.
- Access Windows OS in Safe Mode, press <F8> after POST.

7.6.6 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.



Save Changes and Reset

When you complete the system configuration changes, save the changes with the following steps:

1. Select **Save Changes and Reset** with the arrow keys and press **Enter** key.
2. Select **Yes** and press **Enter** key to save changes and reset. Or Select **No** to quit the save.

After the system is rebooted, the new system configurations take effect.

Discard Changes and Reset

You can reboot the system without saving the changes with the following steps:

1. Select **Discard Changes and Reset** with the arrow keys and press **Enter** key.
2. Select **Yes** and press **Enter** key to discard changes and reset. Or Select **No** to quit.

Restore Defaults

Restore/load default values for all setup options. You can restore the system with the following steps:

1. Select **Restore Defaults** with the arrow keys and press **Enter** key.
2. Select **Yes** and press **Enter** key to the load optimized defaults. Or Select **No** to quit.

Save as User Defaults

This option saves current configuration as User Defaults. You can save your settings as user default settings with the following steps:

1. Select **Save as User Defaults** with the arrow keys and press **Enter** key.
2. Select **Yes** and press **Enter** key to save the settings as user defaults. Or Select **No** to quit.

Restore User Defaults

This option restores User Defaults to all setup options. You can restore the user default settings with the following steps:

1. Select **Restore User Defaults** with the arrow keys and press **Enter** key.
2. Select **Yes** and press **Enter** key to load optimized defaults. Or Select **No** to quit.

EZ Flash 3 Utility

This option is used for updating BIOS. Press **Enter** to launch the EZ Flash 3 screen.

Appendix Motherboard

A

A.1 Jumpers

WARNING

Electrostatic sensitive devices (ESD)

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

Always completely disconnect 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 the y 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 connected 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 get damaged by this action.
- Do not leave the screws or the metal components on the motherboard or inside of the chassis.

Setting Jumpers

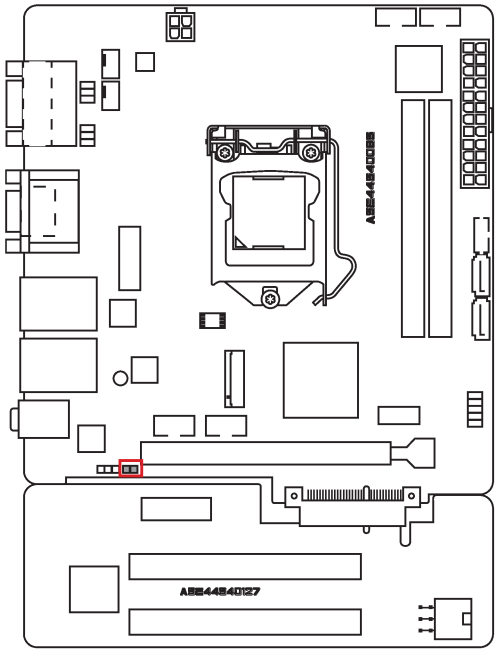
The board has a number of jumpers that allow you to configure. A jumper is a kind of electric switch. By setting jumpers, you can configure your card to match the needs of your application.

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. Some jumpers have three pins, labeled 1, 2 and 3. In this case you can connect either pins 1 and 2 or 2 and 3.

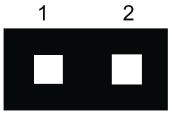
A pair of needle nose pliers may be helpful when working with jumpers. If you have any questions about the best hardware configuration for you application, contact your local distributor or sales representative before you make any change.

Clear CMOS

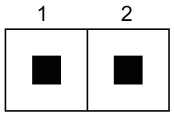


Clear RTC RAM (2-pin CLRTC)

Jumper pins	Function
Connect 1 and 2	Clear CMOS
Disconnect 1 and 2	Protected (Default)



Clear CMOS

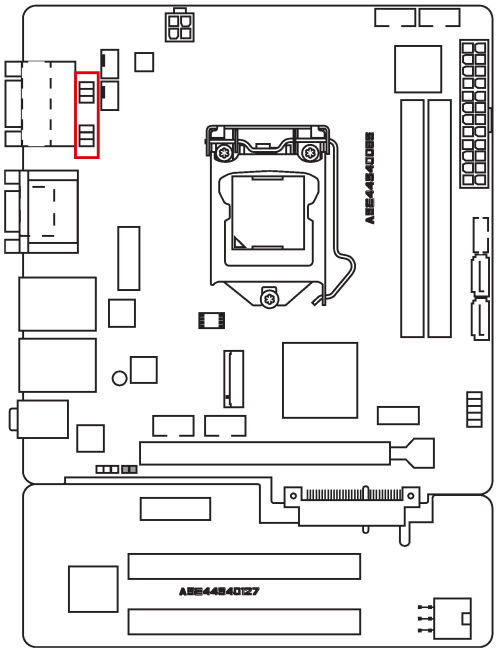


Protected
(Default)

Note

Set the jumper back to protected mode after clearing CMOS.

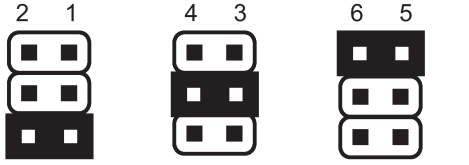
COM1/COM2 Ring/+5V/+12V selection (6-pin COM1_SEL, COM2_SEL)



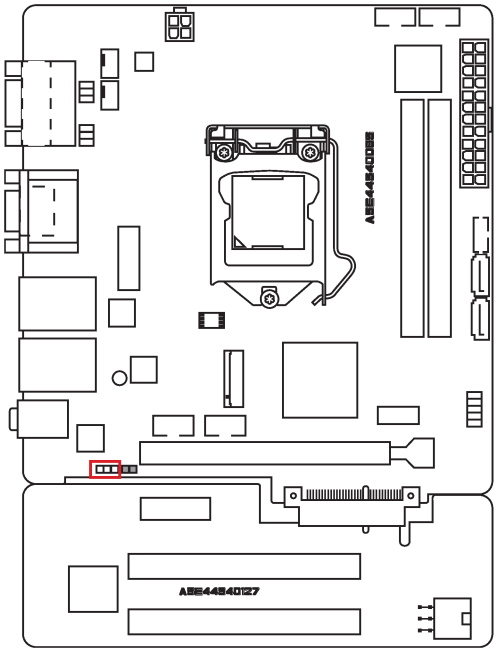
COM1/COM2 Jumper selection

Jumper pins	Function
1-2	+12V
3-4	+5V
5-6	Ring (Default)

COM1_SEL/COM2_SEL



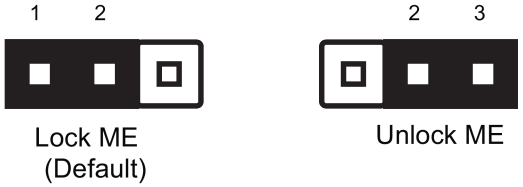
Intel® ME jumper (3-pin DIS_ME)



Intel® ME Jumper (3-pin LOCK_ME)

Jumper pins	Function
1-2	Lock ME(Default)
2-3	Unlock ME

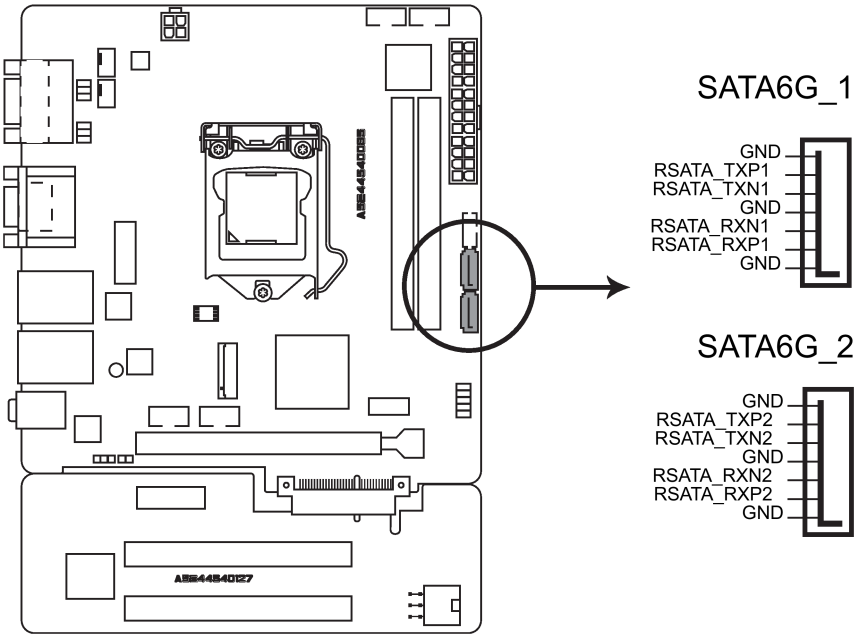
Lock_ME



A.2 Internal Connector

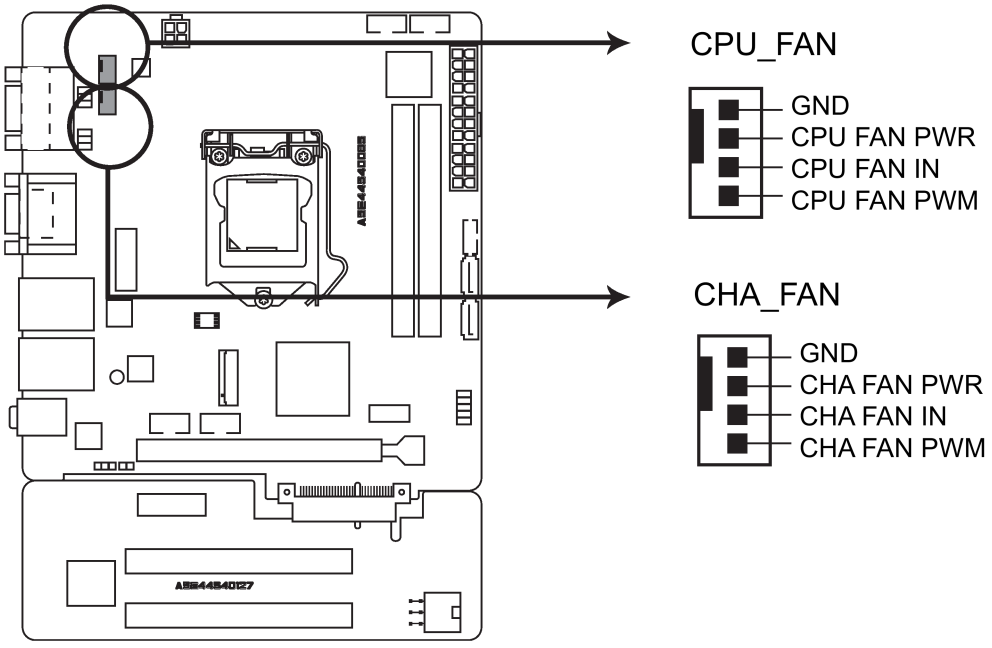
A.2.1 Intel® H110 Serial ATA 6.0Gb/s connectors (SATA6G_1~2)

Intel® H110 Serial ATA 6.0 Gb/s connectors connect to Serial ATA 6.0 Gb/s hard disk drives through Serial ATA 6.0 Gb/s signal cables.



A.2.2 CPU and chassis fan connectors (CPU_FAN, CHA_FAN)

Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.



Note

In order to prevent the damage from insufficient air flow inside the system to motherboard components, connect the fan cables to the fan connectors.

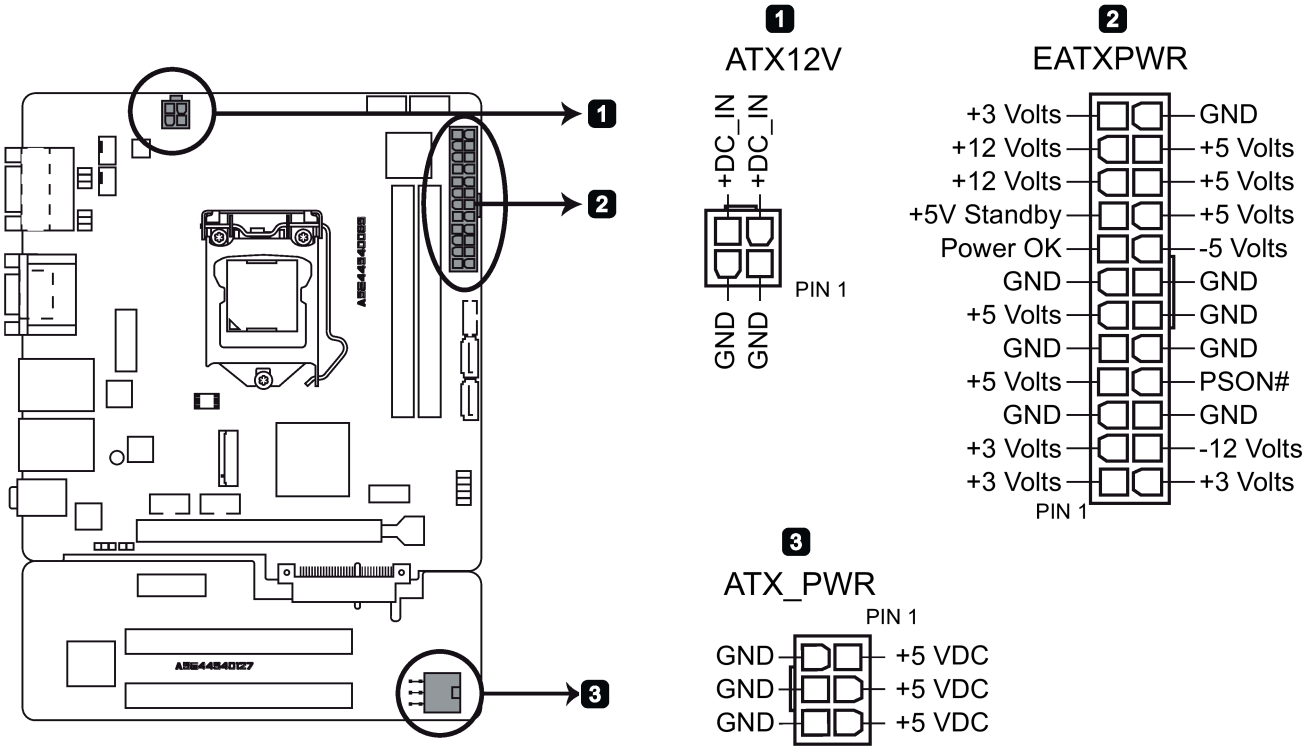
Do not place jumper caps on the fan connectors.

The CPU_FAN connector supports a CPU fan of maximum 1A (12 W) fan power.

A.2.3 ATX power connectors (EATXPWR, ATX12V, ATX_PWR)

These connectors are for ATX power supply plugs. Make sure you insert the ATX power supply plug on motherboard in the right orientation, otherwise the plug cannot be inserted.

Find the proper orientation and push down firmly until the connectors completely fit.

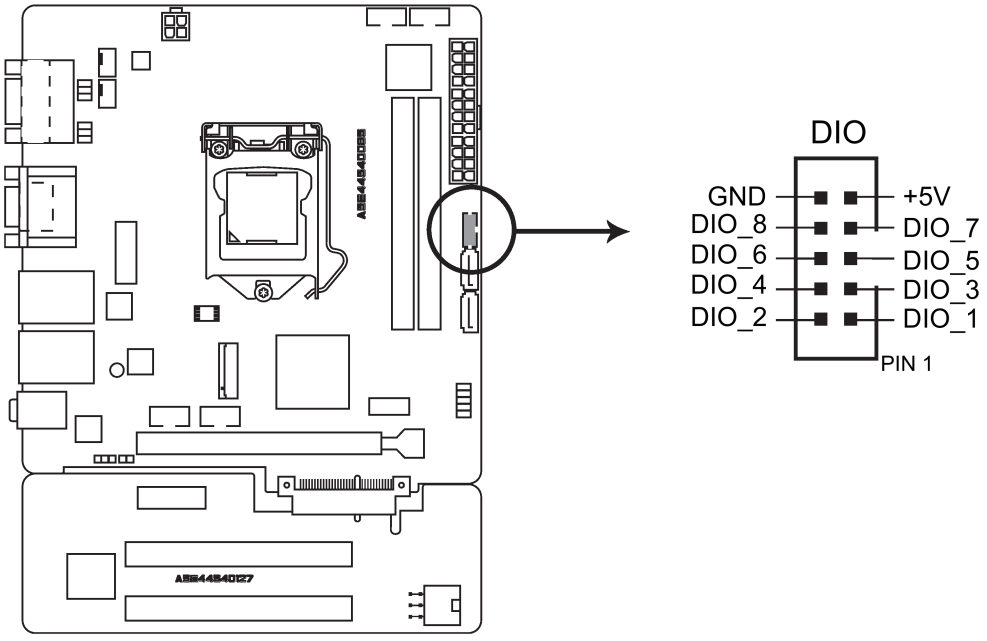


Note

- Connect the 6-pin power plug to provide power to the riser card.
- Siemens recommends that you use an ATX 12V Specification 2.0 compliant or later version power supply unit (PSU) with a minimum of 350W power rating. This PSU type has 24-pin and 4-pin power plugs.
- The 4-Pin ATX +12 V power plug must be connected, otherwise the system cannot be booted up.
- Siemens recommends that you use a PSU with higher power output when configuring a system with more power-consuming devices or when you intend to install additional devices. The system may become unstable or can not be booted up if the power is inadequate.

A.2.4 Digital I/O connector (DIO)

Digital I/O connector includes 8 I/O lines (In/Out programmable). All of the Digital I/O lines are programmable and each I/O pin can be individually programmed to support various devices.

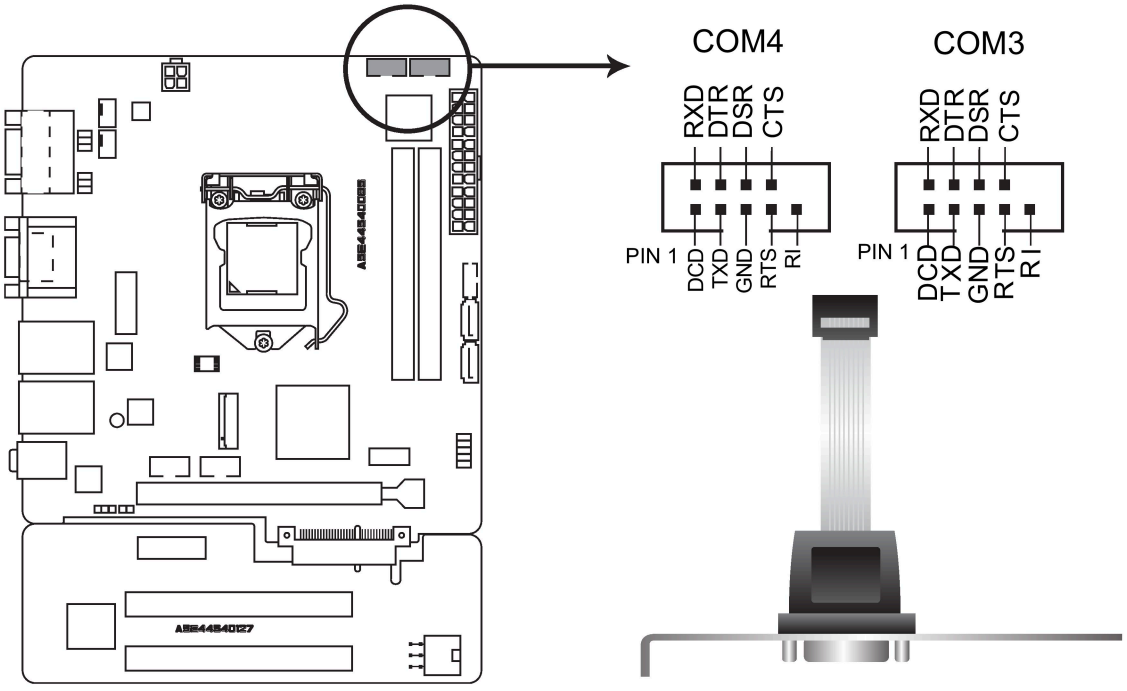


Note

To configure the I/O pins in BIOS, navigate to **Dynamic Digital IO** selection in **Advanced** tab. For the detailed information, refer to Advanced menu (Page 83).

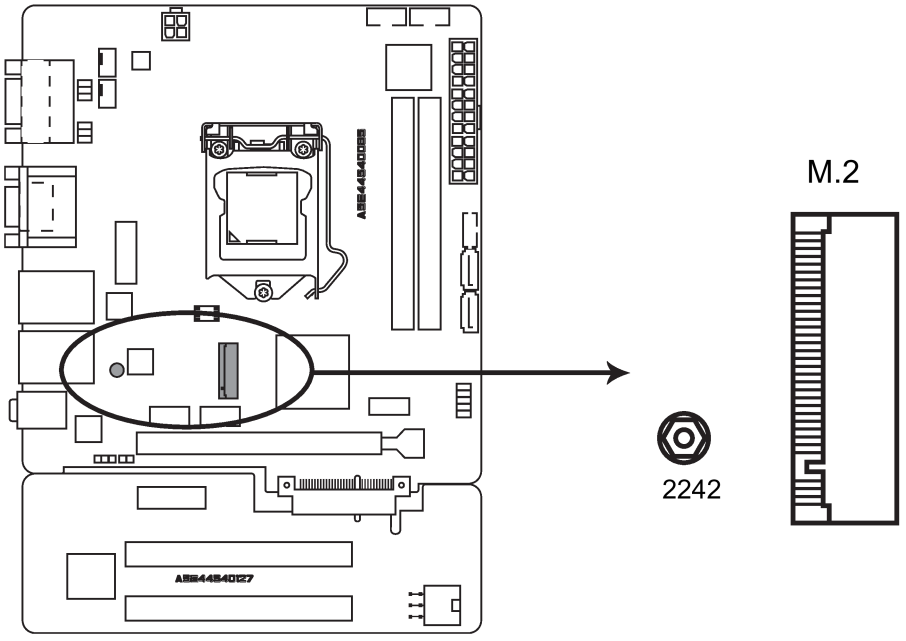
A.2.5 Serial port connectors (COM3, COM4)

These connectors are for serial (COM) ports. Connect the serial port module cable to these connectors, then install the module to a slot opening at the back of the system chassis.



A.2.6 M.2 B Key slot

This socket allows you to install an M.2 module. For the detailed information, refer to M.2 interface (Page 76).

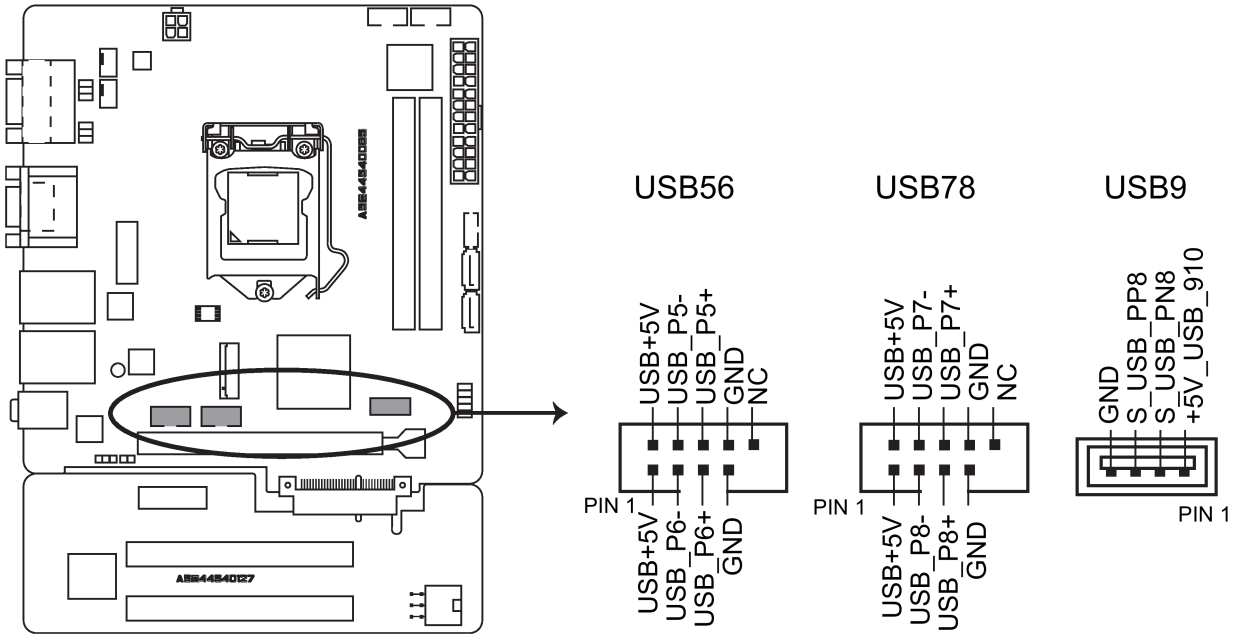


Note

This slot supports type 2242 SATA storage devices.

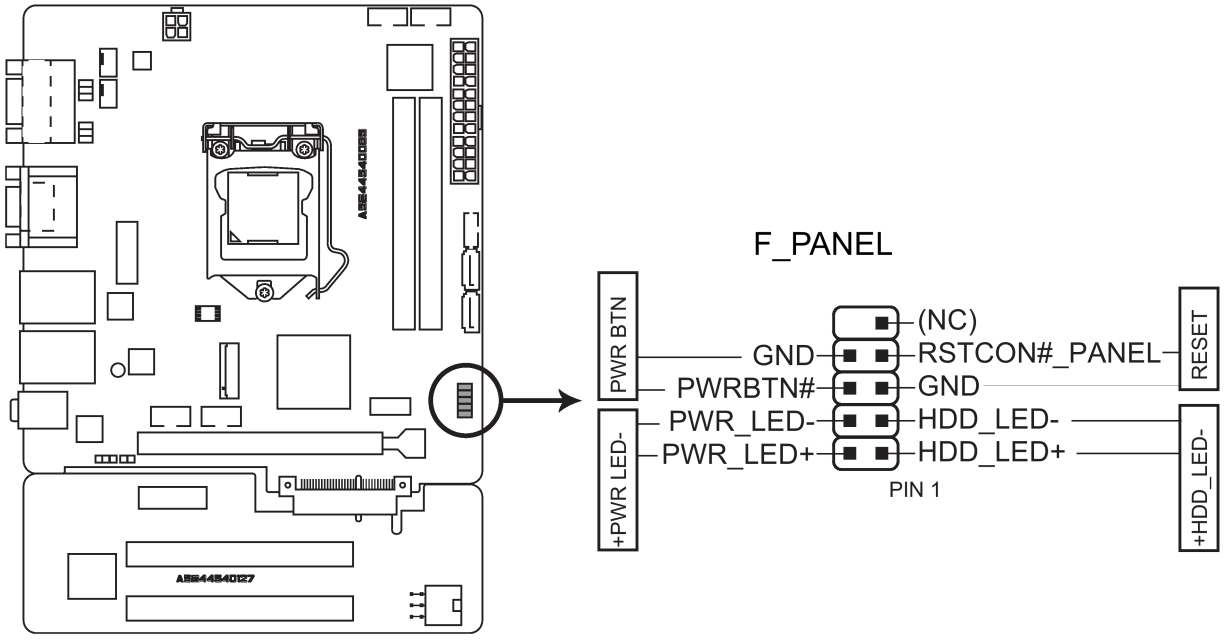
A.2.7 USB 2.0 connectors (USB56, USB78, USB9)

Connect a USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. This USB connectors comply with USB 2.0 specifications and support up to 480Mbps connection speed.



A.2.8 System panel connector (F_PANEL)

This connector supports several chassis-mounted functions.



System power LED (2-pin PWR_LED)

This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

Hard disk drive activity LED (2-pin HDD_LED)

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The HDD LED lights up or flashes when data is read from or written to the HDD.

ATX power button/soft-off button (2-pin PWR_BTN)

This connector is for the system power button.

Reset button (2-pin RESET)

This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

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/My/ww/en/requests#createRequest)
- After Sales Information System SIMATIC IPC/PG

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

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

  (http://sitrain.automation.siemens.com/sitrainworld/?AppLang=en)
- Industry Mall

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

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

- MLFB of the device
- 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

This chapter provides you with tips on how to locate and/or troubleshoot problems which occur.

Problem	Possible cause	Possible remedy
The device is not operational	No power supply	• Check the power supply, the power cord and the power plug. • Check if the On/Off switch is in the correct position.
	Device is being operated outside the specified ambient conditions	• Check the ambient conditions. • After transport in cold weather, wait approximately 12 hours before switching on the device.
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. For detailed information, refer to the monitor operating instructions.
	The power cord or the monitor cable is not connected.	• Check whether the power cord has been properly connected to the monitor and to the system unit or to the grounded shockproof outlet. • Check whether the monitor cable has been properly connected to the system unit and to the monitor.
		If the monitor screen still remains dark after you have performed these checks and measures, contact your technical support team.
The mouse pointer does not appear on the screen	The mouse driver is not loaded	Check whether the mouse driver is properly installed and available when you start the user program. Detailed information about the mouse driver is available in the corresponding documentation.
	Mouse not connected	• Check whether the mouse cord is properly connected to the system unit. • If you use an adapter or extension for the mouse cable, also check these connectors.
		If the mouse pointer still does not appear on the screen after you have performed these checks and actions, contact your technical support team.
Wrong time and/or date on the PC		1. Open the BIOS Setup. 2. Set the time or date.
Although the BIOS setting is OK, the time and data are still wrong	The backup battery is dead.	Replace the backup battery.

Problem	Possible cause	Possible remedy
USB device not responding	The USB ports are not correctly supported.	• Turn on USB Legacy Support for mouse and keyboard. • 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.3 Notes on the use of third-party modules

Problem	Possible cause	Possible remedy
The device crashes during startup	• Redundant I/O addresses • Redundant hardware interrupts and/or DMA channels • Fluctuation of signal frequencies or levels • Different pin assignment	Check your computer configuration: • If the computer configuration corresponds to the delivery state, contact your technical support team. • If the configuration has changed, restore the factory state. To do this, remove the third-party modules and restart the device. If the error no longer occurs, the third-party module being used was the cause of the fault. Replace the thrid-party module with a Siemens module or contact the module supplier.
		If the device still crashes, contact your technical support team.
	• Insufficient output of an external power supply, e.g. UPS	• Use a higher capacity power supply
The device does not start up or switches off immediately	• A counter voltage is fed into the device by connected or installed third-party components	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

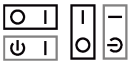
The following tables show all the symbols which may be found on your SIMATIC industrial PC, SIMATIC industrial monitor or SIMATIC Field PG in addition to the symbols which are explained in the operating instructions.

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

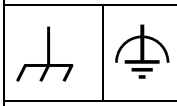
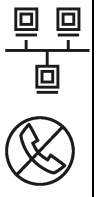
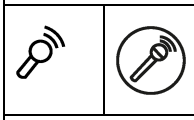
Symbol	Meaning		Symbol	Meaning
	On/off switch, without electrical isolation			Eject CD/DVD
	On/off switch, without electrical isolation			

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

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			

List of abbreviations

D

AC	Alternating current	Alternating current
ACPI	Advanced Configuration and Power Interface	
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	
AT	Advanced Technology	
ATA	Advanced Technology Attachment	
AWG	American Wire Gauge	A standardized wire gauge system. Used in North America and Canada.
BIOS	Basic Input Output System	
CAN	Controller Area Network	
CD-ROM	Compact Disc – Read Only Memory	
CE	Communauté Européenne	
CF	CompactFlash	
CMOS	Complementary Metal Oxide Semiconductors	
COA	Certificate of authentication	
COM	Communications Port	Term for the serial interface
CPU	Central Processing Unit	CPU
CSA	Canadian Standards Association	Canadian organization for tests and certifications according to national or binational standards
CTS	Clear To Send	Clear to send
DC	Direct Current	DC current
DCD	Data Carrier Detect	Data carrier signal detection
DMA	Direct Memory Access	
DOS	Disk Operating System	
DP	DisplayPort	
DQS	Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagement mBH	
DSR	Data Set Ready	Ready for operation
DTR	Data Terminal Ready	Data terminal is ready
DVD	Digital Versatile Disk	
ESD	Components sensitive to electrostatic charge	
EN	European standard	

EEPROM	Electrically Erasable Programmable Read-Only Memory	
ESD	Electrostatic Sensitive Device	Electrostatic Sensitive Devices
	Electrostatic discharge	Electrostatic discharge
EWF	Enhanced Write Filter	
FBWF	File Based Write Filter	
GND	Ground	Chassis ground
HD	Hard disk	Hard disk
HDD	Hard Disk Drive	HDD
HMI	Human Machine Interface	User interface
HORM	Hibernate Once - Resume Many	
HT	Hyper Threading	
I/O	Input/Output	Data input/output for computers
IDE	Integrated Device Electronics	
IEC	International Electronical Commission	
IGD	Integrated Graphics Device	
IP	International Protection	Degree of protection
	in English-speaking countries: Ingress Protection	
IRQ	Interrupt Request	
ISA	Industry Standard Architecture	Bus for expansion modules
LAN	Local Area Network	Computer network that is limited to a local area.
LEDs	Light Emitting Diode	Light emitting diode
LPS	Limited Power Source	
MAC	Media access control	Media access control
MLFB	Machine-readable product designation	
MRAM	Magnetoresistive random-access memory	Backup memory
MS	Microsoft	
MTBF	Mean Time Between Failures	
MUI	Multilanguage User Interface	Language localization in Windows
NEMA	National Electrical Manufacturers Association	
NTFS	New Technology File System	
NVRAM	Non Volatile Random Access Memory	Non-volatile data memory. Data memory is retained without external power supply.
ODD	Optical Disk Drive	
PC	Personal computer	
PCI	Peripheral Component Interconnect	High-speed expansion bus
PCIe	Peripheral Component Interconnect express	High-speed serial, differential full-duplex PtP interface with high data rate.
PG	Programming device	
POST	Power On Self Test	

PXE	Preboot Execution Environment	Software for running new PCs without hard disk data via the network
RAID	Redundant Array of Independent Disks	Redundant hard disk array
RAL	Restricted Access Location	
RAM	Random Access Memory	
RI	Ring Input	Incoming call
ROM	Read-Only Memory	
RS 485	Reconciliation Sublayer 485	Bidirectional bus system
RTC	Real Time Clock	Real-time clock
RTS	Request to send	Request to send
RxD	Receive Data	Data transfer signal
SATA	Serial Advanced Technology Attachment	
SCU	Setup Configuration Utility	
SELV	Safety Extra Low Voltage	Safety extra low voltage
SMART	Self Monitoring Analysis and Reporting Technology	Hard disk error diagnostics program
SRAM	Static Random Access Memory	Static RAM
SSD	Solid State Drive	
TFT	Thin-Film-Transistor	
TxD	Transmit Data	Data transfer signal
UEFI	Unified Extensible Firmware Interface	
UL	Underwriters Laboratories Inc.	US organization for testing and certification according to national or binational standards.
USB	Universal Serial Bus	
VDE	Verband der Elektrotechnik, Elektronik und Informationstechnik e.V (Association for Electrical, Electronic and Information Technologies)	
VT	Virtualization Technology	Intel technology which provides a virtual, closed environment.
VT-d	Virtualization Technology for Directed I/O	Enables the direct assignment of a device (e.g. network adapter) to a virtual device.
WD	Watchdog	Program monitoring with error detection and alarming.

Glossary

AHCI mode

AHCI is a standardized method to address the SATA controller. AHCI describes a structure in the RAM, which contains a general area for control and status, as well as a command list.

APIC mode

Advanced peripheral interrupt controller. 24 interrupt lines are available.

Automation system

A programmable controller (PLC) of the SIMATIC S7 system consist of a central controller, one or several CPUs, and various I/O modules.

Backup

Duplicate of a program, data medium or database, used either for archiving purposes or for the protection of vital and non-replaceable data against loss when the working copy is corrupted. Certain applications automatically generate backup copies of data files, and manage both the current and the previous versions on the hard disk.

Baud

Physical unit for the step speed in signal transmission. Defines the number of transferred signal states per second. With only two states, one baud is equivalent to a transmission rate of 1 bps.

Cache

High-speed access buffer for interim storage (buffering) of requested data.

CE marking

Communauté **E**uropéene: The CE symbol confirms the conformity of the product with all applicable EC directives such as the EMC Directive.

CFast

The faster SATA protocol is used with the CFast standard for memory cards based on CompactFlash. The connectors on these cards are not compatible with a classic CompactFlash card.

Chipset

Located on the motherboard, connects the processor with the PCI or PCIe bus and the external interfaces.

Cold restart

A start sequence, starting when the computer is switched on. The system usually performs some basic hardware checks within the cold start sequence, and then loads the operating system from the hard disk to work memory -> boot

COM interface

The COM interface is a serial V.24 interface. The interface is suitable for asynchronous data transfer.

CompactFlash card

CompactFlash is a digital storage medium in card format and without moving parts. The CF card contains the non-volatile memory and the controller. The interface of the CF card corresponds with the IDE interface. CF cards can be operated without additional electronics on PCMCIA or IDE hard disk controllers using a plug and socket adapter. There are two design forms: CF-I (42.6 x 36.4 x 3.3 mm) and CF-II (42.8 x 36.4 x 5 mm).

Configuration files

These are files containing data which define the configuration after restart. Examples of such files are CONFIG.SYS, AUTOEXEC.BAT and the registry files .

Configuration software

The configuration software updates the device configuration when new modules are installed . This is done either by copying the configuration files supplied with the module or by manual configuration using the configuration utility.

Controller

Integrated hardware and software controllers that control the functions of certain internal or peripheral devices (for example, the keyboard controller).

Device configuration

The configuration of a PC or programming device contains information on hardware and device options, such as memory configuration, drive types, monitor, network address, etc. The data are stored in a configuration file and enable the operating system to load the correct device drivers and configure the correct device parameters. . If changes are made to the hardware configuration, the user can change entries in the configuration file using the SETUP program. .

Drivers

Program parts of the operating system. They adapt user program data to the specific formats required by I/O devices such as hard disk, printers, and monitors.

EMC directive

Directive concerning **E**lectro**m**agnetic **C**ompatibility. Compliance is confirmed by the CE symbol and the EC certificate of conformity.

Energy management

The energy management functions of a modern PC allow individual control over the current consumption of vital computer components (e.g. of the monitor, hard disk and CPU), by restricting their activity based on the current system or component load. Energy management is of particular importance for mobile PCs.

Energy options

The energy options can be used to reduce energy consumption of the computer, while keeping it ready for immediate use. This can be configured in Windows by selecting Settings > Control Panel > Energy options.

Enhanced Write Filter

Configurable write filter that allows you to, for example, boot Windows Embedded Standard from write-protected media (e.g., CD-ROM), set write protection for individual partitions, and adapt the file system performance to user requirements (when using memory cards, for example).

ESD Guideline

Guideline for using electrostatic sensitive components.

Ethernet

Local network (bus structure) for text and data communication with a transfer rate of 10/100/1000 Mbps.

Execute Disable Capability

Hardware implementation that prevents mutual memory accesses by programs and applications. It is only effective when all relevant system components, such as processors, operating systems and applications are supported.

Extensible Firmware Interface

Refers to the central interface between the firmware, the individual components of a computer and the operating system. EFI is located logically below the operating system and represents the successor to PC BIOS, focusing on 64-bit systems.

File Based Write Filter

Configurable write filter to protect individual files from write access.

Formatting

Basic partitioning of memory space on a magnetic data medium into tracks and segments. Formatting deletes all data on a data medium. All data media must be formatted prior to their first use.

HORM

Hibernate once, resume many is a method for fast booting from a single Hibernate file that only needs to be created once. HORM ensures restoration of a uniform, saved system state when booting. This minimizes write access, for example to a memory card, when you start up and shut down Windows Embedded Standard 7.

Hub

A term in network technology. In a network, a device joining communication lines at a central location, providing a common connection to all devices on the network.

Hyper Threading

HT technology (multi-threading) enables the parallel computing of processes. HT is only effective when all relevant system components, such as processors, operating systems and applications are supported.

IGD

Integrated Graphics Device. Graphics interface integrated in the chipset.

Image

This refers to the image, for example, of hard disk partitions saved to a file in order to restore them when necessary.

Intel Active Management Technology

This technology permits diagnostics, management and remote control of PCs. It is only effective when all relevant system components, such as processors, operating systems and applications are supported.

Intel VT

The Intel Virtualization Technology (IVT) is the implementation of a secure closed environment for applications. Special (visualization) software an a VT-capable processor is required for its use.

Interface

- Physical interconnection (cable) of hardware elements such as PLCs, PCs, programming devices, printers or monitors.
- Interface for interactive software applications.

LAN

Local **A**rea **N**etwork: LAN is a local network that consists of a group of computers and other devices that are distributed across a relatively restricted range and are linked with communication cables. The devices connected to a LAN are called nodes. The purpose of networks is the mutual use of files, printers or other resources.

Legacy Boot Device

Conventional drives can be used as USB devices.

License key

The license key represents the electronic license stamp of a license. Siemens AG issues a license key for each software that is protected by a license.

License key USB flash drive

The license key USB flash drive contains the authorizations or license keys required to enable protected SIMATIC software.

Low-voltage directive

EC Product Safety Directive relating to the safety of products which are operated on low voltage (50 V AC to 1000 V AC, 70 V DC to 1500 V DC) and not specified in other directives. Compliance is confirmed by the CE symbol and the EC certificate of conformity.

Module

Modules are plug-in units for PLCs, programming devices or PCs. They are available as local modules, expansion modules, interfaces or mass storage (Mass storage module).

Motherboard

The motherboard is the core of the computer. Here, data are processed and stored, and interfaces and device I/Os are controlled and managed.

Operating system

Generic term which describes all functions for controlling and monitoring user program execution, distribution of system resources to the user programs and the operating mode in cooperation with the hardware (for example, Windows 7 Ultimate).

Pixel

The pixel represents the smallest element that can be reproduced on-screen or on a printer.

Plug&Play

Generally, a reference to the ability of a computer to automatically configure the system for communication with peripheral devices (for example monitors, modems or printers). The user can plug in a peripheral and "play" it at once without manually configuring the system. A Plug&Play PC requires both a BIOS that supports Plug&Play and a Plug&Play expansion card.

POST

Self-test performed by the BIOS after the computer is switched on. Performs a RAM test and a graphics controller test, for example. The system outputs audible signals (beep codes) if the BIOS detects any errors; the relevant message indicating cause of error is output on the screen.

Programmable controller

The programmable controllers of the SIMATIC S7 system consist of a central controller, one or more CPUs, and various other modules (e.g. I/O modules).

PXE server

A **P**reboot E**x**ecution **E**nvironment server is part of a network environment and can provide software to connected computers even before they boot. This can involve operating system installations or servicing tools, for example.

RAL

Restricted **A**ccess **L**ocation: Installation of the device in a production facility with restricted access, for example, a locked control cabinet.

Reset

Hardware reset: Reset/restart of the PC using a button/switch.

Restart

Warm restart of a computer without switching the power off (Ctrl + Alt + Del)

ROM

Read-Only Memory ROM is a read-only memory in which every memory location can be addressed individually. The programs or data are permanently stored and are not lost in the event of a power failure.

S.M.A.R.T

Self-Monitoring, Analysis and Reporting Technology (SMART or S.M.A.R.T.) is an industry standard integrated in storage media. It makes for permanent monitoring of important parameters and early detection of imminent problems.

SATA

Serial ATA Interface for hard disk drives and optical drives with serial data transmission rates of up to 300 Mbps.

SETUP (BIOS Setup)

A program in which information about the device configuration (that is the configuration of the hardware on the PC/PG) is defined. The device configuration of the PC/PG is preset with defaults. Changes must therefore be entered in the SETUP if a memory expansion, new modules or a new drive are added to the hardware configuration.

SSD (Solid State Drive)

A Solid State Drive is a drive that can be installed like any other drive; it does not contain a rotating disk or other moving parts because only semiconductor memory chips of similar capacity will be used. This design makes SSDs more rugged, provides shorter access times, low energy consumption and rapid data transfer.

STEP 7

Programming software for the creation of user programs for SIMATIC S7 controllers.

Troubleshooting

Error cause, cause analysis, remedy

Trusted Execution Technology

Hardware implementation that allows secured execution of programs and applications. It is only effective when all relevant system components, such as processors, operating systems and applications are supported.

Wake on LAN

Wake on Local area network. This function allows the PC to be started via the LAN interface.

Warm restart

The restart of a computer after a program was aborted. The operating system is loaded and restarted again. The CTRL+ ALT+ DEL hotkey can be used to initiate a warm restart.

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