SIEMENS

SIMATIC

Industrial PC SIMATIC IPC347D

Operating Instructions

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07/2015

A5E33297084-AB

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

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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.

Siemens AG
Division Digital Factory
Postfach 48 48
90026 NÜRNBERG
GERMANY

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Preface

Purpose of the Operating Instructions

This operating instruction contains all the information you need for commissioning and operating SIMATIC IPC347D.

This operating instruction is intended both for

- programming and testing personnel who commission the device and connect it with the peripheral equipments.
- service and maintenance personnel who install add-ons or carry out fault/error analyses.

Validity of the Operating Instructions

These operating instructions are valid for all supplied versions of the SIMATIC IPC347D.

The updates of the document will be published on the Siemens technical support (https://support.industry.siemens.com).

Conventions

The terms "PC" or "device" are sometimes used in place of the product name SIMATIC IPC347D in these operating instructions.

Basic knowledge required

Knowledge of personal computers and Microsoft operating systems is required.

General knowledge of automation control engineering is recommended.

Position in the information landscape

The documentation for the SIMATIC IPC347D includes the following sections:

- SIMATIC IPC347D, Quick Install Guide
- SIMATIC IPC347D, Important Notes Product Information
- SIMATIC IPC347D, Operating Instructions

The Quick Install Guide and the "Documentation and Drivers" DVD are in the accessory box supplied with the product. The Operating Instructions is part of the "Documentation and Drivers" DVD.

For further instructions on how to handle the software, refer to the corresponding documentation.

History

Currently released versions of these operating instructions.

Table 1 Versions for the IPC347D

Version	Comments
02/2014	First edition
07/2015	2nd edition

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Overview

1

1.1 Product description

The SIMATIC IPC347D is an industrial PC in 19" rack format design (4U).



SIMATIC IPC347D configuration plan

Type	• 19" (4 U) rack
Mounting	• support horizontal installation
Chipset	• Intel® H61
CPU type	• Intel® Pentium® Processor G2010 (2C / 2T, 3 MB Cache, 2.80 GHz) • Intel® Core™ i5-3340S Processor (4C / 4T, 6 MB Cache, up to 3.30 GHz)[1] • Intel® Core™ i5-3550S Processor (4C / 4T, 6 MB Cache, up to 3.70 GHz)[2]
Memory	• 2 GB DDR3-1600 • 4 GB DDR3-1600
Hard Disk	• 500 GB
Optical Driver	• DVD-ROM • DVD-R/W
Operation System	• Windows 7 Ultimate. Multi-Language (English version is preinstalled)[3], 64-Bit, SP1 • Without operating system
Display	integrated graph engine support up to 1920 x1200 pixels
Power Supply	220 V AC~, 50~60 Hz
Expansion slot	4 x PCI, 1 x PCIe x 1 2.0, 1 x PCIe x 8 (1 lane) 2.0, 1 x PCIe x 16 2.0
Interface	6 x USB (2 is in the front of the IPC and 4 is in rear.), 2 x COM (1 for RS232, 1 for RS422/RS485), 2 x Ethernet (RJ45, 10/100/1000Mbit/s), 1 x VGA, 1 x DVI-D, 2 x PS/2, Audio (line in, line out, mic)
Front LEDs	Power supply status, Hard disk status

1 FS version <= 03

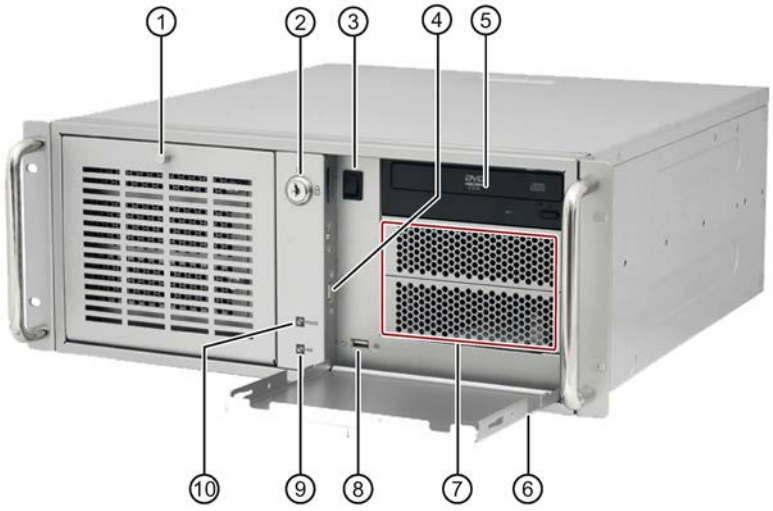
2 FS version >= 04

3 More language packages are available on the recovery DVD. You can install them as your need.

1.2 Design of the device

1.2.1 Exterior design

Front view

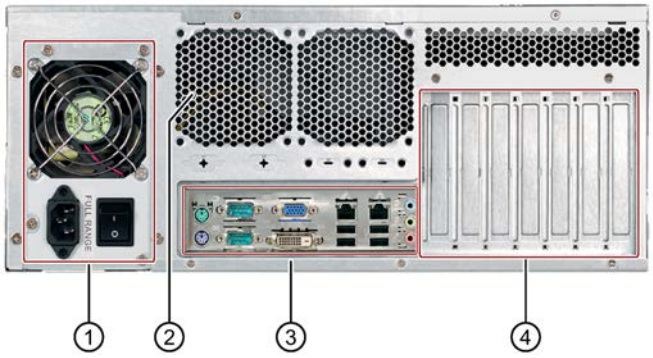


① Front left door
② Lock
③ On/off button
④ Connection for USB devices, backward compatible with USB 1.1 6[1]
⑤ DVD ROM or DVD+-R/W
⑥ Front right door
⑦ Drive bays 2 x 5.25"
⑧ Connections for USB devices, backward compatible with USB 1.1 5 [1]
⑨ HDD status display
⑩ Power status display

[1] Each USB port can be disabled/enabled separately by disabling/enabling the associated USB port in BIOS. On how to disable/enable the USB port, see USB configuration in Advanced setup (Page 94)

	Display	Meaning	LED	Description
⑨	HDD	Display for hard disk access	Off	No accessing
			Green flashing	Accessing data
⑩	Power	PC operating status display	Off	Hibernate, switched off or unplugged
			Green	PC is in operation.
			Green flashing	standby

Rear view



① Power supply

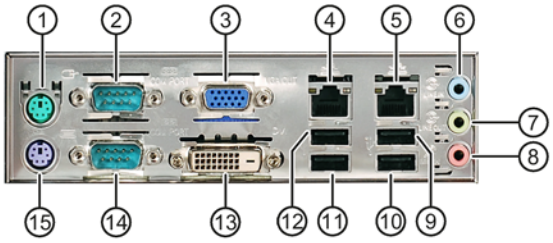
② Air outlet

③ Interfaces

④ Expansion slots for:

- 4 × PCI
- 1 × PCIe × 1
- 1 × PCIe x 8 (1 lane)
- 1 × PCIe x 16

Interfaces



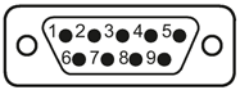
①	Mouse Port	connection for a PS/2 mouse
②	COM Port 1[1]	Serial interface 1 (V.24), 9-pin D-sub socket
③	VGA	Connection for monitor with VGA interface
④	LAN1[2]	RJ-45 Ethernet Port for 10/100/1000Mbps
⑤	LAN2[2]	RJ-45 Ethernet Port for 10/100/1000Mbps
⑥	Line in (blue)	connection for analog audio source, 3.5 mm m jack
⑦	Line out (green)	connection for active speakers or headset, 3.5 mm phono jack
⑧	Microphone (pink)	connection for microphone, 3.5 mm phono jack
⑨	USB Port 1[4]	Connections for USB 2.0 devices, backward compatible with USB 1.1
⑩	USB Port 2[4]	Connections for USB 2.0 devices, backward compatible with USB 1.1
⑪	USB Port 4[4]	Connections for USB 2.0 devices, backward compatible with USB 1.1
⑫	USB Port 3[4]	Connections for USB 2.0 devices, backward compatible with USB 1.1
⑬	DVI-D Port	Connection for CRT or LCD monitor with DVI interface
⑭	COM Port 2[3]	Serial interface 1 (V.24), 9-pin D-sub socket Default setting: RS232, Ring function[2]
⑮	Keyboard port	connection for a PS/2 keyboard

[1, 2,] See the pin assignment below.

[3] COM port 2 also supports RS422 and RS485. You can change it in BIOS. COM port 2 supports +12V voltage, +5V voltage. For more information on setting the COM2_V1 jumpers, refer to Jumpers (Page 75).

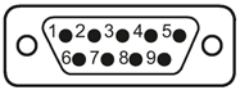
[4] Each of the USB port can be disabled/enabled separately by disabling/enabling its associated USB port in BIOS. On how to disable the USB port, see USB configuration in Advanced setup (Page 94).

Pin assignment for COM port 1



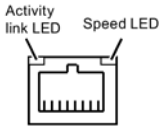
Pin	RS232
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

Pin assignment for COM port 2



Pin	RS-232	RS-422	RS-485
1	DCD	422TX-	485TX-/485RX-
2	RXD	422RX+	
3	TXD	422TX+	485TX+/485RX+
4	DTR	422RX-	
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		

LAN Port LED indications

Activity Link LED		Speed LED		
Status	Description	Status	Description	
Off	no link established	Off	link speed 10Mbps	
Orange	link established	Red	link speed 100Mbps	
Blink	transferring data	Green	link speed 1Gbps	

Power supply

The following figure shows the connector for the IPC347 power supply.



1.2.2 Operator controls

WARNING

No mains disconnection

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

In the case of damage to the device, connecting cables or improper opening of the device, there is a risk of fire and electric shock.

Always pull out the power plug when the device is not in use. Disconnect the device from the network by additional measures, for example, with an isolating switch.

NOTICE

Make sure the disconnect devices main readily operable.

The MAINS plug or an appliance coupler of the apparatus is used as the disconnect device, the disconnect device shall remain readily operable.

On/off switch

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



① On/off switch

On/off button

Note

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

Note

The PC switches on automatically after the power recovers when "Power Failure Recovery" is active.

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

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

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



① The on/off/reset button has three functions:

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

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

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

Safety instructions

2

2.1 General safety instructions

Fully disconnecting the device from mains voltage

⚠ WARNING

Risk of fire and electric shock

The on/off button and 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 follows 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".
- Properly connect the device to a protective conductor.

Devices in the control cabinet

⚠ WARNING

Life-threatening voltages are present with an open control cabinet

When you open the control cabinet, some areas or components 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 to the device, machine or plant due to device and system expansions

Device and system expansions may contain faults and affect the entire device, machine or plant.

Device and system expansions may violate safety rules and regulations regarding radio interference suppression. If you install or replace device or system expansions and damage your device, the warranty is voided.

Note the following:

- Only install device or system expansions designed for this device. Contact your technical support team or the point of sale to find out which device and system expansions are suitable for installation.
- Please observe the information on electromagnetic compatibility in the technical specifications.

CAUTION

Fire hazard due to overheating of the device

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

- Observe the safety and installation instructions for the expansion cards.
- If necessary, install the device in an enclosure that meets the requirements of paragraphs 4.6 and 4.7.3 of the standards EN 60950-1:2006 and IEC/UL/EN/DIN-EN 60950-1.

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 lithium batteries and the released pollutants can cause serious physical injury. Damaged 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 51)" in the section "Device maintenance and repair".
- Replace the lithium battery only with an identical battery or types recommended by the manufacturer.
- Do not throw lithium batteries into fire, do not solder on the cell body, do not recharge, do not open, do not short-circuit, do not reverse polarity, do not heat above 100°C and protect from direct sunlight, moisture and condensation.

High frequency radiation

NOTICE
Unintentional operating situations High frequency radiation, e.g. from a cellular phone, may interfere with device functions and can cause malfunctions resulting in personal injury or material damage. Avoid high-frequency radiation: • Remove radiation sources from the environment of the device. • Switch off radiating devices. • Reduce the radio output of radiating devices. • Please observe the information on electromagnetic compatibility in the technical specifications.

ESD directive

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 directive in the technical specifications.

2.2 Industrial Security

Industrial security

Siemens offers products and solutions with Industrial Security functions that support the safe operation of equipment, solutions, machines, devices and/or networks. They are important components in a comprehensive Industrial Security concept. As a result the products and solutions from Siemens are constantly evolving. Siemens recommends obtaining regular information regarding product updates.

For safe operation of Siemens products and solutions appropriate protective measures (e.g., cell protection concept) must be taken and each component must be integrated in a comprehensive Industrial Security concept, which corresponds with the current state of technology. The products of other manufacturers need to be taken into consideration if they are also used. You can find addition information on Industrial Security under (http://www.siemens.com/industrialsecurity).

Sign up for our product-specific newsletter to receive the latest information on product updates. For more information, see under (https://www.industry.siemens.com/newsletter/public/AllNewsletters.aspx).

Disclaimer for third-party software updates

This product includes third-party software. Siemens AG only provides a warranty for updates/patches of the third-party software, if these have been distributed as part of a Siemens software update service contract or officially released by Siemens AG. Otherwise, updates/patches are undertaken at your own risk. You can find more information about our Software Update Service offer on the Internet at Software Update Service (http://w3.siemens.com/mcms/topics/en/simatic/licenses/software-update-service/Pages/Default.aspx).

2.3 Headphones

CAUTION

Impaired hearing due to excessive sound pressure

The setting of the volume and the equalizer can increase the sound pressure in the headphones. Other factors not mentioned by the manufacturer can also influence the sound pressure, for example, the operating system, equalizer software, firmware and driver.

Excessive sound pressure from headphones can result in impaired hearing or even loss of hearing.

Set the volume control and equalizer to the lowest value before you put on the headphones. Keep checking the volume control setting. Only use headphones and software approved by the manufacturer.

CAUTION

Protection against access by unauthorized persons

An unauthorized user can operate the device incorrectly and bypass logon by restarting the device.

Operator actions by unauthorized persons jeopardize operational reliability.

Take the following safety precautions:

- Lock the front panel cover.
- Do not use keyboards with an on/off button (Power button).
- If the device has an on/off button, assign the parameters of the function of the on/off button to meet your requirements under Windows. You can find the settings in the "Power Options" menu.

2.4 Notes on use

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.

NOTICE
Rack-mount instructions A) Elevated Operating Ambient - If installed in a closed or multi-unit rack, the operating ambient temperature of the rack environment may be greater than the room ambient. Therefore consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer. B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. C) Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading. D) Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern. E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e. g. use of power strips).

CAUTION

Ambient conditions

Ambient conditions for which the device is not suitable can cause faults or damage the device.

Note the following:

- The MAINS plug or an appliance coupler of the device is used as the disconnect device, the disconnect device shall remain readily operable.
- Operate the device only in closed rooms. Failure to comply nullifies the warranty.
- Do not put anything on top of the device.
- To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.
- Device shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the device.
- Operate the device only in accordance with the ambient conditions specified in the technical specifications.
- Do not expose the device to direct sunlight or other strong sources of light.
- Without additional measures, such as a supply of clean air, the device may not be used in locations with harsh operating conditions caused by acidic vapors or gases.
- Protect the device against dust, moisture and heat.
- Observe the permitted mounting positions of the device.
- Do not obstruct the venting slots of the device.

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 IPC347D. Make sure the cable you use provides a proper earth connection.

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

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 you receive a delivery, inspect the packaging for visible transport damage.
2. In case of any transport damage, turn to the shipping company in charge. Have the forwarder 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.

NOTICE
Damage to the device during transport and storage If a device is transported or stored without packaging, shocks, vibrations, pressure and moisture may impact the unprotected device. A damaged packaging indicates that ambient conditions have already massively impact the device. The device may be damaged. Do not dispose of the original packaging. Pack the device when it needs to be transported or stored.

5. Inspect the contents of the packaging and all the accessories you ordered. Make sure that they are complete and not damaged.

6. If the contents of the packaging are incomplete, damaged or do not match with your order, inform our service department or the sales representative who deliver you the product 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 the plant. A damaged device has unpredictable properties and states.

Death or serious injury could occur.

Make sure that the damaged device is not inadvertently installed and put into operation.

NOTICE

Damage from condensation

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

Moisture can result in short-circuits and damage the device.

In order to prevent damage to the device, observe the following rules:

If a condensation happens, wait approximately 12 hours or until the device is completely dry before switching it on.

7. Keep the enclosed documentation in a safe place. It belongs to the device. You need the documentation when you commission the device for the first time and meet other problems in later works.
8. Write down the identification data of the device in the table.

3.1.2 Device identification data

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

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

Rating plate

The rating plate is located on the inside of the front door for the SIMATIC IPC347D.

The rating plate of the SIMATIC IPC347D is shown below.

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



COA label

The COA label (Certificate of Authenticity) is only provided with a pre-installed Windows operating system. Open the front door to check for the COA label.



3.2 Installing the device

3.2.1 Installation information

NOTICE
Risk of fire If you install the device in an unapproved mounting position or if you do not observe the ambient conditions, the device can overheat. Conformity with the low voltage directive becomes void. Device overheating can cause a fire. Proper functioning of the device is no longer guaranteed. Before you install the device, note the following general installation information.

- Install the device only in one of the described permitted mounting positions.
- Provide adequate volume in the switchgear cabinet for air circulation and heat transport. Keep at least 10 cm between the device and the switchgear cabinet.
- Do not cover the vent slots of the device.
- Ensure that the maximum air intake temperature, measured 5 cm before the air intake opening, does not exceed 40° C. The maximum air intake temperature must be accounted for especially when sizing closed switchgear cabinets.
- The minimum distance between the device and the housing is 10 cm on the air output end.
- Ensure that the installed device does not pose a danger, for example, hit someone by falling over.

3.2.2 Mounting location and position

Optional mounting locations

The device can be mounted horizontally in control desks and 19" rack systems.

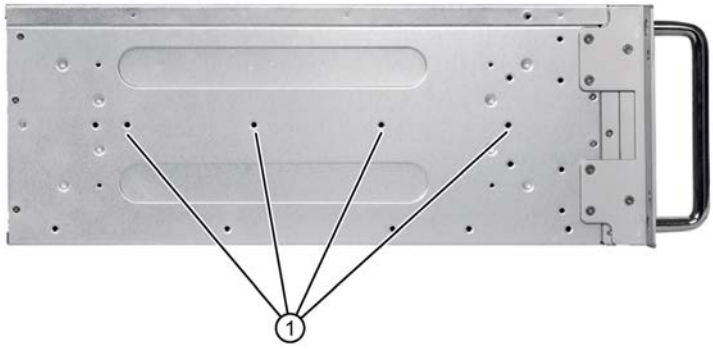
Possible mounting positions

You can mount the device as follows:

- Mounting with mounting brackets, horizontal
- Mounting on device bases, horizontal
- Mounting on telescopic rails

  When telescopic rails are used for mounting, the device can be withdrawn fully from the cabinet or rack. For detailed information on telescopic rails, see the sections "Technical specifications of the telescopic rails (Page 73)" and "Dimensional drawing for the use of telescopic rails (Page 67)".

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



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

⚠ CAUTION

Risk of short-circuit and electric shock

Some small widget or water may drop into the device from the holes in the rear of the device.

Make sure the rear cover of device is vertical to the ground after mounted. Don't put anything filled with liquid on top of the device.

⚠ CAUTION

Risk of physical injury

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

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

Secure the device using additional measures. The mounting screws of the telescopic rails may not protrude more than 5 mm into the device.

3.3 Connecting the device

3.3.1 Connection information

⚠ WARNING

Complete isolation

The on/off switch does not isolate the device from the mains.

In the case of damage to the device or connecting cables, there is a risk of fire. There is a risk of electric shock in the case of improper opening of the device.

Disconnect the device from the mains as follows:

- Always remove the power plug when you are not using the device. The power plug must be freely accessible.
- Use a central isolating switch in the case of cabinet installation.
- Always ensure that the socket on the device or the safety socket of the building installation is freely accessible and located as close as possible to the device, especially if the power plug is secured by a power plug lock.

⚠ 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:

- Pull out the power plug in time when a thunderstorm is approaching.
- Do not touch mains cables and data transmission cables during a thunderstorm.
- Keep sufficient distance from electric cables, distributors, systems, and so on.

NOTICE

Damage by regenerative feedback

Regenerative feedback of voltage to ground by a connected or installed component destroys the device.

Connected or built-in I/Os, for example, a USB drive, are not permitted to supply any voltage to the device. Regenerative feedback is generally not permitted.

⚠ 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 IPC347D. Make sure the cable you use provides a proper earth connection.

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

3.3.2 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. Make sure that the on/off switch ② is in the '0' (off) position.

   Put the switch ② in the '0' position prevents unintentional startup of the device when you plug in the power cable.
2. Connect the power cable to socket ①.
3. Insert the power cable in the electrical socket.
4. Switch on the on/off switch ②.

3.3.3 Connecting the device to networks

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

Ethernet

Wake on LAN and Remote Boot are supported.

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

You need the "SOFTNET S7" software package for using the SIMATIC S7 to communicate.

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 SIMATIC NET can be found on the SIMATIC NET Manual Collection CD. The software package and the documentation are not included in scope of the delivery.

Additional information

You can find additional information at the following link:

Siemens central support (https://support.industry.siemens.com)

3.3.4 Dual-monitoring

You can operate on up to two monitors with the VGA and DVI-D cables.

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

Commissioning the device 4

4.1 Requirements for commissioning

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

- Peripheral equipments, keyboard, mouse and monitor are connected.
- The power supply is connected.

Note

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

4.2 Switching on the device

4.2.1 Initial commissioning

For the configuration with operating system pre-installed, the operating system is set up automatically on the device after the initial switch on. The commissioning procedure in this chapter is only applicable to the IPCs with configuration 4.

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.

Procedure

1. Press the on/off button.

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

2. Follow the instructions on the screen.

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

3. Make the region and language settings.

   Information on changing the regional and language settings at a later time is available in the section **Installing new software**, **Setting up the language selection by means of the Multilanguage User Interface (MUI.)** in the operating system instructions.

Note

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

Result

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

4.3 Switching off the device

Shutting down the operating system

For Windows operating systems:

- Select "Start" > Shut down"

  or

- Briefly press the on/off button (unless otherwise configured in the power options). Information on the position of the button is available in the section "Operator controls (Page 14)".

For non-Windows operating systems:

- Briefly press the on/off button.

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 button and 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 button for more than 4 seconds.

Installing hardware expansions

5

5.1 Opening 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 you take precautionary measures when you open the device, for example, when opening device doors, device covers or the housing cover.

Limitation of liability

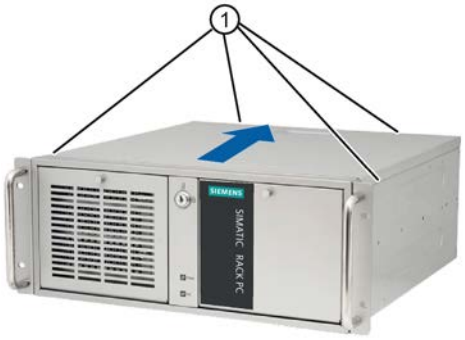
All technical specifications and approvals apply only to expansions which are approved by the Siemens AG. We are not liable for functional limitations caused by using a third-party devices or components.

Observe the installation instructions for the components. UL approval of the device is valid only if UL-approved components are used in observance of their intended purpose ("Conditions of Acceptability").

Requirement

- The device is disconnected from the power supply.
- All connection cables are unplugged.
- PH2 screwdriver

Procedure



1. Remove the retaining screws ①.



2. Move the cover in the direction as the arrow.

3. Lift the cover from the back and remove it.

5.2 Expansion cards

5.2.1 Notes on the expansion cards

Note

Expansion card specification

The device is designed for use with modules conforming to PCI specification 2.3 (32-bit;

33 MHz, Rev. 2.3) and PCIe specification 2.0. The dimensions of the cards cannot exceed the specified dimensions. If the height of the card exceeds the specified dimension, you may experience contact problems, malfunctions and difficulties with the assembly.

The permitted expansion card dimensions are specified in the section Dimensional drawings for the installation of expansion cards (Page 66).

Note

The PCI card is limited to 5 V and universal board. The total power consumption of the modules is not permitted to exceed 75W in total.

5.2.2 Installing expansion cards

Requirements

- The device is disconnected from the mains.
- The device is open.

Procedure

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



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



3. Insert the expansion card into the slot.



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



6. Secure the bracket.

   If you are installing a short expansion card, remove the locking screw from the retainer and install it in the opposite hole.
7. Close the device.

5.3 Disk drives

5.3.1 Removing the drive module

Requirement

- The device is disconnected from the mains.
- PH2 screwdriver

Procedure

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



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



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

5.3.2 Installing drives or hard disks

Requirement

- The drive carrier has been removed.
- PH2 screwdriver

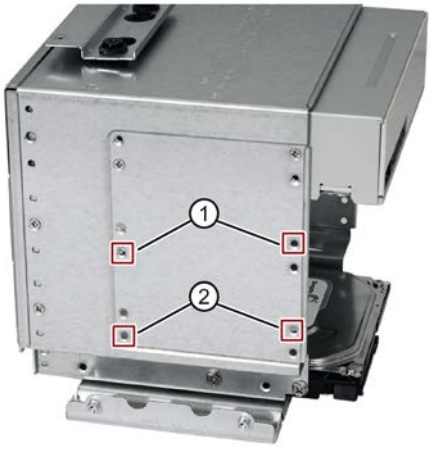
Procedure

1. If you are installing a 3.5" drive or hard disk, attach two mounting brackets or a 3.5"/5.25" mounting rack for the drive.
2. Remove the retaining screws and remove the cover plate for the expansion drive.



3. Secure the drive to the slot ① or ② with 4 screws.

   The screws to be installed on the right side of the slot are highlighted in the figure below.



4. Install the driver cage again.
5. Connect the power and data cables to the drive.

5.3.3 Removing and installing internal hard disks

Requirement

- The device is disconnected from the mains.
- The device is opened.
- The drive module is taken out of the chasis.

Procedure for removing the hard disk drive

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



Procedure for installing the hard disk drive

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

Device maintenance

6

6.1 Removing and installing hardware components

6.1.1 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 the 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 the sales team from whom you purchased your PC to find out which system expansion devices can be installed.

NOTICE

Risk of device damage.

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

⚠ CAUTION

Risk of motherboard damage.

Improper BIOS updating may result in irreparable motherboard damage.

Only use the qualified tool from Siemens and follow the guideline when you need to update the BIOS. The warranty will be invalid if you update the BIOS with unqualified tool and damage the motherboard.

CAUTION

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.

Strictly follow the guidelines mentioned below when handling modules which are sensitive to ESD:

- 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.

Tools

Tools to open the device, see section Opening the device. You can make repairs on the device with the following tool:

- PH2 screwdriver for protective conductor connection and enclosure

6.1.2 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:
Hard disk drive	3 years
CMOS backup battery	5 years
Fan	3 years
Filter mat	Depending on the degree of soiling[1]

[1] The filter can be reused after cleaning.

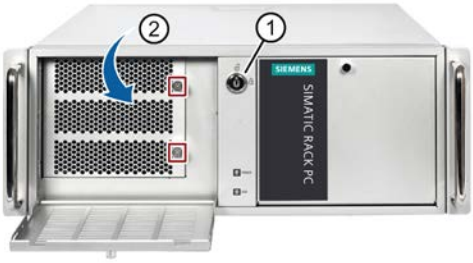
6.1.3 Replacing filters

Requirement

- The device is disconnected from the mains.
- A filter mat

Procedure

1. Unlock the front cover with the key.



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



4. Pull the marked screw to open the fan bracket.
5. Remove the filter in the direction of the arrow.
6. Follow the steps for removing the filter in reverse order to install a new one.

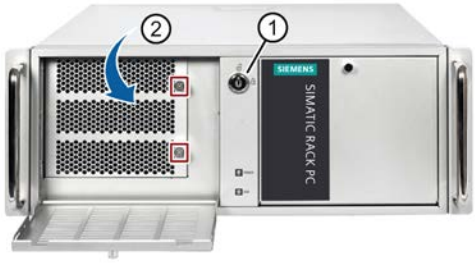
6.1.4 Removing the device fan

Requirement

- The device is disconnected from the mains.
- The front panel cover is open
- T20 screwdriver
- A fan with the same type

Procedure - Removing the fan

1. Unlock the front cover with the key.



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



4. Pull the marked screw to open the fan bracket.
5. Remove the highlighted screws.
6. Remove the fan in the direction of the arrow.
7. Pull the fan plug from the connector.

Procedure - Installing the fan

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

6.1.5 Installing memory module

Dual channel memory

The motherboard provides two DDR3 memory sockets and supports dual channel technology. The memory capacity of the device can be upgraded to a maximum of 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 following table shows the supported memory type.

Module type	Module Size	Description
DDR3-SDRAM	4GB	DDR3-1600 512M x 64 UDIMM 240pin
DDR3-SDRAM	2GB	DDR3-1600 256M x 64 UDIMM 240pin

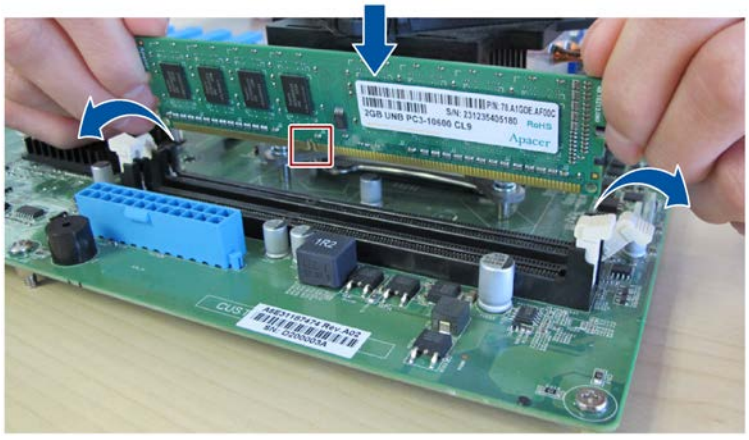
To install the memory module

WARNING

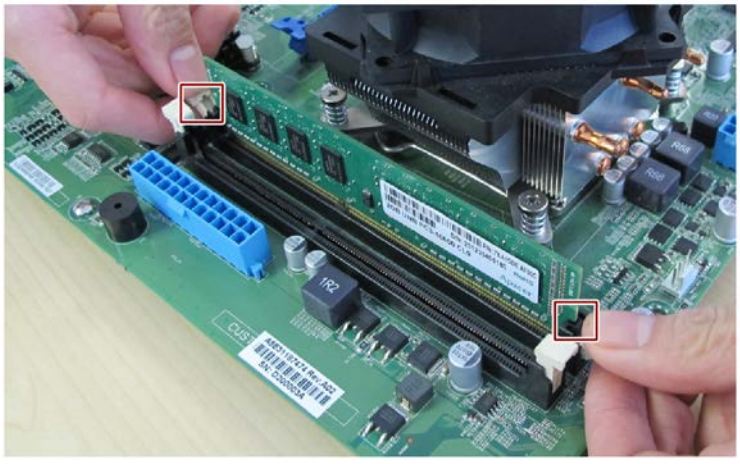
- Only install memory modules designed for the default motherboard.
- Recommend to select memory modules with the same brand, capacity, speed, and chips if you use multiple Memory Modules.
- Unplug the power cord from the power outlet before installing Memory Module.
- A memory module can be installed 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 DDR3 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.



6.1.6 Replacing the backup battery

Note before you replace the battery

Note

Batteries are wearing parts. Backup batteries should be replaced at intervals of 5 years in order to maintain PC functionality.

⚠ CAUTION

Risk of explosion

Risk of explosion if battery is replaced by an incorrect type.

Disposal

⚠ CAUTION

Disposal of the batteries

Depleted batteries must be disposed of in accordance with local regulations.

Preparation

Note

The configuration data of the device are deleted when the battery is replaced. Note the current BIOS setup settings.

Replacing the battery

The location of the backup battery on the motherboard and the procedure for replacing it is described in the Chapter "Jumpers", Battery Socket.

Reconfiguring the BIOS setup

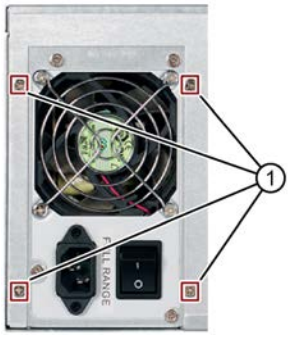
When a battery is replaced, the configuration data of the device is deleted and must be reconfigured in the BIOS setup.

6.1.7 Removing the power supply

Requirement

- The device is disconnected from the mains.
- The top cover is opened.
- All connection cables are unplugged.
- T10 screwdriver

Procedure



1. Disconnect the power supply cables of the drives and the motherboard.
2. Remove the cable ties securing the power cables in the housing.
3. Remove the retaining screws ①.
4. Remove the power supply of the housing from the top.

6.1.8 Removing the motherboard

Requirement

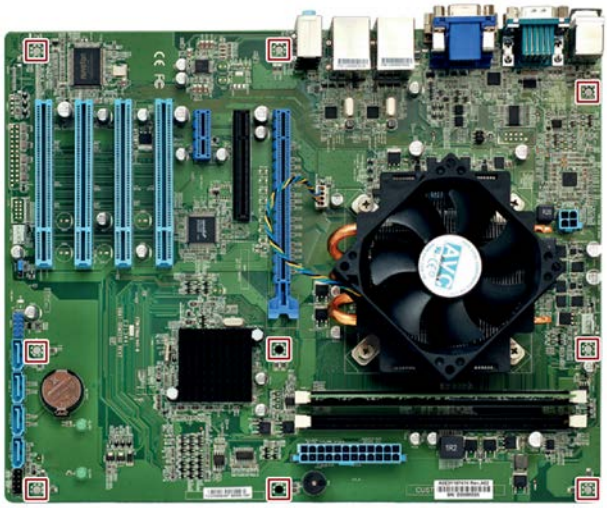
- The device is disconnected from the mains.
- The top cover is opened.
- A motherboard

  The motherboard as a spare part is supplied without a processor and memory modules.

Procedure

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

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



6.1.9 Replacing the processor

Requirement

- The device is disconnected from the mains.
- The device is opened.
- A suitable processor

  Only an approved processor is permitted to be installed on the motherboard of the device. If the processor type is changed, the BIOS must be updated so that the suitable microcode is loaded.

Note

Risk of motherboard damage

The motherboard may get damaged during changing the processor.

Don't change the processor unless it is really necessary.

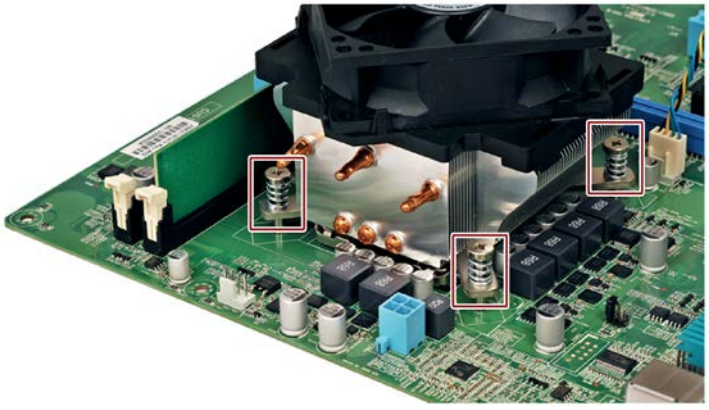
Procedure

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



3. Remove the highlighted screws.

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



4. Remove the heat sink.
5. Unlock the socket and lift the socket cover.

6. Remove the processor.
7. Install the new processor on the socket, as shown in the figure.

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



Processor type and clock frequency

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

Note

Damage to the processor due to high clock frequency

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

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

6.1.10 Beep code

Beep code

Beeps	Description
1 short beep	Power on correctly
4 short beeps	Memory error
5 short beeps	Keyboard error

6.2 Installing the software

6.2.1 Source for installation of the operating system

If the operating system is faulty, you can reinstall it with one of these DVDs:

- With the recovery DVD and "Documentation and Drivers" DVD.

  The recovery DVD is included in the scope of delivery when you have ordered a device with operating system. The recovery DVD includes:

  – The installation program for installing the operating system with the supported languages

  – The tools for setting up the drives

  The basic language of the installed operating system is English. If additional languages are required, install these from the recovery DVD.

  The "Documentation and Drivers" DVD contains the documentation and the hardware drivers.

- From the Restore DVD

  The Restore DVD is included in the scope of delivery when you have ordered a device with operating system. The DVD contains an image file with the following software:

  – Operating system with installed hardware drivers

6.2.2 Restoring the delivery state

You can restore the original factory software using the Restore DVD. The DVD contains the necessary images and tools for transferring the factory software to the drive of your device. Restoration of the entire driver C: (system) and D: or only drive C: is possible. This allows you to retain any user data on drive D:.

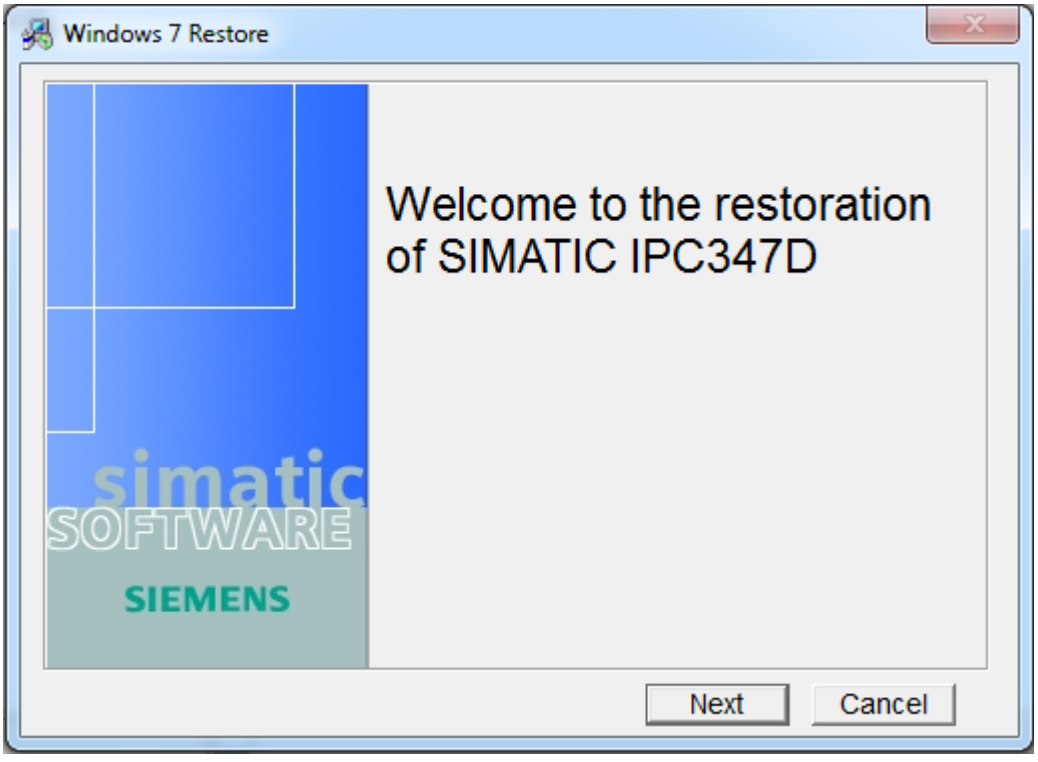
Retrieving authorization or license

- Check whether you can retrieve your authorization or license key from the disk and perform this procedure if possible.
- If backup is not possible, please contact Customer Support. There you can obtain information necessary for software authorization.

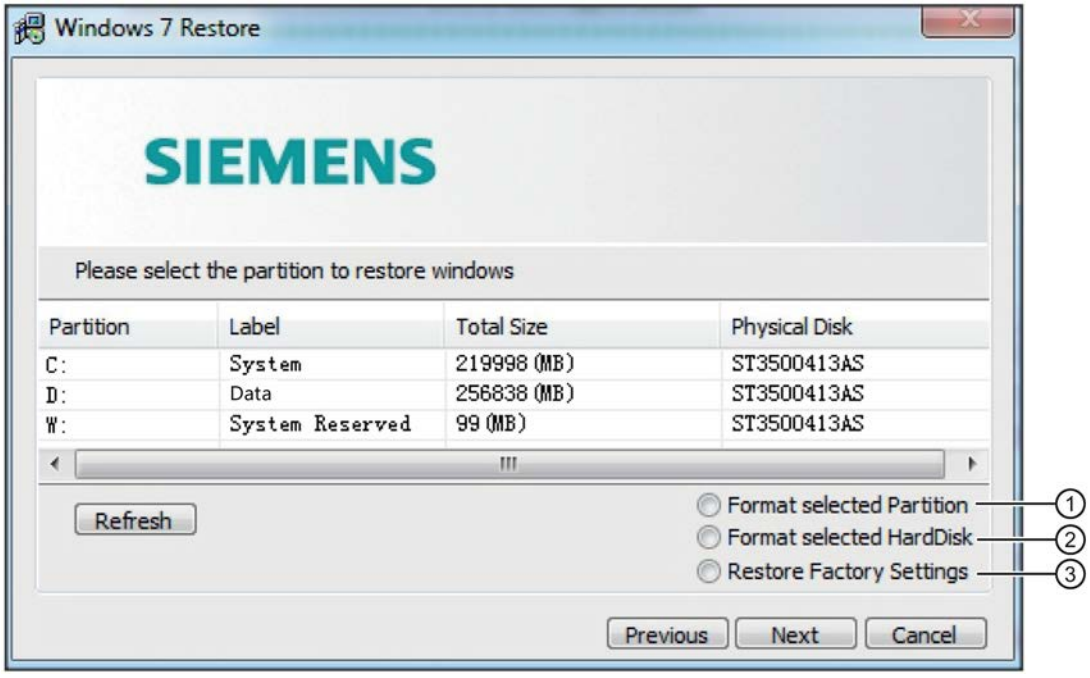
Procedure

1. Insert the Restore DVD into the DVD drive.
2. Reboot the device.
3. Press the <ESC> or <DELETE> key to enter setup.

   The "Boot Menu" is displayed when initialization is completed. For setting the boot sequence, refer to Boot Setup (Page 104).
4. Set CD/DVD as the priority 1 in the boot menu.
5. Reboot the device.
6. Click **next** to enter the start the restoration.



7. Select the disk you want to restore.



①	Format and restore the system to the selected partition.
②	Format all partitions on the selected hard disk, but the partitions size are not changed. The system is restored to the selected partition.
③	The selected hard disk is repartitioned and reformatted to the factory setting. The operating system is restored to the first partition. Note: The selected hard disk must be the same type as the factory-shipped hard disk.

NOTICE
Risk of data lost If "Format selected partition" is set, all data on the selected drive (system partition) will be deleted. All data, user settings and all authorizations or license keys on the selected drive will be lost! All data on the selected drive will be completely deleted, reformatted and overwritten with the original factory software. If "Format selected hard Disk and restore to factory setting" is set, all data, user settings, authorizations or license keys will be lost on the entire hard disk setting.

8. Click **OK** to reboot the device in prompt window after the restoring finished.

6.2.3 Installing Windows

6.2.3.1 Installation of Windows 7

Requirement

You need the Recovery DVD for the operating system you want to install. It is included in the product package.

Procedure

1. Insert the Recovery DVD into the DVD drive.
2. Restart the device with the on/off button.
3. Press the <ESC> or <DELETE> key to enter setup.

   After initialization, a boot menu is displayed.
4. In the boot menu, select the optical drive using the cursor keys. It is identified by a "P" in front of the SATA port number.

   Example:

   ```
   P3 - OPTIARC DVD-ROM DDU1681S
   ```
5. Confirm the selection by pressing ENTER.
6. **Immediately** press any key when you see the following prompt to install the operating system from the Recovery DVD.

   ```
   Press any key to boot from CD or DVD ..
   ```

   After a few seconds, you will see the "Install Windows" installation program. For setting the boot sequence, refer to Boot Setup (Page 104).
7. Now follow the instructions in the installation program. You can find additional information on this in the section: "Install Windows" installation program.

"Install Windows" installation program

The language of the installation program and the operating system you want to install has been preset to English. You can install other languages of the operating system after the installation.

Setting up partitions and integrating storage controllers unknown to the operating system

You can set up partitions during the installation process and integrate storage controllers that are unknown to the operating system. To do so, select "Custom (advanced)" when prompted for the installation type in the "Install Windows" installation program.

The following dialog windows are then available:

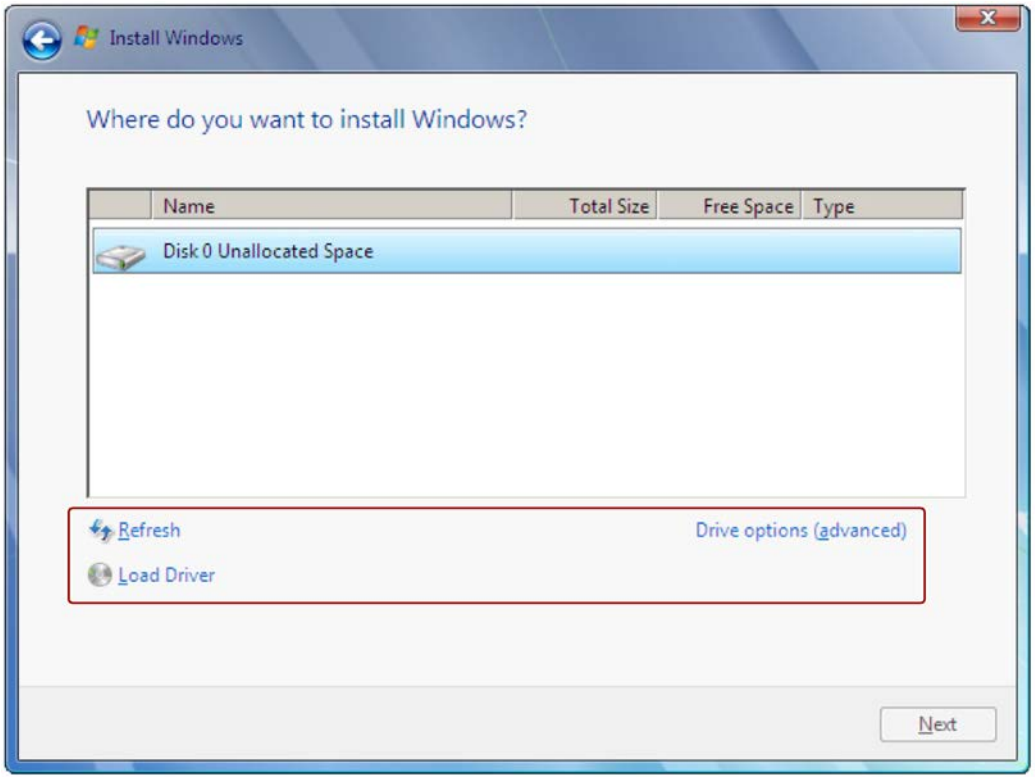


Figure 6-1 Example: Windows installation window

Refresh	Updating
Drive options (advanced)	Integration of controller drivers unknown to the operating system and required for installation.

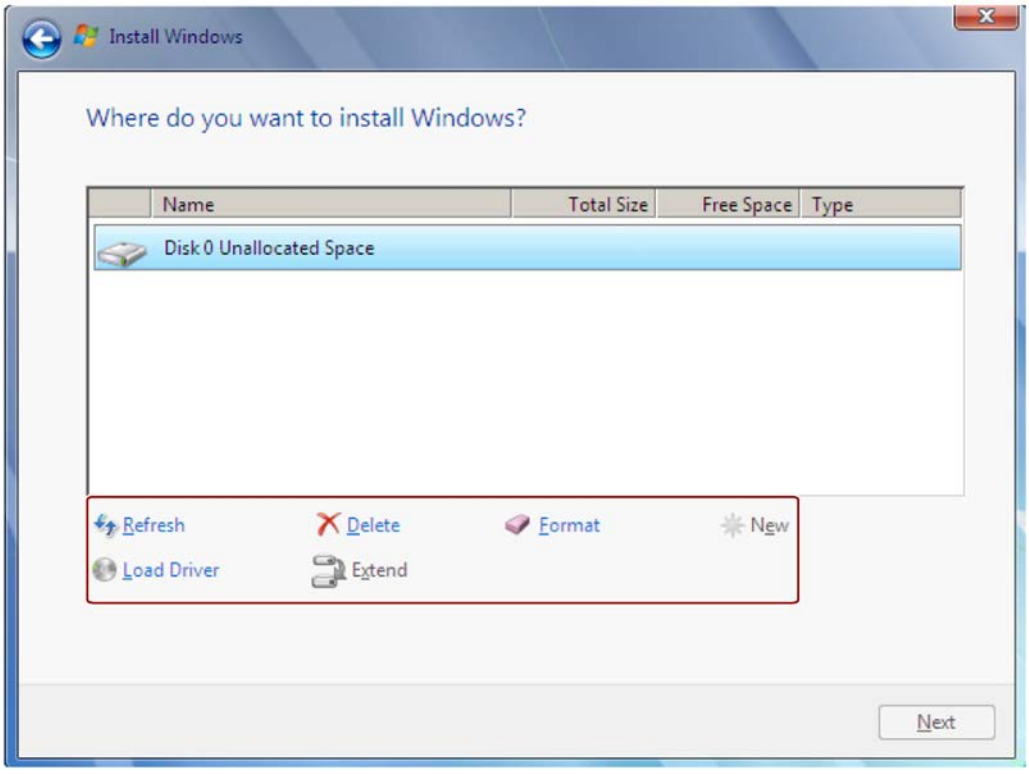


Figure 6-2 Example: Windows installation window "Drive options (advanced)"

Refresh	Updating
Load Driver	Integration of controller drivers unknown to the operating system and required for installation.
Delete	Deleting a partition
Extend	Changing the partition size
Format	Formatting a partition
New	Creating new partitions
	Identification for error messages, for example, if the data medium was not formatted in the required "NTFS" format.

1. Make sure that the partition on which you want to install the operating system is large enough (at least 20GB) and is set up with an NTFS file system.

   The recommended minimum size of this partition varies, depending on the operating system, how much RAM you have available and how much additional software you want to use. Information on how the data medium is partitioned in its delivery state is available in the tables below.

2. Select the partition on which you want to install the operating system.
3. Click "Next".

Installation is started.

The Windows operating system is installed on the data medium.

Partitions in delivery state for Windows 7 64-bit

Partition	Name	Size	File system
First	SYSTEM RESERVED	100 MB	Automatically set up by installation program
Second	SYSTEM	100 GB	NTFS not compressed
Third	DATA	Remainder	NTFS not compressed

6.2.4 Installing drivers and software

Install the drivers and software from the "Documentation and Drivers" DVD that ships with the product. Procedure:

1. Insert the DVD.
2. Double-click **index.htm** to open the navigation page.
3. Select **Drivers** from the index.
4. Select the operating system you use.
5. Install the required driver. For more information on installing the drivers, see Installing the drivers on Windows 7 (Page 89).

Note

The driver for the chipset has to be installed before all other drivers with a new installation of Windows XP or Windows 7.

Technical specifications

7

7.1 Certificates and approvals

ISO 9001 certificate

The Siemens quality management system for our entire product creation process (development, production and sales) meets the requirements of ISO 9001:2008.This has been certified by DQS (the German society for the certification of quality management systems). Certificate No.: 01 100 1430201

Software license agreements

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

CE marking

The device meets the requirements and safety specifications of the EMC Directive 2004/108/EC "Electromagnetic Compatibility" and the Low Voltage Directive 2006/95/EC. The EC declaration of conformity and the corresponding documentation are made available to authorities in accordance with the EC directives stated above. Your marketing contact can provide these if requested.

EMC	EN 61000-3-2:2006 + A1:2009 + A2:2009, EN 61000-3-3:2013,
	EN 61000-6-4:2007 + A1:2011, EN 1000-6-2:2005
LVD	EN 60950:2006 + A11:2009 + A1:2010 + A12:2011

Software license agreements

If the device is supplied with installed software, observe the corresponding license agreements.

UL approval

The following approval is available for the device:

- Underwriters Laboratories (UL) to standard UL 60950-1
- Canadian National Standard CAN/CSA-C22.2 No. 60950-1-07 (I.T.E)

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.

Australia and New Zealand



This product meets requirements of EN IEC 61000-6-4:2011 Generic standard.

KOREA



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.

BSMI



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

7.2 Guidelines and declarations

7.2.1 Electromagnetic compatibility

The device is designed for the following areas of application:

Scope of application	Requirements for	
	Emission	Immunity
Industrial area	IEC 61000-6-4:2011	IEC 61000-6-2:2005

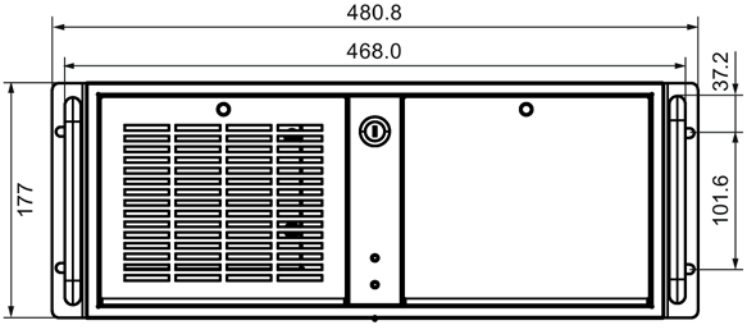
WARNING

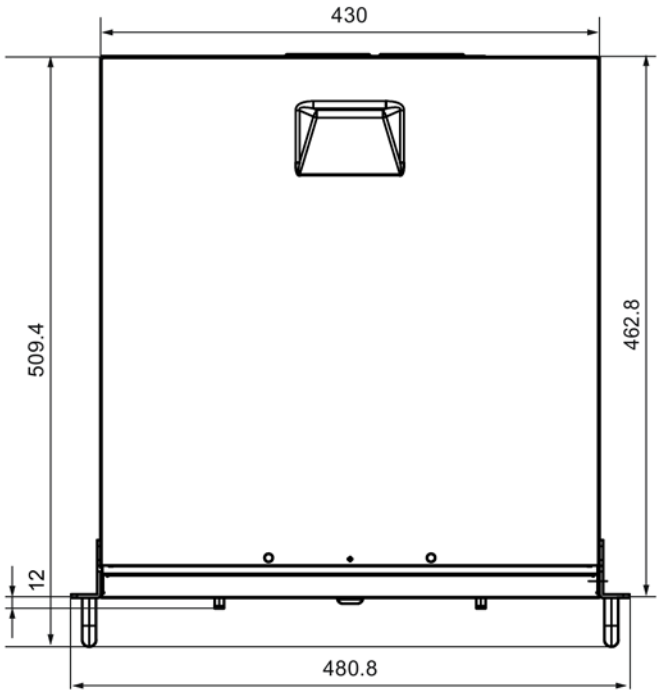
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

7.3 Dimension drawings

7.3.1 Dimension drawing of the device

Front view and plan view

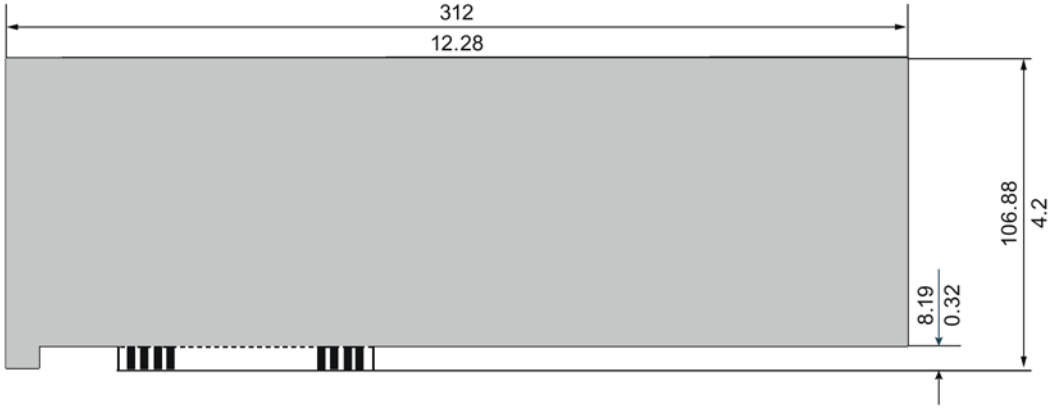




All dimensions are in mm.

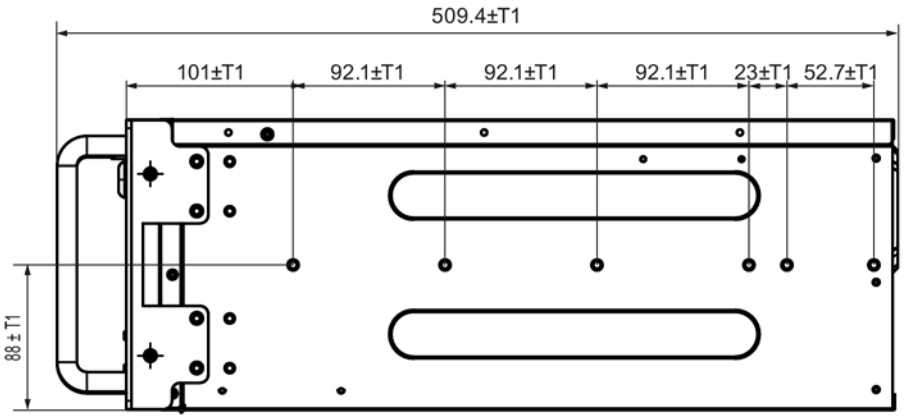
7.3.2 Dimensional drawings for the installation of expansion cards

Long PCI card, PCIe card



Dimension: mm / Inch

7.3.3 Dimension drawing for the use of telescopic rails



Dimensions: mm

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

7.4 Technical specifications

7.4.1 General technical specifications

Note

Applicability of technical specifications

The following technical specifications only apply under the following conditions:

- The default configuration of the device is not changed.
- The device is in good working order.
- The fan cover and filter mat are installed.
- The device is closed.

Dimensions	481 × 177 × 509 (W × H × D in mm) For detailed information on dimensions, refer to "Dimension drawing of the device (Page 65)".
Weight	13.3 up to 17.0 kg; depending on the equipment
Supply voltage (V_N)	100 V AC to 240 V AC (-10%, +10%)
Input current AC	• Continuous current RMS value up to 6 A (at 115 V), 3 A (at 230 V) • During startup up to 140 A and 5 ms
Frequency	50 to 60 Hz; minimum 47 Hz to maximum 63 Hz, sinusoidal

Transient voltage interruption	17 ms at 220 V, 50 Hz@ full load (350 W) max. 10 events per hour; recovery time of at least 1 s
Power consumption	• Full load (100%, 350 W) at 82% efficiency • Typical load (50%, 175 W) at 85% efficiency • Light load (20%, 70 W) a at 82% efficiency
Power loss/heat emission	300 W = 300 J/s = 0.28 BTU/s 270 W = 270 J/s = 0.26 BTU/s
Current output (DC)	+5 V/21 A, +3.3 V/20 A in total 130 W permitted +12 V/16 A, +12 V/16 A, -12 V/0.5 A, +5 Vaux/3.0 A The total sum of all voltages is max. 210 W
Noise emission	< 55 dB (A)
Degree of protection	IP 20 according to EN 60529
Dust protection	overpressure when running
Safety	
Protection class	Protection class I compliant with IEC 61140
Safety regulations	IEC60950-1, GB4943.1-2011

Electromagnetic compatibility

Emitted interference	Conducted Emission (AC): IEC 61000-6-4, CISPR 22 • 0.15 - 0.5 MHz: 79 dB (µV) QP, 66 dB (µV) A • 0.5 - 30 MHz: 73 dB (µV) QP, 60 dB (µV) A Radiation Emission: IEC 61000-6-4, CISPR 22 • 30 - 230 MHz: 40 dB(µV/m) QP (10 m distance) • 230 -1000 MHz: 47 dB (µV/m) QP (10 m distance) • 1- 3 GHz: 76 dB (mV/m) P; 56 dB (mV/m) A (3 m distance) • 3- 6 GHz: 80 dB (mV/m) P; 60 dB (mV/m) A (3 m distance) Harmonic currents: EN 61000-3-2 class D Voltage fluctuation and flicker: EN 61000-3-3
Noise immunity on supply lines	± 2 kV; in accordance with IEC 61000-4-4; Burst ± 1 kV; in accordance with IEC 61000-4-5; Surge sym ± 2 kV; in accordance with IEC 61000-4-5; Surge asym
Noise immunity on signal lines	± 2 kV (in accordance with IEC 61000-4-4; Burst; length > 30m) ± 1 kV (in accordance with IEC 61000-4-4; Burst; length < 30m) ± 2 kV (in accordance with IEC 61000-4-5; Surge, length > 30m)
Immunity to discharges of static electricity	± 4 kV, contact discharge (to IEC 61000-4-2) ± 8 kV, atmospheric discharge (to IEC 61000-4-2)
Immunity to RF interference	Radiation Immunity (to IEC 61000-4-3) • 80-1000 MHz: 10 V/m, 80% AM (1 kHz) • 1.4 - 2 GHz: 3 V/m, 80% AM (1 kHz) • 2 - 2.7 GHz: 1 V/m, 80% AM (1 kHz) Conducted Immunity (to IEC 61000-4-6) • 150 kHz - 80 MHz: 10 V, 80% AM (1 kHz)

Magnetic field	50 Hz / 60 Hz, 30 A/m (to IEC 61000-4-8)
Voltage dips	> 95% reduction, 0.5 cycles (to IEC 61000-4-11) > 30% reduction, 25/30 cycles at 50/60 Hz (to IEC 61000-4-11)
Voltage interruptions	> 95% reduction, 250/300 cycles at 50/60 Hz (to IEC 61000-4-11)

Ambient conditions

Climatic ambient conditions	
Temperature	Tested in accordance with IEC 60068-2-2, IEC 60068-2-1, IEC 60068-2-14
Operation	+5 °C to +40 °C 1 Gradient:≤ 10 °C/h, no condensation
Storage/transportation	–20 °C to +60 °C Gradient:≤ 20 °C/h, no condensation
Relative humidity	Tested in accordance with IEC 60068-2-78, IEC 60068-2-30
Operation	5% to 80% at 25 °C, no condensation Gradient:≤ 10 °C/h, no condensation
Storage/transportation	5% to 95% at 25 °C, no condensation Gradient:≤ 20 °C/h, no condensation
Atmospheric pressure	
Operation	1013 to 795 hPa, (0 to +2000m)
Storage/transportation	1013 to 660 hPa, (0 to +3500m)
Mechanical ambient conditions	
Vibration Storage/transportation	Tested in accordance with IEC 60068-2-6, 10 cycles 5 to 8.4 Hz, amplitude 3.5 mm; 8.4 to 500 Hz: 9.8 m/s^2
Resistance to shock Storage/transportation	Tested in accordance with IEC 60068-2-27 Half-sine: 250 m/s^2, 6 ms, 1000 shocks per axis
Special features	
Quality assurance	In accordance with ISO 9001

1 No burner operation
At +5 °C to +35 °C without restrictions, even burner operation

Motherboard

Processor	• Intel® Pentium® Processor G2010 (2C / 2T, 3 MB Cache, 2.80 GHz) • Intel® Core™ i5-3340S Processor (4C / 4T, 6 MB Cache, up to 3.30 GHz)[1] • Intel® Core™ i5-3550S Processor (4C / 4T, 6 MB Cache, up to 3.70 GHz)[2]
Chipset	Intel® H61 Express
Slots for RAM modules	2 X DIMM socket for DDR3, expandable up to max. 16 GB
Main memory	2 GB or 4 GB, DDR3 1600 240 PIN in signal channel non-ECC, un-buffered memory
Expansion slots	• 4 × PCI • 1 × PCIe x8 (1 lane) • 1 × PCIe x1 • 1 × PCIe x16 You can use modules with a length of up to 312 mm.
Max. permitted power consumption PCIe x1, x8 (1 lane) and x16 slot	3.3 V 3 A; 12 V 2.1 A; 3.3 Vaux 0.4 A
Max. permitted power consumption per PCI slot (5 V, 32-bit)	5 V, 5 A or 3.3 V, 7 A; 12 V 0.5 A; 3.3 Vaux 0.4 A
Max. permitted power loss per PCI slot	≤ 25 W.
PCI modules with exclusive 5 V supply	≤ 25 W.
Max. permitted power loss over all slots	≤ 75 W. In total, the 3.3 Vaux current of 1.2 A must not be exceeded.

[1] FS version <= 03

[2] FS version >= 04

Drives (for configuration details, refer to the order documentation)

Hard disk	Internal installation: • 500 GB, 3.5" SATA, 7200 rpm
DVD-ROM	5.25" SATA Read: • DVD ROM: Single layer 16x, dual layer 12x • DVD +/-R: 16x • DVD +/-RW: 12x, DVD +/-R DL: 8x • CD-ROM/CD-R: 48x • CD-RW DVD-RAM: 5x
DVD writer [1]	5.25" SATA Read: • DVD ROM: Single layer 16x, dual layer 12x • DVD-R/+R: 16x • DVD-RW/+RW: 12x • CD-ROM/CD-R: 48x, Finalized CD-RW: 40x Write: • DVD-RAM 12x • DVD+/-R 24x, DVD+RW 8x, DVD-RW 6x, DVD+/-R9 (DL) 12x • CD-R: 48x, CD-RW or plus: 24x

[1] Depending on the operating system, you need to install additional software (burner software) to use the full functionality of the DVD writer.

When using a DVD writer, the device should generally be free of mechanical disturbances during burning.

Graphics

Graphics memory	Dynamic Video Memory Technology (uses between 32 MB and 1.7 GB RAM)
Resolutions/frequencies/colors	DVI / VGA up to 1920 x 1200 pixels at 60 Hz, color depth up to 32 bit/pixels
Graphics controller	Intel® HD Graphics, 3D engine (integrated in processor)

Interfaces

COM 1	RS232 (V.24), 9-pin D-sub plug
COM 2	RS232/RS485/RS422, 9-pin D-sub plug (selected by BIOS menu)
VGA	Connection of an analog monitor
DVI-D	Connection of a digital monitor
Keyboard	PS/2 keyboard connection
Mouse	PS/2 mouse connection

USB	High speed USB 2.0 • USB (on rear panel): 4 x (500 mA) • USB (on front panel): 2 x (500 mA)
Ethernet	2 x Ethernet interface (RJ45) Wake on LAN, remote boot supported. 10/100/1000 Mbps
Audio • Micro • Line In • Line Out	Realtek® ALC887, 5.1 channels, high definition audio codec.

See also

Product description (Page 9)

7.4.2 Power requirements of the components (maximum values)

Component	**Voltage**					
	+5 V	**+3.3 V**	**+12 V1**	**+12 V2(CPU)**	**-12 V**	**5 V aux**
motherboard with processor and heat sink	2.5 A	1.2 A	4.6 A		0.1 A	0.3 A
Front fan			0.5 A			
Basic system [1]	**2.5 A**	**1.2 A**	**5.1 A**		**0.1 A**	**0.5 A**
Expansions						
Hard disk drive SATA [1]	0.6 A		0.8 A			
DVD ROM [1]	0.9 A		0.8 A			
DVD writer [1]	1.1 A		1.4 A			
Single lines of current (max. permitted) [2]	20 A	21 A	16 A	16 A	0.5 A	3 A
Total power consumption, permitted	210 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 130 W.

7.4.3 Basic power supply

Voltage	Max. current	Voltage stability
+12 V	16 A	± 5 %
+12 V	16 A	± 5 %
–12 V	0.5 A	± 10 %
+5 V	21 A [1]	± 5 %
+3.3 V	20 A [1]	± 5 %
+5 V aux	3.0 A	± 5 %

[1] The total output of the +5 V and +3.3 V voltage must not exceed 130 W.

The inrush current is:

- For 110 V AC: Maximum 70 A, 5 ms
- For 230 V AC: Maximum 140 A, 5 ms

7.4.4 Telescopic rails

Ultimate load per pair	At least 30 kg
Full extraction length	At least 536 mm
Rail thickness	Maximum 9.7 mm
Mounting screws	M5 x 6 mm or M6 × 6 mm

The mounting screws of the telescopic rails may not protrude by more than 5 mm into the enclosure.

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 IPC347D. 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 BIOS description

You can configure the system functions and hardware configuration in the BIOS.

The BIOS is set to a default state suitable to the respective device configuration prior to delivery. The most important settings are shown in the table below.

Tab	Option	Default setting
Advanced	Boot on LAN with PXE	Disabled
	SATA configuration	IDE
	HW monitor--CPU FAN control	Auto Mode
	HW monitor--CHA FAN control	Auto Mode

For a detailed description of how to call up and operate the BIOS setup and which menus and setting options are available, refer to the Appendix BIOS.

CAUTION

Risk of data lost

After a BIOS update, all BIOS settings will restore to its original state.

Appendix Motherboard

A

A.1 Jumpers

Setting jumpers

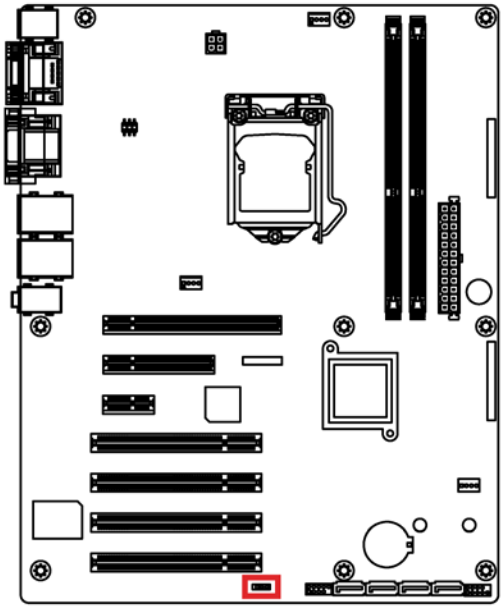
The board has a number of jumpers that allow you to configure your system to suit your application. A jumper is a kind of electric switch. Through setting jumpers, you can configure your card to match the needs of your application.

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

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.

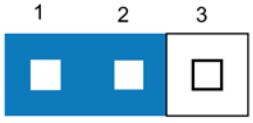
A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distribut or or sales representative before you make any change.

Clear COMS

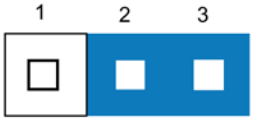


CLRTC1

Jumper position	Function
1-2	protected (default)
2-3	Clear COMS



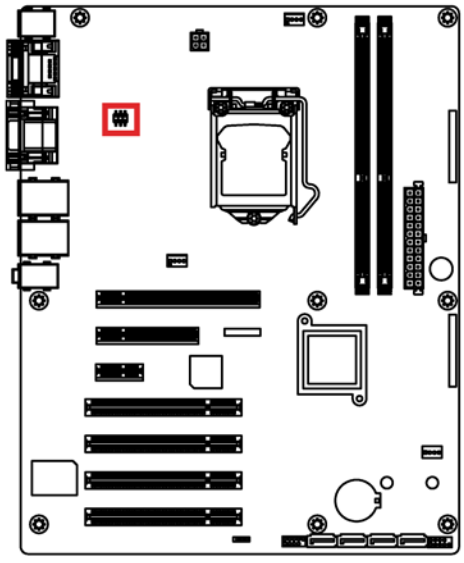
protected(defaulted)



Clear CMOS

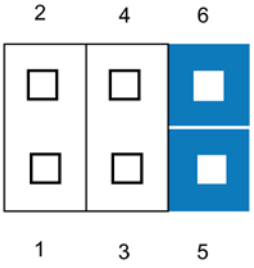
NOTICE
Move the jumper back to protected mode after clearing CMOS.

COM2 Ring/+5V/+12V Selection (COM2_V1)



COM2_V1

Jumper position	Function
1-2	+12V/250mA
3-4	+5V/250mA
5-6	Ring (default)



A.2 Motherboard general

Installing information

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

they are not in the chassis.

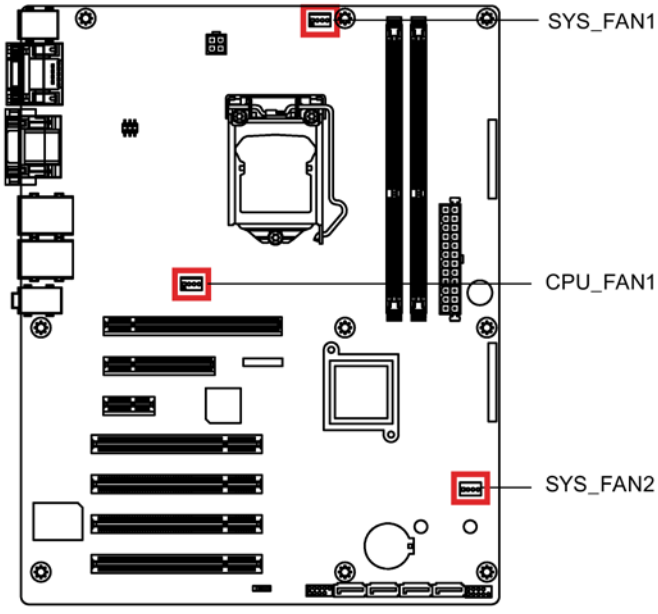
⚠ WARNING

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

- Do not remove or ruin the motherboard serial number labels.
  These labels and the serial numbers are required for warranty validation.
- Wear electrostatic discharge (ESD) wrist strap or gloves when handling or touching the motherboard.
- When handling the motherboard, avoid to touch any metal leads or connectors.
- Always unplug the AC power cord from the power outlet before you installing or removing the motherboard.
- Place the motherboard on an anti-static pad or in a electrostatic shielding container during the operation.
- Turn off the power supply before you removing the power supply cable from the motherboard.
- Before turning on the power supply, check if the input voltage setting follows the local voltage standard.
- Before operating the motherboard, make sure that the cables and the power connectors of all the attached hardware components are connected. Turning on the power before you 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.

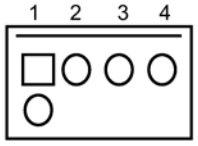
A.3 Fan connector

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



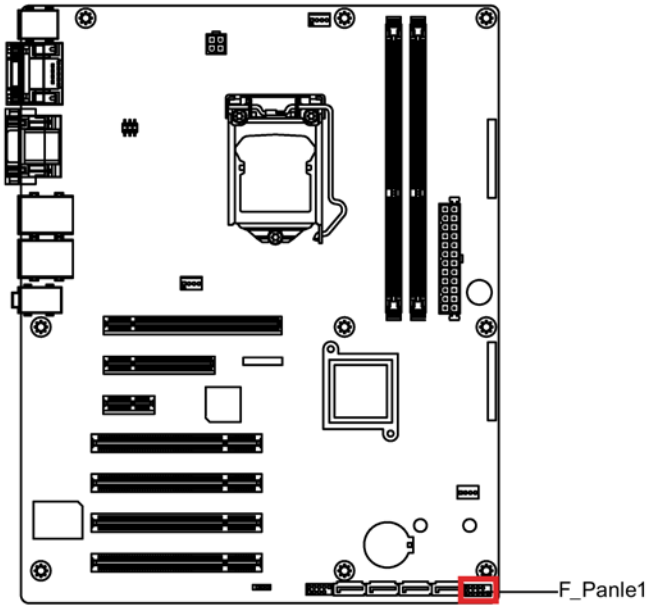
SYS_FAN1/CPU_FAN1/SYS_FAN2

Pin	Signal
1	PWM
2	SENSE
3	VCC
4	GND



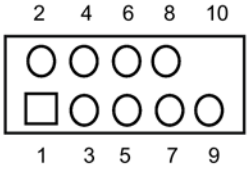
A.4 Front panel connector

The front panel connector is used to connect cable to Chassis Front Panel.



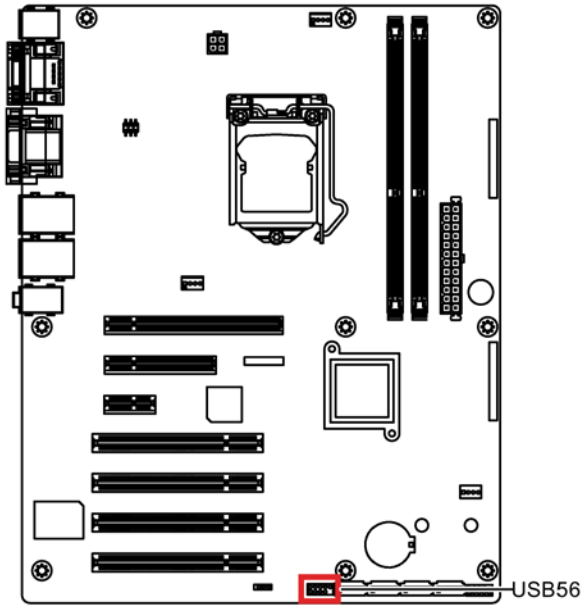
F_Panel1

Pin	Signal
1	HDLED+
2	PLED+
3	HDLED-
4	PLED-
5	GND
6	PWRSW#
7	HWRST#
8	GND
9	(Not Connected)
10	(Empty)



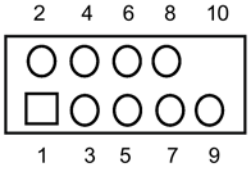
A.5 Internal USB 2.0 connector

The USB2.0 connector is shown below.



USB56

Pin	Signal
1	+5V
2	+5V
3	S_USB_PN4
4	S_USB_PN5
5	S_USB_PP4
6	S_USB_PP5
7	GND
8	GND
9	(Empty)
10	(Not Connected)

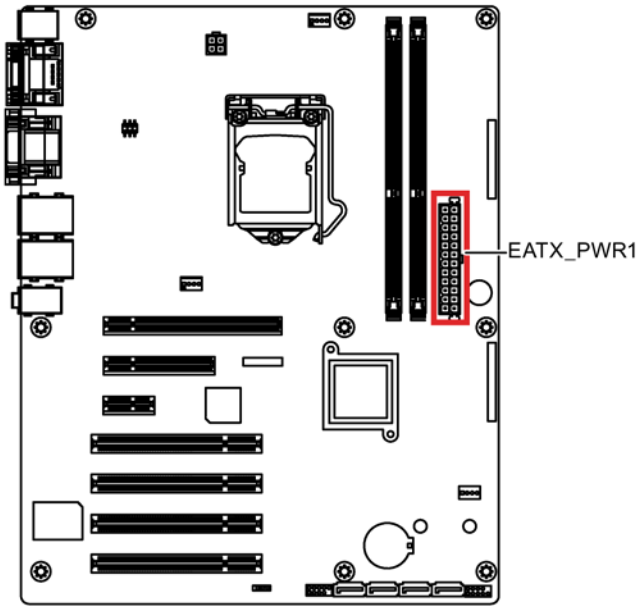


A.6 ATX power 24-pin connector (EATX_PWR1)

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

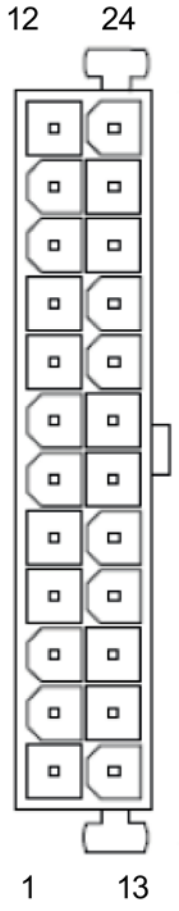
Note

ATX Power 4-Pin connector must be connected, otherwise the system cannot be turned on.



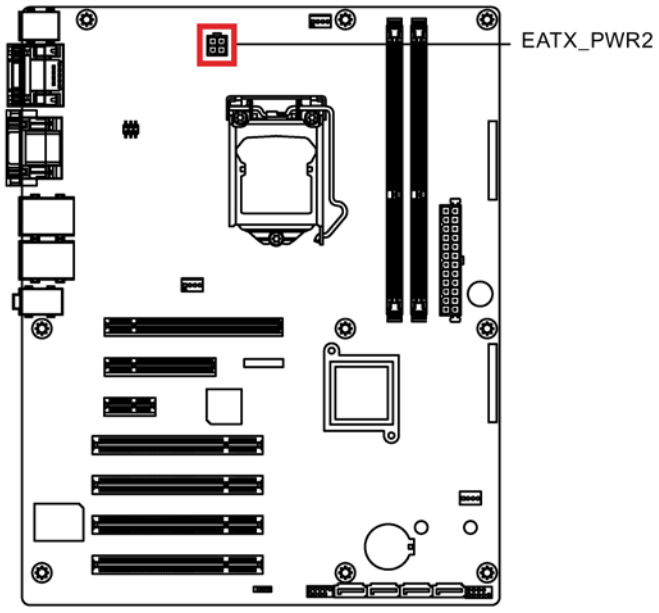
EATX_PWR1

Pin	signal
1	+3.3V
2	+3.3V
3	GND
4	+5V
5	GND
6	+5V
7	GND
8	PSON
9	+5V standby
10	+12V
11	+12V
12	+3.3V
13	+3.3V
14	-12V
15	GND
16	Power on
17	GND
18	GND
19	GND
20	-5V
21	+5V
22	+5V
23	+5V
24	GND



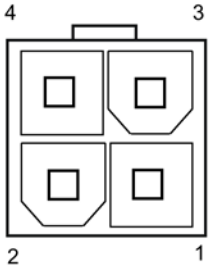
A.7 ATX Power 4-pin connector(EATX_PWR2)

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



EATX_PWR2

Pin	Signal
1	GND
2	GND
3	+12V
4	+12V

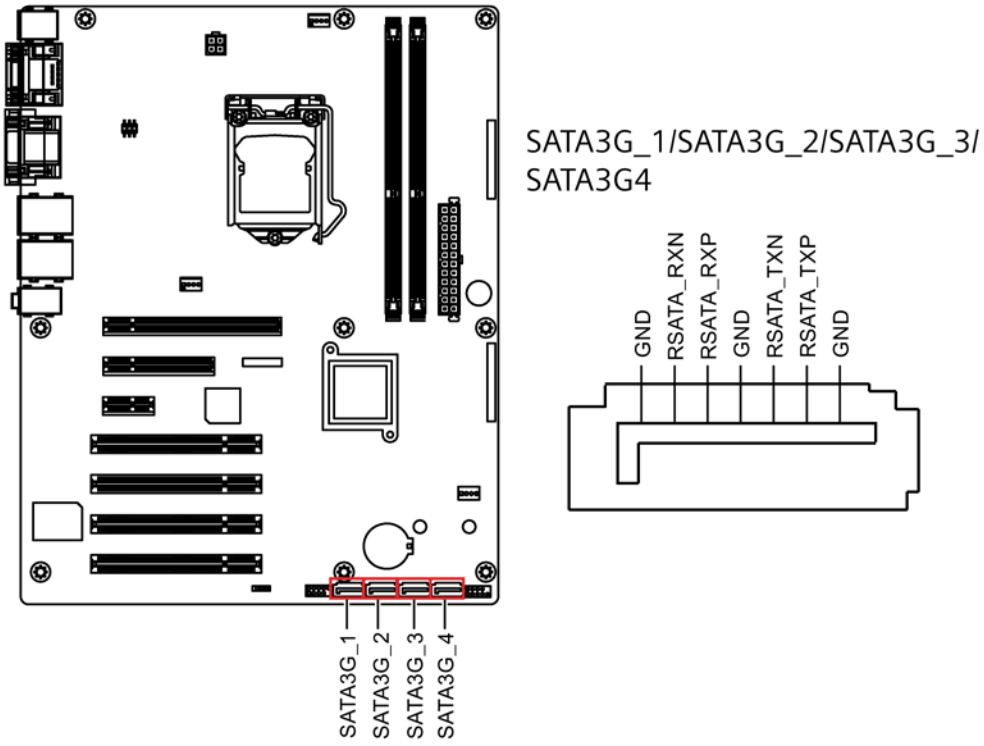


A.8 DDR3 Memory sockets

The motherboard provides two memory sockets, which support two pieces of 240-pin DDR3 Memory Modules. Refer to the chapter Installing memory module (Page 49) for detailed installation instruction.

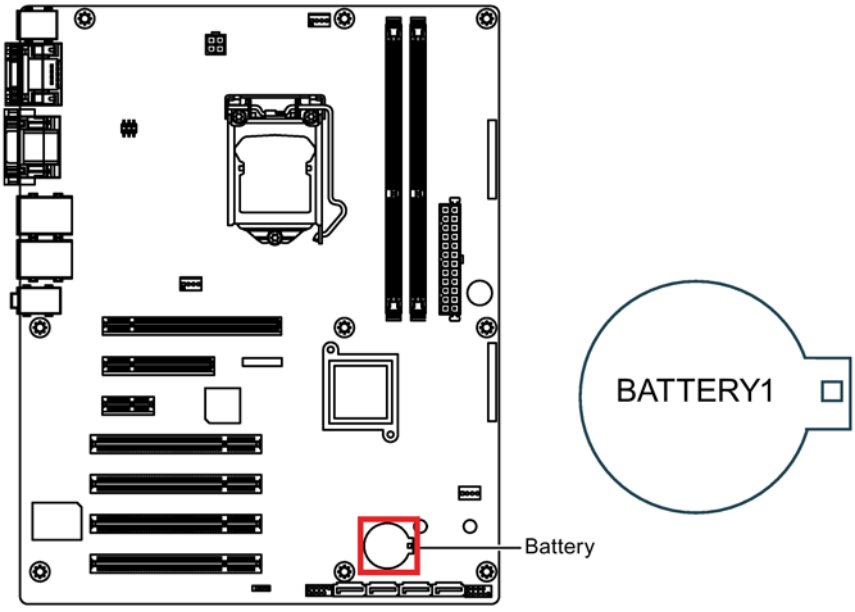
A.9 SATA 3.0Gbps port connectors (SATA3G_1/SATA3G_2/SATA3G_3/SATA3G_4)

The motherboard provides four pieces of 7-pin SATA Port Connectors, which support SATA 3.0Gbps devices through the SATA Cable.



A.10 Battery socket

The battery socket on the motherboard is for CR2032 Battery.



A.11 Intel CPU socket(LGA1)

Intel CPU Socket is for Intel 1155 Pin CPU. Refer to the CPU installing section Replacing the processor (Page 53) for detailed information.

A.12 Installing drivers

A.12.1 Installing the drivers on Windows XP

Requirements

Windows XP Operating System is installed in your IPC.

Note

If you are going to enable AHCI Mode (through BIOS Setup Menu) for your system, r ead Windows XP OS installation with AHCI mode
(Page 88) before installing Windows XP. Otherwise you can only use IDE Mode.

It is recommend to install the latest Windows XP Service Pack (Service Pack 3 currently) to gain the most updated driver support for new technology.

Setting up the language selection for Windows XP

Note

Specific information for setting up the language for Windows XP Professional is available in the following manual (not included in the scope of delivery):

- Microsoft Windows XP Professional, Technical Reference (MSPress No. 934)

To Change the settings for language, region and formats of a registered user account

1. Click **start**, point to **Settings** and click **Control Panel** to open the Control Panel.
2. Double-click **Regional and Language Options**.
3. On the **Languages** tab, under **Language used in menus and dialogs**, click the language you want.
4. You can make the desired changes in the **Regional Settings**, **Languages** and **Advanced** tabs.

Open the navigation page

1. Put the *Documentation and Drivers* DVD in to the optical driver.
2. Double click **My Computer** → **Documentation and Drivers** to open the DVD.
3. Click **index.htm** to open the navigation page.
4. Click **Driver** to open the supported OS list.
5. Select the OS you use on the IPC.

To install the Intel chipset driver

1. Click **Chipset: Intel Chipset H61 Express**.
2. Click  to install the driver.
3. Click **Yes** to allow the computer start the installation.

   The system starts to extract file from driver package.
4. Click **Next** to start driver installation.
5. Click **Yes** to accept License Agreement.
6. Click **Next** to confirm the *Readme file information* and move on.
7. Click **Next** to continue setup.
8. Check the box next to “Yes, I want to restart this computer now.” and click **Finish** to reboot the computer.

To install the Intel graphics driver

1. Click **Display onboard: Intel HD Onboard Graphics**.
2. Click  to install the driver.
3. Click **Next** to start the setup.
4. Click **Yes** to accept License Agreement.
5. Click **Next** to confirm the *Readme file information* and move on.
6. Click **Next** button to continue the setup.
7. Check the box next to “Yes, I want to restart this computer now.” and click **Finish** to reboot the computer.

To install the Realtek LAN driver

1. Click **Ethernet onboard: Realtek 8111 Onboard Network Adaptor**.
2. Click  to install the driver.
3. Click **Run** to allow the computer start the installation.

   Then the installation will proceed automatically.
4. Click **Next** to continue the installation.
5. Click **Install** to start the driver installation.
6. Click **Finish** to confirm the Realtek LAN driver is installed.

To install the Realtek AUDIO driver

1. Click **Audio: Realtek 887 High Definition Audio**.
2. Click  to install the driver.
3. Click **Run** to allow the computer start the installation.

4. Click **Next** to start the driver installation.
5. Check the box next to “Yes, I want to restart this computer now.” and click **Finish** to reboot the computer.

To Install the Intel management engine software

1. Click **Chipset: Intel Management Engine**.
2. Click  to install the driver.
3. Click **Next** to allow the computer start the installation.
4. Click **Yes** to accept License Agreement.
5. Click **Next** to continue the installation.
6. Click **Finish** to confirm the driver is installed.

A.12.2 Windows XP OS installation with AHCI mode

Windows XP OS installation with AHCI mode

Note

This process is required for installation of Windows XP OS into SATA Device with AHCI Mod e (setting through BIOS Menu).

This process must be done during Windows XP installation. Otherwise Windows XP cannot be installed into SATA HDD.

1. Copy AHCI driver into USB floppy disk before Windows XP installation.
2. Insert the USB floppy drive into a USB port before you turn on the IPC. The SATA Mode must be set as “AHCI” in BIOS Setup.
3. Press **F6** during the driver searching.
4. Select the AHCI driver location and press the **ENTER** key.

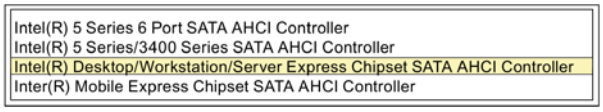


Figure A-1 AHCI driver location

5. Follow the instructions that the window shows, then the system install the driver automatically.

A.12.3 Installing the drivers on Windows 7

Requirements

Windows 7 Operating System is installed in your IPC.

To open the driver list

1. Put the *Documentation and Drivers* DVD into the optical driver.
2. Double-click **My Computer** → **Documentation and Drivers** to open the DVD.
3. Double-click **index.htm**.
4. Click **Drivers** to open the available OS list.
5. Click the OS you use.

The available driver list opened.

Step 1: install the Intel chipset driver

1. Click **Chipset: Intel Chipset H61 Express.**
2. Click  to install the chipset driver.
3. Click **Run** to allow the computer start the installation.

   The system starts to extract file from driver package.
4. Click Run start the installation.
5. Click **Next** to start driver installation.
6. Click **Yes** to accept License Agreement.
7. Click **Next** to confirm the *Readme file information* and move on.
8. Click **Next** button to continue the setup.
9. Check the box next to "Yes, I want to restart this computer now." and click **Finish** to reboot the computer.

Step 2: install the Intel graphics driver

1. Click **Display onboard: Intel HD Onboard Graphics**.
2. Click  to install the chipset driver.
3. Click **Run** to allow the computer to start the installation.

   The system starts to extract file from driver package.
4. Click **Yes** to start the installation.
5. Click **Next** to start the setup.
6. Click **Yes** to accept License Agreement.
7. Click **Next** to confirm the *Readme file information* and move on.

8. Click **Next** to continue setup.
9. Check the box next to "Yes, I want to restart this computer now." and click **Finish** to reboot the computer.

Step 3: install the Realtek LAN driver

1. Click **Ethernet onboard: Realtek 8111 Onboard Network Adaptor**.
2. Click  to install the chipset driver.
3. Click **Run** to start the installation.
4. Click **Yes** to confirm.

   Result: Then the installation proceeds automatically.
5. Click **Next** to continue the installation.
6. Click **Install** to start the driver installation.
7. Click **Finish** to confirm the Realtek LAN driver is installed.

Step 4: install the Realtek AUDIO driver

1. Click **Audio: Realtek 887 High Definition Audio**.
2. Click  to install the Audio driver.
3. Click **Run** to allow the system to start the installation.
4. Click Run to start the installation.
5. Click **Next** to continue the installation.
6. Check the box next to "Yes, I want to restart this computer now." and click **Finish** to reboot the computer.

Step 5: install the Intel management engine software

1. Click **Chipset: Intel Management Engine**.
2. Click  to install the driver.
3. Click **Next** to allow the computer to start the installation.
4. Click **Yes** to accept License Agreement.
5. Click **Next** to continue the installation.
6. Click **Finish**.

Appendix BIOS

B

B.1 BIOS getting start

BIOS setup utility: Aptio TSE

The motherboard's 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 motherboard.
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.

NOTICE
• 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 reset button on chassis. – Press the power button to turn off system then turn it back on.

BIOS setup menu

The Aptio™ TSE BIOS setup menu is the first screen that you can navigate. Each BIOS setup menu option is described in this manual.

Navigation

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.

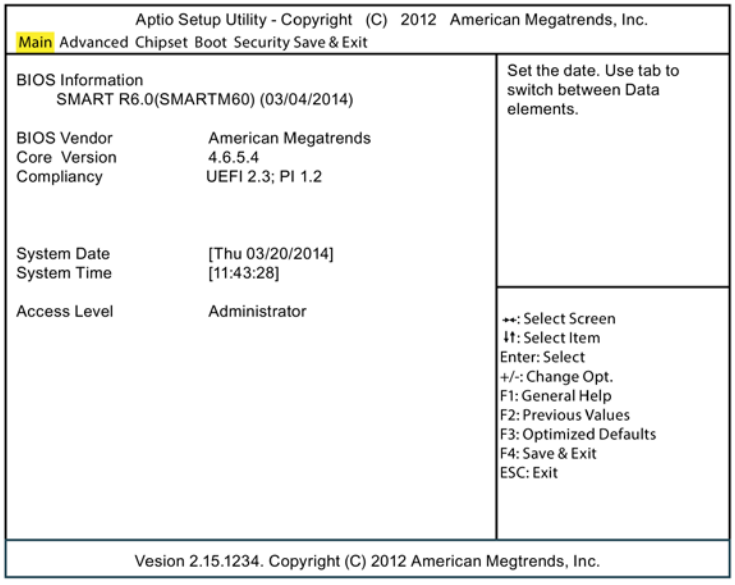
Table B- 1 Navigation keys

Press	To
→ ← : Select Screen	Menu Bar and select a BIOS setup page, for example, the Main page.
↑ ↓ : Select Item	Select a BIOS setup item or sub page.
Enter : 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	To display the general help window.
F2: Previous Values	To enable user to load previous values in BIOS setup Menu.
F3: Optimized Defaults	To enable user to load optimized default values in BIOS Setup Menu.
F4: Save & Exit	To enable user to save the current configuration and exit BIOS Setup Menu.
ESC: Exit	The <ESC> Key allows user to discard any change have made and exit BIOS Setup Menu. Press <ESC> Key to exit BIOS Setup Menu without saving change. The following screen will appear: You can press <Enter> Key to discard changes and exit. Or use arrow keys to select “No” then press <Enter> Key to abort this function and return to previous screen.

B.2 Main setup

The main setup menu

The main setup menu is shown as below.



Note

Take the BIOS version installed on your IPC as standard.

BIOS information

Item	Description
Release information	Show the BIOS release information.
BIOS Vendor	Show the vendor information.
Core Version	Show the BIOS core version information.
Compliancy	Show the UEFI specification version.

System date

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

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.

Access level

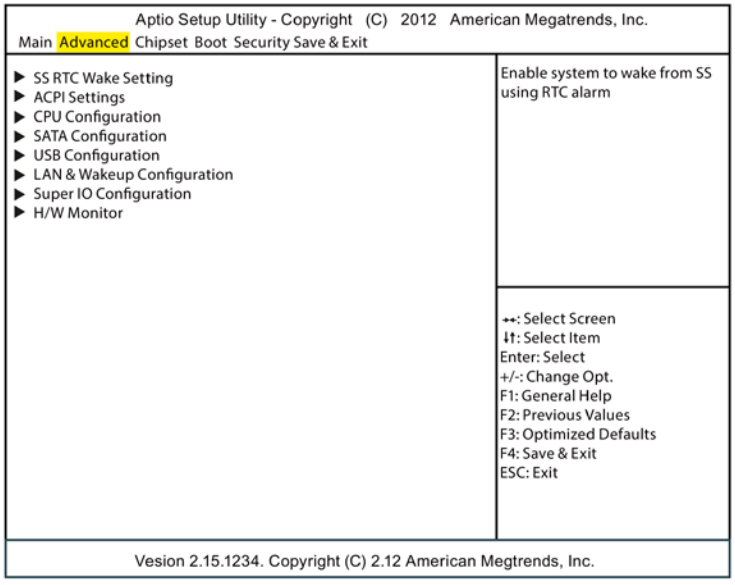
Access level shows what access right you have to setup BIOS. For setting the access level, go to the chapter Security Menu.

Access right	Description
Administrator	Have full access right to change BIOS settings.
User	Have guest level access right and can only change limited items.

B.3 Advanced setup

Advanced Page

Select **Advanced** from the BIOS setup page to enter the Advanced BIOS setup page. The advanced page is shown as below.



S5 RTC wake settings

In S5 RTC wake settings page, you can enable or disable system to wake from S5 using RTC alarm.

NOTICE
You cannot set both of the **wake system with fixed time** and **wake system with dynamic time** as **Enabled** at the same time.

To wake system with fixed time.

Follow the below instructions to enable system wake on alarm event at a specific time.

1. Select the **wake system with fixed time** with the arrow keys and press **Enter** key.
2. Select **Enabled** and press **Enter** key in the active window pop-up.
3. Use arrow key to switch the next item and input the day, hour, minute and second as you need.
4. Press **F4** key and save the change.

Select **Disabled** in step two to disable the system wake on alarm event at a fixed time.

To wake system with dynamic time.

Follow the below instructions to enable system wake on alarm event at a dynamic time. The increase minute ranges from one to five.

1. Select **wake system with dynamic time** with the arrow keys and press **Enter** key.
2. Select **Enabled** and press **Enter** key in the active window pop-up.
3. Enter the increase minute as you need.
4. Press **F4** key and save the change.

Select **Disabled** in step two to disable the system wake on alarm event at a dynamic time.

ACPI settings

ACPI parameters

ACPI parameters are disabled.

ACPI sleep state

With this feature, you can select which ACPI sleep state the system enters after the power button is pressed.

Table B- 2 Setup options for ACPI sleep state

Option	Description
S1 only (CPU stop clock)	When the power button is pressed, the system enters S1(CPU stop clock).
S3 only" (Suspend to RAM)	When the power button is pressed, the system enters S3 only" (Suspend to RAM).

To set the sleep state

1. Press **Enter** key in ACPI settings page.
2. Select the SCPI sleep state you need with arrow key.
3. Press **Enter** key to enable the selection.
4. Press **F4** key and save the change.

CPU configuration

In CPU configuration page, you can view and configure CPU parameters.

Intel virtualization technology

Follow the below instruction to enable or disable the intel virtualization technology.

1. Select **Intel virtualization technology** with the arrow keys and press **Enter** key.
2. Select **Enabled** or **Disabled** as you need and press **Enter** key in the active window pop-up.
3. Press **F4** key and save the change.

Active process cores

You can view and configure the number of cores to be enabled in each CPU package as the instruction below.

1. Select **Active process cores** with the arrow keys and press **Enter** key.
2. Select **all** or **1** as you need and press **Enter** key in the active window pop-up.
3. Press **F4** key and save the change.

Table B- 3 Options for CPU configuration

Option	Description
All	To enable all cores in CPU package.
1	To enable 1 core inside CPU package.

Note

For Quad core CPU, you can select to enable ALL/1/2/3 cores as you need.

SATA configuration

In SATA configuration page, you can view and configure SATA device.

SATA controller

You can enable and disable SATA device with SATA controller.

NOTICE
Once the SATA controller is disabled, the other SATA setup items are disappeared from the SATA configuration page.

Follow the instruction below to enable or disable the SATA controller

1. Select **SATA controller** with the arrow keys and press **Enter** key.
2. Select **Enabled** or **Disabled** as you need and press **Enter** key in the active window pop-up.
3. Press **F4** key and save the change.

SATA mode selection

You can configure SATA controller to a particular mode as the following instructions.

1. Select **SATA selection** with the arrow keys and press **Enter** key.
2. Select **IDE** or **AHCI** as you need and press **Enter** key in the active window pop-up.
3. Press **F4** key and save the change.

IDE legacy/native mode selection

You can configure IDE to a particular mode as the following instructions.

1. Select **IDE Legacy/Native Mode Selection** with the arrow keys and press **Enter** key.
2. Select **Legacy** or **Native** as you need and press **Enter** key in the active window pop-up.
3. Press **F4** key and save the change.

Serial ATA port 'X'

When the SATA controller is enabled and the SATA mode is AHCI, you can enable or disable the ports listed in the SATA configuration page. In this way, you can enable or disable the equipment linked to this port, for example, the ODD.

1. Select the port you want to set with the arrow keys and press **Enter** key.
2. Select **Enabled** or **Disabled** as you need and press **Enter** key in the active window pop-up.
3. Press **F4** key and save the change.

USB configuration

In USB configuration page, you can view and configure USB parameters.

USB device

The USB device shows the USB device detected by BIOS during POST. If there is no device attached to the motherboard, only 2 Hubs is shown.

USB support

Follow the instruction below to enable or disable the USB support.

1. Select **USB support** with the arrow keys and press **Enter** key.
2. Select **Enabled** or **Disabled** as you need and press **Enter** key in the active window pop-up.
3. Press **F4** key and save the change.

Legacy USB support

Follow the instruction below to enable or disable the USB support.

1. Select **Legacy USB support** with the arrow keys and press **Enter** key.
2. Select **Enabled, Disabled** or **Auto** as you need and press **Enter** key in the active window pop-up.
3. Press **F4** key and save the change.

Table B- 4 Options for legacy USB support

Option	Description
Auto	This option disables Legacy USB Support if there is no USB device is connected.
Enabled	This option enables Legacy USB Support.
Disabled	This option keeps USB device available only for EFI application.

USB ports per-port disable control

Follow the instruction below to enable or disable the USB Ports Per-port disable control.

1. Select **USB Port Per-Port Disable control** with the arrow keys and press **Enter** key.
2. Select **Enabled/Disabled** as you need and press **Enter** key in the active window pop-up.
3. Press **F4** key and save the change.

This function is disabled as default. If you enabled the USB ports per-port control, you can disable/enable each USB port as you need.

LAN and wakeup configuration

In LAN and wakeup configuration page, you can view and configure LAN and wakeup parameters.

Launch RTL8111E LAN PXE OpROM

Follow the instruction below to enable or disable the legacy boot option for TRL8111E LANChip.

1. Select **Launch RTL8111E LAN PXE OpROM** with the arrow keys and press **Enter** key.
2. Select **Enabled** or **Disabled** as you need and press **Enter** key in the active window pop-up.
3. Select **Save changes and reset** in the **Save&Exit** menu, and press the **Enter** key.

Resume on PCIE wake/PCI PME/Ring

Follow the instruction below to enable or disable the specific resume function.

1. Select the specific resume function with the arrow keys and press **Enter** key.
2. Select **Enabled, Disabled** as you need and press **Enter** key in the active window pop-up.
3. Press **F4** key and save the change.

Super IO configuration

In Super IO configuration page, you can view and configure super IO chip parameters.

Serial port 1 configuration

Follow the instruction below to enable or disable the serial port 1.

1. Select **Serial port 1** with the arrow keys and press **Enter** key.
2. Select **Enabled** or **Disabled** as you need and press **Enter** key in the active window pop-up.

Once the serial port 1 is enabled, the I/O and IRQ resources assigned to serial port 1 are displayed on screen.

Follow the same approach to enable or disable the serial port 2.

Device mode

When the serial port 2 is enabled, you can configure device mode settings for serial port 2 as following.

1. Select **Device mode** with the arrow keys and press **Enter** key.
2. Select the device mode as you need and press **Enter** key.
3. Press **F4** key and save the change.

Table B- 5 Options for Device mode

Option	Description
RS-232	To enable RS-232 mode for serial port 2.
RS-422	To enable RS-422 mode for serial port 2.
RS-485	To enable RS-485 mode for serial port 2.

For RS-422 and RS-485 mode, you can select high speed mode or normal mode.

For RS-232 mode, only normal mode in the table below is available.

Table B- 6 The baud rate for RS-422 and RS-485

Normal (Default)	High speed
50	400
75	600
110	880
134.5	1076
150	1200
300	2400
600	4800
1200	9600
1800	14400
2000	16000
2400	19200
3600	28800
4800	38400
7200	57600
9600	76800
19200	153600
38400	307200
57600	460800
115200	921600

Hardware monitor

In hardware monitor page, you can view and monitor the hardware status.

Table B- 7 Hardware monitor parameters

Item	Description
CHA fan1 control	Set the control mode for CHA fan1.
CHA fan2 control	Set the control mode for CHA fan2.
CPU temperature	Show the CPU temperature.
system temperature	Show the temperature inside chassis.
CPU fan speed	Show the CPU cooler fan speed.
CHA fan1 speed	Show the chassis fan1 speed.
CHA fan2 speed	Show the chassis fan2 speed.
VCORE	Show VCORE power voltage.
+12V	Show +12V power voltage.
+5V	Show +5V power voltage.
+3.3V	Show +3.3V power voltage.
VBAT	Show VBAT power voltage.

Set the Fan control mode

1. Select **CPU FAN/CHA Fan1/ CHA Fan 2** with the arrow keys and press **Enter** key.
2. Select the device mode as you need and press **Enter** key.
3. Press **F4** key and save the change.

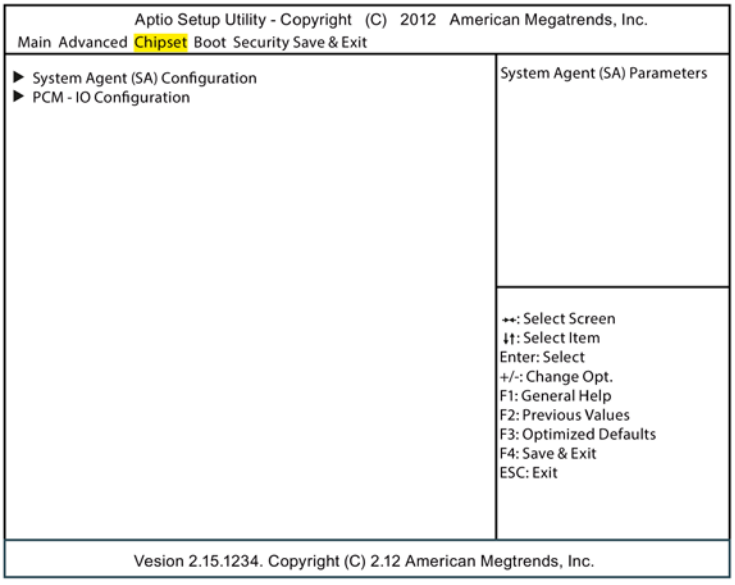
Table B- 8 Options for Fan control

Option	Description
Silent	From fan minimum speed to the maximum which can support specified load when the motherboard is in operation.
Auto	From fan minimum speed which supports over pressure to fan maximum speed
Disabled	Maximum speed

B.4 Chipset setup

Chipset page

Select **Chipset** from the BIOS setup page to enter the Chipset BIOS setup page. The Chipset page is shown as below.



System agent configuration

In system agent configuration page, you can view and configure system agent parameters.

Primary display

Follow the instructions below to select your primary display.

1. Select **Primary Display** with the arrow keys and press **Enter** key.
2. Select the display device you want and press **Enter** key.
3. Press **F4** key and save the change.

Table B- 9 Primary display setting options

Option	Description
Auto	Set to automatically detect. Auto is the default setting.
IGFX	Set IGFX device as primary display.
PEG	Set PEG device as primary display.
PCI	Set PCI device as primary display.

Internal graphics

Follow the instructions below to enable or disable graphic device.

1. Select **Internal Graphics** with the arrow keys and press **Enter** key.
2. Select the mode you want and press **Enter** key.
3. Press **F4** key and save the change.

Table B- 10 Internal graphics setting options

Option	Description
Auto	Set automatically detect the display. Auto is the default setting.
Disabled	Set IGFX device as the primary display.
Enabled	Set PEG device as the primary display.

Once Internal graphics is set as **Enabled** or **Auto**, You can set **DVMT Pre-Allocated** and **DVMT Total Gfx Mem.** Use arrow keys to select mode you want, then press **Enter** key to active it.

Option	Description
DVMT Pre-Allocated	
32M, 64M, 96M, ..., 1024M	Set DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device to a specific size.
DVMT Total Gfx Mem	
128M	Set DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device to be 128M.
256M	Set DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device to be 256M.
MAX	Set DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device to be the maximal available size.

PCH-IO configuration

In PCH-IO configuration page, you can view and configure PCH-IO parameters.

Azalia

Follow the instructions below to select your Azalia device.

1. Select **Azalia** with the arrow keys and press **Enter** key.
2. Select the mode you want and press **Enter** key.
3. Press **F4** key and save the change.

Table B- 11 Azalia setting options

Option	Description
Auto	Azalia will be unconditionally disabled. Auto is set as default.
Disabled	Azalia will be unconditionally enabled.
Enabled	Azalia will be enabled if present, otherwise disabled.

Once Internal graphics is set as **Enabled** or **Auto**, You can set the **Azalia HDMI code Port B.** Use arrow keys to select the mode you want, then press **Enter** key to activate it. **Azalia HDMI code Port B** is enabled as default.

Power mode

Follow the instructions below to enable or disable graphic device.

1. Select **Power mode** with the arrow keys and press **Enter** key.
2. Select the mode you want and press **Enter** key.
3. Press **F4** key and save the change.

Table B- 12 Power mode setting options

Option	Description
ATX Type	Set Power mode to ATX type. ATX type is set as default.
AT Type	Set Power mode to AT type.

High precision timer

Follow the instructions below to set the high precision event timer.

1. Select High Precision Event Timer with the arrow keys and press **Enter** key.
2. Select the mode you want and press **Enter** key.
3. Press **F4** key and save the change.

High precision timer is enabled as default.

Restore AC power loss

Follow the instructions below to set the restore AC power loss.

1. Select **Restore AC Power Loss** with the arrow keys and press **Enter** key.
2. Select the mode you want and press **Enter** key.
3. Press **F4** key and save the change.

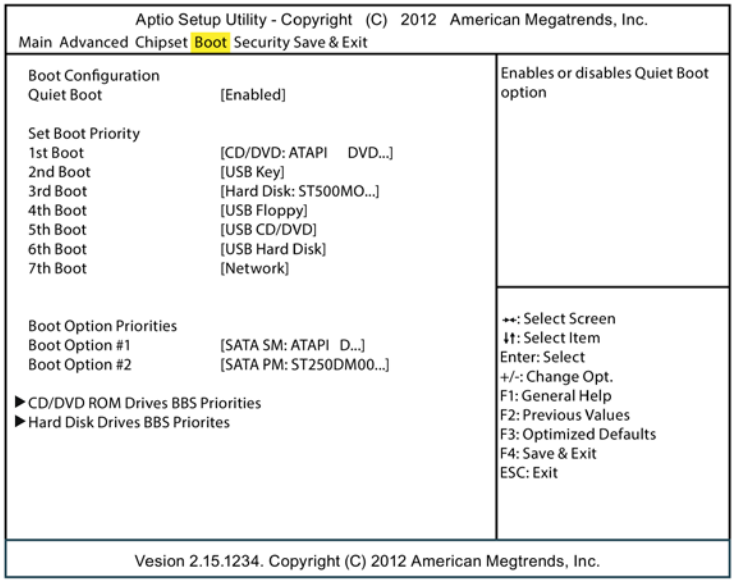
Table B- 13 Restore AC power loss options

Option	Description
Power Off	Set to keep power off.
Power On	Set to keep power on.
Last State	Set as the last state before power failure. Restore AC power loss is set to last state as default.

B.5 Boot Setup

Boot Setup

Select **Boot** from the BIOS setup page to enter the boot setup page. The boot page is shown as below.



Boot configuration

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

Follow the instructions below to select your boot-up screen.

1. Select **Quiet Boot** with the arrow keys and press **Enter** key.
2. Select the **Disabled** or **Enabled** as you want and press **Enter** key.
3. Press **F4** key and save the change.

Table B- 14 Quiet boot options

Option	Description
Disabled	Set the motherboard to display the POST message.
Enabled	Set the motherboard to display the SIEMENS logo. This is the default setting for Quiet boot.

Note

If quiet boot function is set as **Enabled** in BIOS, you can press TAB key to switch to POST message when the IPC is booting.

Set boot priority

In set boot priority page, you can set the boot devices priority for all your boot devices.

Follow the instructions below to set the boot devices priority.

1. Select boot priority you wish to change with the arrow keys and press **Enter** key.

   The option screen opens.
2. Select the device category and press **Enter** key .
3. Press **F4** key and save the change.

Table B- 15 Default boot device priority

Boot priority	Device category
1st boot	CD/DVD
2nd boot	USB key[1]
3rd boot	Hard disk
4th boot	USB floppy
5th boot	USB CD/DVD
6th boot	USB hard disk
7th boot	network

[1] If you don't want boot from the USB key, we recommend you

- disable "boot from the USB key"

  or
- set "boot from USB key" after "boot from hard disk"

  or
- don't plug in any USB device before starting the operating system.

Once bootable devices are attached, the following items show up.

Table B- 16 Bootable devices

Bootable device	Description
Hard Disk Drive BBS Priorities	All the boot options that are configured as Hard Disk Drive are displayed in this page. You can change the priority as similar as changing the main boot option priorities. The 1st boot option has the highest boot priority and appears at the boot option priorities and boot order.
Floppy Drive BBS Priorities	You can set the system boot order for floppy drives in this field. The 1st boot option has the highest boot priority and appears at the boot option priorities and boot order.
CD/DVD ROM Drive BBS Priorities	You can set the system boot order for CD/DVD ROM drives in this field. The 1st boot option has the highest boot priority and appears at the boot option priorities and boot order.
USB Hard Disk Drive BBS Priorities	All the Boot options that are configured as USB Hard Disk Drive are displayed in this field. You can change the priority as similar to the main boot option priorities. The 1st boot option has the highest boot priority and appears at the boot option priorities and boot order.
USB Floppy Drive BBS Priorities	You can set the system boot order for USB floppy drives in this field. The 1st boot option has the highest boot priority and appears at the boot option priorities and boot order.
USB CD/DVD ROM Drive BBS Priorities	All the Boot options that are configured as USB CD/DVD ROM Drive are displayed in this field. You can change the priority as similar to the main boot option priorities. The 1st boot option has the highest boot priority and appears at the boot option priorities and boot order.

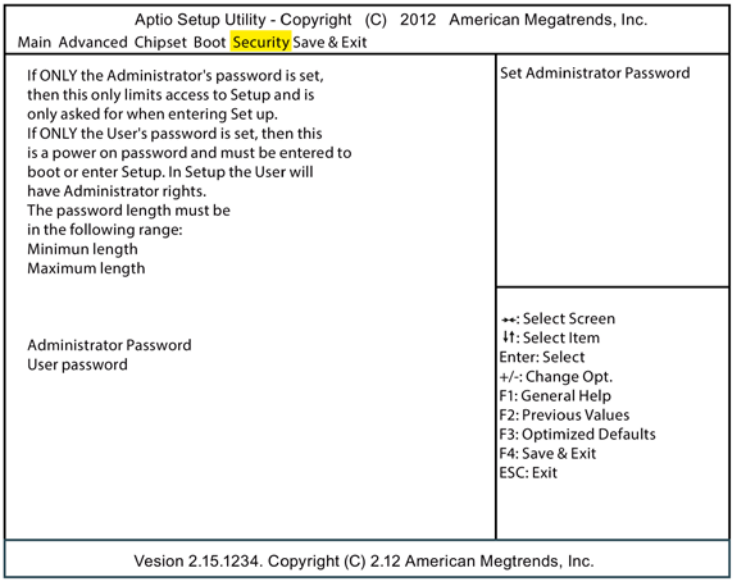
B.6 Security setup

Security setup

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

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

Select **Security** menu item in BIOS Setup screen to enter Security setup screen. Security menu is shown below:



Administrator password

In the security setup page, you can set an administrator password level password for BIOS.

1. Select **Administrator Password** with the arrow keys and press **Enter** key.
2. Enter a password of at least three characters in length. The password can be up to 20 characters long and case-sensitive.
3. Re-enter the password when you are asked to confirm the password in the screen popped up.

User password

In the security setup page, you can set a user level password for BIOS.

1. Select **User Password** with the arrow keys and press **Enter** key.
2. Enter a password of at least three characters in length. The password can be up to 20 characters long and case-sensitive.
3. Re-enter the password when you are asked to confirm the password in the screen popped up.

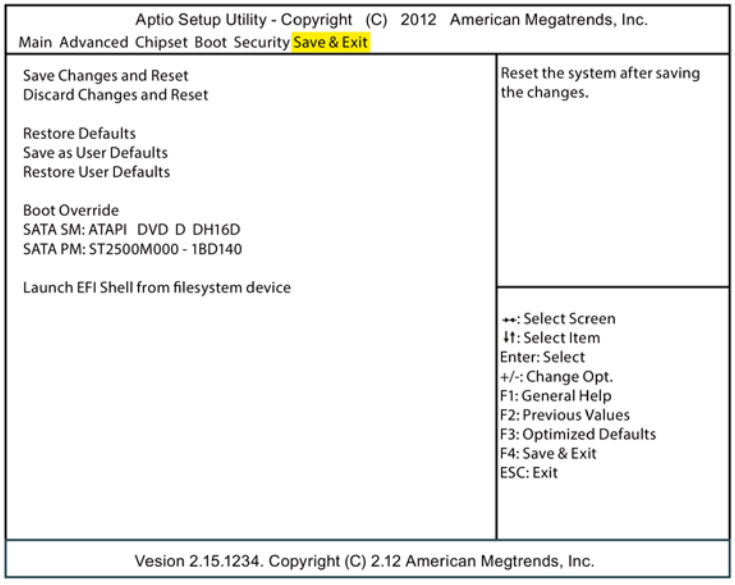
Note

Record the new password when the password is changed. If you forget the password, you must erase the system configuration information in NVRA.

B.7 Save and Exit

Save and exit

Select **Save & Exit** from the BIOS setup page to enter the save and exit page. The save and exit page is shown as below.



Save changes and reset

When you completed the system configuration changes, save the changes with the following instructions.

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 instructions.

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

You can restore the system with the following instructions.

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

You can save your settings as user default settings with the following instructions.

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

You can restore the user default settings with the following instructions.

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.

Boot override

All the available boot options are listed below the **Boot Override**. You can select any of the options to boot from a particular device.

Launch EFI shell from file system device

Restore/Load default values for all the setup options.

Appendix Technical support

C

C.1 Service and support

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

- Technical support (https://support.industry.siemens.com)
- Support request form (http://www.siemens.com/automation/support-request)
- After-sales information system SIMTIC IPC/PG (http://www.siemens.com/asis)
- SIMATIC Documentation Collection (http://www.siemens.com/simatic-tech-doku-portal)
- 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:

- Order number of the device (MLFB)
- BIOS version
- Installed additional hardware
- Installed additional software

Tools & downloads

Please check regularly if updates and hotfixes are available for download to your device.

The downloads are available on the Internet under "After Sales Information System SIMATIC PC/PG" (see above).

C.2 Problem solving

C.2.1 General information

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 is properly connected to – the monitor – the system unit – 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. You can ask for detailed information about the mouse driver from the mouse manufacture.
	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.

Problem	Possible cause	Possible remedy
Wrong time and/or date on the PC		1. Press <F2> during the booting process to open the BIOS Setup. 2. Set the time and date in the setup menu.
Although the BIOS setting is OK, the time and data are still wrong	The backup battery is dead.	Replace the backup battery.
USB device not responding	The USB ports are disabled in BIOS.	Use a different USB port or disable the port.
	USB 2.0 device connected and USB 2.0 is disabled.	Activate/enable USB 2.0.
	The operating system does not support the USB ports.	• Turn on USB Legacy Support for mouse and keyboard. • For other devices, you need the correct USB drivers for the operating system in use.
DVD/CD drive door, if present, does not open	The device is switched off or the open/close button is disabled by a software application.	Emergency removal of the data medium: 1. Switch off the device. 2. Insert a pointed object, for example, an opened paper clip, into the emergency extraction opening of the drive. Apply pressure carefully until the door opens. 3. Pull the door out further with your hand.
Communications Port (COM1) with exclamation mark in the device manager.	This device is available once Windows XP has been installed from the recovery DVD.	Uninstall the device in the device manager. It will then no longer be found.

Appendix List of abbreviations

D

Abbreviation	Term	Meaning
AC	Alternating current	Alternating current
ACPI	Advanced Configuration and Power Interface	
AGP	Accelerated Graphics Port	High speed bus system
AHCI	Advanced Host Controller Interface	Standardized controller interface for SATA devices. This is supported in Microsoft Windows XP as of SP1 and IAA driver.
APIC	Advanced Programmable Interrupt Controller	Extended programmable interrupt controller
AS	Automation system	
ATX	AT-Bus-Extended	
AWG	American Wire Gauge	US standard for the cable diameter
BIOS	Basic Input Output System	Basic Input Output System
CAN	Controller Area Network	
CD-ROM	Compact Disc – Read Only Memory	Removable storage medium for large data volumes
CD-RW	Compact Disc – Rewritable	Rewritable CD
CF	Compact Flash	
CGA	Color Graphics Adapter	Standard monitor interface
CLK	Clock pulse	Clock signal for controllers
CMOS	Complementary Metal Oxide Semi-conductors	Complementary metal oxide semiconductors
COA	Certificate of authentication	Microsoft Windows Product Key
CoL	Certificate of License	License authorization
COM	Communications Port	Term for the serial interface
CP	Communication Processor	Communication computer
CPU	Central Processing Unit	CPU
DRAM	Dynamic Random Access Memory	
DC	Direct Current	DC current
DMA	Direct Memory Access	Direct memory access
DOS	Disk Operating System	Operating system without GUI
DP	Display Port	New powerful digital monitor port
DDRAM	Double Data Random Access Memory	Memory chip with high-speed interface
DVD	Digital Versatile Disk	Digital versatile disk
DVI	Digital Visual Interface	Digital display interface
DVI-D	Digital Visual Interface	Digital display interface with digital signals
ECC	Error checking and correction	Error correction code
EFI	Extensible Firmware Interface	

Abbreviation	Term	Meaning
ESD	Components sensitive to electrostatic charge	
EWF	Enhanced Write Filter	
GND	Ground	Chassis ground
HD	Hard disk	Hard disk
HDA	High Definition Audio	
HDD	Hard Disk Drive	Hard disk drive
HU	Height unit	
HMI	Human Machine Interface	User interface
HORM	Hibernate Once - Resume Many	
HT	Hyper-Threading	
HTML	Hyper Text Markup Language	Script language for creating Internet pages.
HTTP	Hypertext Transfer Protocol	Protocol for data transfer on the Internet
I/O	Input/Output	Data input/output on computers
IAA	Intel Application Accelerator	
IDE	Integrated Device Electronics	
IEC	International Electronical Commission	
IGD	Integrated Graphics Device	
IP	Ingress Protection	Degree of protection
IR	Infrared	Infrared
IRDA	Infrared Data Association	Standard for data transfer via IR module
IRQ	Interrupt Request	Interrupt request
ISA	Industry Standard Architecture	Bus for expansion modules
L2C	Level 2 cache	
LAN	Local Area Network	Computer network that is limited to a local area.
LCD	Liquid Crystal Display	Liquid crystal display
LED	Light Emitting Diode	Light emitting diode
LPT	Line Printer	Printer port
LVDS	Low Voltage Differential Signaling	
MAC	Media access control	Media access control
MC	Memory card	Memory card in credit card format
MLFB	Machine-readable product designation	
MMC	Micro Memory Card	Memory card of the format 32 mm x 24.5mm
MPI	Multipoint-capable interface for programming devices	
MS-DOS	Microsoft Disc Operating System	
MTBF	Mean Time Between Failures	
MUI	Multilanguage User Interface	Language localization in Windows
NA	Not Applicable	

Abbreviation	Term	Meaning
NAMUR	Normenarbeitsgemeinschaft for Mess- und Regelungstechnik in der chemischen Industrie (standardization body for instrumentation and control technology in the chemicals industry)	
NC	Not Connected	Not connected
NCQ	Native Command Queuing	Automatic re-sorting of the file and disk access, for increased performance
NEMA	National Electrical Manufacturers Association	Syndicate of manufacturers of electrical components in the USA
NMI	Non Maskable Interrupt	Interrupt the processor can not reject
NTFS	New Techniques File System	Secure file system for Windows versions (2000, XP, 7)
ODD	Optical Disk Drive	
OPC	OLE for Process Control	Standardized interface for industrial processes
PATA	Parallel ATA	
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.
PCMCIA	Personal Computer Memory Card International Association	
PI	Protective Earth	Protective conductor
PEG	PCI Express Graphics	
PFC	Power Factor Correction	Harmonic suppression for operation on public networks.
PG	Programming device	
PIC	Programmable Interrupt Controller	Programmable interrupt controller
POST	Power On Self Test	
PXE	Preboot Execution Environment	Software for running new PCs without hard disk data via the network
RAID	Redundant Array of Independent Disks	Redundant hard disk array
RAL	Restricted Access Location	Installation of device in operating facilities with restricted access - for example, a locked switchgear cabinet
RAM	Random Access Memory	
RI	Ring Input	Incoming call
ROM	Read-Only Memory	
RS 485	Reconciliation Sublayer 485	Bi-directional bus system designed for up to 32 nodes
RTC	Real Time Clock	Real-time clock
RTS	Reliable Transfer Service	Request to send
RxD	Receive Data	Data transfer signal
SATA	Serial Advanced Technology Attachment	

Abbreviation	Term	Meaning
SCSI	Small Computer System Interface	
SDRAM	Synchronous DRAM	
SELV	Safety Extra Low Voltage	Safety extra low voltage
SJT	Service [Grade] Junior (Hard Service) Thermoplastic	PVC armored cable
SLC	Second Level Cache	
SMART	Self Monitoring Analysis and Reporting Technology	Hard disk error diagnostics program
SMS	Short Message Service	Short message via telecommunication network
SNMP	Simple Network Management Protocol	Network protocol
SO-DIMM	Small Outline Dual Inline Memory Module	
SOM	SafeCard on Motherboard (SOM)	
SPP	Standard Parallel Port	Synonym for parallel port
SRAM	Static Random Access Memory	Static RAM
SSD	Solid State Drive	
SVGA	Super Video Graphics Array	Enhanced VGA standard with at least 256 colors
SVP	Serial number of the device	
SW	Software	
TCO	**T**otal **C**ost of **O**wnership	
TFT	Thin-Film-Transistor	Type of LCD flat-screen
TTY	Tele Type	Asynchronous data transfer
TxD	Transmit Data	Data transfer signal
TXT	Trusted Execution Technology	Hardware implementation
TWD	Watchdog Time	Watchdog monitoring time
UEFI	Unified Extensible Firmware Interface	
UL	Underwriters Laboratories Inc.	US organization for tests and certifications according to own or binational standards (with CSA / Canada) standards
UMA	Unified Memory Architecture	Video memory
URL	Uniform Resource Locator	Designation of the full address of an Internet page
USB	Universal Serial Bus	
UXGA	Ultra Extended Graphics Array	Graphic standard, maximum resolution 1600x1200 pixels.
V.24		ITU-T standardized recommendation for data transfer via serial ports
VCC		Positive supply voltage of integrated circuits
VDE	Verein deutscher Elektrotechniker (Union of German Electrical Engineers)	
VGA	Video Graphics Array	Video adapter which meets industrial standard

Abbreviation	Term	Meaning
VRM	Voltage Regulator Module	
VT	Virtualization Technology	Intel technology with which a virtually closed environment can be made available
VT-D	Virtualization Technology for Directed I/O	Enables the direct assignment of a device (e.g. network adapter) to a virtual device
W2k	Windows 2000	
WAN	Wide Area Network	
WAV	Wave Length Encoding	Loss-free file format for audio data
WD	Watchdog	Program monitoring with error detection and alarming
WLAN	Wireless LAN	Wireless local area network
WoL	Wake on Local Area Network	
WWW	World Wide Web	
XD	Execute Disable Capability	Hardware implementation
XGA	Extended Graphics Array	Graphic standard, maximum resolution 1024x768 pixels

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.

ATAPI CD-ROM Drive

AT Bus **A**ttachment **P**acket **I**nterface (connected to AT bus) CD-ROM drive

Automation system (AS)

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.

BEEP code

The device performs a self-test when it is switched on. If an error is detected during the POST (Power On Self-Test), a series of beep signals are issued. The beep tone series are a code for errors and are composed of 2 x 2 sequences.

Boot disk

A boot disk is a disk with a "Boot" sector. This can be used to load the operating system from the disk.

Cache

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

CE marking

Communauté **E**uropéene The CE mark confirms compliance of the product with corresponding EC Directives, for example, with the EMC Directive.

Chipset

Located on the motherboard, connects the processor with the RAM, the graphics controller, the PCI 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.

Compact Flash cards (CF)

Compact Flash 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. .

Disc-at-once

With this burning technique, data are written to a CD in a single session, and the CD is then closed. Further write access is then no longer possible.

DisplayPort

DisplayPort is a VESA standardized, universal and license-free connection standard for the transmission of image and sound signals. Areas of application are mainly the connection of screens and TVs to computers, DVD players and similar devices.

DP

Display **P**ort: New digital monitor interface.

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.

Dual Core CPU

Dual-core processors significantly increase the speed of computing and program execution compared to the previous generation of single-core processors with hyperthreading technology.

DVD

Like the CD, the DVD is a digital, optical storage medium, but with a larger storage capacity. DVD is the abbreviation of Digital Versatile Disc. R "Recordable" stands for writable once, RW "Rewritable" means you can rewrite the DVD up to approximately 1000 times.

ECC

Error checking and correction is a method for detecting and correcting errors when saving and transferring data, frequently used in conjunction with RAM modules with and without ECC.

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 (EWF)

Configurable write filter that allows you, for example, to boot Windows Embedded Standard from write-protected media (such as CD-ROM), to write protect individual partitions and adapt the performance of the file system to your needs (when using Compact Flash cards).

ESD Guideline

Directive 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 (EFI)

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

File Based Write Filter (FBWF)

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.

Gender changer

Using the gender changer (25-pin/25-pin), the COM1/V24/AG interface of the SIMATIC IPC family can be converted into the usual 25-pin male connector.

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 reduces the writing to a CompactFlash medium to a minimum, for example, when starting up and shutting down Windows Embedded Standard 2009.

Hot plug

The SATA interface gives the device's hard drive system hot plugging capability. Prerequisite for this configuration is a RAID1 system with SATA RAID controller (onboard, or slot module), and at least two SATA removable frames. The advantage of hot plugging is that defective hard disks can be replaced without having to reboot the computer.

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 the 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

See Interface

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

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Interface, multi-point

MPI is the programming interface of SIMATIC S7/M7. Allows remote access to programmable modules, text-based displays and OPs from central locations. The MPI nodes can intercommunicate.

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.

Legacy USB support

Support of USB devices (e.g. mouse, keyboard) on the USB ports without driver.

License key

The license key represents the electronic license stamp of a license. Siemens provides the license keys for protected software.

License key disk

The license key disk 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 VAC to 1000 VAC, 70 VDC to 1500 VDC) and not specified in other directives. Compliance is confirmed by the CE symbol and the EC certificate of conformity.

LPT interface

The LPT interface (Centronics interface) is a parallel interface that can be used to connect a printer.

Memory card

Memory cards in credit card format. Memory for user programs and parameters, for example, for programmable modules and CPs.

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).

Module bracket

The module bracket is used to fasten modules and ensure safe contact and transport. Shocks and vibrations especially affect large, heavy modules. It is therefore recommended to use the module bracket for this type of module. There are also very short, compact and light modules on the market. The module bracket was not designed for these modules because standard fastening is sufficient for them.

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 XP Professional).

Packet writing

The CD-RW is used as a disk medium. The CD can then be read only by packet–writing compatible software or has to be finalized. Finalization of a CD closes the CD within an ISO9660 shell. You can still write to the CD-RW several times in spite of finalization. Not all CD drives can read packet-written CDs . There are restrictions to using this method in general data transfer.

PATA

Interface for hard disk drives and optical drives, with parallel data transmission rate up to 100 Mbps.

PC card

Trademark of the Personal Computer Memory Card International Association (PCMCIA). Designation for auxiliary cards that conform with PCMCIA specifications. A PC card that has roughly the size of a credit card can be plugged into a PCMCIA slot. Version 1 specifies cards of Type I with a thickness of 3.3 millimeters, which are designed mainly for use as external memory. Version 2 of the PCMCIA specification also defines cards of Type II with a thickness of 5 mm and cards of Type III with a thickness of 10.5 mm. Type II cards can realize devices such as modems, fax cards and network interface cards. Type III cards are equipped with devices that require more space, for example wireless communications modules, or rotary storage media such as hard disk drives, for example.

PC/104 / PC/104-Plus

Two bus architectures are especially fashionable today in the industrial world: PC/104 and PC/104-*Plus*. Both are standard in single-board computers of the PC class. The electrical and logical layout of the two bus systems is identical with ISA (PC/104) and PCI (PC/104-*Plus*). Software cannot usually detect a difference between them and normal desktop bus systems. Their advantage is the compact design and the resulting space they save.

PCIe

PCI-Express (Peripheral Component Interconnect Express) is an extension standard for connection of I/O devices with the chipset of a main processor. PCIe is the successor of PCI, PCI-X and AGP and offers a higher data transmission rate in comparison to its predecessors.

PCMCIA

Association consisting of approx. 450 member companies of the computer industry whose focus is set on providing worldwide standards for miniaturization and flexible use of PC expansion cards in order to provide basic technologies to the market.

PEG interface

PCI Express for Graphics. Graphics interface with 16 PCIe lanes for expansions with graphics modules.

PIC mode

Peripheral interrupt controller. 15 interrupt lines are available.

Pixel

PixElement (picture point). 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.

PROFIBUS/MPI

Process **F**ield **Bus** (standard bus system for process applications)

PROFINET

PROFINET is the name of the standard for Industrial Ethernet developed and maintained by the PROFIBUS user organization. PROFINET unites protocols and specifications with which Industrial Ethernet meets the requirements of industrial automation technology.

Programmable controller (PLC)

The programmable controllers (PLC) of the SIMATIC S5 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.

RAID

Redundant **A**rray of **I**ndependent **D**isks: Data storage system which is used to save data and the corresponding error correction codes (parity bits, for example) to at least two hard disk volumes in order to enhance reliability and performance. The hard disk array is controlled by management programs and a hard disk controller for error correction. The RAID system is usually implemented in network servers.

RAL

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

Recovery DVD

Contains the tools for configuring hard disks and the Windows operating system.

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)

Restore DVD

The Restore DVD is used to restore the system partition or the entire hard disk to factory state if the system has crashed. The bootable DVD contains all the necessary image files. You can also create a boot disk allowing restoration via the network.

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

The 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.

SCSI interface

Small Computer System Interface Interface for connecting SCSI devices such as hard disk drives or optical drives.

Session at once

In session at once, the CD can be written to both with an audio session and a data session. The two sessions are written to at once (as in disc at once).

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.

Track-at-once

In track-at-once recording, a CD can be written to in bits in several sessions if the CD was not closed.

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.

Turbo Mode

In this mode individual processor cores can be clocked higher in accordance with the load from the user programs and as required. It is only supported by Core i5 and Core i7 processors.

V.24 interface

V.24 is a standardized interface for data transfer. Printers, modems, and other hardware modules can be connected to a V.24 interface.

Wake on LAN (WoL)

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.

WLAN

Wireless LAN is a local network that transmits data via radio waves, infrared light or another wireless technology. Wireless LAN is mainly used for mobile computer applications in office or factory environments.

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