SIEMENS

SIMATIC

Programming device
SIMATIC Field PG M5

Operating Instructions

03/2016
A5E36432554-AA

Legal information

Warning notice system

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

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

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

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

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

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

Qualified Personnel

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

Proper use of Siemens products

Note the following:

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

Trademarks

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

Disclaimer of Liability

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

Preface

Purpose of this documentation

This manual contains all the information you need to commission and use the SIMATIC Field PG M5.

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

Validity of this documentation

This documentation applies to all available versions of the SIMATIC Field PG M5, and describes the versions delivered as of March 2016.

Position in the information scheme

These operating instructions are available on the "Manuals and Drivers" DVD included with your product.

For supplementary instructions on how to handle the software, please refer to the corresponding manuals.

Conventions

The abbreviation "PG" or the term "device" are also used in this documentation instead of the designation SIMATIC Field PG M5.

History

Currently released versions of this operating manual:

Issue	Comment
03/2016	First edition

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SIMATIC Field PG M5
Operating Instructions, 03/2016, A5E36432554-AA

Overview

<div style="text-align:right; font-size:3em;">1</div>

1.1 Product description

1.1.1 Overview

The SIMATIC Field PG M5 is a robust and turn-key programming tool for the components of SIMATIC-industrial automation.

SIMATIC Field PG M5

1.1.2 Application areas

The compact SIMATIC Field PG M5 is designed for use in the field, for example for:

- configuring, programming as well as simulating automation solutions in the office

- commissioning, maintenance and servicing automation solutions on site at the plant

- use of modern office applications in the office or when traveling

Its robust design makes the Field PG M5 especially well-suited for harsh industrial environments. This is evidenced by the housing made of impact-resistant and torsionally-rigid magnesium alloy and the generously sized bumpers on the corners of the housing, among other design features.

1.1.3 Highlights

Greatest possible mobility guaranteed

- Notebook structure (dimensions, weight) optimal for use in cramped spaces at the plant as well as when traveling
- High-performance lithium-ion battery with rated capacity of 97 Wh for extended cordless operation.
- Housing made of magnesium alloy housing with soft plastic corners – providing good protection for the electronics inside
- Powerful graphics controller with triple head function
- High-resolution, anti-reflective, 15.6" display in 16:9 full HD format guarantees ergonomic working in the TIA Portal

Industrial functionality

- Integrated PROFIBUS DP/MPI interface that supports operation on virtual operating systems
- RS232/TTY interface (COM1)

  The COM interface with RS232 functionality is integrated in every device by default.

  Optional additional TTY interface functionality, which is dependent on the selected hardware.
- Integrated card readers for SIMATIC:
  - SIMATIC Memory Card for S7-300/400
  - SMC (SIMATIC Memory Card for S7-1x00)
  - SIMATIC Micro Memory Card for S7-300/C7/ET200
- Programming interfaces for SIMATIC Memory Card, SMC, SIMATIC Micro Memory Card
- Programming interfaces for S5 EPROM modules (depending on configuration)
- Integrated multi media card reader for:

  - SD card (including SD UHS-II)
  - Multi Media Card (MMC)
- Integrated card reader for smart cards
- Connection to company networks and WLAN without additional hardware due to two fully-fledged and integrated independent Gigabit Ethernet-interfaces
- WLAN corresponding to IEEE 802.11 ac
- Integrated Bluetooth in accordance with standard 4.0
- Fast, easy to replace SATA hard disk
- 4 USB-3.0-ports, one of which is a USB port with charging function for smartphones (on side, bottom)
- HDA interface (High Definition Audio) for sound
- Integrated Trusted Platform Module to TPM 2.0 standard

System availability

- Optional data backup software Image & Partition Creator

1.1.4   Features

General features	
Type of construction	Mobile device
Processor	• 6th generation Intel® Core™ i processor
RAM	Expandable to 32 GB DDR4 SODIMM
Graphics	• Graphic controller: Intel® HD graphics 530 • Graphics memory: part of the graphic memory is dynamically shared in the system memory • Resolutions/frequencies/colors: according to the setting options of the graphics driver
Power supply	100 to 240 V, wide range
Drives and storage media	
HDD / SSD	2.5" SATA • For info on HDD capacity, refer to the ordering documents
Optical drive	DVD+-R/+-RW
Interfaces	
RS232/TTY interface (COM1)	25-pin socket, no galvanic isolation • The RS232 interface is integrated in every device by default. • The TTY interface (20mA) depends on the configuration and cannot be retrofitted. Standard for "S5" equipment variants, active to 100 m.
DVI-I	Interface for external monitor (VGA monitors can be operated with a DVI/VGA adapter) max. DVI resolution: 1920 x 1200 pixels
DPP display port	Interface for external monitor max. PPP resolution: 4096 x 2304 pixels @ 60 Hz
USB 3.0	4 interfaces (1x Type C and 3 x Type A), SuperSpeed, 1x with charging function, e.g. for smartphones: Max. 1.5 A
PROFIBUS/MPI interface	• 9-pin sub-D socket • Transmission rate: 9.6 kbaud to 12 Mbaud, programmable with software
Ethernet	2 x Gigabit Ethernet (RJ45)
Keyboard	Standard notebook
Status displays on the device (LEDs)	Battery status Device status Access to HDD/DVD Access to SD/MMC MPI/DP S5 and S7 Modules / Card Reader (except Smart Card Reader) Num Lock Caps Lock WLAN active

Software	
Operating systems:	Installed: • Windows 7 Ultimate 64-bit, 6 languages German, English, French, Spanish, Italian, Chinese • Prepared for Windows 10 (available in a later delivery stage)

1.2 Design of the device

1.2.1 Exterior design

View with closed display

① Status displays
② Display latch
③ Device handle

Front view with display open
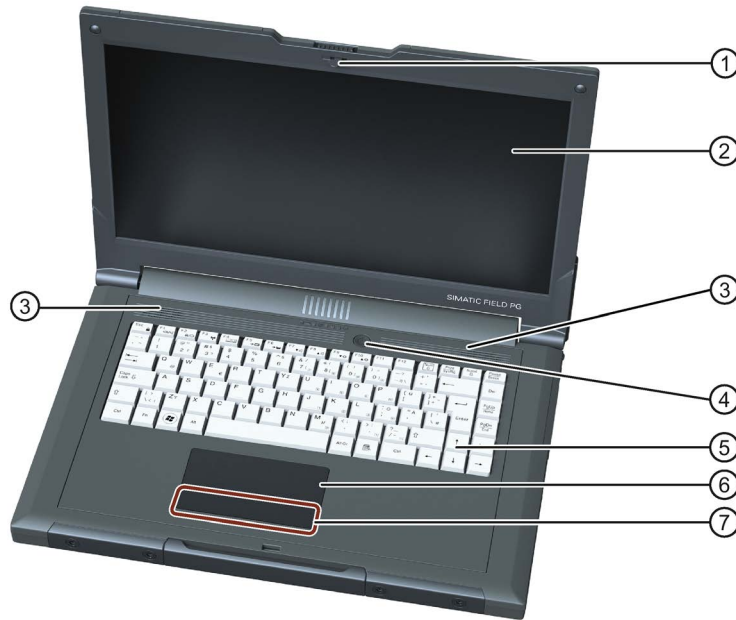
① Display latch
② Display
③ Stereo speakers
④ On/off button (power)
⑤ Keyboard
⑥ Touchpad
⑦ Mouse buttons

View from rear
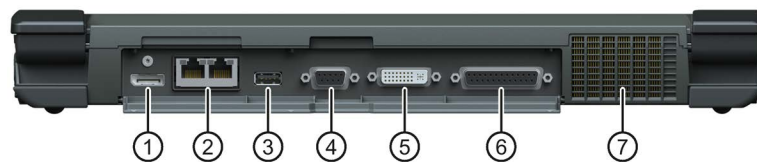
① Display port (DPP)
② 2 x Ethernet
③ USB 3.0 Type A
④ MPI/DP
⑤ DVI-I
⑥ RS232/TTY (TTY functionality, depending on the HW configuration variant)
⑦ Ventilation air outlet

View of left side

①	Opening for Kensington lock
②	Ventilation air inlet
③	Socket for connection to the power supply: DC IN 19 V
④	Audio jack: UAJ connection for audio devices
⑤	USB 3.0 Type C
⑥	Multimedia Card Reader for:

- SD card (including SD UHS-II)
- MMC
- SMC (SIMATIC MC)

⑦   ExpressCard™ Reader for:

- ExpressCard™ Type 34

View of right side
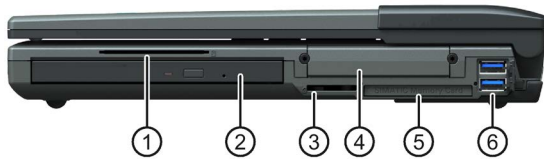
① Smart Card Reader for:

- Smart card according to ISO/IEC 7816 Smart Card Interface

② Optical drive

③ Card reader for:

- SIMATIC Micro Memory Card

④ Exchangeable hard disk unit

⑤ Card reader for:

- SIMATIC Memory Card

⑥ 2 x USB 3.0 ports, with cover
Top port: USB 3.0 Type A
Bottom port: USB 3.0 Type A with charging function

View from below

①	Cover for memory modules
②	Rating plate
③	Rechargeable battery

1.2.2   Operator controls

1.2.2.1   On/off button

① The on/off button (power) has the following functions:

- Switch PG on/off (hold the button down for approximately 1 second; the response depends on the Windows power option settings)
- Switch PG off in the event of a fault (hold down for more than 5 seconds)

1.2.2.2 Clickpad

The Field PG features a clickpad with integrated mouse buttons. It can be used in many programs (with mouse operation) as an input device for controlling the cursor and selecting menus.

① Clickpad for moving the cursor and for moving objects
② Left mouse button, with mechanical pressure point
③ Right mouse button, with mechanical pressure point

In contrast to a touch pad with a differentiated left and right mouse button, the mouse buttons on this clickpad are integrated into the surface. In this case, the function of the left or right mouse button has been transferred to the two integrated mouse buttons Pressing lightly on the clickpad in the selected lower part of the area initiates a left or right mouse click. The clickpad haptically provides a noticeable pressure point.

When you only use the clickpad to move the cursor, the whole area (including the mouse buttons) is available.

Pressing the left mouse button selects an object. The response to the right mouse button depends on the user program.

Clickpad functions

Function	Triggered by
Moving the cursor	Swiping across the clickpad with one finger.
Mouse click, left	Simple tapping on the entire area of the clickpad.
	Brief mechanical pressing of the left mouse button.
Mouse click, right	Brief mechanical pressing of the right mouse button.
Double-click, left	Quick double-tapping on the entire area of the clickpad.
	Quick double-pressing of the left mouse button.
Drag and drop (Drag&Drop)	Pressing the left mouse button while swiping across the clickpad with the other finger at the same time.

Note

Using the clickpad may require some practice.

The clickpad function can be enabled and disabled with the hotkey Fn + F4.

You can configure the advanced clickpad functions under "Mouse" in the Windows Control Panel. The technical principle used means that it is possible to make unintentional mouse clicks with the clickpad when it is used in an environment with EMC interference. In such environments, it is a good idea to use an external mouse. Observe the information on electromagnetic compatibility in section "Technical specifications (Page 81)".

Problems during operation in an environment with EMC interference

A high degree of ambient interference in the vicinity of the Field PG M5 may, in rare cases, cause malfunction of the integrated clickpad.

The malfunction manifests itself in the triggering of unintentional key clicks or delays in the movement of the cursor. In such cases we recommend eliminating the cause of the interference or establishing a greater distance to the source of the interference.

If working in an interference-prone environment cannot be avoided, deactivate the tap function (mouse button emulation) using the clickpad driver. Afterwards use the clickpad keys below the clickpad for operation.

1.2.2.3   Keyboard

Keyboard arrangement

The keyboard is divided into the following function groups:

● Alphanumeric keyboard field with hotkeys

● Function keys

● Control keys

Repeat function

All the keys of the keyboard are equipped with a repeat function, i.e. the character is repeated for as long as the key is pressed.
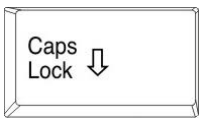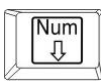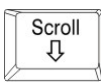
Keyboard labeling

The keyboard comes with international and German labeling.

International   German

Shift

Unshift

in combination with the
ALT GR key

U

4

in combination with the Fn key
with Num Lock: 4
without Num Lock: Cursor left
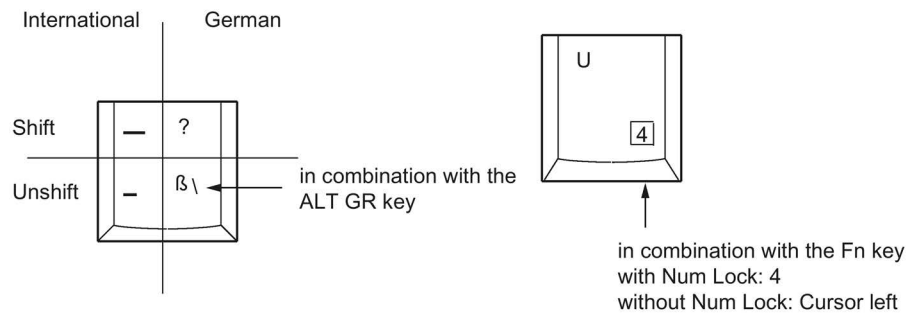
Alphanumeric keyboard field

The largest block of keys is the alphanumeric keyboard with all the keys for letters, numerals and special characters. The arrangement of the characters essentially corresponds to that of a normal keyboard.

Key	Function
Caps Lock ⇩	**Caps Lock** The caps lock key activates uppercase mode. All the characters are then output as capital letters. With a multiple labeled key, the upper left character is displayed. You can switch off the caps lock by pressing the shift key.
Num ⇩	**Num Lock key** This toggles the emulated numerical keypad between alphanumeric keys and number keys. The LED display lights up.
Scroll ⇩	**Scroll Lock** Use this key to decide whether the cursor keys should move the cursor or the screen section (this functionality is not supported by every program).
⊞	**Start key (under Windows)** The start key calls up the Windows Start menu.
🗇	**Menu key (under Windows)** The menu key calls up the menu for the selected object.

Number pad with Fn key

This function is activated using the Num Lock key. The characters and numbers labeled on the front of the number pad keys can be used by simultaneously pressing Fn and one of these keys.
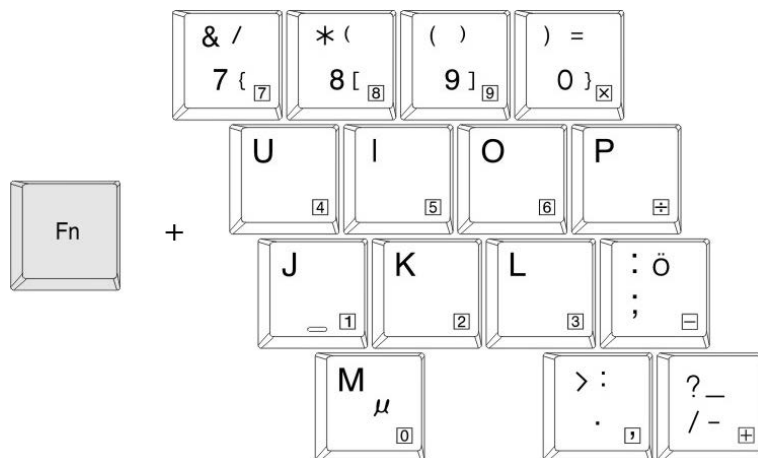
Function keys

Twelve programmable function keys are arranged in the topmost row of keys. The arrangement of these keys depends on the software loaded.

Hotkeys (combination keys)

Using the Fn key and a 2nd key (e.g. a function key) you activate further key codes for specific applications.

Key	Function
Fn + Home	Cursor at start
Fn + End	Cursor at end
Fn + ESC	Disable PG
Fn + F1	Switch speaker on and off
Fn + F2	Control menu for the display/monitor display
Fn + F3	Switch WLAN on and off
Fn + F4	Switch clickpad function (mouse pointer and mouse buttons) on and off
Fn + F5	Standby mode (depending on the configuration of the Power Button in the Windows Power Options)
Fn + F6	Hibernation mode (depending on the configuration of the Power Button in the Windows Power Options)
Fn + F7	Reduce volume
Fn + F8	Increase volume
Fn + F9	Reduce brightness of screen
Fn + F10	Increase brightness of screen

1.2.3 Status displays
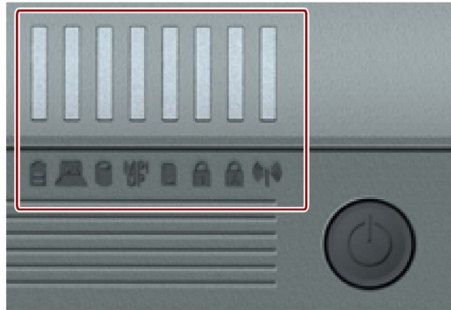
System LEDs

The system LEDs indicate the operating state of the battery, the device, the drives, the S5 and S7 modules, the MPI/DP and card reader interface (except Smart Card Reader). The LEDs can also be seen when the display is closed.

Symbol	LED	Description
(battery)	GREEN ORANGE RED OFF	Battery is charged Battery is being charged Battery capacity too low (only with battery operation) No battery
ON	GREEN ORANGE GREEN flashing ORANGE flashing OFF	Line operation Battery operation Line operation, device is in Standby Battery operation, device is in Standby Device is switched off
(drive)	GREEN	Access to the external memory (hard disk, optical drive)
MPI DP	GREEN	MPI interface active
(card)	GREEN	Module programming (S5 and S7 modules); Card Reader (except Smart Card Reader) active

Keyboard LEDs

The keyboard LEDs indicate the current state of the Num Lock and Caps Lock keys. After switching on the device, the operating displays of the keys light up briefly. The keyboard is ready.

Symbol	LED	Description
(padlock with 1)	GREEN OFF	Num Lock switched on Num Lock switched off
(padlock with A)	GREEN OFF	Caps Lock switched on Caps Lock switched off

Wireless LED

The term wireless relates both to WLAN and to Bluetooth. You may customize both functions in the corresponding application during installation of the software.

The wireless LED located on the right next to the keyboard LEDs indicates the active wireless function.

Symbol	LED	Description
(wireless signal)	ORANGE OFF	Wireless is ON Wireless is OFF

1.3 Accessories

Accessories which are not included in the scope of delivery are available for your device. Information on the accessories that can be ordered is available on the Internet at the following addresses:

- Industry Mall (https://mall.industry.siemens.com)

- IPC expansion components (http://www.automation.siemens.com/mcms/pc-based-automation/en/industrial-pc/expansion_components_accessories)

Order accessories from the SIEMENS Industry Mall

1. Navigate to the Internet URL of the Industry Mall (https://mall.industry.siemens.com)Hotspot-Text.

2. Log in with your customer data (login on the top right).

3. Select the user language.

4. Navigate to the programming devices in the product catalog (tree structure on the left): "Automation technology > Automation systems > SIMATIC Industrial automation systems > Programming devices"

5. In the tree structure on the left, click: Field PG M5.

6. Select the "Accessories" tab in the display area.

Safety notes

2

2.1 General safety instructions

⚠ CAUTION

Observe safety instructions

Please observe the safety instructions on the back of the cover sheet of this documentation. You should not expand your device unless you have read the relevant safety instructions.

This device is compliant with the relevant safety measures to IEC, EN, VDE, UL, and CSA. If you have questions about the validity of the installation in the planned environment, please contact your service representative.

Repairs

Only qualified personnel are permitted to repair the device.

⚠ WARNING

Damage to property and personal injury

Unauthorized opening and improper repairs can cause considerable damage to property or danger for the user.

System expansions

Only install system expansion devices designed for this device. The installation of other expansions can damage the system and violate the radio-interference suppression regulations. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.

NOTICE

Warranty

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

Battery

This device is equipped with a lithium battery for supplying power to the internal real-time clock. Batteries may only be replaced by qualified personnel.

> ⚠️ **CAUTION**
>
> **Risk of explosion when replacing and disposing of the battery**
>
> There is the risk of an explosion if the battery is not replaced as directed. Replace only with the same type or with an equivalent type recommended by the manufacturer. When disposing of batteries, observe the locally applicable legal regulations.

> ⚠️ **WARNING**
>
> **Risk of explosion and release of harmful substances!**
>
> Do not throw lithium batteries into an open fire, do not solder, or open the cell body, do not short-circuit, or reverse polarity, do not heat up above 100 °C, follow the disposal instructions, and protect against direct exposure to sunlight, humidity, and condensation.

ESD guidelines

Modules containing electrostatic sensitive devices (ESDs) can be identified by the following label:

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

- Always discharge any static electricity from your body before handling modules that are sensitive to electrostatic discharge (for example, by touching a grounded object).

- All devices and tools must be free of static charge.

- Always pull the mains connector and disconnect the battery before you install or remove modules which are sensitive to ESD.

- Handle modules fitted with ESDs by their edges only.

- Do not touch any wiring posts or conductors on modules containing ESDs.

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://support.industry.siemens.com).

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://www.automation.siemens.com/mcms/automation-software/en/software-update-service).

Notes on protecting administrator accounts

A user with administrator privileges has extensive access and manipulation options in the system.

Therefore, ensure there are adequate safeguards for protecting the administrator accounts to prevent unauthorized changes. To do this, use secure passwords and a standard user account for normal operation. Other measures, such as the use of security policies, should be applied as needed.

2.2 Safety guidelines for transport

Before you set off

Observe the following information when you are traveling with the PG:

● Back up important data from the hard drive or SSD.

● For safety reasons, switch off the radio component (WLAN) if you cannot be sure that the transmitted radio waves will not interfere with any electrical or electronic equipment in your vicinity.

● If you want to use your PG during a flight, first of all ask the airline company if you are permitted to do so.

● When traveling abroad, ensure the power adapter can be used with the local mains voltage. If this is not the case, you must acquire the appropriate adapter for your PG. Do not use any other voltage transformers!

Note
Using the Field PG in different countries

Verify the compatibility of local mains and power cable specifications are compatible when using the PG abroad. If this is not the case, purchase a power cable that complies with the local conditions. Do not use connection adapters for electrical appliances in order to connect the PG to them.

Transport

Despite the fact that the device is of a rugged design, its internal components are sensitive to severe vibrations or shock. With just a few simple transport precautions you can help to create a trouble-free operation.

● Make sure that the PG is no longer accessing the drives, and remove all data media (such as CDs) from the drives.

● Switch off the PG (see Section On/off button (Page 15)).

● Disconnect the peripheral devices from the PG.

● Close the display and the interface covers on the back of the device.

● Use the integrated handle for brief transportation.

● For longer transport, put the PG with all its accessories into the provided backpack.

You should always use the **original packaging** for shipping and transporting the device.

NOTICE
Risk of damage to the device!
If you are transporting the PG in extreme weather conditions with large fluctuations in temperature, care must be taken to ensure that no moisture forms on or in the device (condensation). If you notice any condensation, wait around 12 hours before you switch on the device.

Installing and connecting the device 3

3.1 Preparations

3.1.1 Checking delivery

Unpacking the device

Note the following points when you unpack the unit

- It is advisable not to dispose of the original packing material. Keep it in case you have to transport the unit again.

- Please keep the documentation in a safe place. It is required for initial commissioning and is part of the device.

- Check the delivery unit for any visible transport damage.

- Check the delivery and your specially ordered accessories against the packaging list to ensure nothing is missing. Please inform your local dealer of any disagreements or transport damages.

3.1.2 Device identification data

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

The figures below are examples. The data of your device may differ from the data in these examples.

Rating plate

The rating plate is located on the underside of the device.

Example:

COA label

The COA label is located on the underside of the device.

Example:
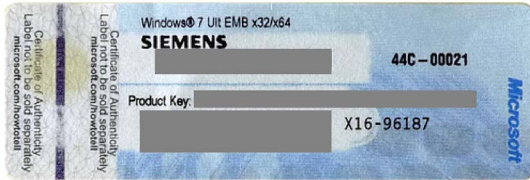
Write down identification data

Identification date	Source	Value
Order number	Rating plate	6ES ...
Serial number	Rating plate	S VP...
Microsoft Windows Product Key	COA-label	
Ethernet address 1	BIOS Setup:	
Ethernet address 2	Menu "Advanced" > "Peripheral Configuration"	

1. Enter the order number, serial number and production status in the table above.

2. Enter the Windows "Product Key" in the table. This is always required to reinstall the operating system.

3. Enter the Ethernet addresses in the table.

3.2 Positioning the device

⚠ WARNING

Risk of fire

The outer housing is made of Magnesium. If it comes into contact with open flame, there is a risk of fire / spreading fire.

NOTICE

Risk of damage to the device

Always set the PG down on its underside, otherwise there is a risk that it will fall over and damage sensitive components.

- Position the programming device to ensure comfortable operation and safety.

- Position the programming device with its bottom on a flat surface and at a comfortable height and distance.

- Ensure that a power outlet is easily accessible near your workplace.

- Ensure that there is enough space for connecting peripherals.

- Do not obstruct any ventilation slots when you position the device.

- Open the display by sliding the lock of the display in the direction of the arrow.

- Flip the display open and adjust it to a convenient viewing angle. The display can be adjusted to any inclination angle between 0 and 150°.
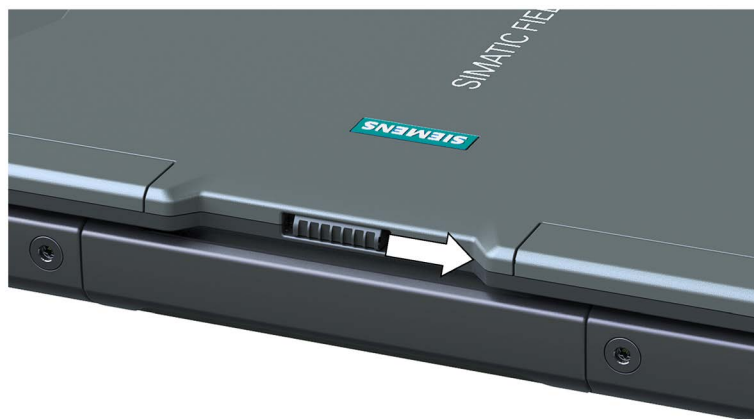
3.3 Connecting the device

3.3.1 Connecting the power supply

To be noted before you connect the device

> **Note**
>
> The external power unit supplies power to the Field PG in mains operation with 120 V and 230 V power supply networks. The voltage range is set automatically.

⚠ **WARNING**

Risk of lightning strikes

Lightning may enter the mains cables and data transmission cables and jump to a person.

Death, serious injury and burns can be caused by lightning strikes.

Take the following precautions:
- Pull out the power plug in good 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, etc.

⚠ **WARNING**

Operation only in grounded power supply systems

The device is designed only to be used in grounded power supply systems
(TN systems to VDE 0100, part 300, or IEC 60364-3).

It must not be used in ungrounded, or impedance-grounded power systems (IT systems).

⚠ **WARNING**

Danger of damage to the device or destruction of the battery

Only use the supplied battery or an original spare part. Information on original spare parts for Field PGs is available in section Accessories (Page 21).

> ⚠ **WARNING**
>
> **Risk of fire and electric shock**
>
> The On/Off button does not completely isolate the device from the power supply. If the device is switched off with the On/Off button, there is still a risk of electric shock and fire, for example, if the device or the connecting cables are damaged or in the event of improper use.
>
> When working on the device or if the device is not used for a long period of time, always disconnect it fully from the power supply. Shut down the operating system and if you are using the device in mains operation, pull out the power plug.

Localized information

For the United States and Canada

For the United States and Canada, a CSA or UL-listed power cord must be used.

The connector must be compliant with NEMA 1-15P.

- **120 V/240 V supply voltage**

  A flexible cable with UL approval and CSA marking must be used. In addition, the cable must exhibit the following properties:

  - SPT-2 or SVT with three wires
  - At least 18 AWG conductor cross-section
  - Max. length of 4.5 m
  - Connector 15 A, min. 125 V

For countries other than the USA and Canada

- **230 V supply voltage**

  This device is equipped with a safety-tested power cord. If you choose not to use this cable, you must use a flexible cable of the following type: At least 18 AWG (0.82 mm^2) conductor cross-section and 15 A/250 V connector. The cable set must conform to the safety regulations of the country in which the devices are installed, and bear the prescribed markings in each case.

Procedure

1. Insert the supplied power supply cable into the external power supply.

2. Insert the low-voltage connector into the appropriate socket for connection to the power supply ① on the left hand side of the device.

3. Plug the external power supply into a socket with a grounded protective conductor.
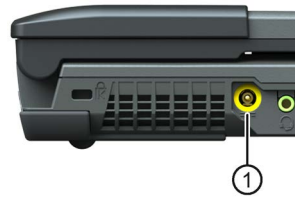
3.3.2 Connect SIMATIC S7 or PROFIBUS

You can connect the PG to a SIMATIC S7 automation system or a PROFIBUS network via the electrically isolated*) MPI/DP interface. The MPI connecting cable (5 m) for connecting to SIMATIC S7-CPUs (order number: 6ES7901-0BF00-0AA0) is supplied as standard. Transmission rates of no more than 187.5 Kbps are possible with this cable. To achieve baud rates higher than 1.5 Mbps, you will need a 12 Mbps PROFIBUS connecting cable (order number 6ES7901-4BD00-0XA0).

Connecting the Field PG to an S7 automation system

1. Switch off your device.

2. Plug the cable into the MPI/DP interface ①.

3. Screw the connector into place.

4. Insert the cable into the respective port on the CPU.

    In the disturbed environment: Bus connector
    6ES7972-0BB10-0XA0
    or
    6ES7972-0BB20-0XA0
    6ES7901-0BF00-0AA0
    (5m long)
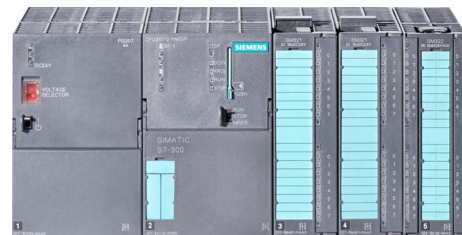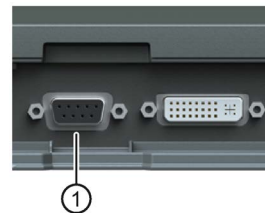
*) Electrically isolated within the safety extra-low voltage circuit (SELV)

NOTICE
Risk of damage to the device
You could damage the port on the Field PG if you use the wrong connecting cable.

3.3.3 Connecting the device to systems and networks

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

Ethernet

The integrated Ethernet interfaces (10/100/1000 Mbps) can be used for communication and data exchange with programmable controllers, such as SIMATIC S7.

PROFIBUS / MPI

The potential-free Profibus interface (12 Mbps) can be used to interconnect distributed field devices or to link to SIMATIC S7.

The "PROFIBUS" software package is needed to link to S7 automation systems.

RS232/TTY interface (COM1)

You can connect the Field PG to a SIMATIC S5 programmable controller via the optional TTY interface.

You will need the "SIMATIC STEP 5 V7.23" software to link to S5 programmable controllers.

WLAN

You can link the Field PG to an Industrial Wireless LAN network using the integrated WLAN interface.

Information on Industrial Wireless LAN can be found in SIMATIC NET (http://www.automation.siemens.com/mcms/automation/en/industrial-communications/iwlan-industrial-wireless-communication)

Further information

Additional information is available in the catalog and the online ordering system Industry Automation and Drive Technologies – Homepage (http://www.siemens.com/automation/service&support).

3.3.4   Connecting peripheral devices

To be noted before you connect the device

NOTICE
Peripheral devices incapable of hot-plugging
Peripheral devices that are incapable of hot-plugging may only be connected after the device has been disconnected from the power supply.

NOTICE
Observe the documentation of your I/O devices
Strictly adhere to the specifications for peripheral equipment.

⚠ WARNING
Equipotential bonding of the signal cable shields
When you connect long signal cables (particularly with connections between buildings), make sure the signal cables are always integrated into the local equipotential bonding system (connecting the cable shielding to the protective conductor).

Connecting a monitor

You can also connect monitors with other appropriate interfaces to the connections for display port and DVI-I with appropriate adapters.

Connecting devices to the USB socket

Connect devices such as drives, mouse, keyboard, printer and USB headsets to the USB sockets.

Connecting audio devices to the UAJ socket

The audio socket on the left-hand side of the device is a so-called UAJ connection (Universal Audio Jack) for a 3.5mm jack.

Depending on the function, a UAJ connector has 2 to 4 contact areas. Depending on their position, they are generally referred to as Tip, Ring 1, Ring 2 and Sleeve.

Depending on the function or standard, the contacts are assigned differently.

The audio controller of the Field PG recognizes the assignment of the contacts of the UAJ connector depending on the connected audio device and is automatically configured.

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

- Audio device with line-out

- Audio device with line-in

- Headphones

- Microphone

- Headset (with headphones and microphone) with the following standards:

    – OMTP: Standard for audio devices from Nokia, etc.

    – CTIA: Standard for audio devices from Apple®

Note

Connection of microphone and headphones with two 3.5mm jacks

An adapter is needed to simultaneously connect a microphone and headphones to a 3.5-mm-jack.

See also

Technical specifications (Page 81)

Commissioning the device

<div align="right" style="font-size:3em">4</div>

4.1　General information on commissioning

NOTICE
Risk of damage to the device!
Make sufficient allowances for the device to warm up to room temperature before you put it into use. If condensation develops, wait at least 12 hours before switching on the device.

Requirements for commissioning

- The power supply is connected or the battery is fully charged.

4.2　Switching on the unit

The operating system and system software of your device are preinstalled on the hard disk.

Following the initial switch on, the operating system is set up automatically on the device.

NOTICE
Faulty installation
If you change the default values in the BIOS setup or if you turn off the device during 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.

Initial power on

1. Press the ON/OFF button for approximately 1 second.

   The green LED "ON" lights up. The device performs a self-test. The following message is output during the self-test:

   ```
   Press Esc for boot options
   ```

2. Wait for the message to disappear. The operating system is started.

3. Follow the on-screen instructions.

4. Type in the Product Key as required.

   The product key can be found on the COA label, see section "Device identification data (Page 27)".

Define the language, region and formats for the user account

The menus, dialogs, and keyboard layout are set up in English under Windows. Use the Control Panel to change to another language and keyboard layout.

Select: "Start > Control Panel > Clock, Language, and Region > Regional and Language Options".

● You can make your required changes for the user account in the "Formats", "Location and Keyboards and Languages" tabs.

● You can make changes for the default account in the "Administrative" tab. You copy the settings by clicking the respective button.

Also read the information provided in sections "Setting up the language selection using the Multilanguage User Interface (MUI) (Page 74)" and "Installing Windows (Page 70)".

Result

The device is restarted automatically and the user interface of the respective operating system is displayed.

From now on, after you switch on the PC, the user interface of the operating system is automatically opened when the startup routine is completed.

License key

A product-specific license key (user authorization) is required to use the STEP 7 and WinCC flexible programming software. This protected software may only be used with the relevant authorization. The License Keys for your SIMATIC software are stored on the included USB memory stick.

Remove the cap from the USB stick and insert the stick into a free USB port of your computer to access the License Keys.

After a short time a drive named "License_Key" will appear in Windows Explorer.

During a new installation, you will be notified by the Setup program if a matching license key has not been installed on your computer. You can then choose to have the Setup program install the license or to install the license later with the Automation License Manager you are going to install.

If you want to transfer the license key later, follow these steps:

1. Close the Automation License Manager. Locate the drive named "License_Key" in the left pane.

2. Click the drive named "License_Key".

   This displays an overview of the license keys found on the license stick.

3. Use a drag-and-drop operation to move the desired license key to one of your drives.

4. After the transfer, the license key is located on the corresponding drive and you can now use the activated software.

Prior to removing the license stick, make sure to give notice according to Windows specifications ("Safely remove hardware").

You may also use the USB License Stick to transfer the License Keys to a different computer, or for intermediate storage of the License Keys.

Note

Software installed on the PG for which there is no license key in the scope of delivery cannot be used or will only run in Trial mode.

4.3 Rechargeable battery

Danger notices

⚠ WARNING
Risk of personal injury or damage to property due to improper handling of the battery
A battery can cause burns, it can explode or release toxic substances.
Do not open or damage the battery. Do not expose battery to heat or fire. Keep the battery away from children.

⚠ WARNING
Danger of damage to the device or destruction of the battery
Only use the supplied battery or an original spare part. Information on original spare parts for Field PGs is available in section Accessories (Page 21).

Disposal

Lithium ion batteries can be recycled. Their components can be used as raw materials for new batteries or other products. A requirement for effective recycling is the collection of used batteries.

NOTICE
Risk of fire - Hazardous to people and the environment
The improper disposal of batteries may cause fire.
Observe the local regulations for the disposal of recyclable materials.
Dispose of batteries properly.

Battery operation

The battery (lithium ion) enables mobile use of the device, independently of an external power supply. It also protects against data loss in the even of a power failure.

As soon as the external power supply is connected, the battery will start charging. In doing so, the following conditions are important:

● When the device is switched off the charging process takes around 3 hours.

● When the device is switched on, the charging process takes between 3 and 6 hours (depending on the system load).

● The charging process is terminated as soon as the battery is fully charged.

● A charged battery will discharge itself during storage (depending on the temperature, and whether or not it is installed) over a few months. It will then have to be recharged.

● The battery charging is terminated when the battery is fully charged or if, for example, the upper temperature limit for charging is exceeded. You can check the battery charge level in Windows.

If, with a connected power supply, the battery LED lights up green, the battery is full and will not be charged any further.

Current consumption in battery operation

You can reduce the off-state battery power consumption of your device to the minimum by disabling the Intel® AMT and USB charging functions in the BIOS. You should remove the battery from the Field PG if you are planning on not operating the device for several months. Ideal storage conditions for the battery pack: Ambient temperature of approximately 20 °C and battery charging state of approximately 50%.

Note

The battery pack may by completely or partially discharged (e.g. due to self-discharge) during commissioning. Prior to completion of the discharge, when merely a residual charge is existent, the LED battery in the battery operation lights up red as a warning. End your work and save your data. There are now only a few minutes battery running time left.

Please note that for a complete disconnection from the mains the mains connector must be removed.

Service life of the battery

Due to the technology used, the capacity of the lithium ion battery used in the PG reduces with each charge/discharge process. A gradual reduction in capacity also takes place if stored at too high or too low temperatures. The operating times of one battery charge in a network-independent operation can therefore gradually reduce over time.

The battery has a typical life span of c. 300 charges and is therefore designed in such a way that with standard handling within six months after purchase of your PG it can still be charged and discharged. A loss of capacity over time is technology-dependent and, as with all manufacturers of comparable devices, it is excluded from the warranty. In the case of a significant drop of efficiency we recommend that you replace the battery. Use only Siemens original spare parts.

You should note the following with regard to the life span of the battery:

- If possible, the battery should always be completely discharged/charged.

- Frequency of use: The more often the battery is used, the faster it reaches the end of its effective life span. A lithium ion battery has a typical life of around 300 charge cycles.

- If you run the computer primarily on mains voltage, you should charge the battery pack to approximately 50% and then remove it from the computer for separate storage.

4.4   Using batteries

⚠ WARNING
Observe the danger notices
Read the notes and information on the proper use and correct disposal of batteries in section "Rechargeable battery (Page 39)".

Requirement

The device is completely isolated from the line voltage.

Procedure

1. Turn the device over so that it is lying on a stable surface with its display unit closed.

2. Release ① the battery cover ② on the bottom of the device.

3. Open the battery cover in the direction of the arrow and, if necessary, remove the old battery.

    Insert the new battery.

4. Close the cover and turn the device over again.

4.5 Operating modes

In accordance with the settings in the Windows Power Options, the Field PG supports different operating states. You can manually or automatically, after a particular time interval, put the device in the following operating states:

● Standby mode (Save to RAM)

● Hibernation (Hibernate, save to disk)

● On

● Off

Parameterize the possible operating modes of the device to the following actions in the power options:

● Operating the on/off button

● Shutting down the operating system (Windows)

● Opening and closing the display lid

● Inactivity of keyboard and mouse

Reactivating the device after standby mode or hibernation

In standby mode the corresponding system-LED flashes, and in hibernation all the operating displays are switched off. To reactivate the Field PG after these two operating modes, press the on/off button briefly.

Parameterize the change to the different operating states

In Windows you can set parameters for the time interval and the actions for change to a different operating mode in the power options. Select:

● "Control Panel\All Control Panel Items\Power Options".

Before changing the power options, make a note of the factory settings, if necessary.

Note

Deactivating Hibernation or Standby mode

By changing the power settings, and by adding extra hardware (such as USB-components) or software to the device, you can modify the operating modes so that the device cannot switch to **Hibernation** or **Standby mode**. Even though the screen display is dark, relevant consumers remain switched on in the device.

Operating modes during transportation of the device

Please remember to always shut down the Field PG or set it to Hibernation prior to transporting it in the backpack. You will recognize these states as after removing the power supply, all status-LEDs of the device are switched off. This way you can ensure the device is not switched on and the battery is not unintentionally discharged during transportation.

Notes on operation and software

<div style="text-align: right; font-size: 2em;">5</div>

5.1 Notes on operation

5.1.1 HDD and SSD

Drives, HDD and SSD with differing capacities can be used.

Note

Please use only drives recommended by Siemens. The order data for removable hard disks can be found in the catalog.

The respective system LED indicates access to the drive. See sectionStatus displays (Page 20).

⚠ CAUTION
Risk of damage to the drives
Drives are sensitive to inadmissible vibrations. Shocks during operation can lead to the loss of data or damage to the drive or data carrier.

5.1.2 Optical drive

This drive allows you, for example, to read the operating instructions on the supplied "Manuales and Drivers" DVD.

Information on burning data storage media (CD-RW or DVD±RW)

NOTICE
Danger of data loss!
Burning is permissible only in an undisturbed environment, i.e. shock and vibration stress must be avoided. Because of heavy fluctuation in the quality of CD-Rs, data may be corrupted in a burning session, even if no error message is initially displayed. The written data can only be verified by comparing these with the source. To be on the safe side, data should be verified after every burning session.

Emergency unlocking mechanism of the drive drawer

If the drive drawer does not open, you can open it using the emergency unlocking mechanism:

1. Completely disconnect the device from the power supply.

2. Carefully guide a long, thin object through the small hole (diameter approx. 1mm) in the drive drawer.

   You can use a thin needle or a straightened paper clip for this. Push it approx. 2-3 mm into the hole.

   The drive drawer will open.

Inserting or removing data storage media

To prevent excessive force acting on the extended drive drawer, hold it at the front panel when inserting or removing the data storage media.

After closing the drawer, the data storage medium is initially tested and then the access display on the drive starts to flash.

- Display flashes:

  A data storage medium which is hard to read but still readable is in the drive.

- Display flashes initially and then is continuously lit:

  The data storage medium inserted is not readable and is defective.

5.1.3   USB socket with charging function

You can use the bottom USB socket under the cover on the side of the device ① to charge USB devices (e.g. smartphones) at a current of up to 1.5 A, even when the Field PG is switched off.

The circuit is compliant with USB standard BC1.2 and also supports charging of Apple devices based on the so-called divider mode method. Devices charged in divider mode will only reach the maximum current in shutdown state.
If you also want to use the charging function in cordless operating mode while the device is shutdown, activate the the corresponding function in the BIOS Setup dialog
Power > USB Charger.

Note

Disable this function again to maintain the minimum possible discharge rate of the battery pack.

5.1.4 Card reader

5.1.4.1 SIMATIC cards for card reader

The card readers of the Field PG can be found on the left and right of the device, see section "Exterior design (Page 12)". You can operate the following SIMATIC cards in the following card readers:

SIMATIC Memory Card

- SIMATIC Memory Card for S7-300/400
  - SIMATIC Memory Card for S7-400 (long design)

  - SIMATIC Memory Card for S7-300 (short design)

SIMATIC Micro Memory Card

- SIMATIC Micro Memory Card for S7-300/C7/ET200

SMC (SIMATIC MC)

- SIMATIC Memory Card for S7-1x00

5.1.4.2   Editing SMCs, SD cards and multimedia cards

You can read, program or erase the following cards with the Multi Media Card Reader:

- SMC (SIMATIC MC)

- SD card (including SD UHS-II)

- MMC (Multi Media Card)

NOTICE
Risk of data loss for SIMATIC Micro Memory Card
Do not use a SIMATIC Micro Memory Card in this case because the card can be damaged by Windows functions.
The slot for the SIMATIC Micro Memory Card is located on the right-hand side of the device, see section "Modifying SIMATIC Micro Memory Cards (Page 49)".

The Multi Media Card Reader ① is located on the left-hand side of the device.

The contact areas of the card face downward. When inserting the card, pay attention to the correct positioning of the card.

To remove the card press it lightly towards the device.

The card is operated by a push-push function.

NOTICE
Do not insert or remove cards while in use.
Inserting or removing a card while it is in use could damage it.
The card may not be removed as long the status indicator is lit, see section "Status displays (Page 20)".
Observe the ESD guidelines (Page 79).

5.1.4.3   Modifying SIMATIC Micro Memory Cards

You can read, program, or erase SIMATIC Micro Memory Cards.

Procedure

1. Switch on the PG.
2. Start your SIMATIC programming function.
3. Use the programming function of your SIMATIC programming software to read, program, or erase the SIMATIC Micro Memory Card.
4. End the programming function of your SIMATIC programming software.
5. Remove the SIMATIC Micro Memory Card from the card reader ①.

NOTICE
Do not insert or remove the module while it is in use
Plugging in or removing the module while the module is being changed could damage the module.
Do not remove the SIMATIC Micro Memory Card if the module programming status display is lit.
Note the ESD Guidelines (Page 79).

5.1.4.4   Editing SIMATIC Memory Cards

You can read, program, or erase SIMATIC Memory Cards in the card reader located on the right-hand side of the device. SIMATIC Memory Cards are available for SIMATIC S5 and SIMATIC S7-hardware.

Procedure

1. Switch the device on.

2. Use the programming function of your SIMATIC programming software to read, program, or erase the SIMATIC Memory Card.

3. End the programming function of your SIMATIC programming software.

4. Remove the SIMATIC Memory Card from the card reader①.
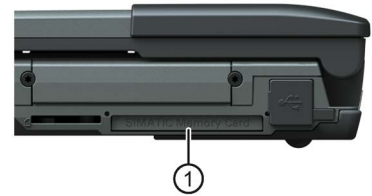
NOTICE
Do not insert or remove cards while in use.
Inserting or removing a card while it is in use could damage it.
The card may not be removed as long the status indicator is lit. See section "Status displays (Page 20)".
Observe the ESD guidelines (Page 79).

Note
Malfunction

The simultaneous use of MPI/DP Online and a SIMATIC Memory Card can cause malfunctions. Simultaneous use is not supported.

Terminate the use of the SIMATIC Memory Card before using MPI/DP.

5.1.4.5   Using ExpressCard™ Type 34

In the card reader for ExpressCards™ you can use the following ExpressCards™ of type 34 for the system expansion and adaptation of different interfaces:

● Memory expansions

● Networking, e.g. over Gigabit Ethernet

● Connection of peripheral devices, e.g. via USB

● Connection of drives via USB or eSATA

The card reader for ExpressCards™ is located on the left-hand side of the device.

Before you insert the card, ensure that the ejector is engaged. To remove the ExpressCard™, press the ejector once to unlock it, and then a second time to eject the card.

NOTICE
Proper insertion and removal of the ExpressCard™
The label of the ExpressCard™ must face upward during insertion.
Only take out the card when data is no longer being transferred (risk of loss of data and system crash).
If you try to insert the ExpressCard™ the wrong way around, the PG and ExpressCard™ can be damaged.
Note the ESD Guidelines (Page 79).

⚠ WARNING
Revocation of the safety approval for ExpressCards™ that are not UL-listed
The ExpressCard™ interface does not meet the requirements of the limited power source. To retain the safety approval of the device, please use only UL-listed ExpressCards™ or cards that meet the relevant requirements of IEC / EN 60950-1. You can obtain further information from the card vendor.

5.1.4.6 Editing smart cards

You can read smart cards with an integrated chip, such as plant ID cards, with the Smart Card Reader.

The Smart Card Reader is located on the right-hand side of the device.

When inserting the card, pay attention to the correct positioning of the card. The chip must face upward.

5.1.5 WLAN and Bluetooth

5.1.5.1 General information about WLAN and Bluetooth

The Field PG M5 supports Bluetooth to standard 4.0.

The Field PG is equipped with a network card for Wireless LAN (WLAN), i.e. you are **not** assigned to a cable network. With WLAN, the same as with cable network, you have access to files, the printer and to the Internet.

Support is provided for the WLAN frequency ranges 2.4 GHz and 5 GHz.

Depending on the surrounding conditions, you can create connections through walls or at distances in the open air of up to 100 m.

The on-board network adapter operates based on the following standards:

- IEEE 802.11 a: The maximum data rate that is theoretically possible with optimum ambient conditions, and low power utilization is 11 Mbps.

- IEEE 802.11 b: The maximum data rate that is theoretically possible with optimum ambient conditions, and low power utilization is 11 Mbps.

- IEEE 802.11 g: The maximum data rate that is theoretically possible with optimum ambient conditions, and low power utilization is 54 Mbps.

- IEEE 802.11 n: The maximum data rate that is theoretically possible with optimum ambient conditions and low power utilization is 300 Mbps.

- IEEE 802.11 ac: The maximum data rate that is theoretically possible with optimum ambient conditions and low power utilization is 866 Mbps.

The IEEE standard offers two modes of operation, the ad hoc mode (Peer to Peer) and the infrastructure mode.

Ad hoc mode

The ad hoc network refers to a wireless network that is established directly between several computers, whereby all computers must have a WLAN facility. No additional devices are necessary.

Infrastructure mode

The infrastructure network uses access points to connect computers to wired networks with the aid of WLAN. These can be a local network (e.g. company networks) or a global network (e.g. Internet).

More detailed information on configuring and operating the WLAN can be found in the online help of the WLAN network adapter.

5.1.5.2 Safety notices for WLAN and Bluetooth operation

You can switch WLAN and Bluetooth of the Field PG on and off with the hotkeys Fn + F3.

- The radio waves necessary for WLAN and Bluetooth can cause interference in hearing aids (unpleasant buzzing) and in the onboard electronics of vehicles. To prevent interference, switch off the Field PG in aircraft, or when driving a vehicle.

- Radio waves caused by WLAN and Bluetooth may lead to malfunctioning of life-support systems. Switch off the WLAN and Bluetooth function if you are in the proximity of such systems, e.g. hospitals, medical electronic systems.

- The range of the wireless connection and the achievable data transmission rate depend on the ambient and environmental conditions.

- A WLAN and Bluetooth connection is not tap-proof. Unauthorized third parties can then receive data.

  To protect the transmitted data, WLAN and Bluetooth have different encryption methods. We recommend that you activate an encryption in accordance with your WLAN and Bluetooth environment.

- If possible, do not bring the WLAN and Bluetooth connection in the vicinity of the following devices as the operation of these devices may result in faults or the complete failure of the WLAN and Bluetooth connection:

  – Microwaves

  – Wireless video-audio transmission systems

  – Wireless telephones (DECT)

> ⚠️ **CAUTION**
>
> **Risk of interference with pacemakers**
>
> The radio waves of WLAN and Bluetooth may interfere with pacemakers.
>
> If you wear a pacemaker, keep a minimum distance of 20 cm from the Field PG when WLAN or Bluetooth is activated.

> ⚠️ **CAUTION**
>
> **Danger of explosion**
>
> The radio waves transmitted by WLAN and Bluetooth may trigger an explosion or fire.
>
> Switch off WLAN and Bluetooth of the Field PG if you go in the vicinity of flammable gases or in an explosive environment (e.g. paint shop).

Siemens is not responsible for radio or television interference that has been caused by unauthorized changes to this device. Furthermore, Siemens shall not be held responsible for the use or replacement of connecting cables and devices that have not been recommended by Siemens. The user alone is responsible for remedying faults that have been caused by such an unauthorized change, or for the use or the replacement of the device.

5.2 Notes on SIMATIC software

Starting STEP 7

Please note that a license key is required to work with STEP 7. For more information, refer to section "Switching on the unit (Page 37)".

- In the Windows desktop, click the SIMATIC Manager icon, or
- Click the **Start** button, and select the desired program with **Simatic > STEP 7**.

> **Note**
>
> The Archive/Retrieve function in STEP 7 is used to transfer a STEP 7 project from one PG to another. To transmit, in the SIMATIC Manager select **File > Archive** or **File > Retrieve**. A detailed description of the procedure is given in section "Steps for File Archiving/Retrieval" of the online help for STEP 7.

Starting WinCC flexible

Please note that a license key is required to use WinCC flexible.

● In the Windows desktop, click on the SIMATIC Manager icon, or

● Click the **Start** button, and select the desired program with **Simatic > WinCC flexible**.

Starting TIA Portal

You have the following options for starting the TIA Portal:

● Click the TIA Portal icon on the Windows desktop:

● Click the **Start** button and select the following path:

   All Programs > Siemens Automation > TIA Portal V1x

5.3   Intel Active Management Technology

Intel® Active Management Technology is a technology for remote maintenance of computers (AMT PCs). This remote maintenance encompasses the following functions:

● Remote power management:

   AMT PCs can be switched on/off and be restarted from another PC.

● Keyboard–Video–Mouse-Redirection (KVM-Redirection)

   Keyboard–Video–Mouse redirection. This enables remote access to the AMT PC, and operation of AMT PCs without functioning operating system.

● BIOS Setup Management

   You can start and change the BIOS Setup remotely.

● Remote reboot:

   An AMT PC can be booted from a bootable ISO file made available by another PC.

● SOL (Serial over LAN):

   You can redirect data of a serial interface to the network. The function is used primarily for text-based remote control of an AMT PC in console mode.

● IDE redirection:

   An ISO file contains a memory image of the content of a CD or DVD with ISO 9660 structure. An ISO file can be implemented on the AMT PC for use as virtual DVD drive on the help desk PC.

Configuration of the AMT PC

You configure AMT in the BIOS Setup and MEBx (Management Engine BIOS Extension). MEBx is a BIOS extension for configuring AMT.

Press <ESC> when the BIOS appears briefly during startup and select the BIOS start page MEBx.

Note

Password protection for the AMT PC

AMT enables virtually unrestricted access to the AMT PC. Protect access to the AMT PC by means of password.

5.4 Trusted Platform Module (TPM)

The Field PG features a so-called Trusted Platform Module (TPM) to standard 2.0. You can enable this module in the **Security** dialog of BIOS-Setup. Follow the instructions of BIOS Setup.

The Trusted Platform Module can be used, for example, in combination with the BitLocker drive encryption under Windows 7 and Windows 10 (available in a later delivery stage). Follow the instructions of the operating system.

Note

Improper usage poses the risk of data loss. Always keep the keys and passwords in a secure place. Encrypted data cannot be retrieved. The Siemens warranty does not cover a hardware reset after loss of the password.

Note

Hotfix required to use TPM 2.0 under Windows 7

When you install TP 2.0 under Windows 7 on your device yourself, note the following:

1. First boot Windows via UEFI.

2. Then install Hotfix KB2920188 from Microsoft.

For more detailed information, visit (https://support.microsoft.com/en-us/kb/2920188 (https://support.microsoft.com/en-us/kb/2920188)).

Expanding device

6

6.1 Removing and installing memory modules

Memory expansion options

The motherboard is equipped with 2 slots for DDDR4-memory modules. You can use these to expand the PG memory capacity to a maximum of 32 GB. The memory modules may not exceed the maximum size of 16 GB.

Preparation

1. Switch off the device. Make sure the device is not in Standby mode (unsaved data could be lost) and that the device cannot get damaged.

2. Close the display unit.

3. Remove all connecting cables from the device.

4. Place the PG with the display unit face down on an level surface.

NOTICE
Observe the ESD guidelines
The electronic components on the PCBS are highly sensitive to electrostatic discharge. It is therefore vital to take precautionary measures when handling these components. Refer to the ESD Guidelines (Page 79) for a description of these measures.

Note

Please use only Siemens memory modules as these have been qualified and cleared for use in this device. You will find the order data in the catalog.

5. Open the battery pack cover; see chapter "Using batteries (Page 42)".

Removing a memory module

1. Remove the battery (Page 42).
2. Remove the screw (Torx T6) that holds the cover.

3. Remove the cover.
4. Carefully push the two clamps to the side. The memory module folds up.

5. Pull the memory module out of the slot.

Installing the memory module

1. Insert the memory module into the slot with the connection contacts in front. Pay attention to the notch (locking element) on the side of the connector.

2. Carefully push the module downwards until the lock engages.

3. Put the cover back over the slot and fasten this with the screw.

4. Insert the battery again (Page 42) and connect the device to the power supply system.

Note

The memory modules must be seated firmly in their slots. Faulty contact of the memory modules may lead to malfunction, e.g. boot failure of the device.

Display of the current memory configuration

The memory expansion is automatically detected. The RAM configuration is indicated in the BIOS Setup, "Main" menu.

Device maintenance and repair

7

7.1 Maintenance

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

Component	Replacement interval
Drives	3 years
Backup battery	5 years

7.2 Installing and removing hardware

7.2.1 Hard disk kit and SSD kit

The hard disk kit and SSD kit consist of the hard disk assembly or SSD assembly (see the order documents for details of the capacity of the HDD or SSD), a Torx screwdriver T8, and a transport and storage bag.

Hard disk kits or SSD kits can be ordered under the following order numbers:

- 6ES7791-2BA02-0AA0 (1 TB HDD)
- 6ES7791-2BA22-0AA0 (512 GB SSD)
- 6ES7791-2BA23-0AA0 (1 TB SSD)

With the SATA to USB 3.0 adapter (order no. 6ES7790-1AA01-0AA0), you can easily create an image of your system for backup purposes, or as the basis for system-specific installations.

See also

Accessories (Page 21)

7.2.2   Replacing the hard disk assembly and SSD assembly

Requirement

Note

Always replace the hard disk with a hard disk or SSD of the same type. The hard disk or SSD are available as a spare part. Information about this can be found in section "Hard disk kit and SSD kit (Page 61)".

- The device is not in Standby or Hibernate mode (unsaved data might be lost) or the device can get damaged.
- The device is completely isolated from the line voltage.
- The battery has been removed, see section "Using batteries (Page 42)".
- All connecting cables have been removed from the device.

Removing the hard disk assembly or SSD assembly

1. Open the display.
2. Remove both screws (Torx T8) on the cover of the hard disk assembly or SSD assembly.

3. Open the cover and remove the hard disk assembly or SSD assembly.

Inserting the hard disk assembly or SSD assembly

1. Push the new hard disk assembly or SSD assembly carefully into the slot as far as it will go.

2. Close the cover, and secure it with the two screws.

See also

ESD Guidelines (Page 79)

7.2.3 Replacing the backup battery

The Field PG has a backup battery. This supplies the hardware clock with power even when the device has been switched off.

Batteries are subject to wear and tear and should be replaced after five years to make sure that your PG works correctly.

Note

The backup battery should only be replaced by the repair center. If you have any queries, please contact your service office or your sales partner.

NOTICE
Risk of damage!
The lithium battery may only be replaced with an identical battery or with a type recommended by the manufacturer (order no.: A5E00047601).

⚠ WARNING
Danger of explosion and the release of harmful substances!
Do not throw lithium batteries into an open fire, do not solder, or open the cell body, do not short-circuit, or reverse polarity, do not heat up above 100 °C, follow the disposal instructions, and protect against direct exposure to sunlight, humidity, and condensation.

NOTICE
Batteries must be disposed of in accordance with local regulations.

7.3 Reinstalling the software

7.3.1 Software and drivers for the device

If ever your software fails, you can use the data storage media included in the scope of delivery to reinstall it.

Operating system package recovery DVD:

The operating system package contains the Recovery DVD with the installation programs for configuring the hard drives and installing the operating system and the languages supported by the operating system (MUI package).

The basic language of the installed operating system is English. To add other languages, install these languages from the Recovery DVD at a later time.

"Manuales and Drivers" DVD

This DVD contains the documentation and the hardware drivers for the Field PG.

"SIMATIC SW for Field PG M5" DVD box

This box contains the DVDs with the SIMATIC software.

Restore DVD set:

The Restore DVD set is supplied as standard. It contains the following restore options:

● Restore Basis:

 To restore the operating system and hardware drivers, without SIMATIC software

● Restore SIMATIC:

 To restore the operating system, hardware drivers and SIMATIC software

---

Note

Before using the recovery DVD or the restore DVD sets, place the data storage medium from which the operating system is to be booted later at the first position in the boot sequence. You make this setting in the "Boot" menu of BIOS Setup.

7.3.2 Restoring the delivery state

You can restore the original software using the Restore DVD. The DVD contains the necessary images and tools for transferring the software to the hard disk drive or SSD of your device.

The following options are available for restoring the delivery state:

● Restore the entire hard disk/SSD with drives C and D

● Restore drive C

 This means data stored on drive D are retained.

Requirement - Back up license keys

- If the operating system is still available, then back up your license keys from your device to an external storage medium before restoring the delivery state.

- If backup is not possible, please contact Customer Support. There you can obtain information necessary for corresponding software authorization. Keep your "Certificates Of License (COLs)" ready for Customer Support. The COLs are included in the scope of delivery in printed form.

NOTICE
Risk of data loss
If "Restore system partition only" is set all data on drive C: (system partition) will be deleted. All data, user settings and all authorizations or license keys on drive C: are lost! All data on drive C: will be completely deleted, reformatted and overwritten with the original factory software.
When "Restore entire hard disk" is set, ALL data, user settings, authorizations or license keys will be lost on the entire drive.

Procedure

1. Insert the Restore DVD into the DVD drive.

2. Reboot the device.

3. Press the <Esc> key when the device boots and keep it pressed.

   The BIOS selection menu is displayed when initialization is completed.

4. Click the "Boot Manager" button.

5. In the boot menu, select the optical drive using the cursor keys.

   To restore a system which boots in "UEFI" mode, you must also boot the restore DVD using UEFI.

   To boot the restore DVD in "UEFI" mode, in the "Boot" menu in BIOS setup select the item for which the optical drive is identified with "UEFI" in front of the name. Example:

   UEFI: MATSHITADVD-RAM UJ8E0

   To restore a system which boots in "Legacy" mode, you must also boot the restore DVD using Legacy.

   To boot the recovery DVD in "Legacy" mode, in the "Boot" menu in BIOS setup select the item for which the optical drive is identified with "P" in front of the SATA port number. Example:

   P5: MATSHITADVD-RAM UJ8E0

   #### Note

   In delivery state, Windows 7 boots in "UEFI" mode.

   In delivery state, Windows 10 (available in a later delivery stage) boots in "UEFI" mode.

6. Follow the instructions on the screen.

   #### Note

   All existing data, programs, user settings, authorizations and license keys on the drives are deleted.

See also

Device identification data (Page 27)

7.3.3 Updating the operating system

Windows

The latest updates for the Windows operating system are available on the Internet at Microsoft (http://www.microsoft.com) and on the device in the Start menu "Start > All Programs > Windows Update > Check for updates".

Note

Before you install new drivers or operating system updates for Windows MUI versions, configure the regional menu and dialog settings and the default English (US) language.

other operating systems

Contact the corresponding manufacturer.

7.3.4 Installing drivers and software

7.3.4.1 Installing the drivers

Note

In the case of multilingual operating systems (MUI versions), you have to set the regional settings for menus and dialogs and the default language to English (US) before you install new drivers or operating system updates.

Install the drivers and software from the "Manuales and Drivers" DVD included with your product. Proceed as follows:

1. Insert the "Manuales and Drivers" DVD into the optical CD/DVD drive.

2. If the suite does not start automatically, run "START.CMD" from the DVD.

3. Select "Drivers" from the index.

4. Select the operating system.

5. Select the required driver.

6. Click the link next to "Driver path" to open the folder containing the driver data.

7. Run Setup from the folder.

Note

The chipset driver must be installed before you install any other drivers for new installations of Windows operating systems.

7.3.4.2   Installing the SIMATIC software

Procedure

1. Insert the respective software DVD from the "SIMATIC SW for Field PG M5" box into the optical CD/DVD drive.

2. If the suite does not start automatically, run "START.CMD" from the DVD.

3. Select "Software" from the index.

4. Click "SIMATIC Software" to run the SIMATIC software setup.

5. Follow the Setup instructions.

6. Run Setup from the folder.

Note

The USB sticks with the license keys that are necessary for running the SIMATIC software are only available for versions that include the respective SIMATIC software.

For more information about license key activation, refer to the section
Initial commissioning – Initial power on (Page 37).

Installing additional SIMATIC software

Proceed as follows to install additional SIMATIC software:

1. Insert the respective software DVD from the "SIMATIC SW for Field PG M5" box into the optical CD/DVD drive.

2. If Setup does not start automatically, run Setup manually from the DVD.

3. Follow the Setup instructions.

For more information about installation, refer to the respective SIMATIC software documentation.

7.3.5   Installing Windows

Note

Specific information on using the Windows operating systems is available on the Internet:

- Microsoft Technet Windows (http://technet.microsoft.com/windows)

The respective manuals are not included in the scope of delivery.

Requirement

You need the Recovery DVD for the operating system you want to install. The recovery DVD is included in the scope of delivery when you have configured a device with operating system.

If you use storage controllers that are unknown to the operating system, for example a RAID or AHCI controller, copy the respective controller driver to a USB stick and keep this USB stick to hand. The controller driver is required during installation.

Procedure

1. Insert the Recovery DVD into the optical drive.

2. Reboot the device.

3. Press the <Esc> key when the device boots and keep it pressed.

   The BIOS selection menu is displayed when initialization is completed.

4. Click the "Boot Manager" button.

5. Select the optical drive using the cursor keys.

   For your system to boot in "UEFI" mode after installation, you must also boot the recovery DVD using UEFI. You data storage medium will be set up with GPT partition management during installation of Windows.

   To boot the recovery DVD in "UEFI" mode, in the "Boot" menu in BIOS setup select the item for which the optical drive is identified with "UEFI" in front of the name. Example:

   UEFI: MATSHITADVD-RAM UJ8E0

   For your system to boot in "Legacy" mode after installation, you must also boot the recovery DVD using Legacy. You data storage medium will be set up with MBR partition management during installation of Windows.

   To boot the recovery DVD in "Legacy" mode, in the "Boot" menu in BIOS setup select the item for which the optical drive is identified with "P" in front of the SATA port number. Example:

   P5: MATSHITADVD-RAM UJ8E0

6. Confirm the selection by pressing ENTER.

7. **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.

8. Now follow the instructions in the installation program.

   You can find additional information on this in the next section.

"Install Windows" installation program

The language of the installation program and the operating system is preset to English. You can change the language of the operating system after the installation. Information on this topic is available in the section "Setting up the language selection using the Multilanguage User Interface (MUI)".

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 available (examples):

Refresh	Updating
Load Driver	Integration of controller drivers unknown to the operating system and required for installation. Please read the information in the section "Information for systems with RAID or AHCI controller".
Drive options (advanced)	To display additional functions that you can use to set up the data storage media, see figure "Windows installation window "Drive options (advanced)".

Refresh	Updating
Load Driver	Integration of controller drivers unknown to the operating system and required for installation. Please read the information in the section "Information for systems with RAID or AHCI controller".
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.

Note

If you want to install the operating system on a data medium connected to a storage controller unknown to the operating system, you have to integrate the driver of the storage controller. Integrate this driver before you partition the data medium and before you install the operating system. For more information on integrating the storage controller, refer to the section "Information for systems with RAID or AHCI controller".

1. Make sure that the partition on which you want to install the operating system is large enough and is set up with a 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 factory 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.

Windows 7 partitions, factory setting

The following information applies to data storage media ≥ 100 GB.

Partition	Name	Size	File system
First	BOOT	100 MB	Automatically set up by installation program
Second	SYSTEM	200 GB	NTFS not compressed
Third	DATA	Remainder	NTFS not compressed

Windows 10 partitions, factory setup (in a later delivery stage)

The following information applies to data storage media ≥ 100 GB.

Partition	Name	Size	File system
First	WinRE	300 MB	NTFS
Second	Boot	260 MB	FAT32, automatically set up by installation program
Third	MSR	128 MB	FAT32, automatically set up by installation program
Fourth	System	200 GB	NTFS not compressed
Fifth	Data	Remainder	NTFS not compressed

Information for systems with RAID or AHCI controller

Data carrier controllers unknown to the operating system must be made known to the operating system prior to installation in the "Install Windows" installation program.

Requirement

You have copied the relevant controller driver to a USB stick.

Procedure

1. Connect the USB stick with the controller driver to the device.

2. Start the "Install Windows" installation program as described above.

3. Select "Load Drivers" in the Windows installation window.

4. Select the respective driver on the USB stick.

7.3.6 Setting up the language selection using the Multilanguage User Interface (MUI)

You can set the display of menus, dialogs or other information, such as date and time, to a different language. For this purpose, you can either select one of the preinstalled languages or install a new language package.

The following command sequences are described in English. Depending on the default setting, they can be displayed in another language.

Procedure

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

Windows 7:

1. Choose:

   "Start > Control Panel > Clock, Language, and Region > Regional and Language Options"

2. You can make the desired changes in the "Formats" and "Location und Keyboards and Languages" tabs.

Windows 10 (in a later delivery stage):

1. Choose:

   "Start > Control Panel > Clock, Language, and Region > Region"

2. You can make the desired changes in the "Formats" and "Location" tabs.

Changing the settings for language, region and formats of the system account and the standard user account

You can change the settings for language, region and formats of the system account (for example, the language in the user login dialog) and the settings of the standard user account (standard setting for new users). The settings of the registered user are copied to the system account and the standard user account for this purpose.

Windows 7:

1. Choose:

   "Start > Control Panel > Clock, Language, and Region > Regional and Language Options"

2. You can make the required changes in the "Administrative" tab. You copy the settings by clicking the respective button.

Windows 10 (in a later delivery stage):

1. Choose:

   "Start > Control Panel > Clock, Language, and Region > Region"

2. You can make the required changes in the "Administrative" tab. You copy the settings by clicking the respective button.

Installing language package

The available language packages are described in the chapter "Design of the device". Some language packages are available on the Recovery DVD in the "Languagepacks" folder.

Windows 7:

1. Choose:

   "Start > Control Panel > Clock, Language, and Region > Regional and Language Options"

2. Select the "Keyboards and Languages" tab.

3. Click the "Install/uninstall languages" button and make the required changes.

Windows 10 (in a later delivery stage):

1. Right-click the start menu in the task bar and select "Command Promt (Admin)".

2. Enter the following command in the command line:

   ```
   Dism /online /Add-Package /PackagePath:#Path to the language pack#
   ```

   For "`#Path to language pack#`", enter the path to the language pack you want to install. Example:

   ```
   Dism /online /Add-Package /PackagePath:E:\Languagepacks\ja-jp\lp.cab
   ```

7.3.7 Data backup / subsequent modification of partitions

7.3.7.1 Hardware supported

> **Note**
>
> Older versions of the SIMATIC IPC Image Creators do not support the hardware of the device.
>
> Support is available as of SIMATIC IPC Image & Partition Creator Version 3.3.
>
> For information on SIMATIC IPC Image & Partition Creator, refer to the corresponding product documentation.

7.3.7.2 Creating an image

To backup your data under Windows, we recommend that you use the "SIMATIC IPC Image & Partition Creator" software tool. This tool is a simple and efficient backup and restore solution for HDD contents and individual partitions (images).

"SIMATIC IPC Image & Partition Creator" supports burning to DVD media.

The software can be ordered from the SIEMENS online ordering system. For detailed information about "SIMATIC IPC Image & Partition Creator", please refer to the corresponding product documentation.

7.3.7.3 Modifying the partitions

Siemens recommends that you use "SIMATIC IPC Image & Partition Creator" to modify partitions. The software is available on order from the SIEMENS Online Ordering System.

For more information on using "SIMATIC IPC Image & Partition Creator", refer to the corresponding documentation.

> **Note**
>
> To run the "Restore system partition only" option from the Restore DVD, the size of the partitions must correspond to the factory default. The factory settings for the partition sizes are listed in chapter "Installing Windows".

7.4 Recycling and disposal

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

Technical specifications 8

8.1 Certificates and approvals

ISO 9001 certificate

The Siemens quality assurance system for all product creation processes (development, production and sales) meets ISO 9001 requirements.

This has been certified by DQS (the German society for the certification of quality management systems).

Software License Agreement

The device is shipped with preinstalled software. Please observe the corresponding license agreements.

Certificates for USA and Canada

Product safety.

The following approval is available for the device:

Underwriters Laboratories (UL) according to UL 60950-1 Second Edition and Canadian Standard CAN/CSA-C22.2 No. 60950-1-07 Second Edition.

WLAN

The integrated wireless LAN conforming to IEEE 802.11 a/b/g/n/ac is certified for Europe, the USA and Canada.

RCM AUSTRALIA/NEW ZEALAND

This product meets the requirements of EN 61000-6-3 Generic standards - Emission standard for residential, commercial and light-industrial environments.

This product meets the requirements of the standard EN 61000-6-3 Generic standards - Emission standard for residential, commercial and light-industrial environments.

8.2 Directives and declarations

8.2.1 Notes on the CE mark

Notes on the CE mark

The following applies to the SIMATIC product described in this documentation:

RTTE directive

This product is designed for the following applications:

Application	Requirement for	
	Emissions	Immunity
Residential, business and commercial operations, and small businesses	EN 61000-6-3	EN 61000-6-1
Industrial applications	EN 61000-6-4	EN 61000-6-2

The devices are compliant with EN 61000-3-2 (Transient currents) and EN 61000-3-3 (Voltage fluctuation and Flicker).

This product meets the requirements of EC directive 1999/5/EC "Radio Equipment and Telecommunications Terminal Equipment - Use of the Radio Spectrum":
EN 300 328 / EN 301 893 / EN 301 489-17 / EN 301 489-1

The directive contains the requirements of the Directive of the Council on the Approximation of the Laws of Member States relating to Electromagnetic Compatibility (EMC Directive).

● Safety: see Low voltage directive

Low voltage directive

This product fulfills the Directive 2014/35/EU of the European Parliament and of the Council on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.

Compliance with this directive has been tested to EN 60950-1.

Declaration of conformity

The EC declaration of conformity and the corresponding documentation are made available to authorities in accordance with the EC directives stated above. Your sales representative can provide these on request.

Installation guidelines

The installation guidelines and safety notices specified in the supplied documentation must be adhered to during commissioning and operation.

Connecting peripherals

Noise immunity requirements to EN 61000-6-2 are met if connected peripherals are suitable for industrial applications. Peripheral devices must only be connected using shielded cables.

8.2.2   ESD Guidelines

Definition of ESD

All electronic modules are equipped with large-scale integrated ICs or components. Due to their design, these electronic elements are highly sensitive to overvoltage, and thus to any electrostatic discharge.

The electrostatic sensitive components/modules are commonly referred to as ESD devices. This is also the international abbreviation for such devices.

Electrostatic sensitive modules are identified by the following symbol:

NOTICE
Risk of overvoltage
Modules that are sensitive to electrostatic discharge can be destroyed by voltages well below those that can be perceived by human beings. Such voltages occur if you touch a component or electrical connectors of a module without first discharging the static from your body. The electrostatic discharge current may lead to latent failure of a module, that is, this damage may not be significant immediately, but in operation may cause malfunction.

Electrostatic charging

Anyone who is not connected to the electrical potential of their surroundings can be electrostatically charged.

The figure below shows the maximum electrostatic voltage which may build up on a person coming into contact with the materials indicated. These values correspond to IEC 801-2 specifications.

Power in kV
(kV)

16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

① Synthetic material

② Wool

③ Antistatic material, for example wood or concrete

5 10 20 30 40 50 60 70 80 90 100   Relative humidity in %
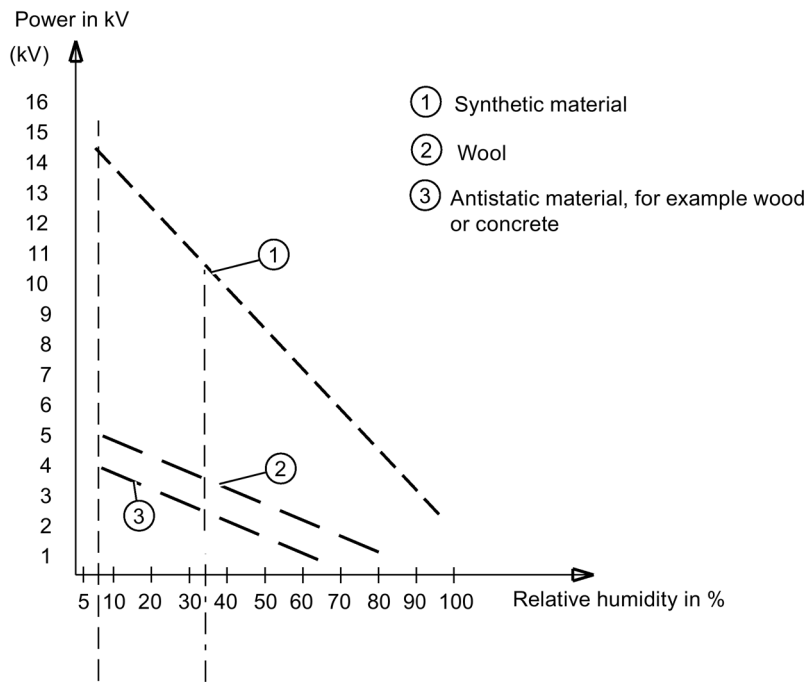
Image 8-1   Electrostatic voltages which an operator can be subjected to

Basic protective measures against electrostatic discharge

- Ensure correct grounding:
  When handling electrostatically sensitive devices, ensure that your body, working environment and any packaging are sufficiently grounded. This prevents electrostatic charge.

- Avoid direct contact:
  As a general rule, only touch electrostatically sensitive devices when otherwise unavoidable (e.g. during maintenance work). Handle the modules without touching any chip pins or conductors. In this way, the discharged energy can not affect the sensitive devices.

  Discharge your body before you start taking any measurements on a module. Do so by touching grounded metallic parts. Always use grounded measuring instruments.

8.3 Technical specifications

General technical data

Order nos.	See order documents or rating plate
Dimensions	385 x 53 x 275 (W x H x D in mm)
Weight	• Without battery Approx. 3 kg • With battery: Approx. 3.4 kg
Supply voltage (U_N)	100 V to 240 V AC (±10%); sinusoidal
Line voltage frequency	50 - 60 Hz (47 to 63 Hz)
Power consumption AC	Max. 100 W
Output voltage of the power supply unit (DC)	19 V
Output current of the power supply unit (DC)	Max. 4.7 A
Output power of power supply unit (DC)	Max. 90 W
Standby power (in battery operation)	Typically 1.5 W
Lithium ion battery (9 cells) with detection of charging condition)	Approx. 8800 mAh; 11.1 V with thermal switch and multi-fuse; recyclable; chargeable up to 40oC; high number of cycles for use in harsh environments; low self-discharge
Noise emissions	< 45 dB(A) to DIN 45635
Degree of protection (entire device)	IP 30 (with closed covers) according to IEC 60529

Safety

Protection class	Safety class II according to IEC 61140
Safety specifications	• IEC 60950-1/EN 60950-1 • UL 60950-1 Second Edition • CAN/CSA-C22.2 No. 60950-1-07 Second Edition

Electromagnetic compatibility (EMC)

Emitted interference	EN 61000-6-3, EN 61000-3-2 Class D and EN 61000-3-3
Noise immunity: Mains borne disturbance variables on supply lines	± 2 kV; (according to IEC 61000-4-4; Burst) ± 1 kV; (according to IEC 61000-4-5; Surge sym./ line to line) ± 2 kV; (according to IEC 61000-4-5; Surge sym./ line to earth)

Noise immunity on signal lines	• ± 1 kV; (to IEC 61000-4-4; burst; length < 30 m) • ± 2 kV; (to IEC 61000-4-4; burst; length > 30 m) • ± 2 kV; (acc. to IEC 61000-4-5; surge pulse/cable to ground; length > 30 m)
Immunity to discharges of static electricity	± 4 kV, contact discharge (according to IEC 61000–4-2; ESD) ± 8 kV, air discharge (according to IEC 61000-4-2; ESD)
Immunity to RF interference	10 V/m with 80% amplitude modulation at 1 kHz, in accordance with SPH 150 kHz to 80 MHz (to IEC 61000-4-6) 10 V/m with 80 % amplitude modulation with 1kHz, 80 MHz to 1000 MHz) (to IEC 61000-4-3) 3 V/m with 80% amplitude modulation at 1 kHz, 1.4 GHz - 2 GHz (acc. to IEC 61000-4-3) 1 V/m, with 80% amplitude modulation at 1 kHz, 2.0 GHz – 2.7 GHz (to IEC 61000-4-3)
Magnetic field	In accordance with SPH 30 A/m, 50 Hz and 60 Hz (acc. to IEC 61000-4-8)

Climatic conditions

Temperature	tested to IEC 60068-2-1, IEC 60068-2-2
During operation *	+ 5 °C to + 40 °C max. 10 °C/h (no condensation)
Storage/transport	–20 °C to + 60 °C at max. 20 °C/h (no condensation)
Relative humidity	tested to IEC 60068-2-78, IEC 60068-2-30, IEC 60068-2-14
During operation *	5% to 85% at 30°C/h (no condensation)
Storage/transport	5% to 95% at 25°C/h (no condensation)

* Burning with the optical drive is only permitted in an undisturbed environment and up to a maximum ambient temperature of 35 °C.

Mechanical ambient conditions

Vibration	Tested in accordance with DIN IEC 60068-2-6
Operation *	10 to 58 Hz; amplitude 0.0375 mm 58 to 500 Hz; acceleration 4.9 m/s^2
Transport	5 to 9 Hz; amplitude 3.5 mm, 9 to 500 Hz: Acceleration 9.8 m/s^2
Shock	Tested in accordance with IEC 60068-2-27
Operation *	Half-sine, 50 m/s^2, 30 ms, 100 shocks
Storage/transport	Half-sine, 250 m/s^2, 6 ms, 1000 shocks

* Burning with the optical drive is only permitted in an undisturbed environment and up to a maximum ambient temperature of 35 °C.

Special features

Quality assurance	According to ISO 9001

Motherboard

Processor	Processor specifications are listed in your order documents.
RAM	Expandable to 32 GB DDR4 SODIMM

Drives

Hard disk	2.5"-SATA HDDs or SSD, capacity specified in BIOS.
Optical drive[1]	DVD+-R/+-RW

[1] Burning with the optical drive is only permitted in an undisturbed environment and up to a maximum ambient temperature of 35°C.

Graphic

Graphic controller	Intel® HD graphics 530
Graphic controller memory	is assigned in the system memory
Resolutions/frequencies/colors	According to the setting options of the graphics driver

LCD display

Type	TFT (Thin Film Transistor), 16: 9, anti-reflection
Size	344 x 194, corresponding to 15.6"
Screen resolution	1920 x 1080 (full HD)
Possible colors	maximum 256 k
Vertical frequency	60 Hz
Contrast	> 200 : 1
Brightness	> 220 cd/m^2
Permissible defective areas	light and dark pixel: Max. 10

Audio

Audio controller	Realtek ALC255, UAA-compatible
Internal loudspeaker	Maximum output power 2 x 1 W

WLAN

IEEE 802.11 a/b/g/n and ac

Keyboard

Variant	Standard notebook
Key distance	19 mm
Key drop	2.5 mm
Labeling	• International / German • AZERTY layout (optional)
Pointing device integrated	Clickpad with integrated key function

Interfaces

RS232/TTY interface (COM1)	• The RS232 interface is integrated in every device by default. • TTY interface (20 mA), depending on configuration, cannot be retrofitted Standard for "S5" equipment variants. Active to 100 m, 25-pin socket, no galvanic isolation or serial interface V.24
DVI-I	Interface for external monitor (VGA screens can be operated using a DVI/VGA adapter), max. resolution DVI/VGA: 1920 x 1200
DPP 1.2 (display port)	Interface for external monitor, max. resolution: 4096 x 2560
USB	• 1x USB 3.0 Type C (left-hand side of device): Max. 1.5 A • 1x USB 3.0 Type A (back of the device): Max. 0.9 A • 1 x USB 3.0 Type A (right-hand side of the device, top): Max. 0.9 A • 1 x USB 3.0 Type A (right-hand side of the device, bottom) with charging function for smartphone: Max. 1.5 A
PROFIBUS/MPI interface	9-pin sub-D socket
• Transmission speed	• 9.6 kBaud to 12 Mbaud, software configured
• Mode of operation	• Electrically isolated: - Data channels A, B - Control lines RTS AS, RTS_PG - 5 V supply voltage (max. 90 mA) Grounded: - Shielding of the DP12 connection line
Physical port	RS485, electrically isolated
Ethernet	2 x Gigabit Ethernet (RJ45)
DC-In	DC power supply input, jack plug
Headphones, microphone, headset	UAJ connection for 3.5mm jack

Card reader

Smart Card Reader	ISO/IEC 7816 Smart Card Interface
ExpressCard™ Reader	1 x ExpressCard™ Type 34
SIMATIC Memory Card Reader	Programming interface for SIMATIC Memory Cards (S5 and S7-400)
SIMATIC Micro Memory Card Reader	Programming interface for SIMATIC Micro Memory Card
Multimedia Card Reader	Interface for: • SMC (mechanical as SD card); programming function • SD card (including SD UHS-II) • MMC

Status displays on the device

- Charge level
- Device status
- Access to HDD/DVD
- MPI/DP
- S5 and S7 modules / Card Reader (except Smart Card Reader)
- Num Lock
- Caps Lock
- WLAN active

8.4 Interface description

8.4.1 External interfaces

DC-In

Power adapter socket. This has the following charge:
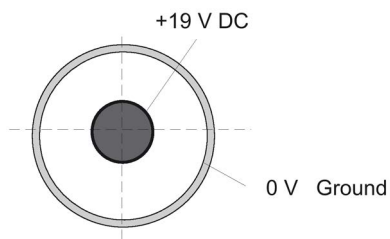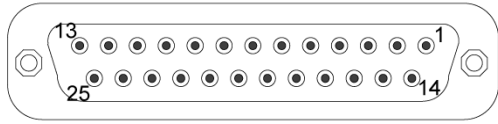
USB 3.0 Type A

Pin no.	Short designation	Meaning	Input/output
1	VBUS	+ 5 V (fused)	Output
2	D-	Data line	Input/output
3	D+	Data line	Input/output
4	GND	Ground	–
5	RX-	Data line	Input
6	RX+	Data line	Input
7	GND	Ground	–
8	TX-	Data line	Output
9	TX+	Data line	Output

USB 3.0 Type C

Pin no.	Short description	Meaning	Input/output
A1	GND	Ground	–
A2	TX1+	Data cable (USB 3.0)	Output
A3	TX1-	Data cable (USB 3.0)	Output
A4	VBUS	+ 5 V (fused)	Output
A5	CC1	Configuration channel	Input/output
A6	D+	Data cable (USB 2.0)	Input/output
A7	D-	Data cable (USB 2.0)	Input/output
A8	-	Not assigned	-
A9	VBUS	+ 5 V (fused)	Output
A10	RX2-	Data cable (USB 3.0)	Input
A11	RX2+	Data cable (USB 3.0)	Input
A12	GND	Ground	-
B1	GND	Ground	-
B2	TX2+	Data cable (USB 3.0)	Output
B3	TX2-	Data cable (USB 3.0)	Output
B4	VBUS	+ 5 V (fused)	Output
B5	VCONN	Configuration channel	Input/output
B6	D+	Data cable (USB 2.0)	Input/output
B7	D-	Data cable (USB 2.0)	Input/output
B8	-	Not assigned	-
B9	VBUS	+ 5 V (fused)	Output
B10	RX1-	Data cable (USB 3.0)	Input
B11	RX1+	Data cable (USB 3.0)	Input
B12	GND	Ground	-

RS232/TTY (COM1)
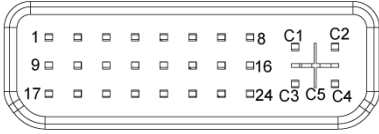
Pin no.	Short designation	Meaning	Input/output
1	-	Shielding	-
2	TxD (D1)	Serial transmit data	Output
3	RxD (D2)	Serial receive data	Input
4	RTS (S2)	Request to send	Output
5	CTS (M2)	Clear to send	Input
6	DSR (M1)	Ready for operation	Input
7	GND (E2)	Functional ground (reference potential)	-
8	DCD (M5)	Data carrier detect	Input
9	+TTY RxD	Current loop receive	Input
10-17	-	Not used	-
18	+TTY TxD	Current loop send	Output
19	+20 mA	Potentially isolated power source	-
20	DTR (S1)	Data terminal ready	Output
21	-TTY TxD	Current loop send	Output
22	RI (M3)	Incoming call	Input
23-25	-	Not used	-

Gender changer for COM1

With the gender changer (25-pin / 9-pin) the COM1/V.24/AG port can be converted to the usual 9-pin male connector. For this, you only have to plug the adapter onto the COM1 socket and secure it with the two hexagonal head screws.

The V.24 and TTY ports of the COM1 can be used alternatively.

DVI-I

Pin no.	Short designation	Meaning	Input/output
S	GND	Ground	–
S1	GND	Ground	–
C1	R	Red	Output
C2	G	Green	Output
C3	B	Blue	Output
C4	HSYNC	Horizontal synchronizing pulse	Output
C5	GND	Ground	-
CSA	GND	Ground	-
1	TX2N	TDMS data 2-	Output
2	TX2P	TDMS data 2+	Output
3	GND	Ground	–
4	NC	Not used	–
5	NC	Not used	–
6	DDC CLK	DDC clock	Input/output
7	DDC CLK	DDC data	Input/output
8	VSYNC	Vertical synchronizing pulse	Output
9	TX1N	TDMS data 1-	Output
10	TX1P	TDMS data 1+	Output
11	GND	Ground	–
12	NC	Not used	–
13	NC	Not used	–
14	+5 V	+5 V	Output
15	GND	Ground	–
16	MONDET	Hotplug detect	Input
17	TX0N	TDMS data 0-	Output
18	TX0P	TDMS data 0+	Output
19	GND	Ground	–
20	NC	Not used	–
21	NC	Not used	–
22	GND	Ground	–
23	TXCP	TDMS clock +	Output
24	TXCN	TDMS clock -	Output

Display port
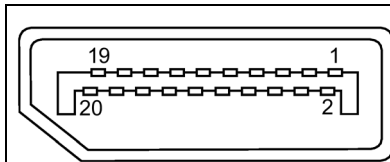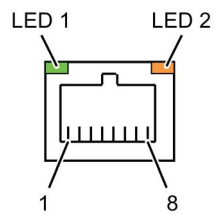
Pin no.	Short designation	Meaning	Input/output
1	ML_Lane0+	DP data 0+	Output
2	GND	Ground	-
3	ML_Lane0-	DP data 0-	Output
4	ML_Lane1+	DP data 1+	Output
5	GND	Ground	-
6	ML_Lane1-	DP data 1-	Output
7	ML_Lane2+	DP data 2+	Output
8	GND	Ground	-
9	ML_Lane2-	DP data 2-	Output
10	ML_Lane3+	DP data 3+	Output
11	GND	Ground	-
12	ML_Lane3-	DP data 3-	Output
13	CONFIG1 CAD	Cable Adapter Detect	Input
14	CONFIG2	Ground (pull-down)	-
15	AUX_CH+	Auxiliary channel+	Bi-directional
16	GND	Ground	-
17	AUX_CH-	Auxiliary channel-	Bi-directional
18	HPD	Hot Plug Detect	Input
19	GND	Ground	-
20	DP_PWR	+3.3V (fused)	Output

PROFIBUS / MPI

The PROFIBUS/MPI socket has the following pinout:

| Pin no.	Short designation	Meaning	Input/output
1	–	Not used	–
2	–	Not used	–
3	LTG_B	Signal line B of MPI module	Input/output
4	RTS_AS	RTSAS, control signal for received data stream. The signal is "1" active when the directly connected PLC is sending.	Input
5	M5EXT	M5EXT return line (GND) of the 5 V power supply. The current load caused by an external consumer connected between P5EXT and M5EXT must not exceed the maximum of 90 mA.	Output
6	P5 EXT	P5EXT power supply (+5 V) of the 5 V power supply. The current load caused by an external consumer connected between P5EXT and M5EXT must not exceed the maximum of 90 mA.	Output
7	–	Not used	–
8	LTG_A	Signal line A of MPI module	Input/output
9	RTS_PG	RTS output signal of the MPI module. The control signal is "1" when the PG is sending.	Output
Shielding		on connector casing	

Ethernet RJ45

Pin no.	Short designation	Meaning		Input/output
1	BI_DA+	Bi-directional data A+		Input/output
2	BI_DA-	Bi-directional data A-		Input/output
3	BI_DB+	Bi-directional data B+		Input/output
4	BI_DC+	Bi-directional data C+		Input/output
5	BI_DC-	Bi-directional data C-		Input/output
6	BI_DB-	Bi-directional data B-		Input/output
7	BI_DD+	Bi-directional data D+		Input/output
8	BI_DD-	Bi-directional data D-		Input/output
S		Shielding		–
	LED 1	OFF Lights up green Lights up orange	10 Mbps 100 Mbps 1 Gbps	–
	LED 2	Lights up green Flashes green	Connection is up indicates activity	–

UAJ

You can connect various audio devices to the UAJ connection. The audio controller socket recognizes the pin assignment of the connector, depending on the connected audio device. Information on connecting the audio devices can be found in section "Connecting peripheral devices (Page 34)".

The pins of a 3.5 mm jack are assigned as follows depending on the audio device:
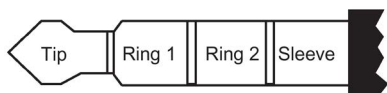
	Tip	Ring 1	Ring 2	Sleeve
Headphone out (stereo)	L	R	-	GND
Line out (stereo)	L	R	-	GND
Line in (stereo)	L	R	-	GND
Microphone in (mono)	MIC	-	-	GND
Headset (OMTP)	L	R	MIC	GND
Headset (CTIA)	L	R	GND	MIC

8.4.2 Connecting cables

SIMATIC S5 cabling

The SIMATIC S5 cable (not always supplied as standard) allows you to connect your PG to a SIMATIC S5 automation device. Note the information in the STEP 5 documentation.
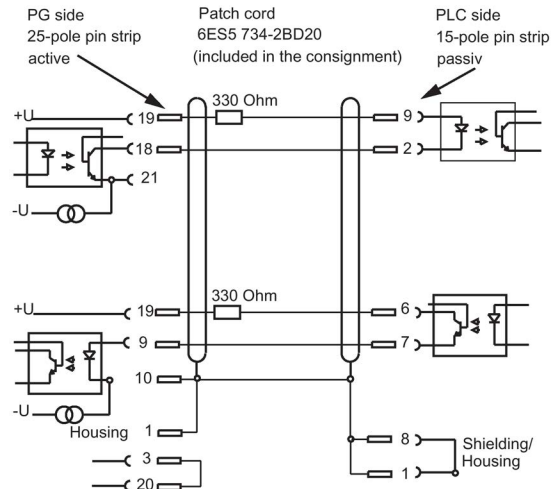
SIMATIC S7 cable for MPI/DP

The 6ES7901-0BF00-0AA0 cable is used to connect your PG to a SIMATIC S7 automation system. Note the information in section "Connect SIMATIC S7 or PROFIBUS (Page 32)."

8.5 System resources

Currently allocated system resources

All system resources (hardware addresses, memory configuration, allocation of interrupts, DMA channels) are assigned dynamically by the Windows OS, depending on the hardware configuration, drivers and connected external devices. You can view the current assignment of the system resources, or any conflicts with the following operating systems:

Windows 7	**Start >** Enter "cmd" in the search function, then enter "msinfo32" in the input box.
Windows 10	(in a later delivery stage)

8.6 BIOS description

8.6.1 Overview

Parameterize your device in the BIOS Setup.

BIOS Setup program

The BIOS Setup program, or BIOS Setup for short, is located, together with the setup parameters, in a FLASH block on the motherboard.

Change the setup parameters of the device in the BIOS Setup, e.g. system time or boot sequence.

Changing the device configuration

Your device configuration is preset for operating with the included software. You should only change the default setup parameters if technical modifications to your device require different parameters.

NOTICE
Malfunctions can occur with running software CPU
If a BIOS update of the PC is performed while SIMATIC software controller, a SIMATIC WinAC for example, is running, the software CPU can malfunction, resulting in communication interruptions or failures, for example. Other actions that put a heavy load on the PC hardware, for example, running hardware tests such as benchmarks, can result in malfunctions of the software CPU.
Do not run a BIOS update or other actions that would put a heavy load on the hardware during operation of a software CPU.
Switch the software CPU to "STOP" before you run a BIOS update or perform other critical actions.

Note

Documentation

BIOS Setup is described for all devices and device configurations. Some BIOS submenus or Setup parameters may not be included, depending on your order. The interface of your BIOS Setup can deviate from the figures in this document.

You can find a detailed description of the BIOS on the Support website under Entry ID 92189185.

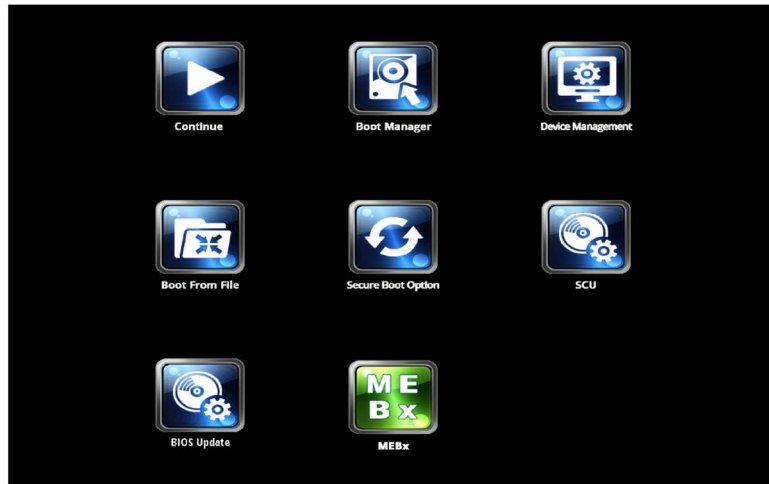## 8.6.2 Opening the BIOS selection menu

Procedure

1. Reset the device (warm or cold restart).

   Depending on the device version, the default settings can differ from the figures shown.

   The following message appears briefly on the display at the end of the self-test:

   `Press ESC for boot options`

2. Press <ESC> to open the BIOS selection menu:

The following keys are available in the BIOS selection menu:

| Buttons	Function
Continue	Exit selection menu, continue start sequence
Boot Manager	Specify the boot media from which to boot: • Hard disk drive • CD-ROM drive • USB drive (USB boot = enabled)
Device Management	Start device manager for UEFI boot media
Boot From File	Boot Maintenance Manager: • Boot Options: Set boot order • Driver Options: Configure drivers • Console Options: Configure connected input device • Boot from File: Start from an ".EFI" file • Reset System: Restoring factory settings
Secure Boot Option [1]	Configuration settings to start the device in Secure Boot mode. The only software modules loaded are those that are known to be safe for the BIOS or the operating system.
SCU	Start BIOS Setup via Setup Configuration Utility
BIOS Update	Update BIOS from USB memory stick
MEBx	Intel Management Engine AMT configuration

[1] Available as of Windows 8 or later

8.6.3 Structure of the BIOS Setup menu

The individual setup parameters are distributed between different menus and submenus. Not all menus are included in each supplied device configuration. The following table shows the menus.

Menu	Meaning
Main	Display system information, for example, BIOS version, processor and memory
Advanced	Configure hardware using different submenus
Security	Security functions, e.g., setting a password
Power	Specify CPU settings and switch-on functions.
Boot	Determine boot options, e.g., boot order
Exit	Save and exit (see Exit menu)

The menus always have the same structure. The figure below shows an example for the "Main" menu. Device-specific information is shown blurred.
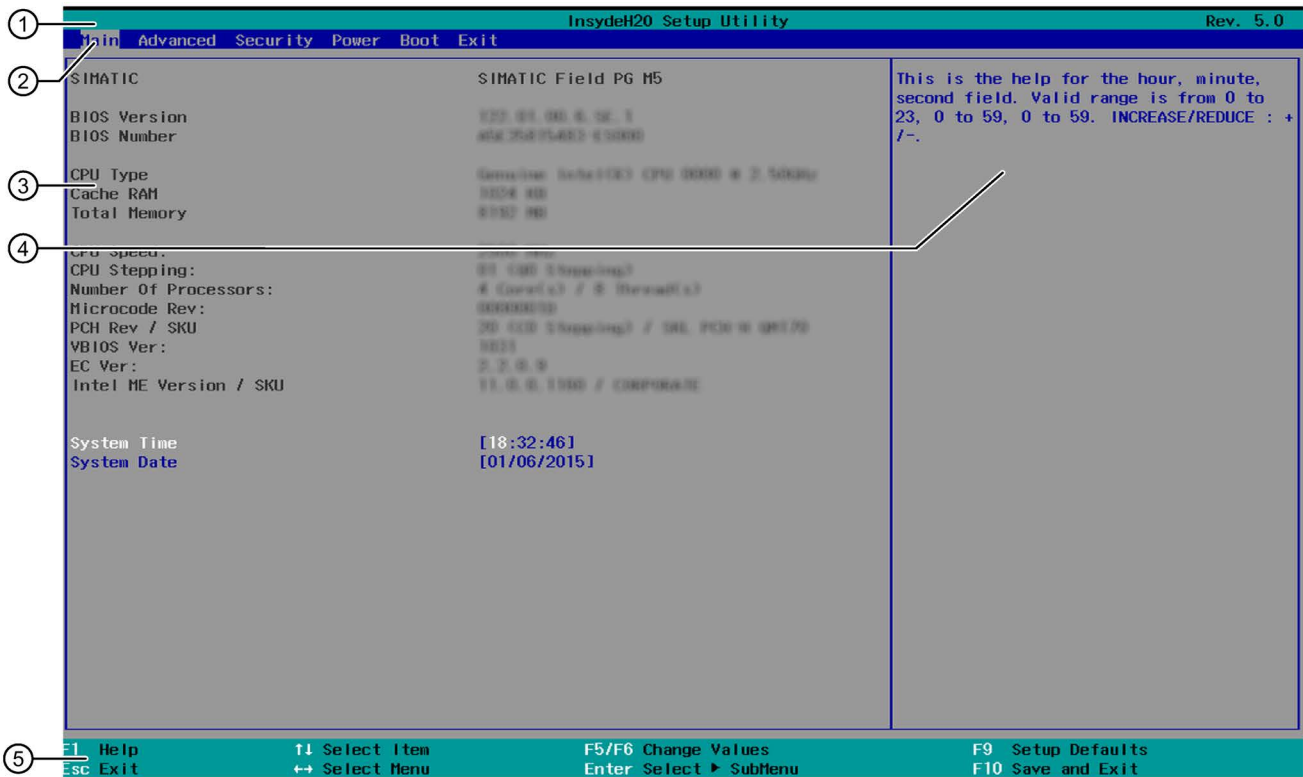

①	Header	The current version of the selected BIOS Setup is displayed in the header.
②	Menu bar	Switch between the various menus "Main", "Advanced", etc. in the menu bar at the top.
③	Settings, submenus and device-specific information	Information about your device is displayed in the center left-hand area; here you can edit settings which are partly in submenus.

| ④ | Help area | Short help texts on the currently selected setup parameters are displayed in the center right-hand area. |
| ⑤ | Key assignment | The key assignment for navigation in the BIOS Setup is found in the footer. |

8.6.4 Exit menu

You always exit BIOS Setup in this menu.
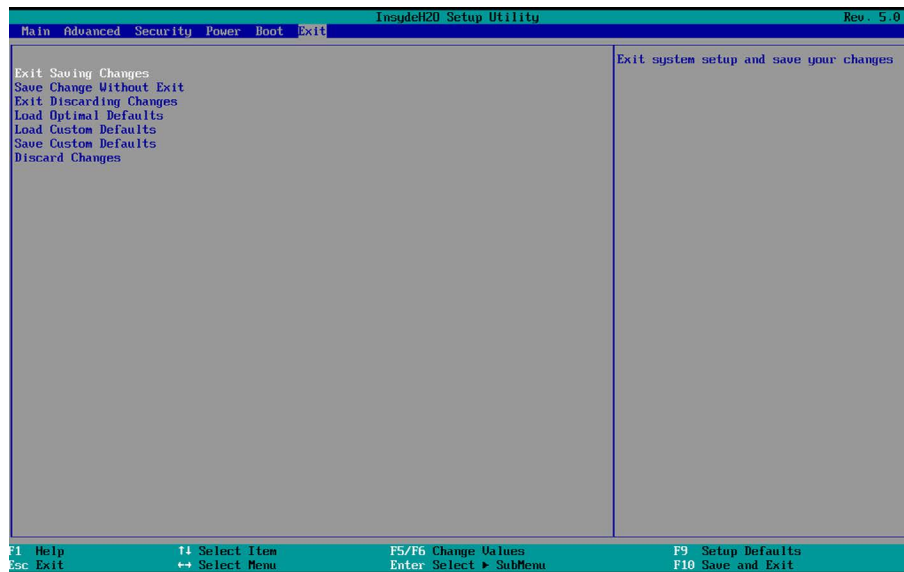
Exit Saving Changes	All changes are saved and the system is restarted with the new Setup parameters.
Save Change Without Exit	All changes are saved
Exit Discarding Changes	All changes are discarded and the system is restarted with the old Setup parameters.
Load Optimal Defaults	All setup parameters are reset to the safe default values. **Notice**: The existing Setup parameters are overwritten by this.
Load Custom Defaults	The profile must be loaded with the custom Setup parameters. Requirement: The parameters are saved prior to this with "Save Custom Defaults".
Save Custom Defaults	The currently configured Setup parameters are saved as a custom profile (see also "Load Custom Defaults").
Discard Changes	All changes are discarded.

8.6.5 Default BIOS Setup entries

Documenting your device configuration

If you have changed any default settings in Setup, you can enter them in the following table. You can then refer to these entries for any future hardware modifications.

Note

Print out the table below and keep the pages in a safe place once you made your entries.

BIOS Setup default settings

System parameters	Defaults	Custom entries
Main		
System Time	hh:mm:sss	
System Date	MM/DD/YYYY	

Boot configuration		
Numlock	On	
POST errors	Never halt on errors	

Peripheral Configuration		
Internal COM 1	Enabled	
On-board Ethernet 1	Enabled	
Ethernet 1 Address	00:1B:1B:41:42:7B (example)	
On-board Ethernet 2	Enabled	
Ethernet 2 Address	00:1B:1B:0A:85:10 (example)	
WLAN	Last State	
MPI (device-specific)	Enabled	
SD card	Enabled	
ExpressCard	Enabled	
Touchpad	Enabled	

Chipset Configuration		
HPET – HPET support	Enabled	
VT-d	Enabled	

Active Management Technology Support		
Intel AMT Support	Disabled	
Intel AMT Setup Prompt	Enabled	
MEBx Selection Screen	Disabled	
Un-Configure ME	Disabled	
Intel AMT Configuration Screens	Enabled	
USB Configure	Disabled	
Intel AMT Password Write	Enabled	
USB Configure	Disabled	
PET Progress	Enabled	
Intel AMT SPI Protected	Disabled	

Security		
TPM Operation	No operation	
Supervisor Password	Not installed	
User password	Not installed	
Power on password	Disabled	
User Access Level	View Only	

Power		
USB charger	Disabled	
Wake on LAN 1	Enabled	
Wake on LAN 2	Enabled	

Advanced CPU Control		
SW Guard Extensions (SGX)	Software Controlled	
Select Owner EPOCH input type	No change in Owner EPOCHs	
Intel (VMX) Virtualization Technology	Enabled	
Active Processor Cores	All	
Hyper-Threading	Enabled	
AES	Enabled	
Intel® SpeedStep™	Enabled	
Intel® Speed Shift Technology	Enabled	
Turbo Mode	Enabled	
C state	Enabled	

Boot		
Boot Type	Dual Boot Type	
Quick Boot	Enabled	
Quiet Boot	Enabled	
Network Stack	Disabled	
PXE Boot capability	Disabled	
Add Boot Options	Auto	
USB Boot	Disabled	
EFI Device First	Enabled	
Timeout	0	

Legacy / Boot Device Priority		
Normal Boot Menu	Standard	

8.6.6 BIOS update

Check regularly if updates are available for download to your device.

You can find additional information on the Internet at the following address:After Sales Information system (http://www.siemens.com/asis).

Noting down and restoring BIOS Setup settings

NOTICE
Irretrievable loss of data
All BIOS Setup settings are deleted after the BIOS update. This can put the system in an undefined state. This may damage the device and the plant. 1. Print out the table in the next section "General BIOS Setup settings". 2. Enter your specific BIOS Setup setting in this table before you run a BIOS update. 3. Start BIOS Setup after the BIOS update. 4. Load the BIOS Setup default settings with <F9> "Setup Defaults". Or use the BIOS Setup command "Load Optimal Defaults" in the "Exit" menu. 5. Make your own Setup settings based on the table you have printed out. 6. Save the BIOS Setup settings with <F10> "Save and Exit".

Performing a BIOS update

NOTICE
Damage to the device
If you switch off the device during the update, the BIOS will be incomplete and corrupt. This may result in malfunctions.
Leave the device switched on during the update.

If you have purchased a new BIOS update for your device, follow these steps to install the update:

1. Connect the device to the power supply.

2. Copy the update to a USB memory stick.

3. Reset the device (warm or cold restart).

   The following message appears briefly on the display at the end of the self-test:

   `Press ESC for boot options`

4. Press <ESC> to open the BIOS selection menu.

5. Click the "BIOS Update" button.

6. Follow the instructions on the screen.

Reboots

There may be several reboots after a BIOS update. These reboots are initiated by the Management Engine (ME). The reboots are required by the ME to adapt itself to the changes of the BIOS update.

8.6.7 Alarm, error and system messages

During startup (the boot process), the BIOS first performs a **P**ower **O**n **S**elf **T**est (POST) and checks whether certain functional units of the PC are operating error-free. The boot sequence is immediately interrupted if critical errors occur.

BIOS initializes and tests further functional units if the POST does not return any errors. In this startup phase, the graphics controller is initialized and any error messages are output to the screen.

The error messages output by system BIOS are listed below. For information on error messages output by the operating system or application programs, refer to the corresponding manuals.

On-screen error messages

On-screen error message	Meaning / tip
Operating system not found	Possible causes: • No operating system installed • Incorrect active boot partition • Wrong boot drive settings in SETUP
Keyboard controller error	Controller error. Contact your technical support team.
SMART failure detected on HDD	Hard disk reports pending failure through S.M.A.R.T.
CMOS battery failed	CMOS battery is not connected.
CMOS battery weak	CMOS battery is weak
Real-time clock has lost power	The CMOS clock was operated without battery or with a battery that was too weak, during battery change, for example. Check the CMOS clock.
Keyboard error	• Field PG: Internal keyboard defective and no external keyboard connected • Other devices: Keyboard defective or not connected
PLD configuration failed	Programming of the PLC on the motherboard has failed.

8.7　Active Management Technology (AMT)

8.7.1　Introduction

Intel® Active Management Technology (Intel® AMT) is an Intel technology for the remote maintenance of SIMATIC Industrial PCs (IPCs) with AMT technology using a management PC. It is not necessary to install an operating system on the SIMATIC IPC with Intel® AM. Intel® AMT provides numerous functions, e.g.:

- **Keyboard Video Mouse (KVM) Redirection**

  KVM connections are always possible using the KVM server that is integrated in the firmware. KVM enables access to IPCs with a corrupted or no operating system as the KVM server is integrated in the AMT hardware. KVM enables you to reboot a remote computer and make changes to its BIOS settings.

- **Remote power management**

  SIMATIC IPC with Intel ® AMT can be switched on and off or restarted using another PC.

- **IDE redirection**

  An image on the management PC can be integrated and used on the SIMATIC IPC with Intel® AMT both as a CD/DVD drive and as a floppy drive. If the image is bootable, you can also boot the SIMATIC IPC with Intel® AMT from it.

  The following figure shows remote maintenance of SIMATIC IPCs with Intel® AMT, e.g. for troubleshooting a corrupt operating system or incorrect BIOS settings:

Administrator Help Desk PC

SIMATIC IPC with Intel® AMT

IPC 1
IPC 2
IPC 3
IPC 4
IPC 5
IPC 6

IPC maintenance

user:

password:

Wake from Sleep

http or https

http or https

Blue screen

http or https

Start

http or https

Changing settings
in the BIOS

http or https

Management PC
(KVM Viewer, IE)

OS-unresponsive/
Repair Mode
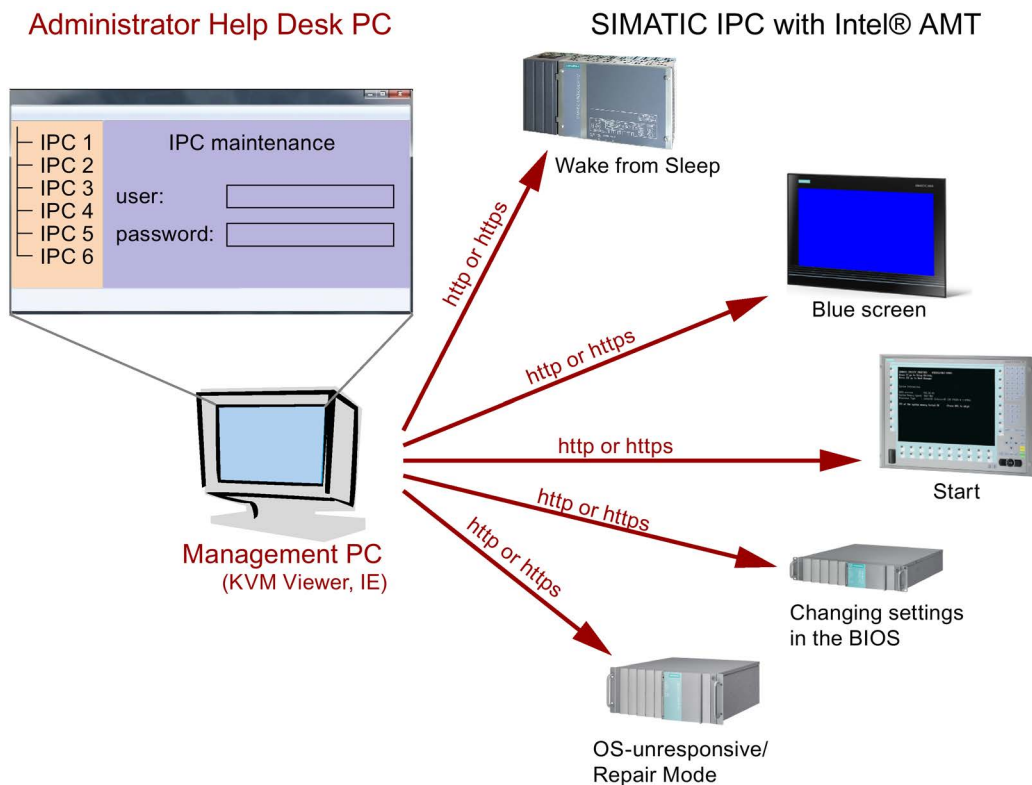
8.7.2 Overview of AMT

This section describes the required measures and settings on the local IPC so that the IPC can be controlled and maintained remotely from a management station known below as the help desk PC.

The local IPC is known below as the "AMT PC".

The sections contain the following information:

- AMT settings in the MEBx and in the BIOS setup

- Basic configuration of AMT

- Further useful notes

8.7.3 Enabling Intel® AMT / basic configuration

For security reasons, Intel® AMT is not enabled on new devices. The Management Engine (ME) is always active.

Procedure

For devices IPCxxxD, Field PG:

1. If necessary, first reset Intel® AMT to the default status.
2. To open the BIOS selection menu, press the <ESC> key while the device is booting.
3. Open the BIOS Setup using the "Setup Configuration Utility (SCU)".
4. Select the "Active Management Technology Support" command in the Advanced menu.

   For IPC547D and IPC547E devices only: Select "AMT Configuration".
5. Activate the option "Intel AMT Support".
6. For IPC547D and PC547E devices only: Select the "Normal" setting for "MEBx Mode".
7. Exit the BIOS Setup with <F10> key (Save and Exit).

   For IPC547D and IPC547E devices only: Exit the BIOS Setup with <F4> key.

For IPCxxxC devices:

1. To open the BIOS selection menu, press the <F2> key while the device is booting.
2. Open the BIOS Setup using the "Setup Configuration Utility (SCU)".
3. Select the "Active Management Technology Support" command in the Advanced menu.
4. Activate the option "Intel AMT Support".
5. Activate the option "Intel AMT Setup Prompt".
6. Exit the BIOS Setup with <F10> key (Save and Exit).

Settings in the MEBx

1. Use the arrow keys to select "MEBx" and confirm with the <Enter> key.
2. Select "MEBx Login".

3. Enter the default password "admin".

   Change the password. The new password must comprise:

   – At least eight characters

   – An upper case letter

   – A lower case letter

   – A number

   – A special character (! @ # $ % ^ & *)

   – The underscore "_" and space characters are valid in the string but do not increase the complexity of the password.

   Note

   If the password is no longer available, you must reset the Intel® AMT to the default settings, see Auto-Hotspot.

   Backup the password to protect it against loss.

   ---

4. Switch to the "Intel (R) AMT Configuration" submenu and enable "Manageability Feature Selection".

5. Switch to the "Intel(R) ME General Settings" submenu and enable access via the network with "Activate Network Access".

6. Confirm the dialogs that appear with "Y".

Drivers are automatically installed once as required in the subsequent restart.

8.7.4 Reset Intel® AMT to default settings with Un-configure

If Intel® AMT was already configured, it is advisable to reset Intel® AMT to default settings. On reset to default settings Intel® AMT is deactivated, among others.

You can skip this item if the device is still in factory state.

Note

All previous settings in the management engine MEBx are deleted.

Correct operation in the plant may be at risk.

Note down all the settings in the MEBx. Make the settings again as necessary following Unconfigure.

---

1. Enable the "Unconfigure ME" entry in "Advanced > Active Management Technology Support" in the BIOS.

2. Exit the BIOS with the <F10> key "Save and Exit". The AMT PC restarts.

3. After the restart, a user prompt appears asking whether you really want to discard all the settings in the management engine:

```
Intel(R) Management Engine BIOS Extension v6.1.0.0005
Copyright(C) 2003-10 Intel Corporation.  All Rights Reserved.

Found unconfigure of Intel(R) ME
Continue with unconfiguration (Y/N)
```

4. Confirm with "Y". On a German keyboard, this means pressing the <Z> key.

The device continues to boot with the factory settings of the management engine.

8.7.5 Determining the network address

To connect the AMT PC with the AMT server, the network address that uniquely localizes the AMT server on the AMT PC must be entered.

If DHCP is set for the automatic assignment of the network address in "Network Setup" in the MEBx of the AMT PC, the network address is not fixed.

Procedure

If the AMT server uses the same network address as the operating system of the AMT PC (most common situation):

1. You can obtain the address of the AMT server in the command line in Windows using "ipconfig" and in UNIX using "ifconfig".

If the AMT server and operating system do not use the same network address, ask your network administrator for the address you have been assigned.

8.7.6 Forcing user consent

When establishing a connection to the AMT PC, the KVM viewer may prompt the user to enter a six-figure code. This code is displayed on the screen of the AMT PC. The user of the AMT PC must inform the user of the KVM viewer of this code.

This code query needs to be set up on the KVM viewer.

Procedure

1. Select "Intel(R) AMT Configuration > User Consent" in the MEBx.

2. Select the value "KVM" for "User Consent".

To allow a user with administrator privileges to avoid this code query, follow these steps:

1. Select "Intel(R) AMT Configuration > User Consent" in the MEBx.

2. Enable "Opt-in configurable from remote IT".

Technical Support $\qquad$ A

A.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 SIMATIC IPC/PG (http://www.siemens.com/asis)
- SIMATIC Documentation Collection (http://www.siemens.com/simatic-tech-doku-portal)
- Your local representative (http://www.automation.siemens.com/mcms/aspa-db/en/Pages/default.aspx)
- Training center (http://sitrain.automation.siemens.com/sitrainworld/?AppLang=en)
- Industry Mall (https://mall.industry.siemens.com)

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

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

Tools & downloads

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

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

A.2 Troubleshooting

A.2.1 General problems

This chapter provides you with tips on how to locate and troubleshoot common problems.

Problem	Possible cause	To correct or avoid error
The device is not operational.	There is no power supply to the device.	Check the power supply, the power cord or the power plug.
	PG is switched off	Press the power button
	The battery is empty or not installed	Charge or install battery.
You cannot move the mouse pointer with the clickpad under Windows	The clickpad is switched off	Switch on the clickpad via the hotkeys Fn + F4
Wrong time and/or date on the PG.		1. Press <ESC> during the boot sequence to open 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.	In this case, please contact your technical support team.
USB device not responding.	The operating system does not support the USB ports.	Enable USB Legacy Support for the mouse and keyboard. For all other devices you will need USB drivers for the specific operating system.
DVD/CD: The front loader 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 pin, for example, or an opened paper clip into the emergency extraction opening of the drive. Apply slight pressure to the contact until the front loader opens. 3. Pull the loader further out.
The following message appears on the display: "No boot device available" NTLDR not found, check the boot data medium...	Incorrect hard disk type entered in SETUP	Use the "Autodetect Fixed Disk" function
The following message appears on the display: "Keyboard stuck key failure"	A key has been blocked during system self-test of the keyboard	Check the keyboard and, if necessary, restart the system
A beep sounds when a key is pressed but no character is displayed	Keyboard buffer is full	<CTRL> <PAUSE>
< \ > key not available	incorrect keyboard driver is being used	with German keyboard driver: <ALTGr> < ß> with international keyboard driver: < \>

A.2.2 Problems with WLAN

The following lists the possible causes for problems with Wireless LAN:

Cannot connect with WLAN

- Verify that WLAN is activated.
  You can use the Fn + F3 hotkey to activate/deactivate the WLAN.

- Check that the other WLAN partner is active.

- Check the WLAN connection settings
  Observe the corresponding notes on WLAN configuration and operation in the Online Help of the WLAN adapter.

Data transmission speed is too low

- Please note that the data rate stipulated and visible under Windows is only a theoretical value / corresponds to the gross value. Determined by the transmission procedure, the actual applicable data rate for the data transmission is usually around 50% of the gross value.

- The maximum data transmission speed depends on many factors.
  Start by verifying that the transmission mode of all network components is set up in accordance with the IEEE 802.11 a/b/g/n or ac standard.

- The spatial arrangement of the network components can also negatively influence the transmission.

  – The distances between the components should be as short as possible.

  – Masonry or reinforced concrete walls have a negative effect on the transmission performance and can, under some circumstances, prevent a connection from being established. For the best performance, a line-of-sight connection of the network components is preferred.

  – A high load on the network, perhaps from too many simultaneous access attempts from different nodes, can lead to lower data rates or communication problems.

Procedure – deactivating the tap function of the clickpad

1. Click "Start" and open the "Control Panel".

2. In the "Category view" first select "Printers and other hardware" and then the "Mouse" menu. In the "classical view" you can select the "Mouse" menu directly.

3. Select the "Device settings" tab and click the "Settings" tab.

4. Select the "Tap" button and deactivate the "Activate tapping" check box.

5. Click "Apply".

Abbreviations

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B

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Abbreviation	Term	Meaning
AC	Alternating current	Alternating current
PLC	Programmable controller	
AHCI	Advanced Host Controller Interface	Standardized controller interface for SATA devices. This is supported in Microsoft Windows XP as of SP1 and IAA driver.
AMT	Active Management Technology	Technology from Intel® that permits the diagnostics, management and remote control of PCs
AS	Automation system	
AWG	American Wire Gauge	US standard for the cable diameter
BIOS	Basic Input Output System	Basic Input Output System
CAN	Controller Area Network	
CD-RW	Compact Disc – Rewritable	Rewritable CD
CE	Communauté Européenne (CE symbol)	The product is in conformance with all applicable EC directives
CMOS	Complementary Metal Oxide Semiconductors	Complementary metal oxide semiconductors
COA	Certificate of authentication	Microsoft Windows Product Key
COM	Communications Port	Term for the serial interface
CPU	Central Processing Unit	CPU
CSA	Canadian Standards Association	Canadian organization for tests and certifications according to own or binational standards (with UL / USA) standards
CTS	Clear To Send	Clear to send
DC	Direct Current	DC current
DCD	Data Carrier Detect	Data carrier signal detection
DMA	Direct Memory Access	Direct memory access
DP	Distributed peripherals	
DPP	Display Port	High-performance digital monitor interface
DQS	Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagement mBH	
DSR	Data Set Ready	Ready for operation
DTR	Data Terminal Ready	Data terminal is ready
DVD	Digital Versatile Disk	Digital versatile disk
DVD-RW	Digital Versatile Disc – Rewritable	Rewritable DVD
DVI	Digital Visual Interface	Digital display interface
DVI-I	Digital Visual Interface	Digital display interface with digital and VGA signals
ESD	Components sensitive to electrostatic charge	

Abbreviation	Term	Meaning
EN	European standard	
EPROM / EEPROM	Erasable Programmable Read-Only Memory / Electrically Erasable Programmable Read-Only Memory	Plug-in submodules with EPROM/EEPROM chips
ESC	Escape character	Control character
FAQ	Frequently Asked Questions	FAQs
GND	Ground	Chassis ground
HDA	High Definition Audio	
HDD	Hard Disk Drive	HDD
IDE	Integrated Device Electronics	
IEC	International Electronical Commission	
IP	Ingress Protection	Degree of protection
IRQ	Interrupt Request	Interrupt request
LAN	Local Area Network	Computer network that is limited to a local area.
LCD	Liquid Crystal Display	Liquid crystal display
LEDs	Light Emitting Diode	Light emitting diode
MLFB	Machine-readable product designation	Order number
MMC	Micro Memory Card	Memory card of the format 32 mm x 24.5 mm
MPI	Multipoint-capable interface for programming devices	
MUI	Multilanguage User Interface	Language localization in Windows
NC	Not Connected	Not connected
NEMA	National Electrical Manufacturers Association	Syndicate of manufacturers of electrical components in the USA
NTFS	New Techniques File System	Secure file system for Windows versions
PCI	Peripheral Component Interconnect	High-speed expansion bus
PCIe	Peripheral Component Interconnect express	High-speed serial, differential full-duplex PtP interface with high data rate.
PG	Programming device	
PROFIBUS	**Pro**cess **Fi**eld **Bus**	Standard bus system for process applications
PXE	Preboot Execution Environment	Software for running new PCs without hard disk data via the network
RAID	Redundant Array of Independent Disks	Redundant hard disk array
RAM	Random Access Memory	
RI	Ring Input	Incoming call
RTS	Reliable Transfer Service	Request to send
RxD	Receive Data	Data transfer signal
SATA	Serial Advanced Technology Attachment	
SELV	Safety Extra Low Voltage	Safety extra low voltage
SMART	Self Monitoring Analysis and Reporting Technology	Hard disk error diagnostics program
SSD	Solid State Drive	Storage medium (not volatile)
S VP	Serial number of the device	
SW	Software	

Abbreviation	Term	Meaning
TFT	Thin-Film-Transistor	Type of LCD flat-screen
TTY	Tele Type	Asynchronous data transfer
TxD	Transmit Data	Data transfer signal
UL	Underwriters Laboratories Inc.	US organization for tests and certifications according to own or binational standards (with CSA / Canada) standards
USB	Universal Serial Bus	
V.24		ITU-T standardized recommendation for data transfer via serial ports
VDE	Verein deutscher Elektrotechniker (Union of German Electrical Engineers)	
VGA	Video Graphics Array	Video adapter which meets industrial standard
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.
WAN	Wide Area Network	
WLAN	Wireless LAN	Wireless local area network
WoL	Wake on Local Area Network	
XD	Execute Disable Capability	Hardware implementation

Glossary

AHCI

Advanced Host Controller Interface

AHCI mode 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.

Automation system (AS)

A programmable logic controller (PLC) of the SIMATIC S7 system consists of a central controller, a CPU, and various I/O modules.

CE marking

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

Chipset

The chipset is located on the motherboard and connects the processor with the RAM, the graphics controller, the PCI bus, and the external interfaces.

COM interface

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

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. .

DPP

Display Port: 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 hyper-threading technology.

EMC directive

Directive concerning Electromagnetic Compatibility. Compliance is confirmed by the CE symbol and the EC certificate of conformity.

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.

ESD directive

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.

Gender changer

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

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 cartridges. The advantage of hot plugging is that defective hard disks can be replaced without having to reboot the computer.

Image

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

Interface

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

- Interface for interactive software applications.

LAN

Local Area Network: 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.

License key

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

Low-voltage directive

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

Module

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

Motherboard

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

MPI

Multi-Point Interface (MPI) is the programming interface of SIMATIC S7/M7. Allows remote access to programmable modules, text displays and Operator Panels from central locations. The MPI nodes can communicate with each other.

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 **Fi**eld **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 logic 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**xecution **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.

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.

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.

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.

SETUP (BIOS Setup)

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

SSD (Solid State Drive)

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

STEP 7

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

Troubleshooting

Error cause, cause analysis, remedy

Trusted Platform Module (TPM)

The Trusted Platform Module (TPM) is a chip in accordance with the TCG specification that provides fundamental security functions as extension for computers or similar devices. These functions can support, for example, license protection objectives and/or data security.

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.

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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