SIEMENS

SIMATIC

Industrial PC
SIMATIC IPC477E PRO

Operating Instructions

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Legal information

Warning notice system

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

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

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

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified 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.

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Disclaimer of Liability

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

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Preface

1

Purpose of the Operating Instructions

These operating instructions contain all the information you need for commissioning and operating the SIMATIC IPC477E PRO.

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

Basic knowledge required

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

Scope of the operating instructions

These operating instructions apply to "SIMATIC IPC477E PRO" industrial PCs with article numbers 6AV7251-...-... .

Changes and additions to the manuals are documented in the product information. Therefore, regularly check whether product information has been made available for your product.

Scope of this documentation

The documentation for the IPC includes the following:

- Product information, e.g. "Important notes on your device"
- Quick Install Guide SIMATIC IPC477E PRO
- SIMATIC IPC477E PRO Operating Instructions

The documentation is supplied with the IPC in multiple languages as PDF on the USB stick supplied in the documentation package.

Conventions

In these operating instructions, "device" is used as the standard term for "SIMATIC IPC477E PRO".

In these operating instructions, the terms "Windows Embedded Standard 7 P" and "Windows Embedded Standard 7 E" are also abbreviated with the term "Windows Embedded Standard". "Windows 7" is used as an abbreviation for "Windows 7 Ultimate".

A touch device generally refers to a device with a capacitive multi-touch screen or a resistive single touch screen. Touch screen is the general term for a resistive single touch screen or a capacitive multi-touch screen.

Note

A note is important information about the product, handling the product or a reference to specific sections of the documentation that require special consideration.

History

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

Edition	Comments
08/2017	First edition
07/2020	Conversion to IEC/UL/EN/DIN-EN 61010-2-201
11/2020	Approval for the hazardous area
02/2021	Fourth edition: • Approval for the hazardous area was removed from these operating instructions and documented in a product information.
08/2024	Fifth edition: • Update

See also

Product Information (https://support.industry.siemens.com/cs/ww/en/view/109744171)

Overview

2

2.1 Product description



Features

SIMATIC IPC477E PRO provides high-level industrial functionality.

- Compact design
- Maintenance-free operation
- IP65 degree of protection
- Rugged
- Used for shipping and offshore applications
- Expansion with system components

The range has been expanded by the PRO device with all-round IP65 degree of protection; the device not only impresses with its ease of servicing, but also with its sophisticated design and low mounting depth.

Device variants

The delivery note contains information on the precise scope of functions and product package for your device.

The SIMATIC IPC477E PRO is available in the following device variants, which differ in regard to the display size, operating method and optional expansions:

PRO device with capacitive multi-touch screen

- Display:
  - 15" display, resolution 1366 × 768 pixels
  - 19" display, resolution: 1366 x 768 pixels
  - 19" display, resolution 1920 x 1080 pixels
  - 22" display, resolution: 1920 x 1080 pixels
  - 24" display, resolution 1920 × 1080 pixels
- optionally prepared for:
  - Support arm without extension components (flange at top)
  - Support arm and extension components (round tube)
  - Pedestal/extension components (flange at bottom)
- A base adapter and adapter sets that can be ordered separately support mounting systems from various manufacturers.
  - Base adapter for support arm and pedestal included in the product package.
  - Cover plate for device version for support arm and extension components included in the product package.
- Fully dust-proof and splash-proof with IP65 degree of protection and Enclosure Type 4X / 12 (indoor use only)

Operating systems

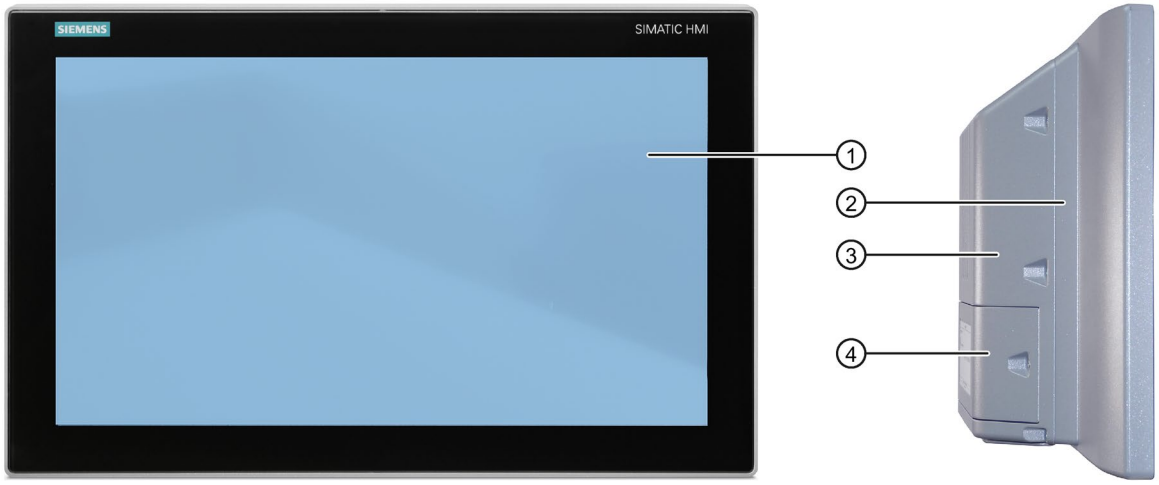
The following table shows the operating systems that are available:

Operating system			
Windows 10 IoT Enterprise (64-bit)	**Windows 7 Ultimate (32/64-bit)**	**Windows Embedded Standard 7 P (32-bit)**	**Windows Embedded Standard 7 E (32/64-bit)**
x	x	x	x*

* WES7E is also supplied with IPC477E PRO devices. Multitouch is operated in single touch mode with WES7E.

2.2 Installation

Front view and side view



① Display with multi-touch screen
② Enclosure
③ Backplane cover
④ Terminal compartment cover

Bottom view



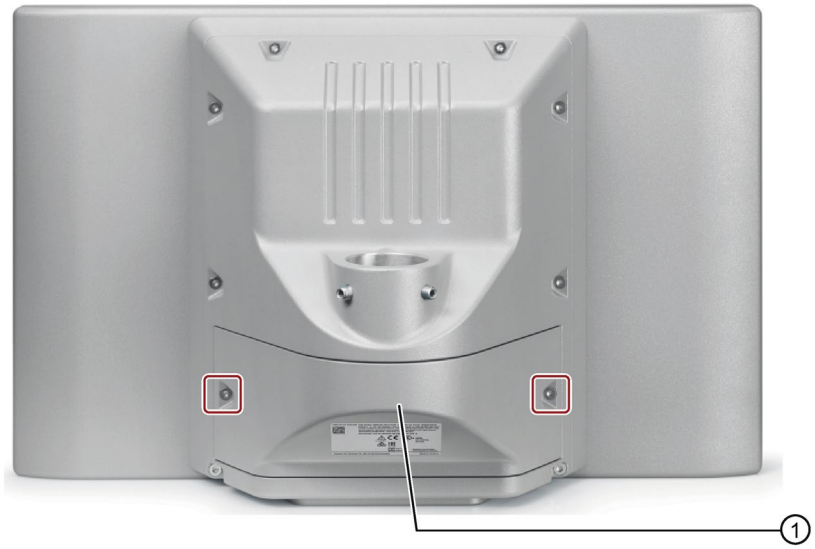
① Mechanical interface for mounting/base adapter

Rear view - device version "prepared for pedestal/extension components" and "prepared for support arm without extension components".



① Backplane cover
② Terminal compartment cover
③ Mechanical interface for mounting/base adapter

Rear view - device version "prepared for support arm and extension components"

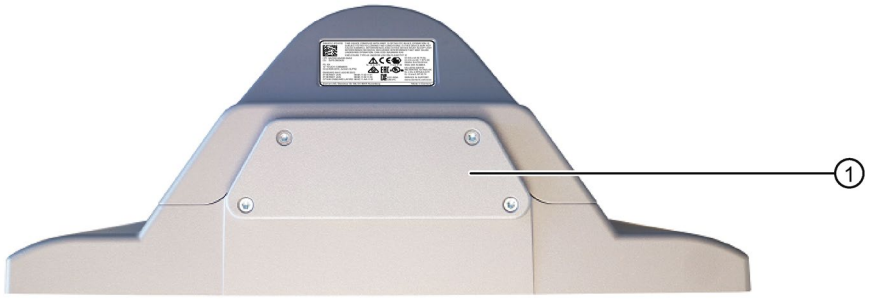


① Terminal compartment cover

Note

The device version "prepared for support arm and extension components" is intended for devices with an extension (see System components (Page 16)).

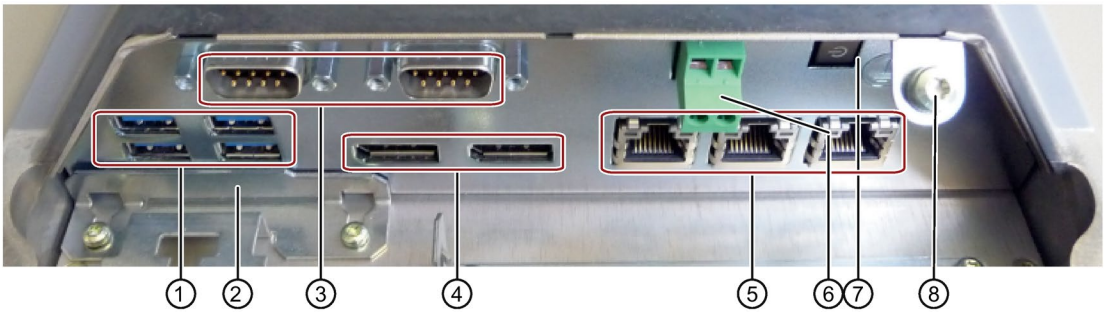
Bottom - device version "prepared for support arm and extension elements"



① Cover plate

2.2.1 Interfaces and operator controls for PRO device

The assignment of the interfaces is shown inside the terminal compartment cover.



①	4 × USB interface (X60), (X61), (X62), (X63)	USB 3.0 high speed
②	Slot (X50) for CFast card	Behind the strain relief
③	COM1/2 port (optional) • COM1 port (optional) (X30) • COM2 port (optional) (X31)	Serial port, 9-pin D-sub connector
④	2 x DisplayPort • DisplayPort (X70) • DisplayPort (X71)	
⑤	3 × Ethernet interface (X1) P1, (X2) P1, (X3) P1	RJ45 Ethernet port, 10/100/1000 Mbps
⑥	Connection terminal 24 V DC power supply (X80)	Connection terminal inserted in delivered condition
⑦	On/off switch	
⑧	Protective conductor connection	

2.3 Accessory kit

PRO device

- The base adapter including four M4x12 screws is included in the scope of delivery for devices "prepared for support arm without extension elements (flange on top)" and devices "prepared for stand/extension elements (flange on bottom)".
- The device version "prepared for support arm and extension components" includes a cover plate with four M4x12 screws in the product package.
- Additional documents may be supplied with the accessory kit.

2.4 Accessories

Accessories are available for your device. These are not included in the product package. You can find Information on available accessories on the Internet at:

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

Expansion components and accessories (https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10144445)

System components for devices with all-round IP65 protection (https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10299123?tree=CatalogTree)

SIMATIC IPC CFast cards

- 2 GB optional or
- 4 GB optional or
- 8 GB optional or
- 16 GB optional or
- ≥ 30 GB optional



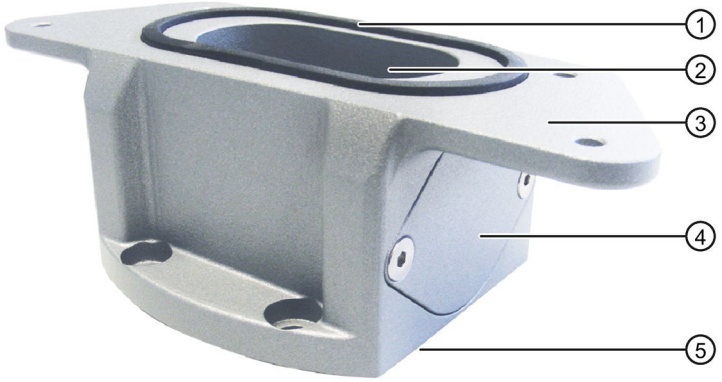


2.5 System components

2.5.1 Base adapter

PRO devices of the type "suitable for support arm" or "suitable for stand" can be mounted on a support arm or stand using the base adapter. Depending on the support arm system used, an adapter plate may have to be installed in addition (see Accessories (Page 15)).

A base adapter is included with the corresponding PRO devices. The base adapter can also be ordered separately.



① Seal
② Cable channel
③ Mechanical interface to the PRO device
④ Cover
⑤ Mechanical interface to support arm or stand

Article number for the base adapter as accessory: 6AV7674-1KA00-0AA0.

See also

Prepared for support arm or stand without extension elements (flange on top) (Page 33)

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

Expansion components and accessories (https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10144445)

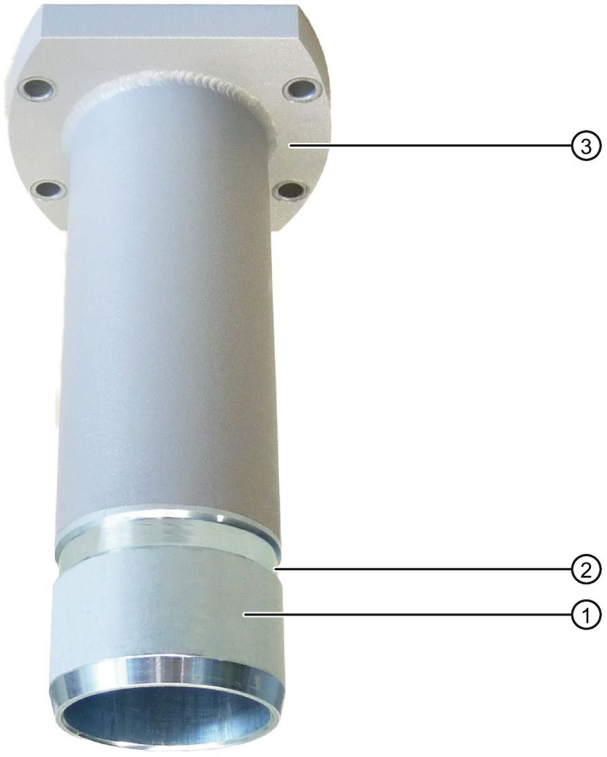
System components for devices with all-round IP65 protection (https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10299123?tree=CatalogTree)

2.5.2 Round tube adapter

Flange mount for device version "prepared for support arm and extension components"

An optional flange mount that is not included in the product package is available for the device version "prepared for support arm and extension components".

The flange mount converts the flange mount connection into a mechanically compatible interface to the base adapter. The flange of the flange mount has the same drilling pattern as the base adapter. This means you can use all couplings of the support arm or pedestal systems with mechanical interface for the base adapter.



① Flange mount
② Ring groove for fastening on PRO device with setscrews
③ Mechanical interface to support arm

Article number of the flange mount: 6AV7674-1KF00-0AA0

Additional information

You can find information on mounting the PRO device at Prepared for support arm and extension elements (flange mount) (Page 36).

You can find Information on available accessories on the Internet at:

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

See also

Prepared for support arm or stand without extension elements (flange on top) (Page 33)

System components for devices with all-round IP65 protection (https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10299123?tree=CatalogTree)

2.5.3 Adapter set for support arm and stand mounting of PRO device

The PRO device can be mounted on systems from third-party vendors (see section "Mounting the device (Page 32)"). For this you will need the Siemens base adapter (see Base adapter (Page 16)) and a proprietary adapter set.

Siemens also offers its own adapter for VESA-compatible third-party systems:

Adapter set	Suitable for support arm systems	Article number
SIEMENS: • Adapter set VESA75 • Adapter set VESA100	• VESA75-compatible systems • VESA100-compatible systems	• 6AV7674-0KE00-0AA0 • 6AV7674-0KD00-0AA0
RITTAL: Adapter for Siemens PRO-Panel • Intermediate plate • Screws	• CP40 steel • CP60/120 for Support arm connection 120 × 65 mm	• 6206.500
ROLEC: Adapter for Siemens PRO-Panel • Intermediate plate • Screws	• profiPlus-50 • taraPLUS for Ø 65 mm hole circle	• 142.024.000
BERNSTEIN: Coupling for Siemens SIMATIC PRO • No intermediate plate required • Coupling with integrated adaptation for PRO device	• CS-3000	• 1015300187 RAL 9006 white aluminum • 1015300043 RAL 7016 anthracite gray

Information provided without guarantee.

2.5.4 Extension Unit and operator controls

Extension components - Extension Unit

Note

When the IPC477E PRO is extended with an Extension Unit, the effect on the device approvals for the entire system must be taken into account.

The Extension Unit is used to install additional operator controls under a SIMATIC PRO device of the type "Suitable for extension components" with 16:9 display.

The example in the figure below shows the Extension Unit 22" with eight operator controls including emergency stop button.



The Extension Units have individual configuration possibilities and are supplied without operator controls. The available slots are suitable for installation of operator controls.

The Extension Units are available in 4 different sizes:

- 15"
- 19"
- 22"
- 24"

For greater flexibility, three different connection options can be selected per size for the PLC connection of the operator controls:

- Hardwired
- PROFINET
- PROFIsafe

In addition, different operator controls such as emergency stop, selector switch, illuminated pushbutton, keyswitch, indicator light or RFID reader are available.

Note

Only operator controls with Siemens approval may be installed in the Extension Unit.

You can find information on "System components for PRO device Extension Units" on the Internet (https://support.industry.siemens.com/cs/de/de/view/109742323/en).

Additional information

Information on system components for devices with all-round IP65 protection is available on the Internet (https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10299123?tree=CatalogTree).

Safety guidelines

3

3.1 General safety instructions

⚠ WARNING

Life-threatening voltages are present with an open control cabinet

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

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

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

⚠ WARNING

The installer of the system is responsible for the safety of a system in which the device is integrated.

There is a risk of malfunction which could result in death or serious injury.

- Ensure that only suitably qualified personnel perform the work.

System expansions

NOTICE

Damage through system expansions

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

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

Note the following for system expansions:

- Only install system expansion devices designed for this device. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.
- Read the information on electromagnetic compatibility (Page 92).

Battery and rechargeable battery

WARNING

Risk of explosion and release of harmful substances

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

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

Note the following when handling lithium batteries:

- Replace spent batteries promptly. You can find information on installing and removing the backup battery in the Operating Instructions.
- Replace the lithium battery only with an identical battery or types recommended by the manufacturer.
- Do not throw lithium batteries into fire, do not solder on the cell body, do not recharge, do not open, do not short-circuit, do not reverse polarity, do not heat above 100°C and protect from direct sunlight, moisture and condensation.

Strong high-frequency radiation

NOTICE

Observe immunity to RF radiation

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

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

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

ESD Guideline

Electrostatic sensitive devices can be labeled with an appropriate symbol.



NOTICE

Electrostatic sensitive devices (ESD)

When you touch electrostatic sensitive components, you can destroy them through voltages that are far below the human perception threshold.

If you work with components that can be destroyed by electrostatic discharge, observe the ESD Guideline (Page 94).

3.2 Industrial Security

Industrial Security

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

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

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

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

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

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

Disclaimer for third-party software updates

This product includes third-party software. Siemens Aktiengesellschaft only provides a warranty for updates/patches for the third-party software if such updates/patches have been distributed as part of a Siemens software update service contract or officially released by Siemens Aktiengesellschaft. Otherwise, updates/patches are undertaken at your own risk. You can find more information about our Software Update Service offer on the Internet.

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.

3.3 Notes on usage

WARNING

Risks associated with the unprotected machine or plant

According to the results of a risk analysis, certain hazard potentials associated with the unprotected machine exist. These hazards could lead to personal injury.

Avoid such hazards by taking the following precautions in accordance with the risk analysis:

- Installation of additional safety equipment on the machine or plant. In particular, the programming, parameter assignment and wiring of the inserted I/O modules must be executed in accordance with the safety performance identified by the necessary risk analysis (SIL, PL or Cat.).
- Use as intended must be validated for the device by means of a function test on the plant. These tests help you to identify programming, parameter assignment and wiring errors.
- Documentation of the test results that you can enter in the relevant safety verification documents, if necessary.

Environment

NOTICE

Ambient conditions and chemical resistance

Unsuitable environmental conditions can cause faults or damage the device. Failure to comply voids the warranty and the approvals in accordance with IEC/EN/UL 61010-2-201.

For this reason, please observe the following precautions:

- Always operate the device in closed rooms.
- Operate the device only in accordance with the ambient conditions specified in the technical specifications.
- Protect the device from dust, moisture and heat.
- Do not expose the device to direct sunlight or to other strong sources of light.
- Without additional safety measures, such as a supply of clean air, the device may not be used in locations with harsh operating conditions caused by acidic vapors or gases.
- Observe the permitted operating positions of the device.
- Clean the enclosure surface with a damp cloth and make sure that no water enters the device.

LCD displays

NOTICE

"Image Sticking" and backlighting

Despite the use of modern LCD technologies, the "Image Sticking" effect can occur if the LCD display is used unfavorably. Image Sticking, also known as "Image Retention" or "ghost image", is a phenomenon in which a faint outline of the previous screen content remains visible after the content has changed.

The long-term display of static screen content at high brightness can lead to "Image Sticking". High ambient temperatures can accelerate this effect.

Observe the following information to maximize the technical service life of the LCD display and ensure an optimal viewing experience:

- Prevention: Avoid displaying static screen content.
- Color management: Use low-contrast colors for symbols, texts and backgrounds. For intense colors, use a color gradient (grayscales/pastel colors). Avoid border lines.
- Brightness control: Dim the LCD brightness during periods of inactivity to reduce power consumption and extend the LCD service life.
- Screen saver: Activate the screen saver for longer periods of inactivity.
- After longer operating time > 8 hrs: Switch off the LCD display for at least 20% of the active time or activate the screen saver.
- Ambient temperature: At high ambient temperatures, it is advisable to switch off the LCD display more frequently or to use a screen saver.

SIMATIC screen saver "Anti Image Sticking"

The SIMATIC screen saver "Anti Image Sticking" is a standalone software component that is installed automatically with the new configuration tool SIMATIC IPC Panel Drivers and Tools (PDT) V1.7, or higher. SIMATIC IPC Panel Drivers and Tools (PDT) V1.7, or higher, differs from the previous version only with respect to the SIMATIC screen saver, which you configure using the IPC Configuration Center.

NOTICE

Intended use

PDT V1.7, or higher, can only be used for devices intended for it. You can find information on valid devices and the corresponding software versions in the associated documentation at (https://support.industry.siemens.com/cs/ww/de/view/109964184/en).

Defective pixels in the display

At present, the manufacturing process of modern displays does not guarantee that all pixels of the display will be perfect. A small number of defective pixels in the display is therefore unavoidable. This does not present a functional problem as long as the defective pixels are not bunched in one location.

Additional information is available in the section "General technical specifications (Page 107)".

Mounting and connecting the device

4

4.1 Preparing for mounting

4.1.1 Checking the delivery package

Procedure

1. When accepting a delivery, please check the packaging for visible transport damage.
2. If any transport damage is present at the time of delivery, lodge a complaint at the shipping company in charge. Have the shipper confirm the transport damage immediately.
3. Unpack the device at its installation location.
4. Keep the original packaging in case you have to transport the unit again.

Note

Damage to the device during transport and storage

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

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

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

5. Check the contents of the packaging and any accessories you may have ordered for completeness and damage.

6. If the contents of the package are incomplete, damaged or do not correspond to your order, you can use the online form After Sales Information System (ASIS) (https://siemens.com/asis) to provide feedback on product deliveries and repairs.

   Complete the online form for product delivery (quality control notification) under the heading "Product delivery: Feedback on quality control and repairs".

⚠ DANGER

Electric shock and fire hazard due to damaged device

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

A damaged device has unpredictable properties and states.

Death or serious injury could occur.

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

NOTICE

Damage from condensation

If the device is subjected to low temperatures or extreme fluctuations in temperature during transportation, as is the case in cold weather, for example, moisture can build up on or inside the device (condensation).

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

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

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

7. Please keep the enclosed documentation in a safe place. It belongs to the device. You need the documentation when you commission the device for the first time.
8. Write down the identification data of the device.

4.1.2 Device identification data

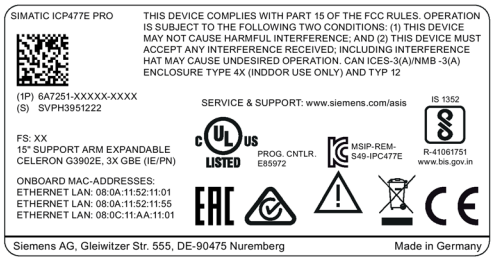
Unpacking the device

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

Enter the identification data in the table below:

Identification date	Source	Value
Serial number	Rating plate	S VP ...
Article number of the device	Rating plate	6AV7251... (SIMATIC IPC477E PRO)
Microsoft Windows Product Key Certificate of Authenticity	In the device (remove cover of terminal compartment)	The COA label is for available with pre-installed Windows operating system.
Ethernet address 1	BIOS setup, "Advanced" menu	
Ethernet address 2		
Ethernet address 3		

Example of a SIMATIC IPC477E PRO rating plate



COA label

Microsoft Windows "Product Key" from the "Certificate of Authenticity" (COA):

The COA label is present only when Windows Embedded Standard 7 or Windows 7 is installed.

- COA label of a device with the Windows Embedded Standard 7 operating system



- COA label of a device with Windows 7 operating system



- COA label of a device with Windows 10 operating system



Note

The COA labels shown are shown by way of example and may differ on the device.

The Windows 10 COA label has an additional security feature which conceals part of the product key.

The scratch-off panel consists of a small transparent label with a silver-colored scratch coating, which was applied to conceal part of the 25-character product key. This scratch-off panel is designed to protect the product key from being obtained and used by unauthorized third parties.

You usually do not need this product key for commissioning because a valid product key has already been integrated into the pre-installed operating system.

4.2 Permitted operating positions

Operating position

The operating positions described below are permitted for the PRO devices.

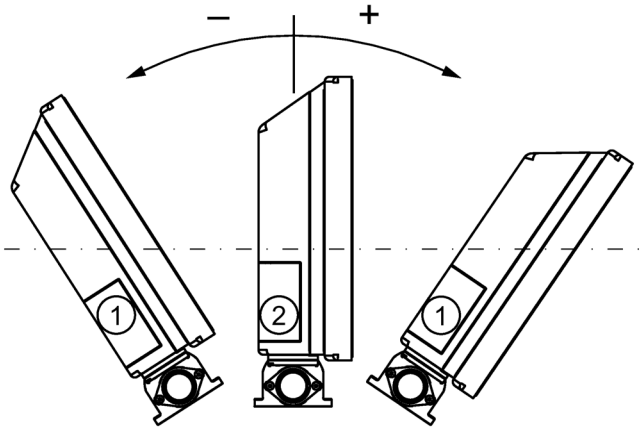
- Standard operating position: Vertical installation in horizontal format
- Inclined installation in horizontal format with a vertical inclination of maximum ±45 °

The vertical installation in upright format is prohibited for the PRO device.

Note

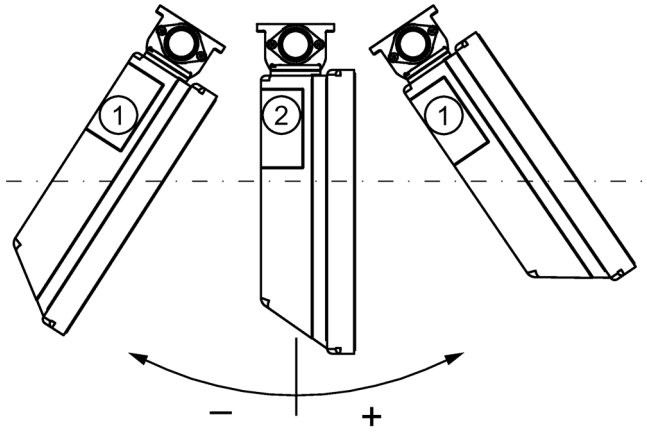
To ensure heat dissipation of the device, keep at least 5 cm distance between the device and neighboring walls or other devices/machines and make sure that there is adequate air flow.

Device version prepared for pedestal/extension components (flange at bottom)



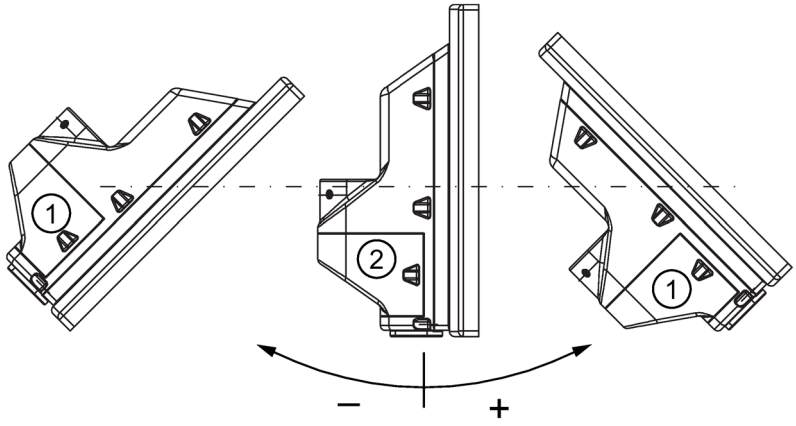
	Operating position	Deviation from the vertical
①	Inclined	≤ 45°
②	Vertical	0°

Device version prepared for support arm without extension components (flange at top)



	Operating position	
①	Inclined	≤ 45°
②	Vertical	0°

Device version "prepared for support arm and extension components (round tube)"



	Operating position	
①	Inclined	≤ 45°
②	Vertical	0°

4.3 Mounting the device

4.3.1 Notes on mounting

⚠ WARNING

The device must be mounted securely.

Inadequately dimensioned fasteners may cause the device to fall down. Serious physical injury may result.

Make sure that fasteners are adequately dimensioned during installation. Make sure to consider the weight of the device and the forces acting on the device when dimensioning. This applies in particular to dynamic load of the device. All fasteners including mounting surfaces, support arm systems, and fastening elements such as screws must be able to carry at least four times the weight of the device.

Observe any further statutory specifications applying at the location of use of the device and further applicable regulations with regard to fastening the device.

Pay attention to the torque specifications in the following sections.

NOTICE

Degree of protection for overall device

If you are using a support arm system or a pedestal system that does not have IP65 degree of protection or Enclosure Type 4X / 12 (indoor use only), IP65 degree of protection and Enclosure Type 4X / 12 (indoor use only) are voided for the entire device. Spray and water jets as well as penetrating substances can then damage the device.

Only use a support arm system or pedestal system that has IP65 degree of protection and Enclosure Type 4X / 12 (indoor use only).

Note

Liability disclaimer

The device is mounted to a pedestal or a support arm via the mechanical interface with screws. Siemens AG assumes no liability for the consequences of incorrect installation.

Warranty at risk

If you do not install the HMI device in accordance with the specifications in these operating instructions, the warranty for the device is voided.

- Always install the device according to these operating instructions.
- If the seal on the backplane cover is damaged, it can be repaired. For a repair scenario, following the instructions in the section "Repair information (Page 77)".

IP65 degree of protection and Enclosure Type 4X / 12 (indoor use only) at risk

If there are no seals on the mechanical interfaces or if they are damaged, IP65 degree of protection and Enclosure Type 4X / 12 (indoor use only) is at risk. Check the condition and proper seating of the seals.

NOTICE
Damaging the seal when opening If the device has not been opened for a long time, the backplane cover or terminal compartment cover may stick to the seal of the enclosure. Opening the device with excessive force or with tools will destroy the seal. Spray and water jets as well as penetrating substances can then damage the device. Open the terminal compartment cover gently, without too much pressure.

4.3.2 Prepared for support arm or stand without extension elements (flange on top)

Note

Mounting without base adapter

If you install the device without a base adapter, you must adjust the mechanical interface between the support arm or pedestal and the unit accordingly, including placement of an appropriate seal on the mechanical interface of the device.

Requirements

- All packaging components and protective films have been removed.
- Siemens base adapter with screws (supplied with the device version "prepared for support arm without extension components (flange at top)" and "prepared for pedestal/extension components (flange at bottom)").
- One of the following support arms or pedestal systems:
  - Support arm or pedestal with mechanical VESA interface and the corresponding Siemens adapter set
  - Support arm or pedestal with mechanical interface for the Siemens base adapter
    The type of mechanical interface differs depending on the type of support arm or pedestal.

  See section "System components (Page 16)"
- The following cables are fed through the pedestal or the support arm to which the device is mounted:
  - Protective conductor
  - Power supply cable
  - Data cables, e.g. USB

    For even large connectors to fit, run their cables through the pedestal or support arm first.

Procedure

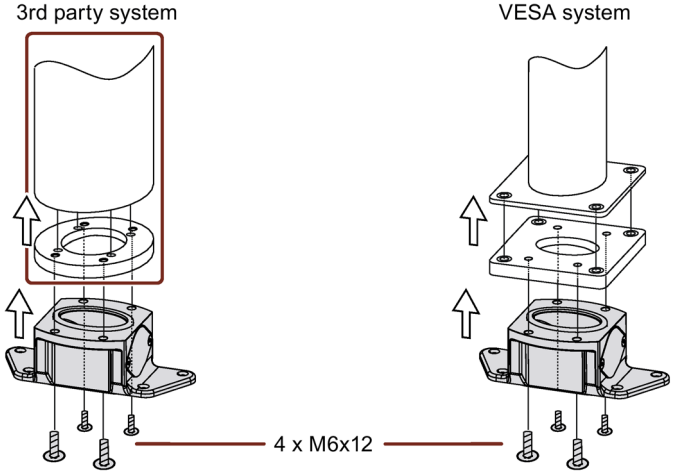
This section describes the mounting of the device to a support arm system. Installation on a pedestal is carried out in the same way.

For devices of the type "suitable for support arm", the base adapter is screwed to the device from the top; for devices of the type "suitable for pedestal", it is screwed from below.

A device for a support arm system cannot be used on a pedestal, and vice versa.

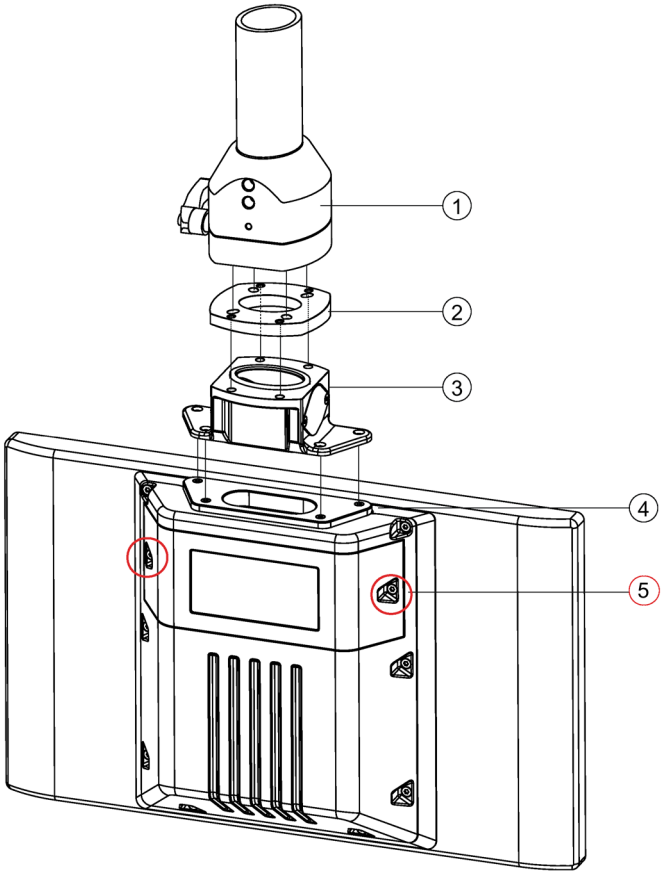
NOTICE
Observe the torques If you apply **too much** torque to tighten the screws of the backplane cover and the terminal compartment cover or the screws for fastening the device to a support arm or pedestal, the threads of the enclosure, intermediate plate or support arm may be damaged. If you tighten the screws with a torque that is **too low**, the device is not sealed.

1. If an adapter plate for the Siemens base adapter is included in your support arm system, attach the adapter plate to the support arm with 4 M6x12 screws. Pay attention to the torque that is specified for the support arm.



2. Attach the base adapter with 4 M6x12 screws to the mechanical interface of the support arm from below. Pay attention to the torque that is specified for the support arm.

3. Remove the screws ⑤ of the terminal compartment cover.



① Support arm head
② Intermediate plate
③ Base adapter
④ Countersunk head screws for device
⑤ Screws for terminal compartment cover

4. Open the terminal compartment cover ⑤ and set it aside safely.
5. Insert all connection cables through the opening of the PRO device.
   Make sure that the connecting cables are not damaged.

   Recommendation: Route large connectors (e.g. RS232 connectors) and their cables through the pedestal or support arm first.
6. Attach the device with 4 M4x12 countersunk head screws to the base adapter ③ from the top, torque 2.5 Nm.
   Make sure that the connecting cables are not pinched.
7. Connect all cables according to the description in the section Connecting the device (Page 40).
8. Fasten the cover plate ⑤ to the device with the 2 screws, torque 1.5 Nm.
   Check that the seal is sitting correctly.

4.3.3 Prepared for support arm and extension elements (flange mount)

Requirements

- One of the following support arm systems:
  - Support arm with round tube end with an exterior diameter of 48.3 mm +/-0.5 mm, appropriate for the opening of the PRO device
    When selecting the flange mount, ensure its inner diameter is large enough to allow all required cables and their connectors to pass through.
  - Support arm with mechanical interface, appropriate for the flange of the flange mount, and Siemens flange mount (not included in product package)
  - Support arm with mechanical VESA interface, the corresponding Siemens adapter set and the Siemens flange mount adapter (not included in product package)

  See System components (Page 16))
- All packaging components and protective films have been removed.
- The lower cover of the PRO device is included in the accessory kit.
- The following cables are fed through the support arm to which the device is mounted:
  - Protective conductor
  - Power supply cable
  - Data cables, e.g. USB

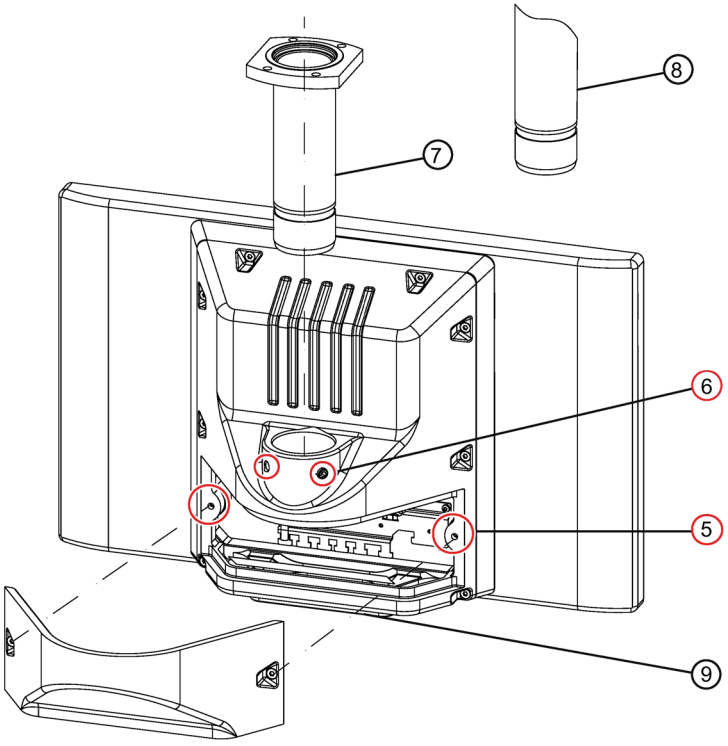
    For even large connectors to fit, run their cables through the pedestal or support arm first, for example, RS232.

Procedure

The following description shows an example of how to attach the PRO device to a support arm system using the optionally available Siemens flange mount ⑦. Mounting to a 48.3 mm round tube ⑧ that fits the opening of the PRO device is performed in a similar fashion.

NOTICE
Observe the torques If you apply **too much** torque to tighten the screws of the backplane cover and the terminal compartment cover or the screws for fastening the device to a support arm or pedestal, the threads of the enclosure, intermediate plate or support arm may be damaged. If you tighten the screws with a torque that is **too low**, the device is not sealed.

1. Remove the screws ⑤ of the terminal compartment cover.
2. Open the terminal compartment cover and set it aside safely.



⑤ Screws for terminal compartment cover
⑥ Setscrews
⑦ Flange mount (not included in the product package; see System components (Page 16))
⑧ Third-party round tube (Ø 48 mm)
⑨ Cover plate (Included in the product package; see Accessory kit (Page 15))

3. Grease the flange mount ⑦ or 48.3 mm round tube ⑧ with grease suitable for NBR seals, and insert the flange mount ⑦ or 48.3 mm round tube ⑧ into the corresponding opening of the PRO device.

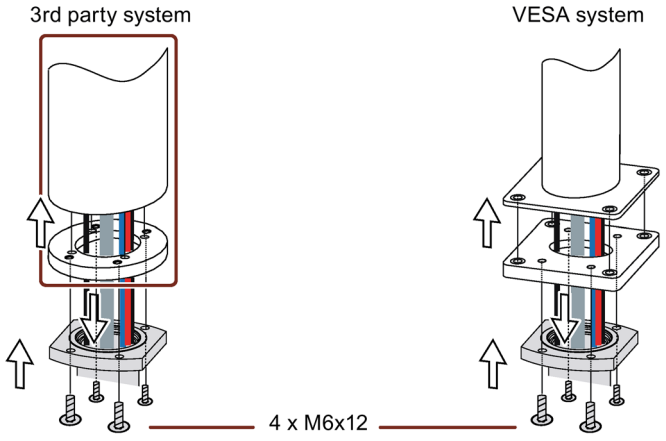
   Make sure that the sealing ring (O-ring) is not damaged. Fasten the flange mount with the 2 setscrews ⑥ M8x10 from the accessory kit.

   Observe the appropriate torque:

   – Siemens flange mount ⑦: 8 Nm
   – 48.3 mm round tube of steel ⑧: 8 Nm
   – 48.3 mm round tube of aluminum ⑧: 5 Nm

NOTICE
48.3 mm round tube ⑧ For the device to not loosen and drop in case of vibrations, the round tube must offer a groove into which the setscrews can be fitted. Otherwise the device can become loose due to vibrations and drop.

4. If an adapter plate ⑨ for the Siemens flange mount is included with your support arm, attach the adapter plate to the support arm with 4 M6x12 screws. Pay attention to the torque that is specified for the support arm.



5. Insert all connection cables through the opening of the flange mount or 48.3 mm round tube into the connection compartment of the PRO device. Make sure that the connection cables are not damaged.
6. Attach the device with 4 M6 screws, 16 mm to 20 mm long, to the support arm from below. The screws are not included in the product package of the PRO device.

   Pay attention to the torque that is specified for the support arm.

   Make sure that all connecting cables are fed through the flange mount into the interior of the device without damage.
7. Connect all cables according to the description in the section Connecting the device (Page 40).

8. Fasten the cover plate ⑤ to the device with the 2 screws, torque 1.5 Nm. Check that the seal is sitting correctly.
9. Fasten the cover plate ⑨ from the PRO device product package with 4 M4x12 screws, torque 1.5 Nm.
   Alternatively, you can extend the PRO device by adding an Extension Unit at the bottom. Read the associated documentation.

4.4 Connecting the device

4.4.1 Notes on connecting

⚠ WARNING

Risk of fire and electric shock

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

You should therefore protect the device as follows:

- Always pull out the power plug when you are not using the device or if the device is defective. The power plug must be freely accessible.
- Connect the device to a protective conductor as instructed, see section "Connecting the protective conductor".
- Use a central isolating switch.

⚠ WARNING

Risk of lightning strikes

A lightning flash may enter the mains cables and data transmission cables and jump to a person.

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

Take the following precautions:

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

NOTICE

Fault caused by I/O devices

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

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

Note the following when connecting I/O devices:

- Read the documentation of the I/O devices. Follow all instructions in the documentation.
- Only connect I/O devices which are approved for industrial applications in accordance with EN 61000-6-2 and IEC 61000-6-2.
- I/O devices that are not hotplug-capable may only be connected after the device has been disconnected from the power supply.

NOTICE

Damage through regenerative feedback

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

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

4.4.2 Power supply

4.4.2.1 Opening and closing the terminal compartment cover

Requirements

- The device is disconnected from the power supply.
- Torx TX20 screwdriver

Opening the terminal compartment cover

Opening the terminal compartment cover for pedestal and support arm device versions without extension components.



Opening the terminal compartment for device version prepared for support arm and extension components (round tube).



1. Loosen the indicated M4x16 screws.

NOTICE
Damaging the seal when opening If the device has not been opened for a long time, the backplane cover and terminal compartment cover may stick to the enclosure due to the seal. Opening the device with excessive force or with tools will destroy the seal. Spray and water jets as well as penetrating substances can then damage the device. Open the terminal compartment cover gently, without too much pressure.

2. Carefully lift up the terminal compartment cover and set it aside.

   The assignment of the interfaces is shown on the inside of the terminal compartment cover.

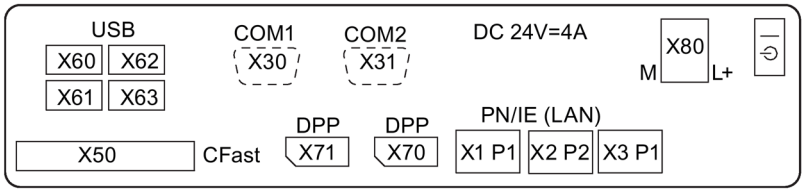


Figure 4-1 Terminal compartment cover - Interface designation

3. Run the connecting cables through the support arm or pedestal ① into the PRO device and connect them to the interfaces on the inside.

Closing the terminal compartment cover

1. Check that the seal is properly seated on the terminal compartment cover.

Note

IP65 degree of protection at risk

If the seal on the terminal compartment cover is damaged, IP65 degree of protection is at risk. The device must be repaired. Proceed as described in the section Repair information (Page 77).

2. Place the terminal compartment cover on the backplane cover. Make sure that no cables are crimped.

   Secure the terminal compartment cover from falling down.

Note

Do not exceed the permissible torque

If you tighten up the M4x16 screws with a torque of > 1.5 Nm, you may damage the threading in the enclosure.

3. Tighten the M4x16 screws of the terminal compartment cover using a maximum torque of 1.5 Nm.

4.4.2.2 connecting the PE conductor

The connection for the protective conductor is labeled with the following symbol:



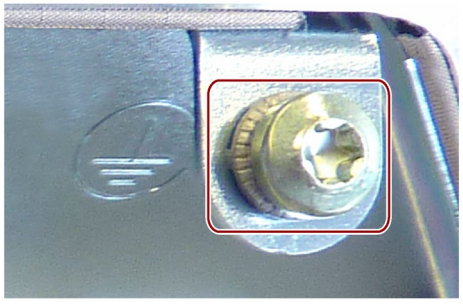
Requirements

- The device is installed.
- 1 protective conductor, minimum cross section 2.5 mm^2 (= AWG14)
- 1 T20 screwdriver
- 1 cable lug for M4

Procedure

1. Clamp the cable lug onto the protective conductor.
2. Connect the cable lug to the screw at the designated protective conductor connection.

   Tighten the M4 screw with a torque of max. 1.5 Nm.



3. Connect the protective conductor to the protective conductor connection of the control cabinet from which the PRO device is supplied.

4.4.2.3 Connecting the 24 VDC power supply

⚠ WARNING

Electric shock and risk of fire

Voltages that exceed an extra-low voltage can cause electric shock or fire. Death or serious bodily injury can result.

- The device may only be connected to a 24 V DC power supply which meets the requirements of a safe extra-low voltage (SELV/PELV) in accordance with the standard IEC/EN/DIN EN/UL 61010-2-201.

The device has reverse polarity protection.

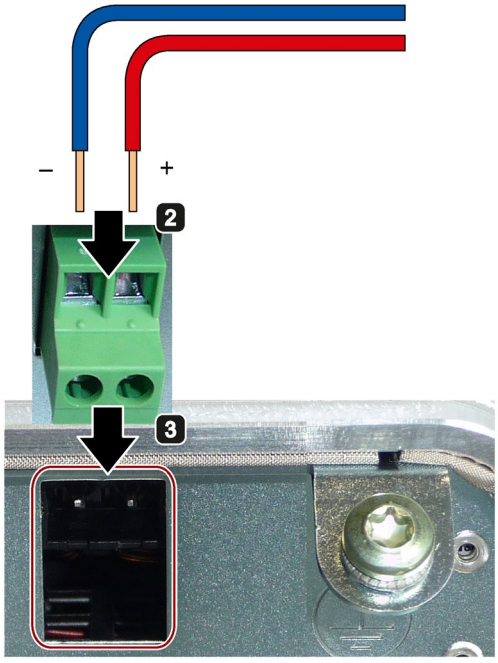
Note

The 24 V DC power supply must be adapted to the input data of the device (see technical specifications).

Requirements

- The device is installed.
- The protective conductor is connected.
- The connection terminal is wired.
- The corresponding 24 V DC power supply is switched off.
- A two-core cable with a cable cross-section of ≥ 0.5 mm^2 for the 24 V DC connection.
- A slotted screwdriver with approx. 3 mm blade.

Procedure



Similar to figure

1. Switch off the 24 V DC power supply.
2. Connect the wires of the power supply.
3. Plug the connecting terminal into the connection socket at the indicated position.

   The connecting terminal must snap into the connection socket.
4. Secure the power supply cable to the strain relief with a cable tie.

Note

Reverse polarity protection

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

4.4.3 Connecting peripheral equipment

Note

Ensure suitability for industrial applications

Connect only I/O devices approved for industrial applications according to EN IEC 61000-6-2.

Note

I/O devices capable of hot-plugging (USB)

I/O devices capable of hot-plugging (USB) may also be connected while the IPC is in operation.

NOTICE

I/O devices incapable of hot-plugging

I/O devices incapable of hot-plugging may only be connected after the device has been disconnected from the power supply. Strictly adhere to the specifications for peripheral equipment.

Note

Wait at least ten seconds between removing and reinserting USB devices.

When using standard USB devices, bear in mind that their EMC immunity level is frequently designed only for office environments. These USB devices are adequate for commissioning and servicing purposes. Only industrial grade USB devices are permitted for use in industrial environments. The USB devices are developed and marketed by the respective provider. The product supplier in each case provides support for the USB devices. Moreover, the terms of liability of the individual vendors or suppliers apply here.

Note

Strain relief

Use the metal eyelets on the rear side to mount the cable strain reliefs for cable ties.

4.4.4 Connecting the device to networks

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

Ethernet

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

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

Industrial Ethernet

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

Note

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

PROFINET

PROFINET can be operated via:

- Standard Ethernet interfaces (RT)

SIMATIC NET

Use this software package to create, operate and configure an innovative network for Field & Control level.

The current documentation for SIMATIC NET is available on the Industry Online Support under:

- SIMATIC NET: PC Software Commissioning PC Stations - Manual and Quick Start (https://support.industry.siemens.com/cs/us/en/view/77377601)
- SIMATIC NET PC software SIMATIC NET PC Software V19 (https://support.industry.siemens.com/cs/ww/en/view/109826907).

The software package and the documentation are not included in the product package.

Additional information

You can find additional information on the Internet at: Industry Mall, the ordering system for automation and drive technology (https://mall.industry.siemens.com)

4.4.5 Installing the strain relief

The scope of delivery includes an accessories kit that contains the following strain reliefs and the associated screws:

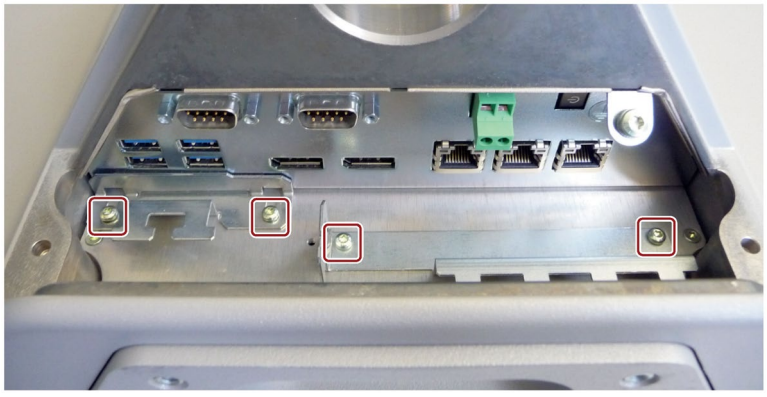
- Strain relief for USB and DisplayPort cable
- Strain relief for LAN RJ45 cable

Requirement

- Strain reliefs
- Screws
- Screwdriver T10

Procedure

Fasten the two strain reliefs to the device using the enclosed screws.



4.4.6 Securing the cables

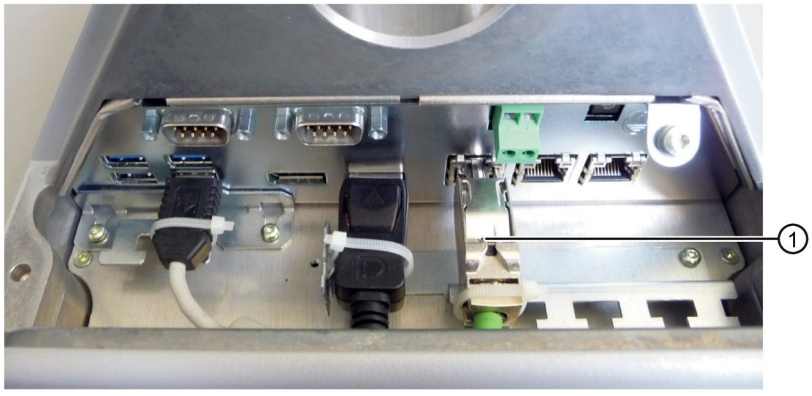
After the various strain reliefs have been mounted on the device, the cables are additionally secured to the device with screws or cable ties.

Requirement

- Installed strain reliefs
- Cable ties (not included in the scope of delivery.)
- Screws
- Cutting tool

Procedure

1. Pass the cable tie around the respective strain relief bar and secure the cables as shown.



① Fastening with cable ties

2. Cut off the protruding ends of the cable ties.

Commissioning the device 5

5.1 Notes on commissioning and operation

⚠ CAUTION

Danger of burns

The surface of the device can reach temperatures of up to 85 °C. Any unprotected contact may cause burns.

Avoid direct contact during operation of the device. Touch the device only with appropriate protective gloves.

Note

Windows 10 - Read the UWF information

The configurable write filter (Unified Write Filter) is available with Windows 10.

Read the UWF information if you activate and use it, otherwise you may experience data loss.

Note

Windows Embedded Standard 7 - Note the EWF and FBWF information

Two configurable write filters (Enhanced Write Filter and File Based Write Filter) are provided with Windows Embedded Standard. Read the EWF/FBWF information if you activate and use them, otherwise you may experience data loss.

- Enhanced Write Filter (EWF) (Page 65)
- File Based Write Filter (FBWF) (Page 67)

Note

Configuring memory cards in the device

Memory cards used in a device need to be configured on that device. Memory cards configured on other devices will not boot as the drive parameters will be different.

LCD displays

Note

"Image Sticking" and backlighting

The brightness of the backlighting deteriorates over the course of the screen's service life. A permanent picture with bright screen objects leads to a burn-in effect.

- Use a screen saver to extend the service life of the screen and the backlighting and to prevent the "Image Sticking" effect.

You can find additional information in the section Notes on usage (Page 24).

Notes on operation

Note

During the boot process...

- Make sure that there are no conductive liquids on the touch screen during startup.
- Do **not** touch the touch screen during startup.
  The device automatically calibrates the touch screen during startup.

Requirement

- The terminal compartment cover of the PRO device is open.
- The device is connected to the power supply.
- The protective conductor is connected.
- The connection cables are plugged in correctly.
- The following hardware is available for initial commissioning:
  - One USB keyboard
  - One USB mouse

Note

Switching on the PRO device

An external on/off switch is recommended to avoid having to continually open the terminal compartment cover.

5.2 Initial commissioning

Following the initial switch-on, the operating system pre-installed on the device 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.

Procedure - Switching on the device

1. Set the on/off switch to the "ON" position.

   The module carries out a self-test. During the self-test, the following message appears:

   ```
   Press ESC for boot options
   ```

2. Wait for the message to disappear.
3. Follow the instructions on the screen.
4. Make the region and language settings.

   If you want your system language to be international, select English. Information about changing the region and language settings subsequently can be found in the section "Installing the software" under "Maintaining and servicing your device".

   Note

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

5. Type in the product key as required.

   The product key is located on the "Certificate of Authentication", in the "Product Key" line.

Result

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

Procedure - Switching off the device

To turn off the device, always select "Start > Shutdown".

If the device is not going to be used for a long period of time after shutdown, set the on/off switch to the  position.

NOTICE
Disconnecting the device from the power supply The on/off switch does not separate the device from the mains. To de-energize the device, remove the power supply terminal.

Additional information

Information on your operating system can be found on the Internet:

- Microsoft® Windows® 7 (https://support.industry.siemens.com/cs/ww/de/view/109749497/en?dl=en)
- Microsoft® Windows® 10 (https://support.industry.siemens.com/cs/ww/de/view/109749498/en?dl=en)
- Microsoft® Windows Embedded Standard® 7 (https://support.industry.siemens.com/cs/ww/de/view/109749499/en?dl=en)

5.3 Windows Action Center

Warning from the Windows Action Center

The Action Center checks the status of the device with regard to the important safety aspects listed below. If a problem is found, the Action Center provides recommendations on how you can better protect the device.

- **Firewall**: The Windows Firewall adds protection to the device by blocking network or Internet access to the device by unauthorized users. The firewall is enabled in the delivery state.
- **Antivirus software**: Antivirus programs add protection to the device by searching for and eliminating viruses and other security threats. No antivirus software is installed in the delivery state.
- **Automatic updates**: Using the Automatic Update feature allows Windows to regularly search for the latest critical updates for the device and to install them automatically.

  This option is enabled for Windows 7 and Windows Embedded Standard 7 with the factory settings.
- **User Account Control:** User Account Control issues a warning when programs attempt to modify important Windows settings. You can then either acknowledge this warning or prevent the program from changing the Windows settings.

  This option is enabled for Windows 7 and Windows Embedded Standard 7 with the factory settings.

Operating the device and device functions

6

6.1 Operator input options

Depending on your device and the connected I/O devices, the following operator input options are available:

- Touch screen for touch device

⚠ CAUTION
Unintentional actions with touch screen operation If you touch the touch screen while system-internal processes are running, unintended reactions of the device may be triggered. Do not touch the screen in the following situations: • During the boot process • When plugging or unplugging USB components • While Scandisk is running • During a BIOS update

NOTICE
Damage to the touch screen Hitting the touch screen with hard objects may damage it and can result in a total failure of the touch screen. Only touch the touch screen with your fingers or a suitable touch stylus.

- On-screen keyboard
- External keyboard, connected via USB
- External mouse, connected via USB
- Touch pen

6.2 Operating the device

You operate the multi-touch screen with one or multiple fingers. You can also operate it using gestures with up to five fingers at a time.

⚠ WARNING

Personal injury or property damage due to no earth connection

An inadequate earth connection or the lack of one may cause malfunction of the capacitive touch screen. Functions may not work properly. This can result in personal injury or property damage.

- Always connect the device to an earth conductor.
- The earth conductor from the device must be connected directly to earth with low impedance (short connection, minimum cross-section 2.5 mm^2 = AWG14).

You can find additional information on connecting the earth conductor in the section "connecting the PE conductor (Page 44)".

⚠ WARNING

Personal injury or property damage due to maloperation

Incorrect operation of devices with a touch screen can occur. This can result in personal injury or property damage.

Take the following precautions:

- Configure the plant so that safety-related functions are not operated with the touch screen.
- Switch off the device for cleaning and maintenance.

WARNING

Danger of malfunction due to improper execution of gestures on the touch screen

If gestures are executed incorrectly on the touch screen with multi-touch function, these gestures may not be recognized or could be recognized incorrectly. The entries made are then not implemented by the device or are implemented incorrectly or in an unintended manner.

Incorrect execution of multi-touch functions can lead to errors in the operation of the plant and thus to physical injury.

Note the following when operating the touch screen with multi-touch function:

- The touch screen reacts to contact on its surface, not to pressure.
- When using a touch pen: Operate the touch screen only with a touch pen for capacitive touch.
- Avoid unintended multiple touches, for example, with your knuckles.

Before you start to operate the device, make sure you are familiar with the multi-touch functions of the Windows operating system, as well as with the application to be used and its functions. Ensure that the gestures which the user executes on the multi-touch display are recognized by the application. It is possible that certain gestures need to be trained beforehand.

WARNING

Personal injury or property damage due to no protective conductor

An inadequate protective conductor or the lack of one might cause malfunction of the capacitive touch screen. Functions may not work properly. This can result in personal injury or property damage.

- Always connect the device to a protective conductor.
- Additional information on connecting the protective conductor can be found in the section "connecting the PE conductor (Page 44)".

Notes on operation

Note when operating the multi-touch screen:

- Surface contact with a diameter of about 5 to 20 mm is required for an operator action to be detected.
- An operation with gloves with a material thickness of <2 mm is detected in most cases. However, check the usefulness of the gloves you are using.
- To avoid incorrect operation, certain inputs are ignored and blocked from further entry:
  - Simultaneous operation with more than 5 fingers.
  - Surface contact with a diameter of > 3 cm, for example, resting the palm of the hand on the touch screen
  - As soon as the touch screen is no longer touched, input is possible again.

Functions of the multi-touch screen

General functions

- Detection of up to 5 finger touches at a time.
- Detection of gestures that are supported by the operating system or the software installed on the device.

Note

Multi-touch operation can provide advanced features or pose limitations depending on the operating system and the software installed on the device. Read the corresponding documentation.

- You do not need to calibrate the touch screen. Some operating systems do offer touch calibration. However, this calibration does not result in increased accuracy.

Security functions in an industrial environment

The touch screen is locked for security reasons when following happens:

- There is a conductive liquid on the touch screen with ground contact via the enclosure or the operator, for example.
- Electromagnetic interference is present that exceeds the specification according to EN 61000-4-2.

Once the interference is over, the touch screen is no longer locked.

6.3 Panel Drivers and Tools software

Panel description - Panel Drivers and Tools software

The SIMATIC IPC PDT software installs the "IPC Configuration Center" and, optionally, the "IFP Ethernet Monitor" software.

The existing hardware components are automatically detected by the associated software.

The most important features of the software are:

- Easy dialog-guided installation
- Simple configuration via the IPC Configuration Center of:
  - Brightness
  - Information
  - Screen saver
  - Tools
  - Touch settings

All other functions are described in the IPC Panel Driver and Tools operating manual.

SIMATIC IPC Panel Drivers and Tools software

The software SIMATIC IPC Panel Drivers and Tools as well as the complete description of the functions for your device are available for you in the Industry Online Support.

- Download the software PDT V1.7 or higher from the Internet at: (https://support.industry.siemens.com/cs/ww/en/view/109792891)
- The complete description of the functions for your device can be found along with the corresponding download file on the Internet at (https://support.industry.siemens.com/cs/ww/de/view/109974159/en).

6.4 Extended device functions

6.4.1 Monitoring functions

6.4.1.1 Overview of the monitoring functions

The basic version of the device also provides monitoring functions. The following display, monitoring and control functions are available when the appropriate software is used:

- Temperature monitoring: Overtemperature, undertemperature, or cable break at a temperature sensor
- Monitoring of drives with S.M.A.R.T. functionality
- Watchdog: Hardware or software reset of the computer
- Operating hours counter: Information about total time of operation
- Battery monitoring: The charge level of the battery is monitored.

SIMATIC IPC DiagBase

If you have ordered your device with a Microsoft® Windows® operating system, the SIMATIC IPC DiagBase monitoring software is installed.

Information on the software and documentation of SIMATIC IPC DiagBase can be found under:

- SIMATIC IPC DiagBase (https://support.industry.siemens.com/cs/ww/de/view/109749690/en)

SIMATIC IPC DiagMonitor

The SIMATIC IPC DiagMonitor monitoring software can be ordered optionally.

If a device is ordered with SIMATIC IPC DiagMonitor, the monitoring software SIMATIC IPC DiagMonitor is included with the device in the delivery state.

Information on the software and documentation of SIMATIC IPC DiagMonitor can be found under:

- SIMATIC IPC DiagMonitor (https://support.industry.siemens.com/cs/ww/de/view/39129913/en)

6.4.1.2 Temperature monitoring/display

Three temperature sensors monitor the temperature of the device at several positions:

- Processor temperature
- Temperature close to the RAM ICs/chips
- Temperature close to the interfaces

A temperature error is triggered under these circumstances:

- The configured low threshold for the temperature has been violated.
- The configured high threshold for the temperature has been violated.

A temperature error causes the following reaction:

Reaction	Option
The DiagBase or DiagMonitor software alerts the user.	None

The temperature error is retained in memory until temperatures have fallen below the thresholds and it is reset by one of the following measures:

- Acknowledgment of the error message by the monitoring software
- Restart of the device

6.4.1.3 Watchdog (WD)

Configuration

You configure the watchdog with the DiagBase or DiagMonitor software.

Function

The watchdog is able to monitor system runtime and informs the user about the different reactions that are triggered if the system does not respond to the watchdog within the specified monitoring time.

A watchdog alarm is retained after a restart and is reset and logged by the DiagBase or DiagMonitor software. The watchdog configuration is retained in the process.

Watchdog reactions

The following reactions can occur if the watchdog is not addressed within the set time:

Option	Reaction
Reset on	Executes a hardware reset when the watchdog expires
Reset off[1]	Executes no action when the watchdog expires
Restart [1]	Restarts the operating system when the watchdog expires
Shutdown [1]	Shuts down the operating system when the watchdog expires

[1] Option is device-specific.

NOTICE
"Reset on" option The "Reset on" option immediately triggers a hardware reset that may result in loss of data under Windows and damage to the installation.

Watchdog monitoring times

The monitoring time can be configured with the DiagBase or DiagMonitor software.

Note

When you change the monitoring time, the change takes effect immediately.

6.4.1.4 Battery monitoring

The installed backup battery has a limited service life, see section "Replacing the backup battery (Page 81)". A two-tier battery monitoring checks the status of the backup battery. The SIMATIC DiagBase and SIMATIC DiagMonitor diagnostic software determines the status of the backup battery.

When the first warning level is reached, the battery for buffering CMOS data still has a remaining service life of at least one month.

6.4.1.5 Mass storage monitoring

The state of the SSD and CFast cards is monitored via SMART bit and reported by DiagBase or DiagMonitor.

6.4.2 Unified Write Filter (UWF)

The Unified Write Filter is a configurable write filter that makes it possible to assign write-protection to data storage media, such as hard disks, CFast cards, SSDs, internal USB drives, or external SATA drives.

External removable data storage media such as USB sticks and other flash drives, which are recognized by the operating system as a removable data storage medium, are not supported.

UWF combines the advantages of older write filters such as EWF and FBWF. It prevents all write access to protected media and transfers the data to buffer memory (overlay). This increases the reliability and stability of the system as well as the service life of write-sensitive media such as SSDs and CFast cards.

Note

UWF is disabled in the delivery state.

Note that memory is reduced when UWF is enabled.

NOTICE
Risk of data loss with enabled UWF When UWF is enabled, all changes made to storage media with a UWF write protection after booting can be lost when the device is shut down. Proceed as follows to prevent this situation: • Make changes to storage media only when UWF is disabled.

See also

SIMATIC IPC Windows 10 User Manual
(https://support.industry.siemens.com/cs/ww/de/view/109749498/en?dl=en)

6.4.3 Enhanced Write Filter (EWF)

Purpose and function

The EWF (Enhanced Write Filter) is a function that is only available for Windows Embedded operating systems. It provides write protection that can be configured by the user.

You can use the Enhanced Write Filter to boot Windows Embedded Standard from read-only media, for example, CFast card, or provide individual partitions with write protection.

EWF can be used to minimize write access to CFast cards. This is important because the write cycles on CFast cards are limited due to technical reasons. We therefore recommend using EWF if you work with CFast cards.

Note

HORM / compressed NTFS

EWF is indispensable if HORM or compressed NTFS is used.

NOTICE
Activate only one write filter per partition - otherwise you risk data loss
EWF and FBWF are preinstalled in the SIMATIC IPC images.
Ensure that only one write filter is enabled on a partition, otherwise you risk data loss.

Note

The Enhanced Write Filter is deactivated in the Windows Embedded Standard default state.

After the operating system and programs have been installed, you should back up your data and then enable the EWF.

Set EWF

The following programs can be used to install, enable or disable the EWF:

- EWFMGR.EXE
- SIMATIC IPC EWF Manager

Der SIMATIC IPC EWF Manager is pre-installed and included on the USB flash drive.

Start the SIMATIC IPC EWF Manager as follows:

- "Start > All Programs >Siemens Automation > SIMATIC > EWF Manager > EWF Manager

Configure the SIMATIC IPC UWF Manager with:

- "Start > All Programs > Siemens Automation > SIMATIC > EWF Manager > EWF Settings

  or

- Click the "SIMATIC IPC EWF Manager" icon in the system tray.

The following functions are available:

Function	Command
Write-protect drive C: Switching on	`ewfmgr c: -enable`
Write-protect drive C: disable (modified files are transferred)	`ewfmgr c: -commitanddisable`
Modified files on drive C: Accept	`ewfmgr c: -commit`
Display information about the EWF drive	`ewfmgr c:`
Display help	`ewfmgr /h`

Note

The EWF commands affecting the write protection do not become active until after the next booting process.

Note

The EWF command `ewfmgr c: -commitanddisable` cannot be used with the `-Live` options (i.e. not like this: `ewfmgr c: -commitanddisable -live`).

Special features for the use of Enhanced Write Filters (EWF)

- If the EWF is enabled, changes made after the boot sequence on drive C: are lost in the event of a power failure.
  To prevent data loss in the event of a power failure, we recommend using a UPS.
- You can save the data in the EWF RAM overlay to the CFast card or the hard disk before you shut down the device. To do so, enter the following command in the command prompt:

```
ewfmgr c: -commit
```

Note

When the system is set to automatically adjust the clock for daylight saving time adjustment, systems without central time management and with activated EWF set the clock forward or backward by one hour in the daylight saving time or standard time period each time the system boots.

The reason for this behavior is that Windows Embedded Standard 7 makes a registry entry that the changeover to daylight saving time has occurred. Since this file is also protected against modification by the EWF, the marker is lost during the boot sequence and the adjustment is made again.

We therefore recommend that you deactivate the automatic adjustment and change the clock manually.

Procedure:

1. Deactivate automatic adjustment in the Control Panel. In the Time Zone tab opened with the menu command Start > Control Panel > Date and Time, remove the check mark from the "Automatically adjust clock for daylight saving changes" check box.
2. Save the change you have made with `ewfmgr c: -commit` and then reboot the system.

6.4.4 File Based Write Filter (FBWF)

Purpose and function

With the Feature Pack 2007 for Windows XP Embedded and Windows Embedded Standard 7, Microsoft introduced a second write filter, File Based Write Filter (FBWF).

In contrast to EWF, which protects partitions based on sectors, FBWF works on the file level. If FBWF is enabled, all files and folders of a partition are protected unless they are included in an exception list.

FBWF is disabled by factory default in the operating system images for SIMATIC IPC and must be enabled and configured by the user.

When you enable FBWF, the folders C:\FBWF and D:\FBWF are authorized for writing by default.

Comparison between EWF and FBWF

- You should prefer FBWF, because it is more flexible in its configuration and allows immediate writing without rebooting.

Note

HORM / compressed NTFS

EWF is indispensable if HORM or compressed NTFS is used.

NOTICE
Activate only one write filter per partition - otherwise you risk data loss EWF and FBWF are pre-installed in the SIMATIC IPC images. Ensure that only one write filter is enabled on a partition, otherwise you risk data loss. Make sure that you only activate one write filter for each partition.

Configuring FBWF

FBWF can be configured in command console using the program FBWFMGR.EXE.

Note

- Observe the following syntax: Enter a **space** after the drive designation colon.
- Changes for direct write access only take effect after rebooting.
- Only existing files and folders can be entered in the exception list.

Function	Command
Display the current FBWF status	`fbwfmgr /displayconfig`
Enable FBWF after the next startup	`fbwfmgr /enable`
Write to protected files	`fbwfmgr /commit c: \Test.txt`
Adding/removing elements in the exception list:	
• Add file	`fbwfmgr /addexclusion C: \Test.txt`
• Add folder	`fbwfmgr /addexclusion C: \Test folder`
• Remove file	`fbwfmgr /removeexclusion C: \Test.txt`
• Remove folder	`fbwfmgr /removeexclusion C: \Test folder`
Call up the help function	`fbwfmgr /?`

Detailed instructions on FBWF are available on the Internet (https://msdn.microsoft.com/en-US/library/aa940926(WinEmbedded.5).aspx).

6.4.5 Buffer memory NVRAM

The motherboard is equipped with an optional NVRAM that applications can use to back up data in the event of a power failure. Failure of the supply voltage for a duration longer than 5 ms is indicated by the DC FAIL signal.

Depending on the system utilization, up to 512 KB can be saved in the NVRAM.

A memory window with a maximum size of 512 KB can be displayed by means of PCI address register. The base address is initialized by the BIOS.

A corresponding function is implemented there for using the NVRAM under WinAC RTX and for using the CPU150xS SW controller.

6.4.6 Trusted Platform Modul (TPM)

Depending on the ordered configuration, the motherboard contains a Trusted Platform Module (TPM). A TPM is a chip that adds important security functions to your device, such as enhanced protection of the PC against unauthorized manipulation by third parties. The current operating systems, for example, Windows 7 or Windows 10, support these security functions.

NOTICE
Import restrictions TPM technology is subject to legal restrictions in some regions and may not be used there. You could commit a crime by importing or exporting the device in certain countries. Note the respective import provisions for the TPM module.

Activating the Trusted Platform Module

The TPM can be activated under "Security" in the BIOS setup. Please follow the instructions in the BIOS setup.

Using the Trusted Platform Module

The TPM can be used in Windows 7 with the "BitLocker" drive encrypter. Please follow the instructions for this in the operating system.

Note

Risk of data loss

If you lose the password for the drive encryption, you will not be able to restore the data. You will then lose accesss to the encrypted drive.

The warranty does not cover a reset of the hardware in the event of a loss of a password.

Please store the password carefully and make sure it is protected against unauthorized access.

Expanding the device and assigning the device parameters

7

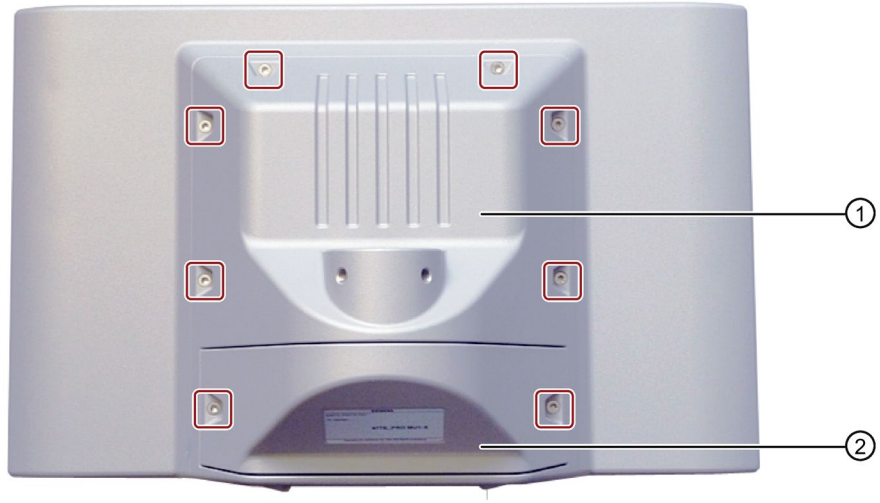
7.1 Opening and closing the backplane cover

Requirements

- The device is disconnected from the power supply.
- Torx TX20 screwdriver

Opening the backplane cover

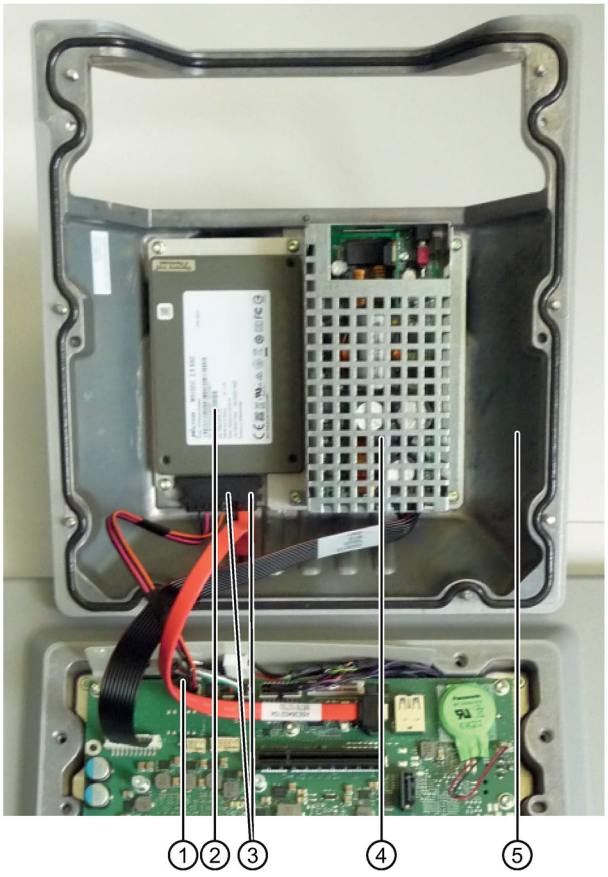




NOTICE
Damaging the seal when opening If the device has not been opened for a long time, the backplane cover and terminal compartment cover may stick to the enclosure due to the seal. Opening the device with excessive force or with tools will destroy the seal. Spray and water jets as well as penetrating substances can then damage the device. Open the backplane cover and terminal compartment cover gently, without applying too much pressure.

1. Loosen the two indicated M4x16 screws of the terminal compartment cover ② (the screws are captive in the covers).
2. Open the connection compartment cover ② and set it safely aside. (see also section "Power supply (Page 42)").
3. Remove the green connection terminal. The connection terminal is plugged in and can be pulled out from the front.
4. Loosen the eight M4x16 screws of the backplane cover ① (the screws are captive in the covers).

5. Open the backplane cover ①, gently open it 90° upwards and place it on the edge of the enclosure, as shown below.



NOTICE
Damage to the device An SSD ② and power supply ④ are built into the backplane cover and connected to the motherboard with short cables ③. If you open up the backplane cover ⑤ completely or set it aside, you pull on the cables by their connectors. The device may be damaged. 1. Secure the backplane cover ⑤ from falling down. 2. Pull out the cable connector ③ (see section "Replace SSD (Page 82)"). 3. Unplug the power supply connector ① on the motherboard.

6. Now you can install and remove the hardware.

Closing the backplane cover

1. Check that the seal is properly seated on the backplane cover.

   Note

   IP65 degree of protection at risk

   If the seal on the backplane cover is damaged, the IP65 degree of protection is at risk. The device must be repaired. Proceed as described in the section Repair information (Page 77).

2. Place the backplane cover on the enclosure. Make sure that no cables are crimped.

   Secure the backplane cover from falling down.

3. Plug in the green connection terminal again.
4. Close the terminal compartment cover.

   Note

   Do not exceed the permissible torque

   If you tighten up the screws with a torque > 1.5 Nm, you could may the threading in the enclosure.

5. Tighten the M4x16 screws of the backplane cover in crosswise order using a maximum torque of 1.5 Nm. Check all screws again to ensure that the maximum torque of 1.5 Nm has not been exceeded.

7.2 Installing and removing a memory module

The procedures for installing and removing the memory module are the same for all device variants.

The motherboard is equipped with one slot for an SO-DIMM DDR4 memory module. You can use it to expand the memory capacity of the device to a maximum of 16 GB.

Note

Use only the memory modules recommended by Siemens Aktiengesellschaft. You can find additional information in the section "Accessories (Page 15)".

Requirements

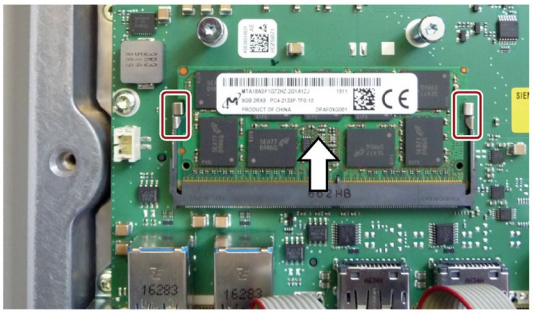
- The device is disconnected from the power supply.
- The device is open.

Procedure

NOTICE
ESD guidelines Note the protective measures required when working with ESD in the section "ESD guideline (Page 94)".

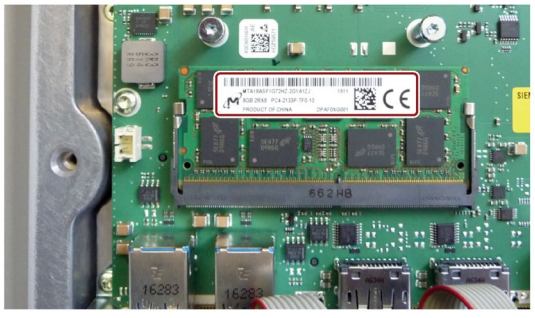
Removal

1. Press the marked latches towards the outside.
   The memory module tilts forward.
2. Pull the memory module out of the slot in the direction of the arrow.



Installation

1. Insert the memory module into the marked slot at an incline with the contact side toward the motherboard.
2. Carefully press the memory module into the contact strip until the latches engage.



3. Close the device.

7.3 Installing and removing a CFast card

The procedures for installing and removing the CFast card are the same for all device variants. Use only SIMATIC IPC CFast cards for industrial application.

Note

Note the following points:

- Use the slot (X50) described here exclusively for a **CFast card**.
- Do not insert **CompactFlash cards (CF cards)** into the slot for the CFast card.
- Always replace the SIMATIC IPC CFast card with a SIMATIC IPC CFast card of the same output version or higher. For the SIMATIC IPC477E PRO, only SIMATIC CFast cards with output version 02 or higher may be used.

  The output version can be found on the SIMATIC CFast card, see the section "Accessories (Page 15)".

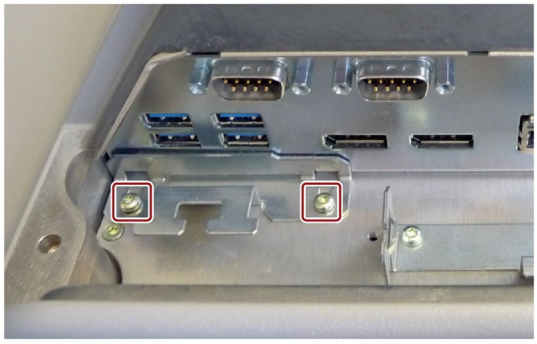
Requirements

- The device is disconnected from the power supply.
- The terminal compartment cover is open.
- SIMATIC IPC A CFast card that is approved for industrial use.

Procedure

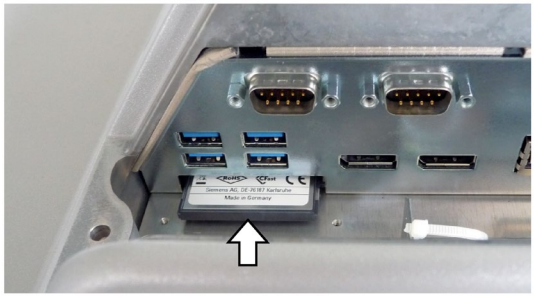
Removal

1. For PRO device: Loosen the indicated screws and remove the strain relief.



2. Press on the CFast card in the direction of the arrow.

   The CFast card moves approximately 5 mm out of the slot.
3. Remove the CFast card.



Installation

Note

Carefully insert the CFast card into the slot (X50) without applying excess force.

1. Insert the CFast card into the slot (X50).
2. Press the CFast card until it latches.
3. Fasten the strain relief with the two screws.
5. Close the device.

See also

Replace SSD (Page 82)

7.4 Assigning CPU power consumption parameters

The CPU can be switched to one of the following modes via a BIOS Setup setting (BIOS setup > Menu "Power" > "Power&Performance" > "CPU Power Management Control" > "CPU Power Level"):

Operating mode	Description
Standard	Default setting The CPU clock is dynamically limited with maximum 3D graphics performance. The maximum CPU power consumption is 17 W.
Performance optimized	Setting the high performance for CPU and Graphics at the same time. Especially for demanding 3D programs. The maximum CPU power consumption is 25 W. Note: The maximum ambient temperature must be reduced by 9 °C when installed inclined in horizontal format and 5 °C in all other operating positions.
Determinism optimized	Same as standard, but additionally optimized for deterministic operation with constant CPU frequency.
Temperature optimized	Setting for lowest power consumption. The CPU clock is limited at a higher load. The maximum power consumption of the CPU is 12 W.

Maintaining and repairing the device

8

8.1 Maintenance

To maintain high system availability, we recommend the preventative replacement of those PC components that are subject to wear. The table below indicates the intervals for this replacement.

Component	Replacement interval:
CMOS backup battery	5 years
SSD / CFast card	Depends on the type of use [1]

[1] The interval for replacement depends greatly on the type of use. A specific interval cannot be given.

All drives are monitored with the software tools DiagBase or DiagMonitor on the basis of their SMART status. As soon the SMART status of the SSD switches to "Not OK", a message is sent in DiagBase or DiagMonitor, or when you start up the PC. You should then back up your data and replace the drive.

8.2 Repair information

Making repairs

Install only system expansions approved for this device. If you install other expansion devices, you may damage the device or violate the safety requirements and regulations on RF suppression. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.

⚠ WARNING

Opening the device

Unauthorized opening and improper repairs on the device may result in substantial damage to equipment or endanger the user. If you install or replace a system expansion and damage your device, the warranty will become void.

The device may only be repaired by qualified personnel.

Safety when working in and on electrical systems

Work in or on electrical systems may only be carried out by authorized persons. The following safety regulations apply in Germany for the prevention of electric shock and electrocution:

1. Switch off the system
2. Secure the system to prevent it switching back on
3. Check the system to ensure it is de-energized
4. Ground and short the system
5. Cover or shield adjacent live parts

These safety rules are based on the DIN VDE 0105 standard.

Note

These safety steps must always be taken in the above order before any work on electrical systems. Once work on an electrical system is finished, cancel the safety steps starting with the last and finishing with the first.

In accordance with the applicable safety regulations, clearly indicate on an electrical system that work on it is underway.
Observe the safety regulations applicable in the country of operation.

CAUTION

Electrostatic-sensitive components

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

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

WARNING

Risk of explosion and release of harmful substances

Improper handling of lithium batteries can result in an explosion of the batteries. Explosion of the batteries and the released pollutants can cause severe physical injury.

Observe all safety and handling instructions for lithium batteries. Do not expose lithium batteries to flames and do not solder the battery cell. Do not recharge, open, or short lithium batteries. Do not reverse lithium battery polarity or heat the batteries to over 100°C. Keep lithium batteries out of direct sunlight and protect them from moisture and condensation.

Note the following when handling lithium batteries:

- A worn battery jeopardizes the function of the device. Change the battery in good time.
- Replace the lithium battery only with batteries of the same type or a type recommended by SIEMENS.

  The article number for the lithium battery is A5E34345932.

NOTICE
Batteries and rechargeables pollute the environment Do not dispose of used batteries or rechargeables in household waste. Users are obliged by law to return used batteries and rechargeable batteries. You as the user are legally responsible disposing used batteries or rechargeables in a correct manner. Observe the following rules for the disposal of batteries and rechargeables: • Dispose of used batteries and rechargeable batteries separately as hazardous waste in accordance with local regulations. • You can return used batteries and rechargeable batteries free of charge to public collection points and wherever batteries and rechargeable batteries of the type in question are sold • Mark used battery containers as "Used batteries".

Limitation of liability

All technical specifications and approvals for the device apply only if you use expansion components that have a valid CE approval (CE marking). The installation instructions for expansion components in the associated documentation must be observed.

UL approval of the device only applies when the UL-approved components are used according to their "Conditions of Acceptability".

We are not liable for functional limitations caused by the use of third-party devices or components.

8.3 Cleaning the Device Front

The device is designed for low-maintenance operation. You should still clean the device front regularly, however.

⚠ CAUTION

Unwanted reactions when cleaning the device

You risk unintentional actuation of control elements if you clean the device while it is switched on.

You may possibly trigger unwanted actions of the device or controller that are liable to cause personal injury or damage to the machinery.

Always switch off the device before you clean it.

Cleaning Agents

NOTICE

Damage to the HMI device caused by impermissible cleaning agents

Impermissible and unsuitable cleaning agents may cause damage to the HMI device.

Clean the enclosure surface with a damp cloth and make sure that no water enters the device. Do not use the following cleaning agents:

- Aggressive solvents or scouring powder
- Steam jets
- Compressed air

Procedure

1. Switch off the device.
2. Dampen the cleaning cloth.
3. Clean the enclosure surface with the cleaning cloth and make sure that no water enters the device.
4. Clean the device with the cleaning cloth.

8.4 Installing and removing hardware

8.4.1 Replacing the backup battery

Requirements

- The device is disconnected from the power supply.
- The power supply connector is pulled out.
- The device is open, see the section "Opening and closing the backplane cover (Page 70)".
- A replacement battery is included

Procedure

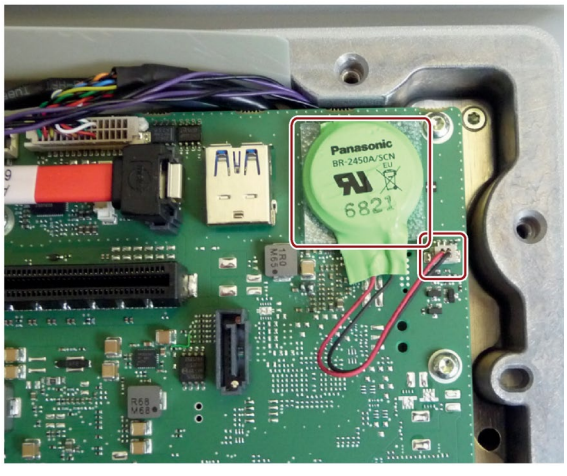
NOTICE
Time setting is lost The time and the setup settings are deleted if it takes longer than 30 seconds to replace the battery. The device is no longer synchronized. Time-controlled programs will no longer run or will run at the wrong time. This may damage the plant. Set the device time again.

Note

Writing down the BIOS settings

Make a note of the current BIOS setup settings or save them as a user profile in the BIOS setup Exit menu. You will find a list for noting the settings in the BIOS description.

1. Remove the labeled connector.
2. The battery is fastened with a Velcro fastener.
   Grip the labeled battery and carefully pull it out.



For installation, proceed in the reverse order and reconnect the device.

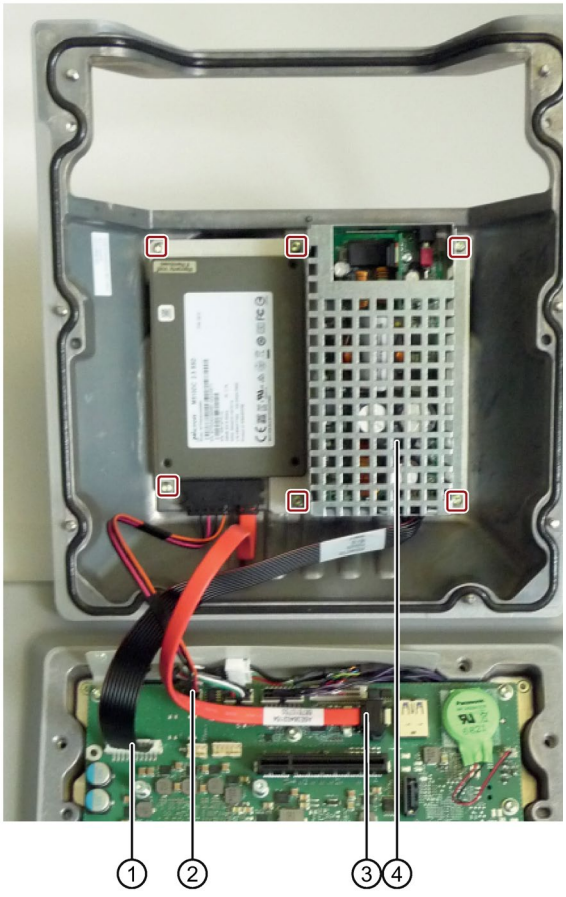
8.4.2 Replace SSD

Requirements

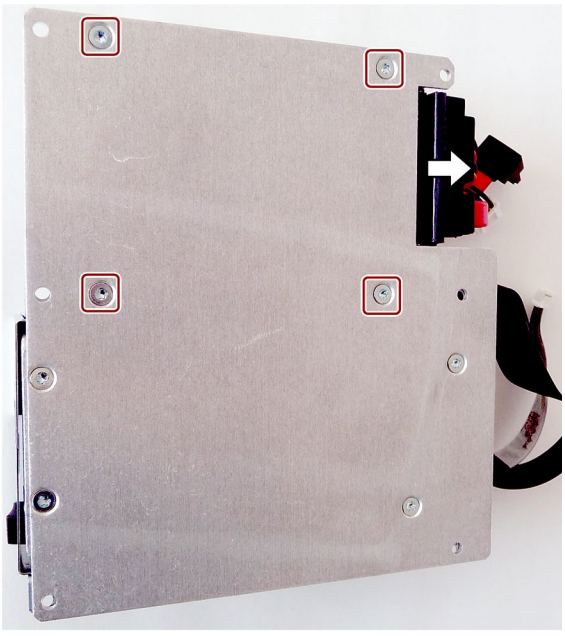
- The device is disconnected from the power supply.
- The device is open, see the section "Opening and closing the backplane cover (Page 70)".
- An SSD is installed in the backplane cover.
- T10 screwdriver

Procedure

1. Pull out the connectors ①, ② and ③. Take into account the safety latch of the cable in doing so.
2. Set the backplane cover down flat.
3. Remove the indicated screws and firmly hold down the cover ④ of the power supply.
4. Remove the drive cage with the SSD and power supply and place it with the back facing up.



5. Remove the indicated countersunk screws on the back.
6. Remove the SSD.
7. Pull out the SSD connector from the interface.



Installation

Note

Do not exceed the maximum permissible torques

If you tighten the screws with too much torque, the threading in enclosure and drive cage may be damaged. Note the maximum permitted torques:

0.8 Nm for the following connections:

- M3 x 5 pan-head screws for mounting the drive cage in the backplane cover

0.5 Nm for the following connections:

- M3 x 5 countersunk screws for mounting the SSD drive in the drive cage

---

Proceed in reverse order for the installation.

1. In step 1 above, ensure that the connectors are not installed with reverse polarity.
2. Close the device.

8.5 Installing the software

8.5.1 Reinstalling the operating system

8.5.1.1 General installation procedure

If your operating system is no longer functioning correctly, you can reinstall it in one of two ways:

- With the Recovery function of the supplied USB flash drive
- With the Restore function of the supplied USB flash drive

The USB flash drive is set up as bootable for these functions. For this purpose, "USB Boot" must be set to "enabled" in the BIOS Setup.

Note

Installing the operating system in UEFI mode

To install an operating system in UEFI mode, the USB flash drive must also be booted in UEFI mode. Since Windows Embedded operating systems are installed in MBR mode, the USB flash drive must be booted for the Restore function in Legacy mode.

Note

GPT partitioning with Windows 10

Please note that GPT partitioning should be selected for Windows 10 (GPT: GUID Partition Table).

Recovery function (only with Windows 7 Ultimate and Windows 10)

NOTICE
Windows Embedded
The Recovery function is not available for Windows Embedded operating systems.

The supplied USB contains the installation program with tools for configuring the drives and installing the operating system with the supported languages.

The basic language of the installed operating system is English. To add other languages, install these languages from the supplied USB flash drive (Documentation and Drivers).

Contents of the "DocuAndDrivers" directory

The supplied USB flash drive contains the documentation, hardware drivers and updates.

In Windows, these contents are available via a menu.

Restore function

If you have ordered IPC477E PRO with operating system, the supplied USB flash drive contains the Restore function.

8.5.2 Partitioning the data storage medium

8.5.2.1 Partitioning in Windows Embedded Standard 7

You will need to reconfigure the partitions after installing a new drive, to repair corrupt partitions or to change the partitioning.

Partitioning of the SIMATIC IPC CFast card

The SIMATIC IPC CFast card for Windows Embedded Standard 7 comes configured with the following default partitions:

Table 8- 1 32-bit version of the operating system

Partition	Name	Size of the card			File system
		8 GB	16 GB	≥ 30 GB	
First	SYSTEM	6 GB	12 GB	30 GB	NTFS (not compressed)
Second	DATA	Remain-der	Remain-der	Remain-der	NTFS (not compressed)

* Due to partitioning/formatting, the actual CFast capacity does not correspond to the memory size specified on the SIMATIC IPC CFast card.

Table 8- 2 64-bit version of the operating system

Partition	Name	Size of the card			File system
		8 GB	16 GB	≥ 30 GB	
First	SYSTEM	7 GB	12 GB	30 GB	NTFS (not compressed)
Second	DATA	Remain-der	Remain-der	Remain-der	NTFS (not compressed)

* Due to partitioning/formatting, the actual CFast capacity does not correspond to the memory size specified on the SIMATIC IPC CFast card.

Partitioning of the SSD

The following partitions are configured in the delivery state of the SSD with Windows Embedded Standard 7:

Partition	Name	Size of data medium		File system
		>100 GB	>100 GB	
Primary	SYSTEM	60 GB	100 GB	NTFS not compressed
Second	DATA	Remainder	Remainder	NTFS not compressed

To restore the partitions to their original delivery state, we recommend you use the software **SIMATIC IPC Image & Partition Creator.** Additional information is available in the accompanying documentation.

8.5.2.2 Partitioning in Windows 7 Ultimate

You will need to reconfigure the partitions after installing a new drive, to repair corrupt partitions or to change the partitioning.

Partitioning of the HDD or SSD

In delivery state, the following default partitions are set up on the HDD or SSD for the Windows 7 Ultimate operating system:

Partition	Name	Size of data medium			File system
		< 54 GB	>54 GB	>100 GB	
Primary	Boot	100 MB	100 MB	100 MB	Automatically set up by installation program
Second	System	40 GB	50 GB	100 GB	NTFS not compressed
Third	Data	Remainder	Remainder	Remainder	NTFS not compressed

8.5.2.3 Changing the partitions under Windows 7 and Windows 10

With the disk management, you can adapt the partitioning of your drives.

You can reduce or delete an available partition to acquire unassigned memory space, which you can use to set up a new partition or to increase an existing partition.

Note

Data lost in the case of deleting a partition!

If you delete a partition, all the data on this partition is lost.

Back up your data before you change partitions.

Requirement

You are logged on as an administrator.

Procedure - Reduce partition

A partition can only be reduced if sufficient space is available.

1. Click with the right mouse button on the partition to be reduced and click on "Reduce size".
2. Follow the instructions.

Procedure - Increase partition

Note

To increase a partition, this partition must not be formatted with a file system or the partition must be formatted with an "NTFS" file system.

1. Click in the partition manager with the right mouse button on the partition to be increased and click on "Increase size".
2. Follow the instructions on the screen.

Additional information is available in the "Help" menu under "Help topics" and "Search".

8.5.3 Installing drivers and software

Note

Set country settings to English (US)

In the case of multilingual operating systems (MUI versions), you must set the menus and dialogs and the default language to English (US) in the regional settings before new drivers and operating system updates are installed.

You can install a second language package for service purposes at a later time with the supplied USB flash drive under Windows Embedded Standard 7.

Procedure

1. Connect the supplied USB flash drive to the USB port.
2. Start the program "START_DocuAndDrivers".
3. Select "Drivers" in the index.
4. Select the device and operating system.
5. Select the desired driver
6. Open the folder with the driver information: Click on the link next to "Driver path".
7. Start the setup program in this folder.

Note

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

8.5.4 Update installation

8.5.4.1 Updating the operating system

Windows

The latest updates for the Windows operating system are available on the Internet at Microsoft and on the device in the Start menu "Start > Settings > Update & Security > Windows Update > Search 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.

8.5.4.2 Installing or updating application programs and drivers

Drivers for USB flash drives are included in the operating system and do not have to be installed separately.

For information about installation of SIMATIC software packages, refer to the corresponding manufacturer documentation.

For updates of third-party drivers and application programs, contact the respective manufacturer.

8.5.5 Backing up data

We recommend the software tool **SIMATIC IPC Image & Partition Creator** (as of V3.4) to back up data under Windows. This tool provides convenient and efficient functions for backing up and restoring the full content of memory cards, hard disks and individual partitions (images).

The **SIMATIC IPC Image & Partition Creator** can be ordered using the Siemens online ordering system (https://mall.industry.siemens.com). For more information about SIMATIC IPC Image & Partition Creator, refer to its product documentation.

8.6 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

9

9.1 Certificates and approvals

Note

Possible approvals

The following overview shows possible approvals.

Only the approvals specified on the device apply to the device itself.

ISO 9001 certificate

The Siemens quality management system for our entire product creation process (development, production and sales) meets the requirements of ISO 9001:2008.

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

Certificate no.: 001323 QM08

Software license agreements

If the device is supplied with pre-installed software, you must observe the corresponding license agreements.

9.1.1 UL 61010-2-201

UL approval

- Underwriters Laboratories (UL) according to standard UL 61010-2-201 (PROG.CNTLR.) Second Edition, File E85972
- Canadian National Standard CAN/CSA-C22.2 No. 61010-2-201 Second Edition

FCC (USA) and ICES (Canada) Compliance

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

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

RCM AUSTRALIA/NEW ZEALAND

This product meets the requirements of EN 61000-6-4:2007 Generic standards - Emission standard for industrial environments.

This product meets the requirements of the standard EN 61000-6-4:2007 Generic standards – Emission standard for industrial environments.

KOREA

This product meets the requirements of Korean certification.

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

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

BIS (India)

This product meets the requirements of the Bureau of Indian Standard (BIS).

Tested according to IS 13252(Part 1):2010/ IEC 60950-1 : 2005.

Ambient conditions for use of the devices in shipbuilding

The device is suitable for shipping and offshore applications.

The installation and attachment conditions are the same as those for industrial applications.

The admissible environmental conditions are described in the marine approvals of the individual marine companies.

Marine approvals

The following ambient conditions are permitted:

- ENV1, ENV2 and ENV3

  In accordance with "Lloyd's Register's Type Approval System, Test Specification Number 1 - 07/2015".

  Note

  EMC requirements for installation on deck and on the bridge.

  When used with a filter of the type Corcom xFC10 (tested) or similar, the device fulfills the EMC requirements for installation on deck and on the bridge.

The following marine approvals are provided for the device.

- ABS American Bureau of Shipping (USA)
- BV Bureau Vertias (France)
- DNV GL (Norway/Germany)
- LR Lloyds Register of Shipping
- Class NK Nippon Kaiji Kyokai (Japan)
- China Classification Society (CCS)
- Korean Certification (KC Mark)

NOTICE
Ambient conditions and installation guidelines The admissible environmental conditions and installation guidelines can be found in the certificates issued by the individual shipbuilding companies. After acceptance, the certificates are made available on the Internet (https://support.industry.siemens.com/cs/ww/en/ps/25042/cert?ct=446).

9.2 Declaration of Conformity

9.2.1 CE marking



The device meets the guidelines listed in the following sections.

EU Declaration of Conformity

The associated declaration of conformity is available on the Internet at the following address: Panel PC certificates (https://support.industry.siemens.com/cs/ww/en/view/37369031).

9.2.2 Electromagnetic compatibility

Electromagnetic compatibility

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

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

Scope of application	Requirements for	
	Interference emission	Immunity to interference
Industrial area	EN 61000-6-4	EN 61000-6-2

RoHs directive

This product meets the requirements stated in the RoHS directive (Restriction of Hazardous Materials): 2011/65/EU

Compliance with the directive has been reviewed according to the following standard: EN IEC 63000

9.2.3 UKCA marking

UKCA marking



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

- Electromagnetic Compatibility Regulations 2016 (EMC)
- Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016 (Explosion Protection) [1]
- Regulations on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2012 (RoHS)

[1] : Marking on nameplate, if applicable

UKCA Declaration of Conformity

The associated declaration of conformity is available on the Internet at the following address:

- Panel PC certificates (https://support.industry.siemens.com/cs/ww/en/view/37369031)

9.3 Directives and declarations

9.3.1 ESD guideline

What does ESD mean?

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

The following abbreviations are commonly used for electrostatic sensitive devices:

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

Electrostatic sensitive devices can be labeled with an appropriate symbol.

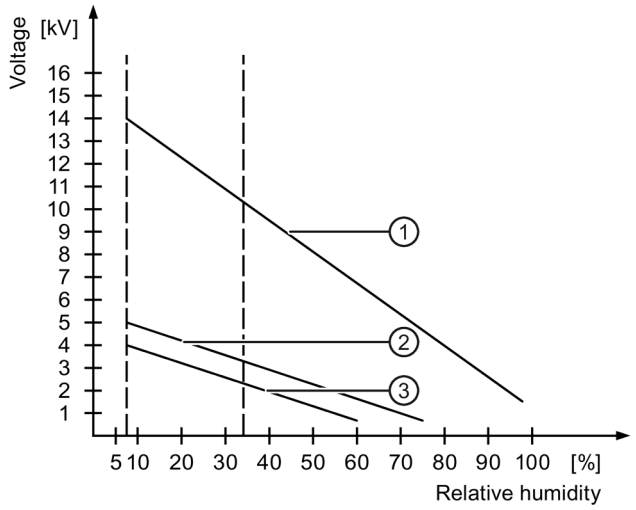


NOTICE
Damage to ESD from touch Electrostatic sensitive devices, ESD, can be destroyed by voltages which are far below the human perception limit. If you touch a component or electrical connections of a module without discharging any electrostatic energy, these voltages may arise. The damage to a module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

Charge

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

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



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

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

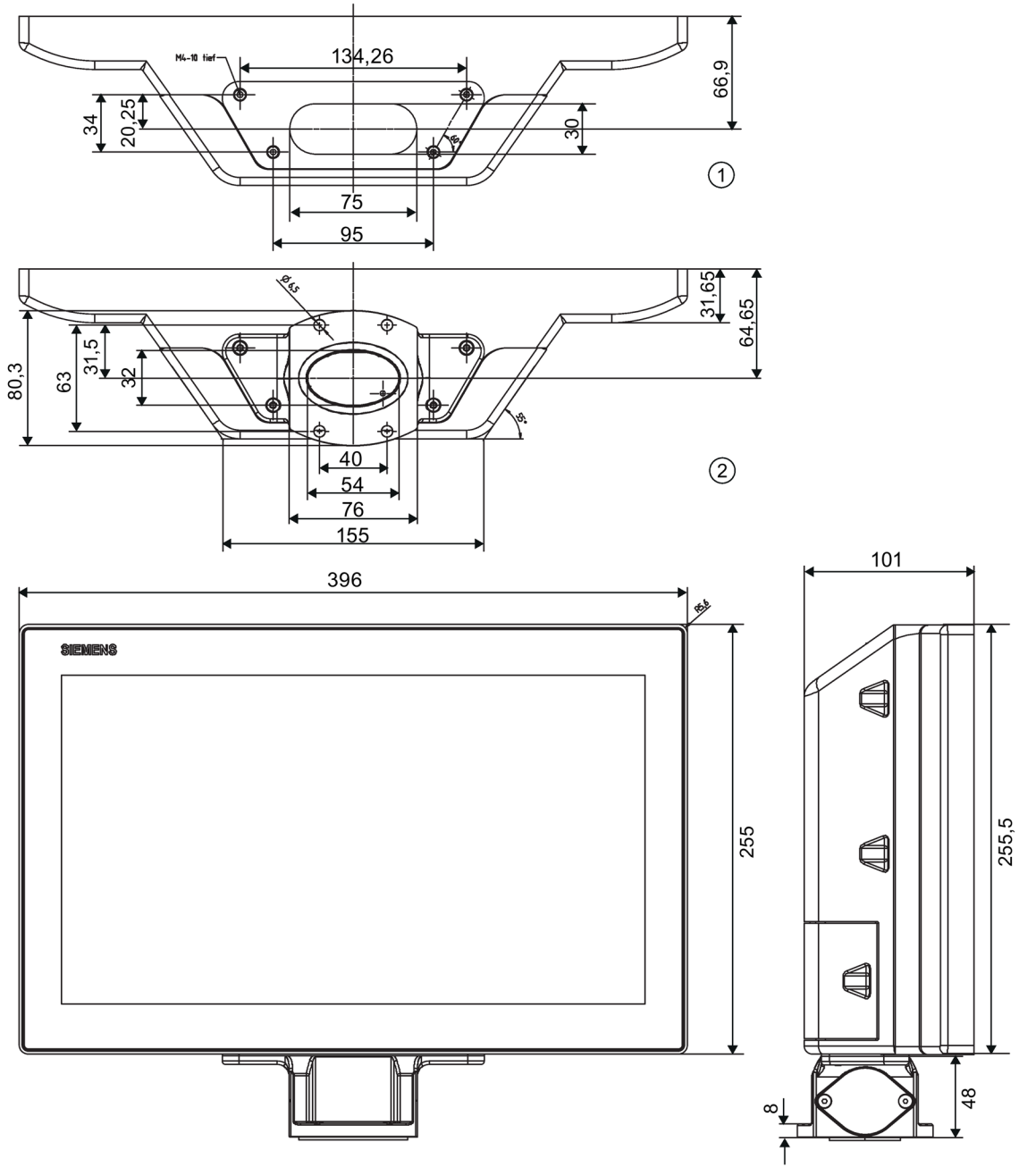
Protective measures against discharge of static electricity

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

9.4 Dimension drawings

9.4.1 Dimension drawing of 15" device with capacitive multi-touch screen

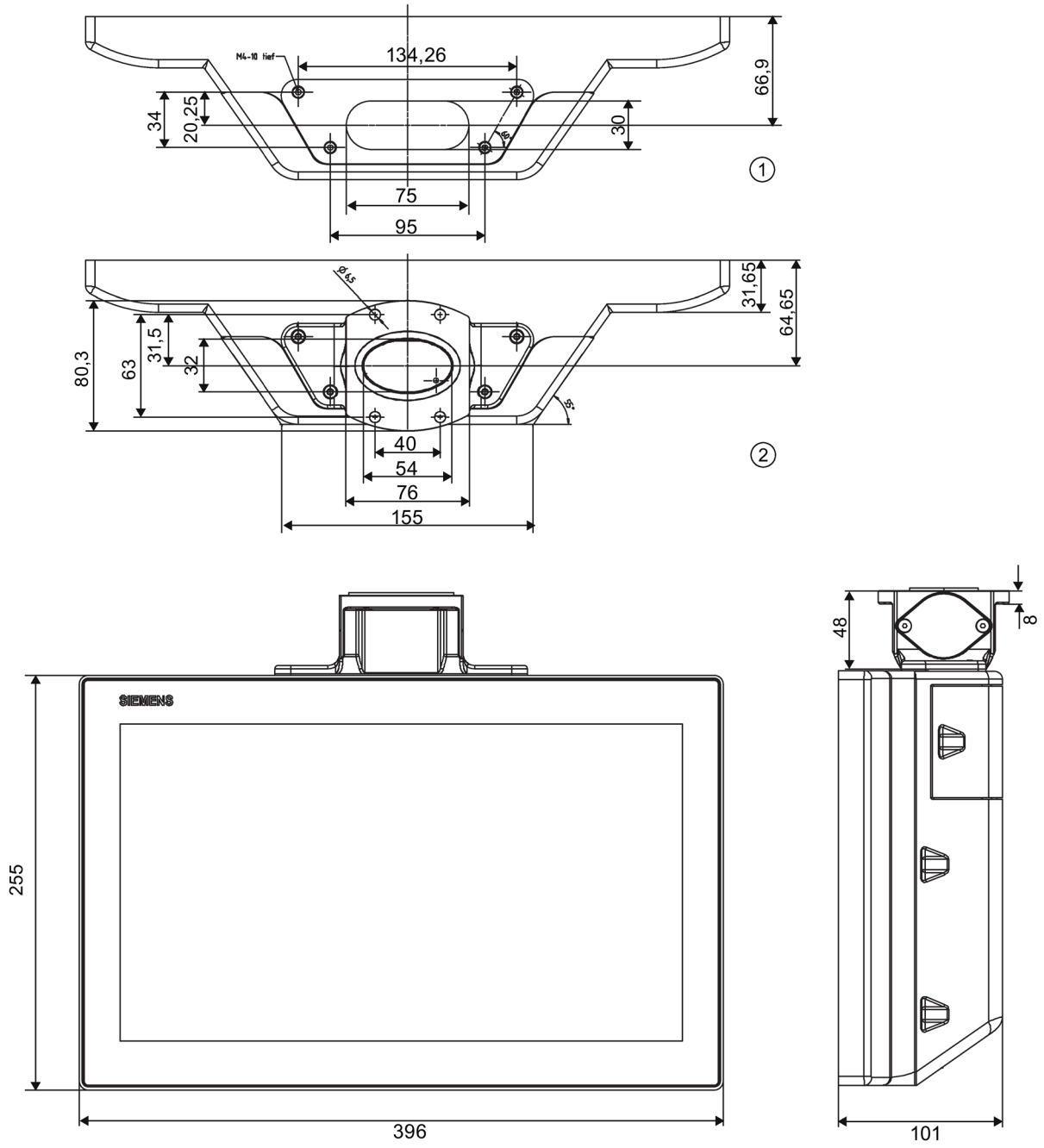
Prepared for pedestal



① Without base adapter
② With base adapter

All dimensions in mm

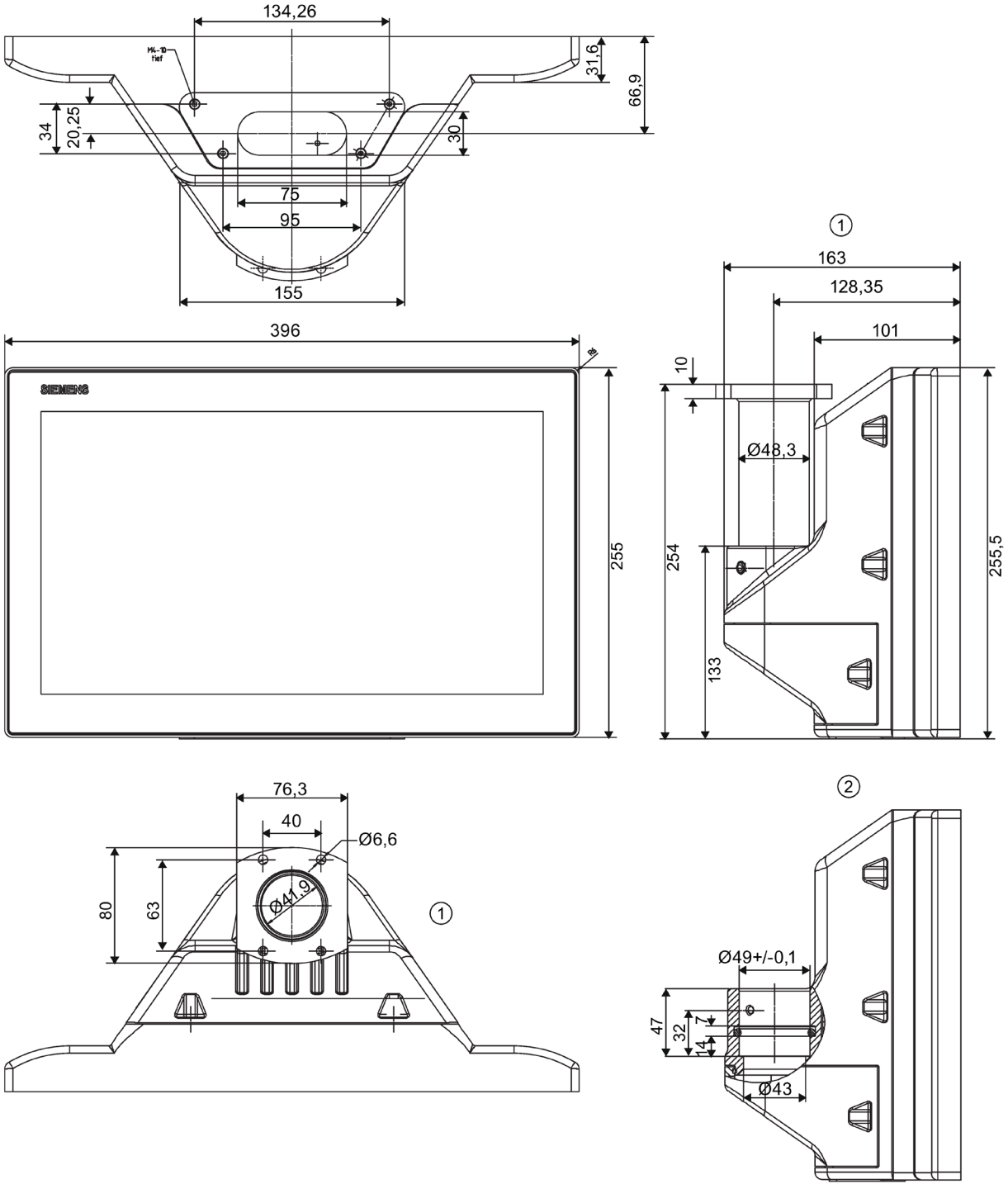
Prepared for support arm



① Without base adapter
② With base adapter

All dimensions in mm

Prepared for support arm and extension components

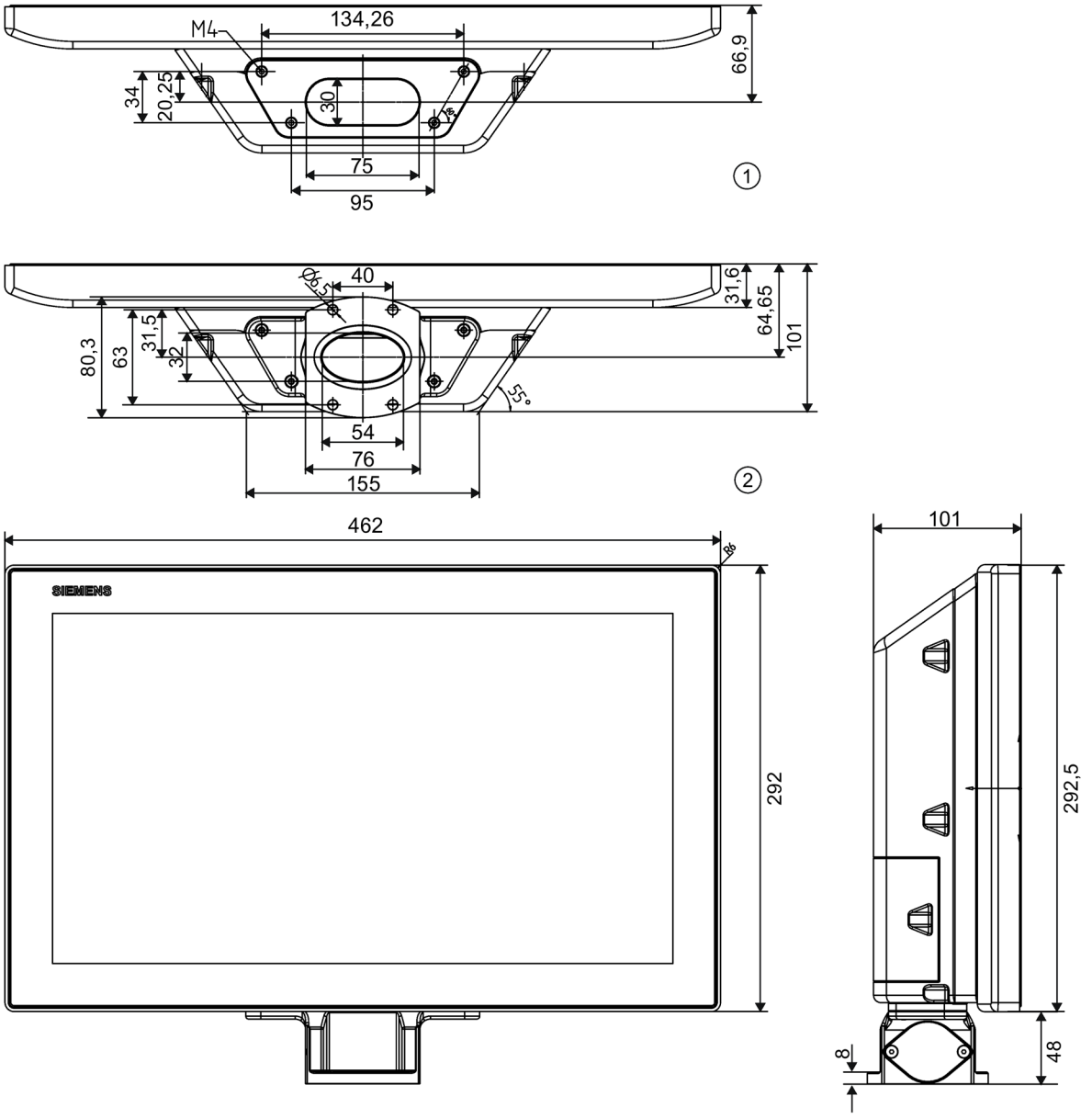


① With flange mount
② Without flange mount

All dimensions in mm

9.4.2 Dimension drawing of 19" device with capacitive multi-touch screen

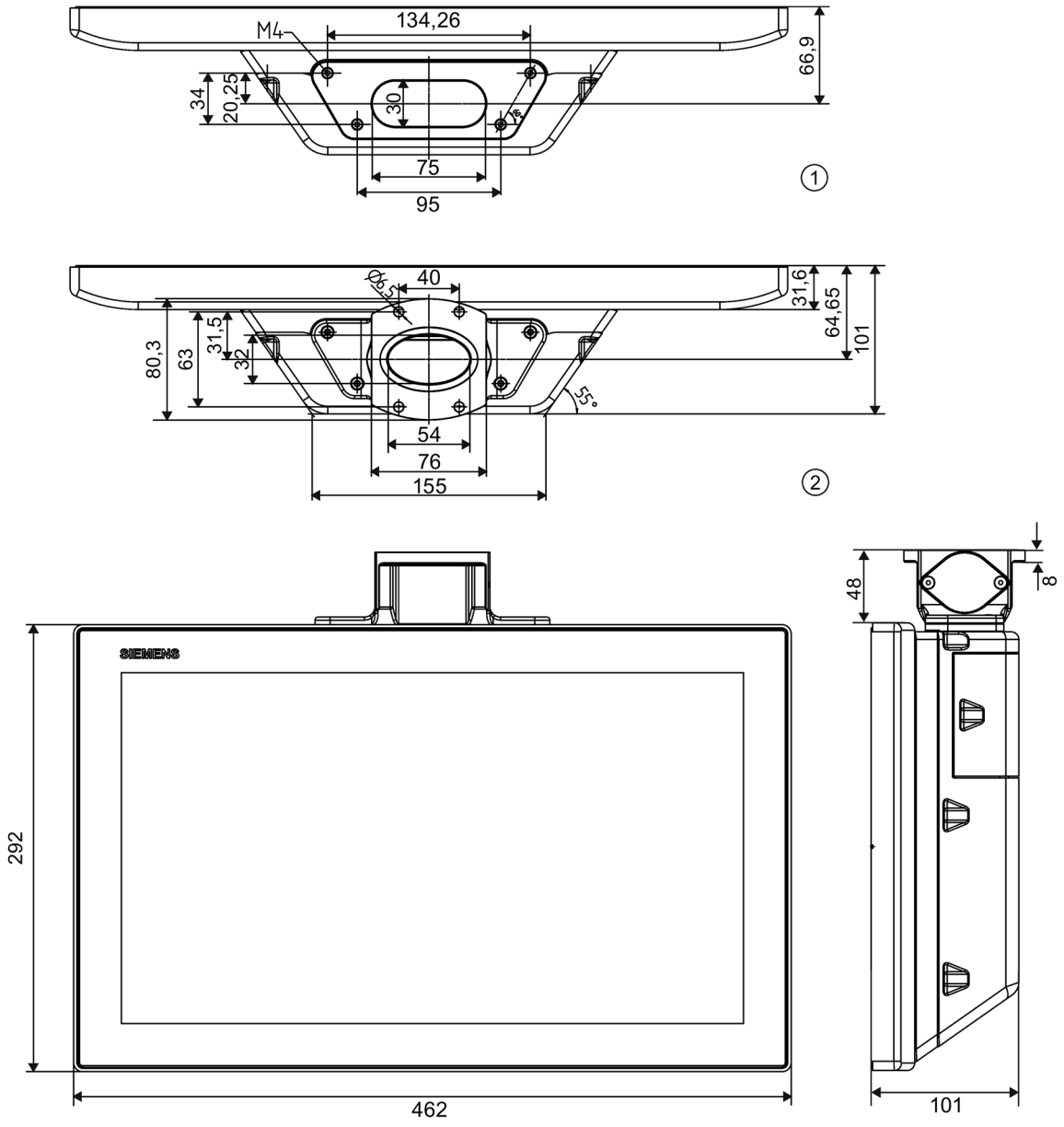
Prepared for pedestal



① Without base adapter
② With base adapter

All dimensions in mm

Prepared for support arm

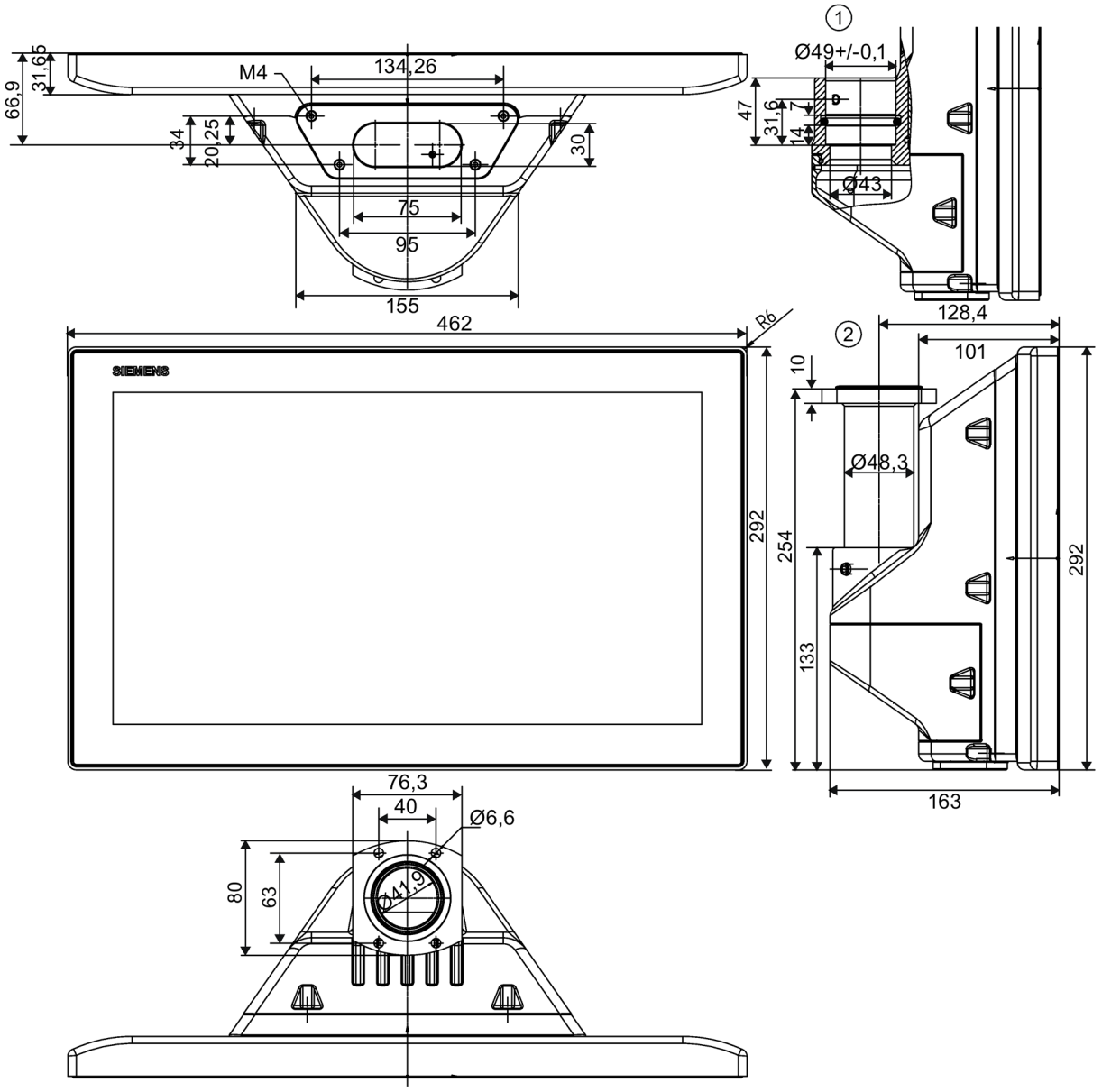


① Without base adapter

② With base adapter

All dimensions in mm

Prepared for support arm and extension components



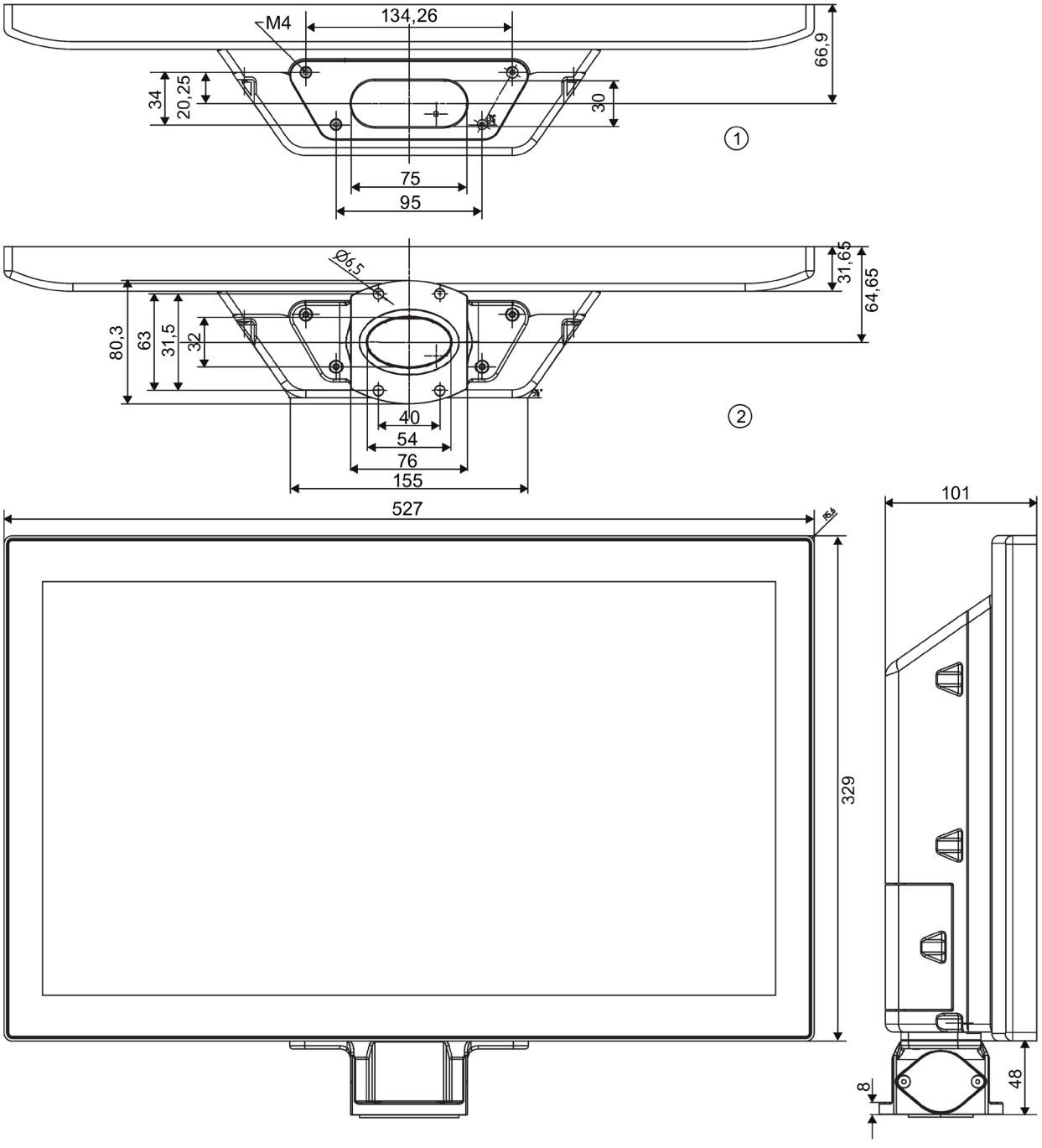
① Without flange mount

② With flange mount

All dimensions in mm

9.4.3 Dimension drawing of 22" device with capacitive multi-touch screen

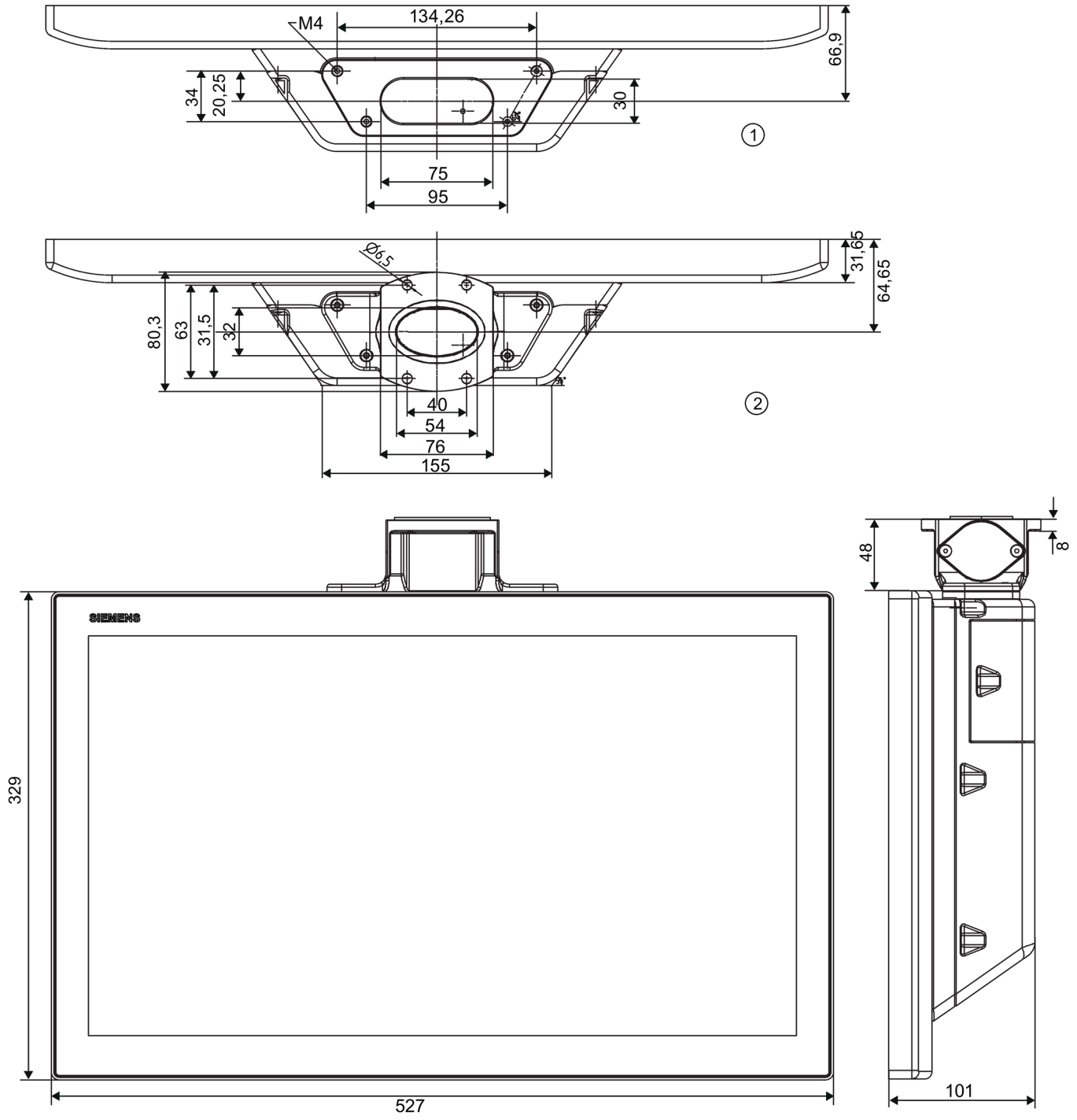
Prepared for pedestal



① Without base adapter
② With base adapter

All dimensions in mm

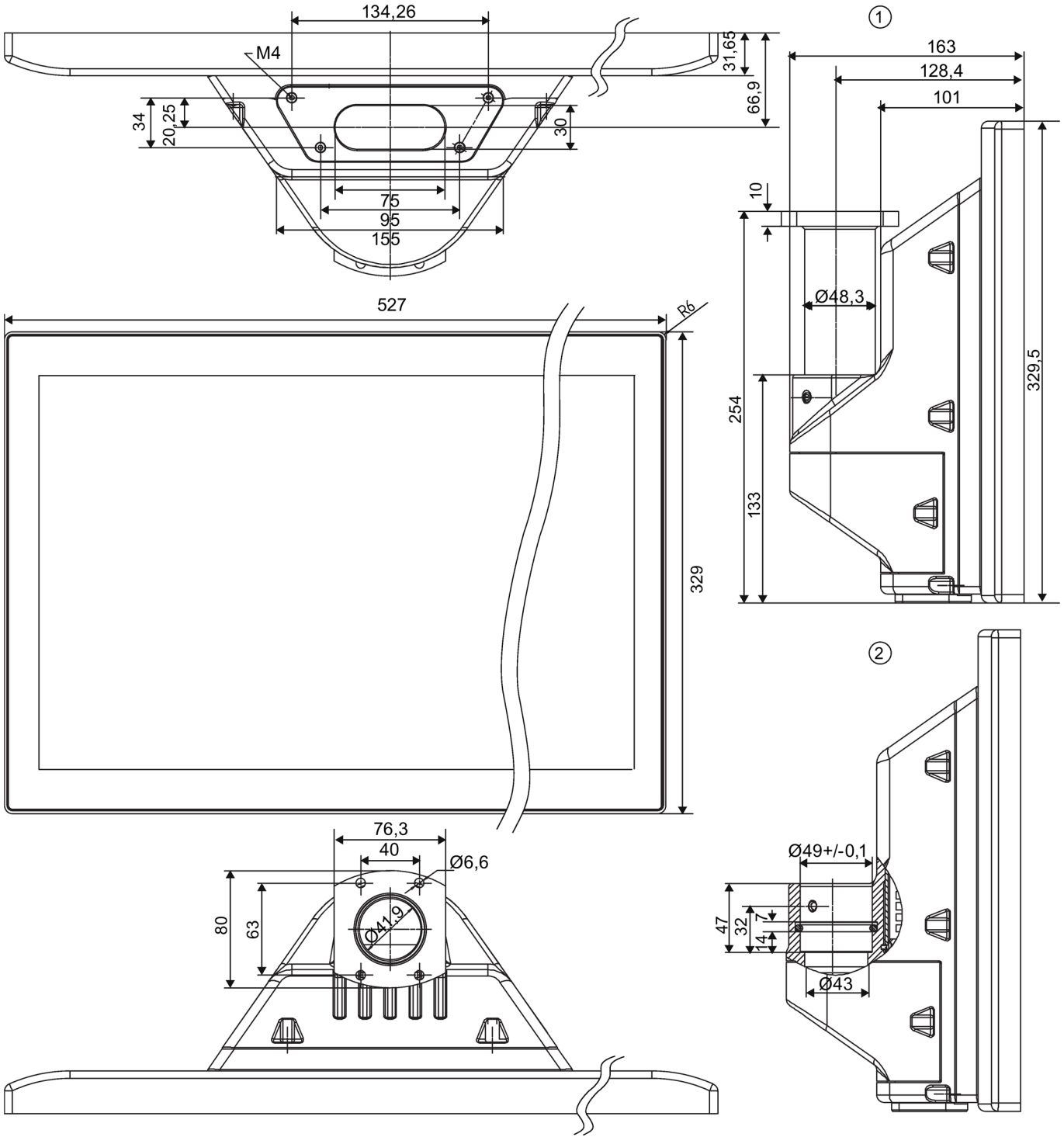
Prepared for support arm



① Without base adapter
② With base adapter

All dimensions in mm

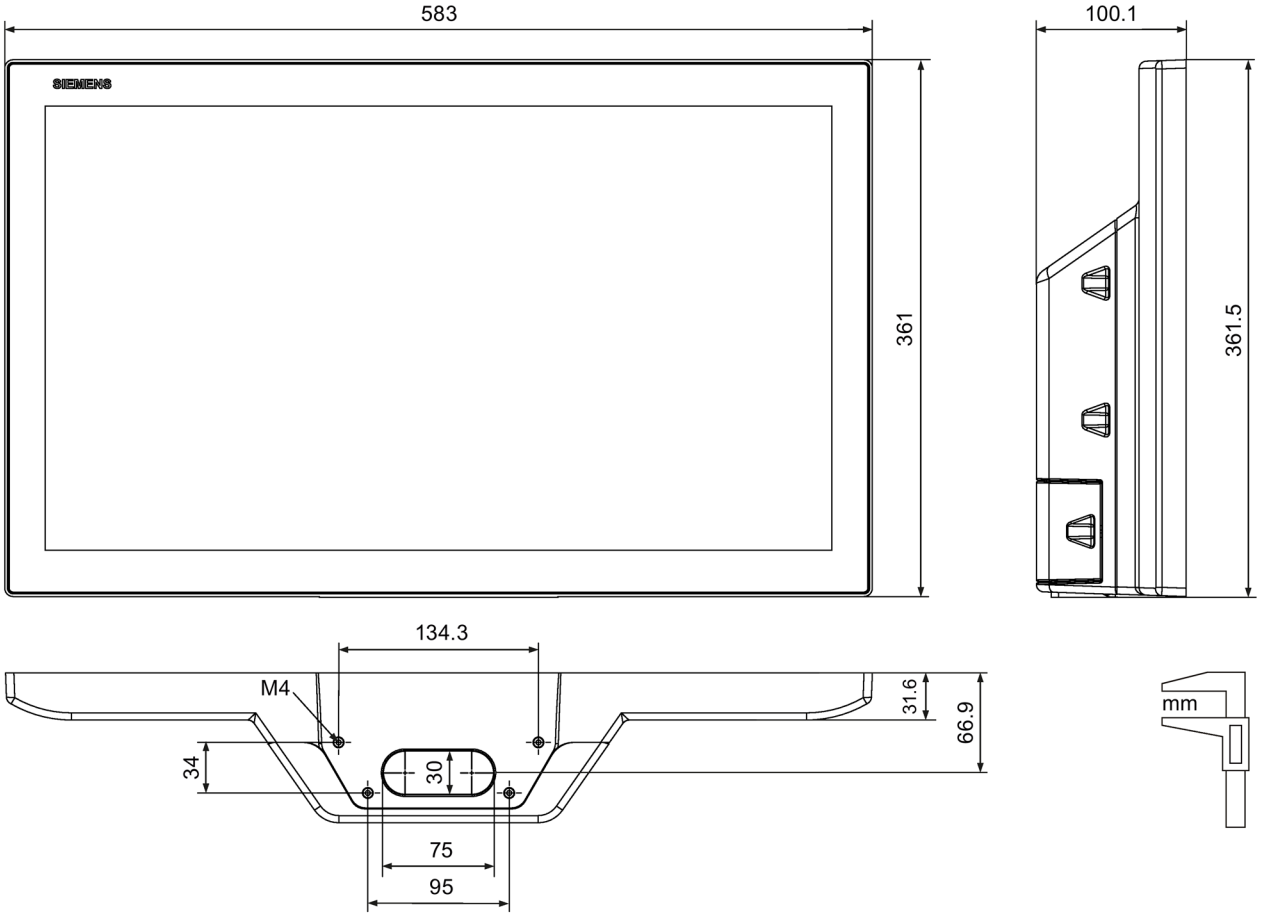
Prepared for support arm and extension components



① Without flange mount
② With flange mount

9.4.4 Dimension drawing of 24" device with capacitive multi-touch screen

Prepared for pedestal



9.5 Technical specifications

9.5.1 General technical specifications

Weight per PRO device: • 15" display pedestal or support arm	• 6.8 kg
• 15" display prepared for support arm and extension components	• 7.5 kg
• 19" display pedestal or support arm	• 8.2 kg
• 19" display prepared for support arm and extension components	• 8.8 kg
• 22" display pedestal or support arm	• 9.3 kg
• 22" display prepared for support arm and extension components	• 9.9 kg
• 24" display pedestal or support arm	• 10 kg
• 24" display prepared for support arm and extension components	• 10.6 kg
Power supply [1]	• 24 V DC (-20 % / +20 %) [1]
Input current 24V DC	• 4 A
Short-term voltage interruption according to Namur	Min. 20 ms at 20.4 V (DC)
Degree of protection	• IP 65 to IEC60529 [2] • Enclosure nach UL50 Type 4X / 12 (indoor use only) [2]
Protection class	Protection class I according to IEC 61140
Safety specifications	EN 61010-1; EN 61010-2-201; UL 61010-1; UL 61010-2-201; CAN/CSA-C22.2 No. 61010-1; CAN/CSA-C22.2 No. 61010-2-201
Quality assurance	In accordance with ISO 9001
Degree of pollution	Device is designed for environments with pollution degree 2
Transient overvoltages	Device is designed for connection to supply with overvoltage category II (transient overvoltages up to 2500 V)

[1] The device may only be connected to a 24 V DC power supply which meets the requirements of a safe extra-low voltage (SELV/PELV) in accordance with the standard IEC/EN/DIN EN/UL 61010-2-201.

At least 5 A inrush current for 15 ms is required for device startup. The peak value of the starting current depends on the input voltage and the impedance of the 24 V DC power supply. Peak currents greater than 6.5 A are possible. This will not have a negative impact on device functionality.

[2] not evaluated by UL

Power consumption of the device

The table below shows the maximum power consumption of PRO devices depending on the processor.

Device type	
15" Touch	70 W
19" Touch	78 W
22" Touch	75 W
24" Touch	90 W

The values are determined under the following test conditions:

- 24 V DC supply voltage
- Internal storage media:
  - One SSD
  - A CFast card
- External storage media: 4 x USB 3.0, max. 10 W total power loss at all USBs
- 3 active LAN interfaces
- BIOS setting: High Performance
- "Dim" setting with SetBrightness dialog: 99 (9 ... 99 ≙ 10 ... 100%)

Electromagnetic compatibility

Interference emission	EN 61000-6-4; CAN CSA CISPR 32 Class A; EN 55032 Class A; FCC Class A; KS C 9832
Immunity with regard to conducted interference on the supply lines	± 2 kV according to IEC 61000-4-4; burst ± 1 kV according to IEC 61000-4-5; symmetrical surge ± 2 kV according to IEC 61000-4-5; asymmetrical surge
Noise immunity on signal lines	± 2 kV according to IEC 61000-4-4; Burst; Length > 3 m ± 1 kV according to IEC 61000-4-4; Burst; length < 3 m ± 2 kV according to IEC 61000-4-5; Surge, symmetric, length > 30 m
Immunity to electrostatic discharge	± 6 kV contact discharge in accordance with IEC 61000-4-2 ± 8 kV air discharge in accordance with IEC 61000-4-2
Immunity to RF interference	10 V/m, 80 – 2700 MHz 80% AM according to IEC 61000-4-3 3 V/m, 2.7 – 6 GHz 10 V, 10 kHz ... 80 MHz according to IEC 61000-4-6
Immunity to magnetic fields	100 A/m, 50/60 Hz according to IEC 61000-4-8

Motherboard

Depending on the device variants, the device features the following components:

Processor	• Intel® Celeron® Processor G3902E (2 MB cache, 1.6 GHz) • Intel® Core™ i3-6102E Processor (3 MB cache, 1.9 GHz) • Intel® Core™ i5-6442EQ Processor (6 MB cache, up to 2.7 GHz) • Intel® Xeon® Processor E3-1505L v5 (8 MB cache, up to 2.8 GHz)
Main memory	Memory modules without ECC: • 4 GB DDR4-SDRAM SODIMM • 8 GB DDR4-SDRAM SODIMM • 16 GB DDR4-SDRAM SODIMM Memory module with ECC (not combinable with i5 CPU): • 8 GB DDR4 SDRAM SODIMM • 16 GB DDR4 SDRAM SODIMM
Backup memory [1]	512 KB NVRAM

[1] For devices with retentivity

Drive and memory media

Depending on the device variants, the device features the following components:

Solid State Drive	2.5", ≥ 240 GB, SATA (optional) and 480 GB SATA (optional)
CFast card	2 GB optional or 4 GB optional or 8 GB optional or 16 GB optional or ≥ 30 GB optional

15" display

	15"
Display type	LCD
Active display area	348 x 197 mm
Resolution	1366 x 768 pixels
Possible colors	Up to 16.7 million
Brightness control	Yes, value range 0 to 99 0 = backlighting off
Backlighting Half Brightness Life Time (MTBF [1])	LED 50000 h
Pixel error class in accordance with ISO 9241-307	II
Touch force capacitive multi-touch screen	With test pen, 2 mm diameter: 5 N

[1] MTBF: Operating hours after which the maximum brightness is reduced by half compared to the original value. MTBF is increased by using the integrated dimming function, for example time-controlled via screen saver or centrally via PROFIenergy.

19" display (HD)

	19"
Display type	LCD
Active display area	410 x 230 mm
Resolution	1366 x 768 pixels
Possible colors	Up to 16.7 million
Brightness control	Yes, value range 0 to 99 0 = backlighting off
Backlighting Half Brightness Life Time (MTBF [1])	LED 50000 h
Pixel error class in accordance with ISO 9241-307	II
Touch force capacitive multi-touch screen	With test pen, 2 mm diameter: 5 N

[1] MTBF: Operating hours after which the maximum brightness is reduced by half compared to the original value. MTBF is increased by using the integrated dimming function, for example time-controlled via screen saver or centrally via PROFIenergy.

19" display (FHD)

	19"
Display type	LCD
Active display area	410 x 230 mm
Resolution	1920 x 1080 pixels
Possible colors	Up to 16.7 million
Brightness control	Yes, value range 0 to 99 0 = backlighting off
Backlighting Half Brightness Life Time (MTBF [1])	LED 50000 h
Pixel error class in accordance with ISO 9241-307	II
Touch force capacitive multi-touch screen	With test pen, 2 mm diameter: 5 N

[1] MTBF: Operating hours after which the maximum brightness is reduced by half compared to the original value. MTBF is increased by using the integrated dimming function, for example time-controlled via screen saver or centrally via PROFIenergy.

22" display

	22"
Display type	LCD
Active display area	475 x 267 mm
Resolution	1920 x 1080 pixels
Possible colors	Up to 16.7 million
Brightness control	Yes, value range 0 to 99 0 = backlighting off
Backlighting Half Brightness Life Time (MTBF [1])	LED 30000 h
Pixel error class in accordance with ISO 9241-307	II
Touch force capacitive multi-touch screen	With test pen, 2 mm diameter: 5 N

[1] MTBF: Operating hours after which the maximum brightness is reduced by half compared to the original value. MTBF is increased by using the integrated dimming function, for example time-controlled via screen saver or centrally via PROFIenergy.

24" display

	24"
Display type	LCD
Active display area	527 x 296 mm
Resolution	1920 x 1080 pixels
Possible colors	Up to 16.7 million
Brightness control	Yes, value range 0 to 99 0 = backlighting off
Backlighting Half Brightness Life Time (MTBF[1])	LED 30000 h
Pixel error class in accordance with ISO 9241-307	II
Touch force capacitive multi-touch screen	With test pen, 2 mm diameter: 5 N

1 MTBF: Operating hours after which the maximum brightness is reduced by half compared to the original value. MTBF is increased by using the integrated dimming function, for example time-controlled via screen saver or centrally via PROFIenergy.

Interfaces

COM 1 / COM 2	RS 232, max. 115 Kbps, 9-pin, D-sub plug (+-12 V)
2 x DisplayPort (DPP) [3]	Connection of display devices with DisplayPort connection (per interface: 3.3 V; 500 mA)
Keyboard	Connection via USB port
Mouse	Connection via USB port
USB	Back of device: • 4 × USB 3.0 • Max. 2 USB 3.0 can be operated simultaneously in the high current mode • Max. 10 W for all USB devices
Ethernet [1]	3 × RJ45 connection, Intel 1 x I219LM, 2 x I210 10/100/1000 Mbps, electrically isolated, teaming-capable [2]

1 For unique labeling, the Ethernet ports are numbered on the enclosure. The numbering by the operating system can differ.

2 Teaming can be set and initiated in the configuration interface. In teaming operation, jumbo frames, e.g. for the camera application, are not supported.

3 The DisplayPort interfaces are compatible with DisplayPort V1.2.

9.5.2 Environmental conditions

Climatic ambient conditions

Maximum permitted ambient temperature during operation Temperature, tested according to IEC 60068-2-1, IEC 60068-2-2			
Multi-touch devices			
	Temperature during storage/transport Gradient	-20 °C to +60 °C Operation: Max. 10 K/h; no condensation Storage: Max. 20 K/h; no condensation	
	Note: For the "Performance Optimized" setting (see: Assigning CPU power consumption parameters (Page 76)), the ambient temperature must be reduced by 9 °C with inclined installation in horizontal format and 5 °C in all other operating positions.		
Intel Celeron processor			
	all operating positions [1]	With SSD: CFast only:	+0 to +45 °C +0 to +45 °C
Intel i3 or i5 or Xeon processor			
	all operating positions [1]	With SSD: CFast only:	+0 to +40 °C +0 to +45 °C
Temperature during storage/transport Gradient		-20 °C to +60 °C Operation: Max. 10 K/h; no condensation Storage/transport: Max. 20 K/h; no condensation	

[1] See "Permissible operating positions" in the section "Installing and connecting the device".

Relative humidity, tested in accordance with IEC 60068-2-78, IEC 60068-2-30	
Operation	0 to 31 °C: 5 ... 80%; decreasing linearly to 5 ... 25% at 45 °C
Storage/transport	5 to 95 % at 25/55 °C, no condensation
Air pressure, in accordance with IEC 60068-2-13	
Operation	1080 hPa to 795 hPa, corresponds to an elevation of 1000 m to 2000 m
Storage/transport	1080 hPa to 660 hPa, corresponds to an elevation of 1000 m to 3500 m

Mechanical ambient conditions

Vibration, tested according to DIN IEC 60068-2-6	
Operation with CFast and SSD	5 Hz to 8.4 Hz: 3.5 mm 8.4 to 200 Hz: 9.8 m/s^2
Storage/transport	5 to 8.4 Hz: 3.5 mm 8.4 Hz to 500 Hz: 9.8 m/s^2
Shock resistance, tested in accordance with IEC 60068-2-27, IEC 60068-2-29	
Operation	50 m/s^2, 30 ms
Storage/transport	250 m/s^2, 6 ms

See also

Permitted operating positions (Page 30)

9.5.3 Power requirements of the components

Maximum power consumption of the auxiliary components

Auxiliary components		Maximum permitted power consumption (per interface)			Max. total power
		+5 V	+3.3 V	+12 V	
USB device	High current	0.9 A	-	-	The maximum total power of all externally connected USB devices is 10 W.
DisplayPort			500 mA		

9.5.4 Integrated DC power supply

Input voltage	24 V DC (-20%/+20%)
Power consumption	Max. 80 W
Power failure buffering	Hold-up time ≥20 ms with 20.4 V (DC_FAIL is active after > 5 ms)
Efficiency	>85 %

Note

Inrush current

At least 5 A inrush current for 15 ms is required for device startup.

The peak value of the starting current depends on the input voltage and the impedance of the 24 V DC power supply. Peak currents greater than 6.5 A are possible. This will not have a negative impact on device functionality.

9.5.5 Restoring the factory state of the software

You can restore the original factory software using the Restore function. The USB flash drive contains the necessary images and tools for transferring the factory software to the SSD or memory card of your PC. The following options are available for restoring software:

- Restoring the entire SSD or memory card with drive C: (system) and drive D: Use the "Restore entire hard disk" option.
- Restore drive C: only This allows you to retain any user data on drive D: Use the "Restore system partition only" option.

NOTICE
Data are deleted When you select the "Restore entire hard disk" option, all data, user settings and authorizations or license keys on the hard disk are lost. The hard disk is reset to the delivery state with partitions "C:" and "D:". If the "Restore system partition only" option is set, all files on drive C: (System) are deleted. All data, user settings and existing authorizations or license keys on drive "C:" will be lost. Drive "C:" on the hard drive is completely erased, reformatted and the original software is written to it.

Procedure

Note

The "USB Boot" option has to be set to "Enabled" in the BIOS menu "Boot" so that the device can boot from the USB flash drive.

1. Connect the USB flash drive to the device.
2. Restart the device.
3. Press <ESC> when the following BIOS message appears:

   ```
   Press ESC for boot options
   ```

   The BIOS selection menu is displayed when initialization is completed.
4. To boot from the USB flash drive, select the Boot Manager.
5. Select the USB flash drive in the Boot Manager and confirm the entry.
6. Select the Restore function and confirm the entry.
7. Follow the on-screen instructions.

9.5.6 Windows

Note

WIN 10

Specific information on using the Windows operating systems is available in the following manuals (not included in the product package):

- Windows 10 - Step by Step (MS Press No. 324)
- Windows 10 Plain and Simple (MS Press No. 422)
- Windows 10 Inside Out (MS Press No. 325 / MS Press No. 418)

Note

WIN 7

Specific information on using the Windows operating systems is available in the following manual (not included in the product package): Microsoft Windows 7 - Technical Reference (MS Press No. 5927).

Requirement

- USB keyboard and monitor
- USB stick provided with Recovery function for the operating system ordered

Procedure

Note

The "USB Boot" option has to be set to "Enabled" in the BIOS menu "Boot" to allow the device to boot from the USB stick.

1. Connect the USB stick to the device.
2. Restart the device.
3. Press <ESC> when the following BIOS message appears:

   ```
   Press ESC for boot options
   ```

   The BIOS selection menu is displayed when initialization is completed.
4. To boot from the USB stick, select the Boot Manager.
5. Select the USB stick in the Boot Manager and confirm the entry.
6. Select the Recovery function and confirm the entry.

7. Follow the on-screen instructions.

   After a few seconds, you will see the "Install Windows" installation program.

NOTICE
Data deleted All data, user settings and existing authorizations or license keys on drive C: are deleted during the installation of Windows. • Back up all data. • Check the data and time in the BIOS setup, "Main" menu and correct the displayed time if necessary.

8. Now follow the instructions of the installation program "Install Windows". You will find additional information in the operating system manual.

"Install Windows" installation program

The language of the installation program and the operating system you want to install has been preset to English. You can change the language of the operating system after the installation. You can find information on this in section: "Setting up the language selection by means of the Multilanguage User Interface (MUI)".

Setting up partitions under Windows

You can set up partitions during the installation process.

The recommended minimum size for Windows system partition varies, depending on the amount of RAM and additional software that you are going to use. Information about the partitioning of the data volume in the delivery state is available in "Partitioning in Windows 7 Ultimate (Page 86)".

Setting up the language selection by means of 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.

Setting up language selection

Note

WIN 10

Specific information on using the Windows operating systems is available in the following manuals (not included in the product package):

- Windows 10 - Step by Step (MS Press No. 324)
- Windows 10 Plain and Simple (MS Press No. 422)
- Windows 10 Inside Out (MS Press No. 325 / MS Press No. 418)

Note

WIN 7

Specific information on setting up the language selection for Windows operating systems can be found in the manual "Microsoft Windows 7, Technical Reference (MS Press No. MSE-5927)", not included in the scope of delivery.

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

1. Choose:

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

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

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.

Installing new language packages

Some language packages are available on the Recovery section of the USB stick in the "Language packs" folder.

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.

The following languages can be installed at a later time:

Language	Windows
German	X
English	X
French	X
Italian	X
Spanish	X
Chinese (Hong Kong)	X
Chinese (simplified)	X
Chinese (Taiwan)	X
Japanese	X
Russian	X

9.5.7 Windows Embedded Standard

If your software becomes corrupt for any reason, you can re-install it using the USB stick provided. The USB flash drive contains an image file for the device memory with the original software package (operating system with installed hardware drivers).

Note

You require a USB keyboard and the supplied USB flash drive to reinstall the operating system. Before performing the new installation, you should check the date and time set in the BIOS Setup, "Main" menu, and correct these if necessary.

Procedure - Changing the system language

You can change the language using the supplied USB flash drive. The USB stick contains the required language packages and help for changing the system language.

Note

Note the license terms of Windows Embedded Standard 7

Note the license terms for Windows Embedded Standard 7 and especially the extended software terms of the Siemens AG.

You can find the license terms in the delivered document "MICROSOFT SOFTWARE LICENSE TERMS for Windows Embedded Standard 7" and in the system drive under \Windows\System32\license.rtf.

Procedure - Changing the system language

1. Connect the supplied USB flash drive to a free USB port of the device.
2. Restart the device and press "ESC" to access the BIOS.
3. Switch to the "Boot" menu and select the setting "USB Boot" = "Enabled".
4. Switch to the "Exit" menu and select "Exit Saving Changes".
5. Restart the device and press the "ESC" key and then enter the "Boot Manager" menu.
6. Select the USB flash drive and press "Enter" to boot from this.
7. Follow the instructions on the screen.
8. After selecting the menu dialog language, select the menu item "Manage language packages".

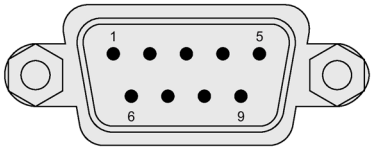
   Depending on the current language setup, you have the following options in the "Manage language packages" menu:

   – Display language settings
   – Install language
   – Change language
   – Uninstall installed language

9.6 Hardware descriptions

9.6.1 External interfaces

9.6.1.1 Serial interface (X30), (X31)



RS232
RS422
RS485

RS-232 assignment

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

Pin assignment RS422

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

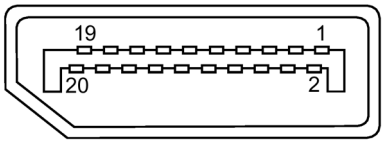
Pin assignment RS485

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

9.6.1.2 CFast (X50)

Pin	Short name	Meaning
S1	SGND	Signal GND (ground for signal integrity)
S2	A+	SATA differential
S3	A-	SATA differential
S4	SGND	Signal GND (ground for signal integrity)
S5	B-	SATA differential
S6	B+	SATA differential
S7	SGND	Signal GND (ground for signal integrity)
PC1	CDI	Card Detect In
PC2	GND	Device GND
PC3	TBD	TBD (not connected)
PC4	TBD	TBD (not connected)
PC5	TBD	TBD (not connected)
PC6	TBD	TBD (not connected)
PC7	GND	Device GND
PC8	LED1	LED Output (not connected)
PC9	LED2	LED Output (not connected)
PC10	IO1	Reserved Input/Output (not connected)
PC11	IO2	Reserved Input/Output (not connected)
PC12	IO3	Reserved Input/Output (not connected)
PC13	PWR	Device Power (3.3V)
PC14	PWR	Device Power (3.3V)
PC15	GND	Device GND
PC16	GND	Device GND
PC17	CDO	Card Detect Out

9.6.1.3 DisplayPort (X70), (X71)

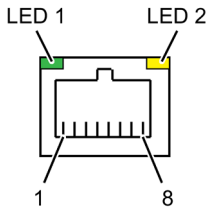


The DisplayPort interfaces (X70) and (X71) available on the device are compatible with the DisplayPort V1.2 specification.

Pin	Short name	Meaning	Input / output
1	ML_Lane0+	DP data 0+	Output
2	GND	Ground	-
3	ML_Lane0-	DP data 0-	Output
4	ML_Lane1+	DP data 1+	Output
5	GND	Ground	-
6	ML_Lane1-	DP data 1-	Output
7	ML_Lane2+	DP data 2+	Output
8	GND	Ground	-
9	ML_Lane2-	DP data 2-	Output
10	ML_Lane3+	DP data 3+	Output
11	GND	Ground	-
12	ML_Lane3-	DP data 3-	Output
13	CONFIG1 CAD	Cable Adapter Detect	Input
14	CONFIG2	Ground (PullDown)	-
15	AUX_CH+	Auxiliary channel+	Bidirectional
16	GND	Ground	-
17	AUX_CH-	Auxiliary channel-	Bidirectional
18	HPD	Hot Plug Detect	Input
19	GND	Ground	-
20	DP_PWR	+3.3V (fused)	Output

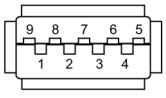
9.6.1.4 Ethernet (X1) P1, (X2) P1, (X3) P1

Ethernet RJ45 interface



Pin no.	Short description	Meaning	Input / output
1	BI_DA+	Bi-directional data A+	Input/output
2	BI_DA-	Bi-directional data A-	Input/output
3	BI_DB+	Bi-directional data B+	Input/output
4	BI_DC+	Bi-directional data C+	Input/output
5	BI_DC-	Bi-directional data C-	Input/output
6	BI_DB-	Bi-directional data B-	Input/output
7	BI_DD+	Bi-directional data D+	Input/output
8	BI_DD-	Bi-directional data D-	Input/output
S		Shield	–
	LED 1	Off: 10 Mbps Green light: 100 Mbps Orange light: 1000 Mbps	–
	LED 2	Lit: Active connection, e.g., to a hub Flashing: Activity	–

9.6.1.5 USB 3.0 (X60), (X61), (X62), (X63)



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

9.6.2 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 configuration of system resources or possible conflicts with the following operating systems:

Windows Embedded Standard and Windows 7 Ultimate	Start menu "Start": Enter "msinfo32" in the search field and press "Return" to confirm.

The following tables and images describe the system resources for the delivery state of the device.

The interrupts are assigned to devices by BIOS. There are exclusive non-shared interrupts for DP12 and the first Ethernet interface.

This means that applications or realtime operating system expansions can operate these devices exclusively and with high-performance without having to share the interrupt with other devices.

Interrupt sharing in APIC mode:

Interrupt		**Interrupt type**
IRQ0	HPET (High Precision Event Timer), when HPET is enabled in the BIOS "Advanced" menu. System Timer, when HPET is disabled.	ISA exclusive
IRQ1	Free	
IRQ2	Interrupt controller 2	ISA exclusive
IRQ3	Com Port 2 (COM2)	ISA exclusive
IRQ4	Com Port 1 (COM1)	ISA exclusive
IRQ5	Free	ISA exclusive (CAN)
IRQ6	Free	
IRQ7	Free	
IRQ8	System CMOS / real-time clock	ISA exclusive
IRQ9	ACPI-SCI (system control interrupt)	
IRQ10	Free	
IRQ11	Free	
IRQ12	Free	
IRQ13	Numeric data processor	ISA exclusive
IRQ14	Free	
IRQ15	Free	
IRQ16	High Definition Audio Controller SATA AHCI Controller LAN1 (I219-LM) Graphics Management Engine Interface USB XHCI Controller	PCI shared
IRQ17	PCIe-x4 slot on Riser (1x4)	PCI exclusive
IRQ18	PCIe-x4 slot on Riser LAN2 (I210)	PCI shared

Interrupt		Interrupt type
IRQ19	LAN3 (I210) (optional)	PCI exclusive
IRQ20	Free	
IRQ21	Free	
IRQ22	Free	
IRQ23	Free	

9.6.3 Input/output areas

9.6.3.1 Overview of the internal module registers

The following addresses are used for the internal registers:

Addresses	Input/output unit
I/O 062h	Watchdog enable register (Page 127)
I/O 066h	Watchdog trigger register (Page 127)
I/O 404Dh	Battery status register (Page 128) (read-only, if RTC_BAT_SURVEY_EN is enabled)

See also

Watchdog trigger register (read only, address 062h) (Page 127)

Watchdog enable register (read/write address 062h) (Page 127)

Battery status register (read only, if the RTC_BAT_SURVEY_EN address is set to "1"; 404Dh) (Page 128)

9.6.3.2 Watchdog trigger register (read only, address 062h)

Watchdog trigger register

The watchdog is triggered by a read action (address 066h) by this register. The result of the read access can be disregarded (i.e., dummy read).

9.6.3.3 Watchdog enable register (read/write address 062h)

Meaning of the bits

Watchdog enable register (r/w address 062h)								
Bit								**Meaning of the bits**
7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	
								Watchdog enable bit (WDE)
							0	Watchdog circuit disabled
							1	Watchdog circuit enabled
								Watchdog Mode
						0		Standard
						1		Macro
								Reserved
					0			Reserved
					1			

Watchdog enable register (r/w address 062h)								
								Scaler watchdog time (Normal/Macro)
		0	0	0				94 ms / 2 s (default)
		0	0	1				210 ms / 4 s
		0	1	0				340 ms / 6 s
		0	1	1				460 ms / 8 s
		1	0	0				590 ms / 16 s
		1	0	1				710 ms / 32 s
		1	1	0				840 ms / 48 s
		1	1	1				960 ms / 64 s
								Trigger red Watchdog LED
	0							Red LED (WD) off
	1							Red LED (WD) on
								Watchdog error / Display and reset
0								WD inactive
1								WD triggered Reset LED after watchdog alarm (Bit 7 = write 1)

9.6.3.4 Battery status register (read only, if the RTC_BAT_SURVEY_EN address is set to "1"; 404Dh)

The status of the CMOS battery is monitored when the GPIO "RTC_BAT_SURVEY_EN" is set to '1'; the status (two-tier) can be read from the battery status register.

Meaning of the bits

Battery status register (read-only, if enabled with RTC_BAT_SURVEY_EN, address 404Dh)								
Bit								**Meaning**
7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	
0	0							CMOS battery capacity is still sufficient.
0	1							CMOS battery capacity is exhausted (remaining capacity is sufficient for approx. one month)
1	1							CMOS battery is empty

9.6.3.5 NVRAM address register

NVRAM occupies a 512 KB memory address area that can be read via PCI registers.

Meaning of the bits

NVRAM address register		
PCI register address: NVRAM base address register	PCI register content: NVRAM memory address (default)	Length of the memory area
C2B0 0000	Address is assigned dynamically (depending on device configuration)	80000 h

9.7 BIOS description

9.7.1 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 109781666 (https://support.automation.siemens.com/WW/view/en/109781666).

9.7.2 Opening the BIOS selection menu

Procedure

1. Switch on the device or restart the device.
2. Immediately after switching on the device, press the "Esc" button and keep it pressed.

Note

The following message appears briefly after the device is switched on:

```
Press ESC for boot options
```

The BIOS selection setup appears:



The number of buttons in the BIOS selection setup depends on your device version.

The following buttons are available:

Buttons	Function
Continue	Exit selection menu, continue start sequence
Boot Manager	Specify the boot media from which to start, for example: • Hard disk drive • CD-ROM drive • USB device
Device Management	Start device manager for UEFI boot media
Boot From File	Boot Maintenance Manager: • Boot Options: Set boot sequence • 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	Setup Configuration Utility: The BIOS Setup
BIOS Update	Update BIOS from USB memory stick
MEBx [2]	Intel Management Engine BIOS Extension from Active Management Technology Support (AMT)

[1] Available as of Windows 8, if supported by device

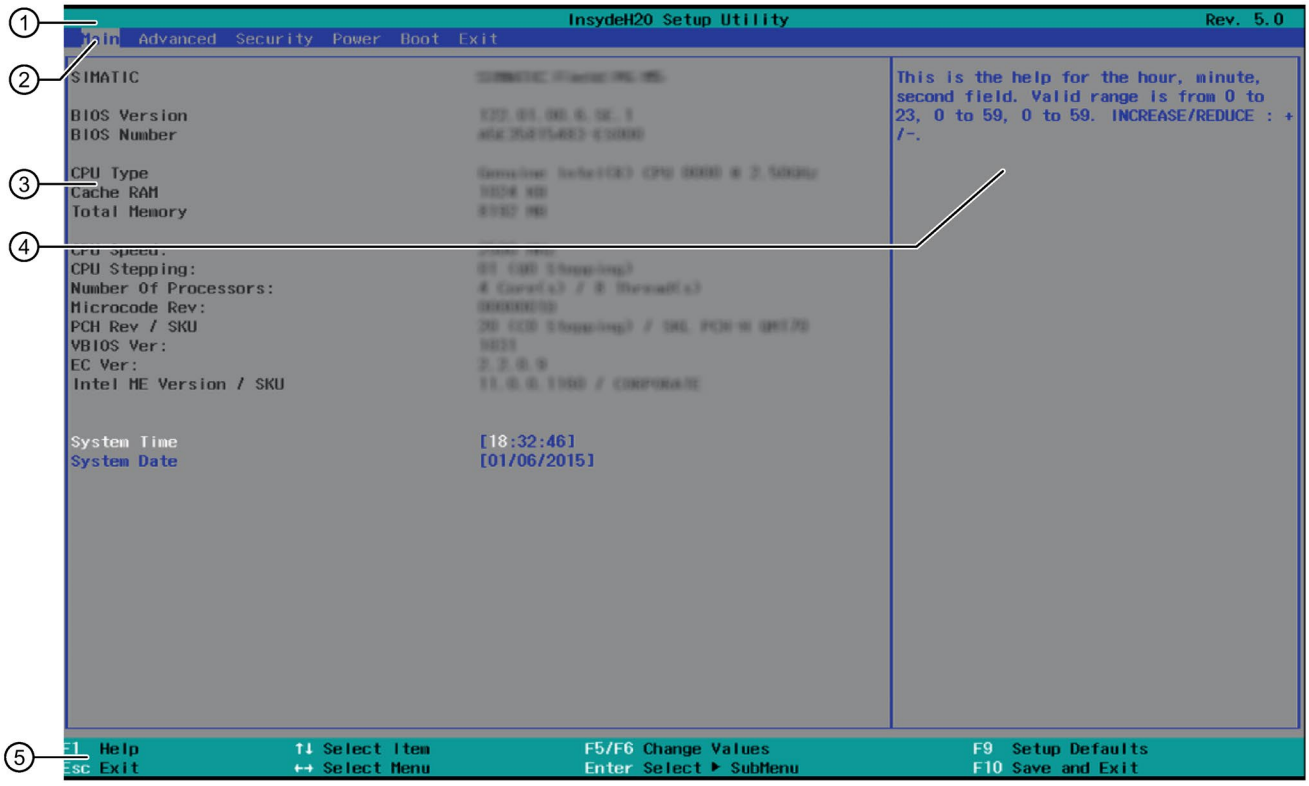
[2] Only if hardware supports AMT and the AMT option "Intel AMT Configuration Screens" is set to "Enabled" in the BIOS Setup.

9.7.3 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 power management of CPU and the device
Boot	Determine boot options, e.g., boot order
Exit	Save and exit (see Exit menu)

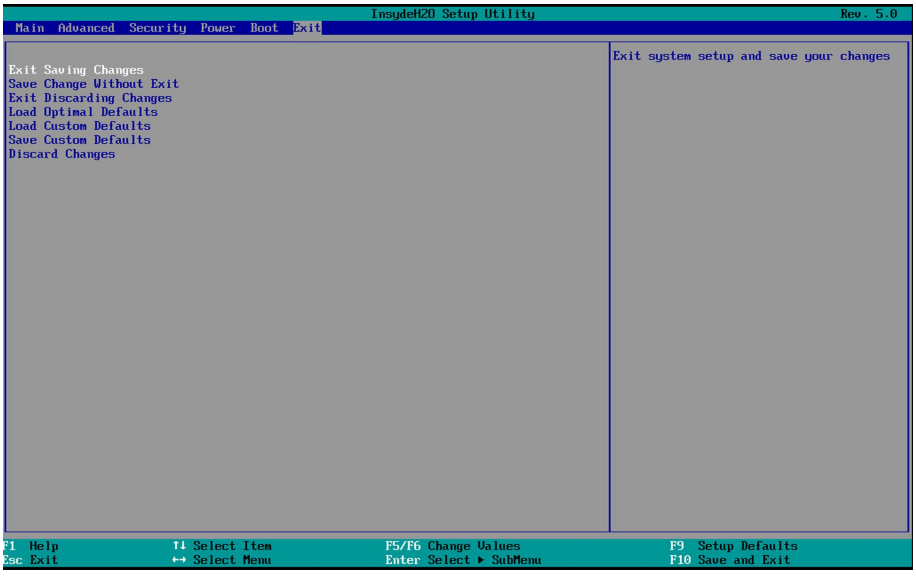
The menus always have the same structure. The figure below shows an example for the "Main" menu. Device-specific information is shown blurred.



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.

9.7.4 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.

9.7.5 BIOS update

Check regularly if updates are available for download (https://support.industry.siemens.com/cs/ww/en/view/109763408) to your device.

Additional information can be found on the Internet at the following address: After Sales Informations System of SIMATIC PC (https://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. Make a note of your specific BIOS Setup settings before the BIOS update. 2. Start BIOS Setup after the BIOS update. 3. Load the BIOS Setup default settings with <F9> "Setup Defaults". Or use the BIOS Setup command "Load Optimal Defaults" in the "Exit" menu. 4. Make your own Setup settings again based on your notes. 5. 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.

9.7.6 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
CMOS battery failed	CMOS battery is empty or not connected.
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.

9.8 Functional scope in Windows

9.8.1 Windows Embedded Standard 7

The overview shows the most important device functions under Windows Embedded Standard 7:

Function	HDD / SSD version	Memory card version
.Net Framework	Available, V3.5	Available, V3.5
Accessories	Available	Available
Aero background	Available	Available
Backup and Restore	Available	Available
Bluetooth	Available	Available
Dialog box filter	Available	Available
DirectX and Windows Device Experience	Available, V11	Available, V11
Domain services	Available	Available
Driver database	Available	Not available
Driver frameworks	Available	Available
Encrypted File System (EFS)	Available	Available
Enhanced Write Filter	Available	Available
Fax and Scan	Available	Available
File Based Write Filter (FBWF)	Available	Available
Fonts	134	48
Help and Support Engine	Available	Available
Hibernate Once Resume Many (HORM)	Available	Available
Image Mastering API V2	Available	Available
IME Base Components	Available	Available
Internet Explorer	Available, IE 11	Available, IE 11
Internet Information Server (IIS)	Available,V7.0	Available, V7.0
Language (Standard)	English [1]	English [1]
Mobility Center	Available	Available
Network and Sharing Center	Available	Available
Network Diagnostics	Available	Available
Pagefile	Available	Available
Printing Utilities and Management	Available	Available
Registry Filter	Available	Available
Remote Assistance	Available	Available
Remote Client	Available	Available
Remote Desktop	Available	Available
SIMATIC IPC DiagBase	Available	Available
Speech	Available	Not available
System Management Administrative Tools	Available	Available

Function	HDD / SSD version	Memory card version
Telnet Server	Available	Available
User Account Control	Available	Available
Windows Explorer Shell	Available	Available
Windows Firewall	Available	Available
Windows Installer	Available	Available
Windows Media Player	Available, V12	Available, V12
Windows PowerShell 2.0	Available	Available
Windows Search and Natural Language 6	Available	Available
Windows Security Center	Available	Available
Windows Update	Available	Available
Wireless Networking	Available	Available

[1] Note the licensing agreements for Windows Embedded Standard 7.

Additional information on language selection is available in the section "Windows (Page 116)".

Technical support

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://www.siemens.com/industrialsecurity)
- Support request form (https://www.siemens.com/supportrequest)
- After Sales Information System SIMATIC IPC/PG (https://www.siemens.com/asis)
- SIMATIC Documentation Collection (https://www.siemens.com/simatic-tech-doku-portal)
- Your local representative (https://www.automation.siemens.com/aspa_app)
- Training center (https://siemens.com/sitrain)
- Industry Mall (https://mall.industry.siemens.com)

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

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

Current documentation

Always use the current documentation available for your product. You can find the latest edition of this manual and other important documents by entering the article number of your device on the Internet (https://support.industry.siemens.com/cs/ww/en/ps/25042). If necessary, filter the comments for the entry type "Manual".

Tools & downloads

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

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

A.2 Problem solving

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

Problem	Possible cause	Possible remedy
The device is not operational	No power supply	• Check the power supply, the power cord and the power plug. • Check if the On/Off switch is in the correct position.
	Device is being operated outside the specified ambient conditions	• Check the ambient conditions. • After transport in cold weather, wait approximately 12 hours before switching on the device.
The monitor remains dark	The brightness button has been set to dark	Increase brightness using the brightness button. For detailed information, refer to the monitor operating instructions.
	Power cord is not connected	• Check whether the power cord has been properly connected to the monitor and to the system unit or to the grounded shockproof outlet. • If the monitor screen still remains dark after you have performed these checks and measures, contact your technical support team.
The mouse pointer does not appear on the screen	The mouse driver is not loaded	Check whether the mouse driver is properly installed and available when you start the user program. Detailed information about the mouse driver is available in the corresponding documentation.
	Mouse not connected.	• Check whether the mouse cord is properly connected to the system unit. • If you use an adapter or expansion for the mouse cable, also check these connectors. • If the mouse pointer still does not appear on the screen after you have performed these checks and actions, contact your technical support team.
Wrong time and/or date on the PC		1. Press <ESC> during the booting process to open the BIOS Setup and then select the "Setup Configuration Utility (SCU)" button. 2. Set the time and date in the setup menu.
Although the BIOS setting is OK, the time and data are still wrong.	The backup battery is dead.	Replace the backup battery.
USB device not responding.	The USB ports are disabled in BIOS.	Use a different USB port or enable the port.
	The operating system does not support the USB ports.	• Turn on USB Legacy Support for mouse and keyboard. • For other devices, you need the USB device drivers for the required operating system.
"chkdsk" is not functioning	EWF (Enhanced Write Filter) has been activated. The "chkdsk" command is not supported if the EWF has been activated.	Deactivate the EWF or use an alternative method to "chkdsk".

A.3 Notes on the use of third-party modules

Problem	Possible cause	Possible remedy
The PC crashes during startup.	• I/O addresses are assigned twice. • Hardware interrupts and/or DMA channels are assigned twice • Signal frequencies or signal levels are not adhered to • Different pin assignment	Check your computer configuration: • If the computer configuration corresponds with factory state, please contact your technical support team. • If the computer configuration has changed, restore the original factory settings. Remove all third-party expansion cards, then restart the PC. If the error no longer occurs, the third-party expansion card was the cause of the fault. Replace this expansion card with a SIEMENS card or contact the card supplier.
		If the PC still crashes, contact your technical support team.
	PCIe Gen1 expansion card does not behave according to specification.	1. Remove the expansion card. 2. In the BIOS Setup in the "Advanced > System Agent (SA) Configuration > PCIe Port Configuration" menu, set the respective setup parameter "Max Link Speed" permanently to "Gen1". 3. Install the expansion card again.

Markings and symbols

B

B.1 Overview

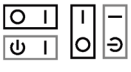
The following tables show all the symbols which may be found on your SIMATIC industrial PC, SIMATIC industrial monitor or SIMATIC Field PG in addition to the symbols which are explained in the operating instructions.

The symbols on your device may vary in some details from the symbols shown in the following tables.

B.2 Safety

Symbol	Meaning		Symbol	Meaning
	Warning, observe the supplied documentation.			Lock is closed
	Attention, radio equipment			Lock is open
	Disconnect the power plug before opening			Opening for Kensington lock
	Attention ESD (Electrostatic sensitive device)			Warning of hot surface

B.3 Operator controls

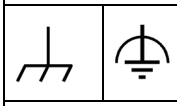
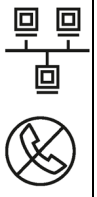
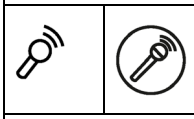
Symbol	Meaning		Symbol	Meaning
	On/off switch, without electrical isolation			Eject CD/DVD
	On/off switch, without electrical isolation			

B.4 Certificates, approvals and markings

The following table shows symbols relating to certificates, approvals and markings which may be on the device. You can find more information in the operating instructions for your device:

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

B.5 Interfaces

Symbol	Meaning		Symbol	Meaning
⎓	Connection to the power supply			PS/2 mouse interface
	Protective conductor terminal			PS/2 keyboard-interface
	Connection for functional earthing (equipotential bonding line)			Multimedia Card Reader
DPP	DisplayPort interface			Smart Card Reader
	DVI-D interface			Line In
LAN 	LAN interface, not approved for connecting WAN or telephone			Line Out
	Serial port			Microphone input
	USB port			Universal Audio Jack
	USB 2.0 high-speed port			Headphone output
	USB 3.0 super-speed port			

List of abbreviations

C

Abbreviation	Term	Meaning
AC	Alternating current	Alternating current
ACPI	Advanced Configuration and Power Interface	
PLC	Programmable controller	
AGP	Accelerated Graphics Port	High speed bus system
AHCI	Advanced Host Controller Interface	Standardized controller interface for SATA devices. This is supported in Microsoft Windows XP as of SP1 and IAA driver.
APIC	Advanced Programmable Interrupt Controller	Extended programmable interrupt controller
APM	Advanced Power Management	Tool for monitoring and reducing power consumption of the PC
AS	Automation system	
ASIS	After Sales Information System	
AT	Advanced Technology	
ATA	Advanced Technology Attachment	
ATX	AT-Bus-Extended	
AWG	American Wire Gauge	US standard for the cable diameter
BIOS	Basic Input Output System	Basic Input Output System
CAN	Controller Area Network	
CD-ROM	Compact Disc – Read Only Memory	Removable storage medium for large data volumes
CD-RW	Compact Disc – Rewritable	Rewritable CD
CE	Communauté Européenne (CE symbol)	The product is in conformance with all applicable EC directives
CFast	CF + AST	The acronym CFast is the combination of CF (CompactFlash) and AST (ATA Serial Transport).
CGA	Color Graphics Adapter	Standard monitor interface
CLK	Clock pulse	Clock signal for controllers
CMOS	Complementary Metal Oxide Semiconductors	Complementary metal oxide semiconductors
COA	Certificate of authentication	Microsoft Windows Product Key
CoL	Certificate of License	License authorization
COM	Communications Port	Term for the serial interface
CP	Communication Processor	Communication computer
CPU	Central Processing Unit	CPU
CRT	Cathode Ray Tube	

Abbreviation	Term	Meaning
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
DRAM	Dynamic Random Access Memory	
DC	Direct Current	DC current
DCD	Data Carrier Detect	Data carrier signal detection
DMA	Direct Memory Access	Direct memory access
DOS	Disk Operating System	Operating system without GUI
DPP	DisplayPort	New powerful digital monitor port
DQS	Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagement mBH	
DDRAM	Double Data Random Access Memory	Memory chip with high-speed interface
DSR	Data Set Ready	Ready for operation
DTR	Data Terminal Ready	Data terminal is ready
DVD	Digital Versatile Disk	Digital versatile disk
DVI	Digital Visual Interface	Digital display interface
DVI-I	Digital Visual Interface	Digital display interface with digital and VGA signals
ECC	Error checking and correction	Error correction code
ECP	Extended capability port	Extended parallel port
EFI	Extensible Firmware Interface	
EGA	Enhanced Graphics Adapter	PC to monitor interface
ESD	Electrostatic-sensitive components	
DM	Electronic Manual	
EIDE	Enhanced Integrated Drive Electronics	An enhancement of the IDE standard
EISA	Extended Industry Standard Architecture	Extended ISA standard
EMM	Expanded Memory Manager	Manages memory expansions
EM64T	Extended Memory 64 technology	
EN	European standard	
EPROM / EEPROM	Erasable Programmable Read-Only Memory / Electrically Erasable Programmable Read-Only Memory	Plug-in submodules with EPROM/EEPROM chips
EPP	Enhanced Parallel Port	Bi-directional Centronics interface
ESC	Escape character	Control character
EWF	Enhanced Write Filter	
FAQ	Frequently Asked Questions	FAQs
FAT 32	File Allocation Table 32-bit	32-bit file allocation table
FBWF	File Based Write Filter	
FD	Floppy disk	Disk drive, 3.5"
FSB	Front Side Bus	
GND	Ground	Chassis ground
HD	Hard disk	Hard disk
HDA	High Definition Audio	
HDD	Hard Disk Drive	Hard disk drive
HU	Height unit	
HMI	Human Machine Interface	User interface

Abbreviation	Term	Meaning
HORM	Hibernate Once - Resume Many	
HT	Hyper-Threading	
HTML	Hyper Text Markup Language	Script language for creating Internet pages.
HTTP	Hypertext Transfer Protocol	Protocol for data transfer on the Internet
Hardware	Hardware	
I/O	Input/Output	Data input/output on computers
IAA	Intel Application Accelerator	
IDE	Integrated Device Electronics	
IEC	International Electronical Commission	
IGD	Integrated Graphics Device	
IP	Ingress Protection	Degree of protection
IR	Infrared	Infrared
IRDA	Infrared Data Association	Standard for data transfer via IR module
IRQ	Interrupt Request	Interrupt request
ISA	Industry Standard Architecture	Bus for expansion modules
ITE	Information Technology Equipment	
L2C	Level 2 cache	
LAN	Local Area Network	Computer network that is limited to a local area.
LCD	Liquid Crystal Display	Liquid crystal display
LED	Light Emitting Diode	Light emitting diode
LPT	Line Printer	Printer port
LVDS	Low Voltage Differential Signaling	
LW	Drive	
MAC	Media access control	Media access control
MC	Memory Card	Memory card in credit card format
MLFB	Machine-readable product designation	
MMC	Micro Memory Card	Memory card of the format 32 mm x 24.5 mm
MPI	Multipoint-capable interface for programming devices	
MS-DOS	Microsoft Disc Operating System	
MTBF	Mean Time Between Failures	
MUI	Multilanguage User Interface	Multilanguage operating system with Windows with language toggling; 5 languages: German, English, French, Spanish and Italian
NA	Not Applicable	
NAMUR	Normenarbeitsgemeinschaft for Mess- und Regelungstechnik in der chemischen Industrie (standardization body for instrumentation and control technology in the chemicals industry)	
NC	Not Connected	Not connected
NCQ	Native Command Queuing	Automatic re-sorting of the file and disk access, for increased performance
NEMA	National Electrical Manufacturers Association	Syndicate of manufacturers of electrical components in the USA
NMI	Non Maskable Interrupt	Interrupt the processor can not reject
NTFS	New Techniques File System	Secure file system for Windows versions (2000, XP, 7)

Abbreviation	Term	Meaning
NVRAM	Non Volatile Random Access Memory	Non-volatile data memory. Data memory is retained without external power supply.
ODD	Optical Disk Drive	
OPC	OLE for Process Control	Standardized interface for industrial processes
PATA	Parallel ATA	
PC	Personal computer	
PCI	Peripheral Component Interconnect	High-speed expansion bus
PCIe	Peripheral Component Interconnect express	High-speed serial, differential full-duplex PtP interface with high data rate.
PCMCIA	Personal Computer Memory Card International Association	
PI	Protective Earth	Protective conductor
PEG	PCI Express Graphics	
PG	Programming device	
PIC	Programmable Interrupt Controller	Programmable interrupt controller
PIC-E	Peripheral Component Interconnect Express	
POST	Power On Self Test	
PXE	Preboot Execution Environment	Software for running new PCs without hard disk data via the network
RAID	Redundant Array of Independent Disks	Redundant hard disk array
RAL	Restricted Access Location	Installation of device in operating facilities with restricted access - for example, a locked switchgear cabinet
RAM	Random Access Memory	
RI	Ring Input	Incoming call
ROM	Read-Only Memory	
RS 485	Reconciliation Sublayer 485	Bi-directional bus system designed for up to 32 nodes
RTC	Real Time Clock	Real-time clock
RTS	Reliable Transfer Service	Request to send
RxD	Receive Data	Data transfer signal
SATA	Serial Advanced Technology Attachment	
SCSI	Small Computer System Interface	
SDRAM	Synchronous DRAM	
SELV	Safety Extra Low Voltage	Safety extra low voltage
SLC	Second Level Cache	
SMART	Self Monitoring Analysis and Reporting Technology	Hard disk error diagnostics program
SMS	Short Message Service	Short message via telecommunication network
SNMP	Simple Network Management Protocol	Network protocol
SO-DIMM	Small Outline Dual Inline Memory Module	
SOM	SafeCard on Motherboard (SOM)	
SPP	Standard Parallel Port	Synonym for parallel port
SRAM	Static Random Access Memory	Static RAM
SSD	Solid State Drive	

Abbreviation	Term	Meaning
SVGA	Super Video Graphics Array	Enhanced VGA standard with at least 256 colors
SVP	Serial number of the device	
SW	Software	
TCO	**T**otal **C**ost of **O**wnership	
TFT	Thin-Film-Transistor	Type of LCD flat-screen
TPM	Trusted Platform Module	Chip with security functions
TTY	Tele Type	Asynchronous data transfer
TxD	Transmit Data	Data transfer signal
TXT	Trusted Execution Technology	Hardware implementation
TWD	Watchdog Time	Watchdog monitoring time
UEFI	Unified Extensible Firmware Interface	
UL	Underwriters Laboratories Inc.	US organization for tests and certifications according to own or binational standards (with CSA / Canada) standards.
UMA	Unified Memory Architecture	Video memory
URL	Uniform Resource Locator	Designation of the full address of an Internet page
USB	Universal Serial Bus	
UWF	Unified Write Filter	
UXGA	Ultra Extended Graphics Array	Graphic standard, maximum resolution 1600x1200 pixels.
V.24		ITU-T standardized recommendation for data transfer via serial ports
VCC		Positive supply voltage of integrated circuits
VDE	Verein deutscher Elektrotechniker (Union of German Electrical Engineers)	
VGA	Video Graphics Array	Video adapter which meets industrial standard
VRM	Voltage Regulator Module	
VT	Virtualization Technology	Intel technology with which a virtually closed environment can be made available.
VT-D	Virtualization Technology for Directed I/O	Enables the direct assignment of a device (e.g. network adapter) to a virtual device.
W2k	Windows 2000	
WAN	Wide Area Network	
WAV	Wave Length Encoding	Loss-free file format for audio data
WD	Watchdog	Program monitoring with error detection and alarming.
WLAN	Wireless LAN	Wireless local area network
WoL	Wake on Local Area Network	
WWW	World Wide Web	
XD	Execute Disable Capability	Hardware implementation
XGA	Extended Graphics Array	Graphic standard, maximum resolution 1024x768 pixels.

Glossary

AHCI mode

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

APIC mode

Advanced peripheral interrupt controller. 24 interrupt lines are available.

Automation system

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

Backup

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

Baud

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

Cache

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

CE marking

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

CFast card

CFast is a digital storage medium in card form without moving parts. A CFast card uses the SATA protocol and its connectors are not compatible with a classic CompactFlash card.

Chipset

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

Cold restart

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

COM interface

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

Configuration files

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

Configuration software

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

Controller

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

Device configuration

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

Drivers

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

EMC directive

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

Energy management

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

Energy options

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

Enhanced Write Filter

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

ESD Guideline

Guideline for using electrostatic sensitive components.

Ethernet

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

Execute Disable Capability

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

Extensible Firmware Interface

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

File Based Write Filter

Configurable write filter to protect individual files from write access.

Formatting

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

HORM

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

Hub

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

Hyper Threading

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

IGD

Integrated Graphics Device. Graphics interface integrated in the chipset.

Image

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

Intel Active Management Technology

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

Intel VT

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

Interface

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

LAN

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

Legacy Boot Device

Conventional drives can be used as USB devices.

License key

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

License key disk

The license key disk contains the authorizations or license keys required to enable protected SIMATIC software.

Low-voltage directive

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

Module

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

Motherboard

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

Operating system

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

Pixel

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

Plug&Play

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

POST

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

Programmable controller

The programmable controllers of the SIMATIC S5 system consist of a central controller, one or several CPUs and various other modules (for example, I/O modules).

PXE server

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

RAL

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

Recovery function of the USB stick

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

Reset

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

Restart

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

Restore function of the USB stick

The restore function is used to restore the system partition or the entire hard disk to factory state if the system has crashed. The USB stick contains all the necessary image files and is bootable.

ROM

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

S.M.A.R.T

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

SATA

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

SETUP (BIOS Setup)

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

SSD (Solid State Drive)

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

STEP 7

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

Troubleshooting

Error cause, cause analysis, remedy

Trusted Execution Technology

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

Wake on LAN

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

Warm restart

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

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