

SIEMENS

SIMOTION

SIMOTION P320-3 and Panel Fronts




Manual

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

Preface

Contents of the Product Manual

This manual describes the embedded IPC for motion control SIMOTION P320-3 and the SIMOTION P panel fronts that can be connected via the Remote Panel PC Kit.

The manual is part of the SIMOTION P320-3 documentation package.

Thanks to its rugged construction, the embedded IPC is particularly suited for the special environmental conditions in the production machine area. The hardware has been designed for continuous duty and together with the embedded Windows operating system and the avoidance of rotating parts contributes to this ruggedness.

Sections in this manual

The following describes the purpose and objectives of the manual:

- Safety instructions
Important notes, warnings and precautionary measures that you must observe with handling the SIMOTION P320-3.
- Description
Provides general information about the SIMOTION P320-3, the SIMOTION panel fronts and the integration in the SIMOTION system.
- Hardware description
Describes the connections, the displays of the SIMOTION P state application, the distributed configuration with SIMOTION panel fronts and the technical data of the individual components.
- Use planning
Aspects of storage, transport, environmental and EMC conditions to be considered in the preparatory stage.
- Installation/mounting
Describes the possibilities of the mechanical fastening of the SIMOTION P320-3 and the SIMOTION panel fronts.
- Connecting
Provides general information and important notes that you must observe for the connection of SIMOTION P350-3.
- Technical data
Provides information about the properties and features of the devices, and the components that can be connected.

- Dimension drawings
 - Contains the dimension drawings and dimensions of the SIMOTION P320-3 and the SIMOTION panel fronts.
- Accessories
 - Provides information about spare parts and accessories of the SIMOTION P320-3.
- Appendix
 - Appendices with factual information for reference (e.g. guidelines, approvals, certificates, ESD, abbreviations).
- Index to locate information

Scope of validity

This manual is valid for the hardware of the SIMOTION P320-3 and the SIMOTION panel fronts as of SIMOTION software version V4.1.5.

The type designation of your SIMOTION P is shown on the type plate.

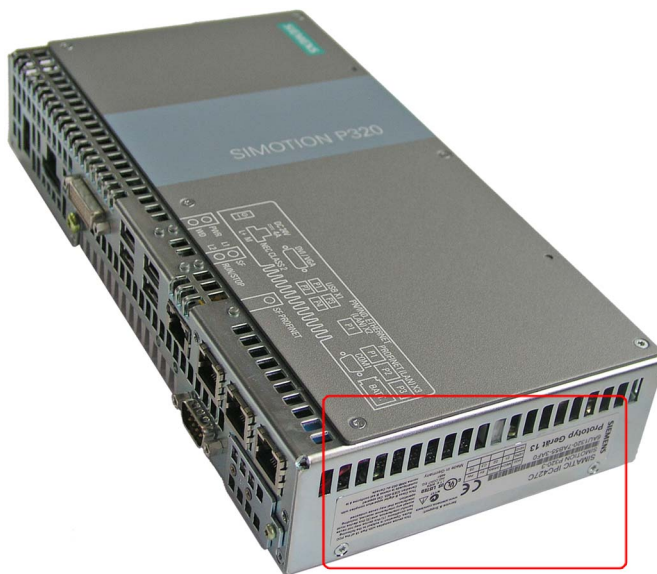


Figure 1 Type plate of the SIMOTION P320-3

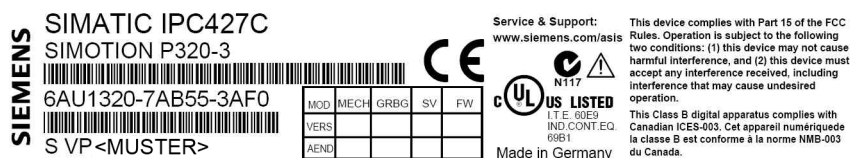


Figure 2 Type plate

Conventions

The term "PC" or "device" is used to refer to the SIMOTION P320-3 in this document.

Standards

The SIMOTION system was developed in accordance with ISO 9001 quality guidelines.

SIMOTION Documentation

An overview of the SIMOTION documentation can be found in a separate list of references.

This documentation is included as electronic documentation in the scope of delivery of SIMOTION SCOUT. It comprises 10 documentation packages.

The following documentation packages are available for SIMOTION V4.3:

- SIMOTION Engineering System
- SIMOTION System and Function Descriptions
- SIMOTION Service and Diagnostics
- SIMOTION IT
- SIMOTION Programming
- SIMOTION Programming - References
- SIMOTION C
- SIMOTION P
- SIMOTION D
- SIMOTION Supplementary Documentation

Hotline and Internet addresses

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- Ordering documentation/overview of documentation
- Additional links to download documents
- Using documentation online (find and search in manuals/information)

<http://www.siemens.com/motioncontrol/docu>

Please send any questions about the technical documentation (e.g. suggestions for improvement, corrections) to the following e-mail address:

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FAQs

Frequently Asked Questions can be found in SIMOTION Utilities & Applications, which are included in the scope of delivery of SIMOTION SCOUT, and in the Service&Support pages in **Product Support**:

<http://support.automation.siemens.com>

Technical support

Country-specific telephone numbers for technical support are provided on the Internet under **Contact**:

<http://www.siemens.com/automation/service&support>

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Safety notes


1.1 General safety instructions

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

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

Repairs

Only authorized personnel are permitted to repair the device.

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

System expansions

Only install system expansion devices designed for this device. If you install other upgrades, you may damage the system or violate the safety requirements and regulations for radio frequency interference suppression. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.

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

Battery

This device is equipped with a Lithium battery. Batteries may only be replaced by qualified personnel.

CAUTION

There is the risk of an explosion if the battery is not replaced as directed. Replace the battery only with the same type or with an equivalent type recommended by the manufacturer. Dispose of used batteries in accordance with local regulations.

WARNING

Risk of explosion and release of harmful substances!

Therefore, do not throw lithium batteries into an open fire, do not solder or open the cell body, do not short-circuit or reverse the polarity, do not heat to above 100 °C, dispose of them in accordance with regulations, and protect them from direct exposure to sunlight, humidity, and condensation.

ESD guidelines

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



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

- Always discharge your body's static electricity before handling modules that are sensitive to ESD (for example, by touching a grounded object).
- All devices and tools must be free of static charge.
- Always pull the mains connector and disconnect the battery before installing or removing modules which are sensitive to ESD.
- Handle modules fitted with ESDs only by their edges.
- Do not touch any connector pins or conductors on modules containing ESDs.

1.2 Recycling and disposal

The disposal of the product must conform to the appropriate valid national regulations.

The low-pollution equipment used in the products described in this manual means most of them can be recycled. To recycle and dispose your old device in an environmentally friendly way, please contact a company that specializes in the disposal of electronic waste.

Description

2.1 Field of application

2.1.1 Product description

Technical Description

The PC-based SIMOTION P320-3 motion control system runs with the Windows Embedded Standard 2009 operating system and with a real-time expansion for SIMOTION. The hardware consists of an industrial PC with innovative Intel technology. Other PC applications can run at the same time as the SIMOTION applications. The I/O systems are controlled with the PROFINET onboard controller (= permanently integrated PROFINET onboard interface module) for PROFINET.

Panels with 12" or 15" screen diagonal (touch or keys) are available for the visualization. In addition, the PC standard interfaces such as Ethernet can be used to connect additional PCs, such as a master computer or a Teleservice router.

Highlights

SIMOTION P offers the following advantages of a PC-based solution:

- Innovative Intel technology
- Long-term availability
- Openness of the PC (Windows applications)
- Connection of a wide range of PC devices
- CompactFlash card
- Control and HMI tasks on one system (HMI = Human Machine Interface)

Possible applications

Typical applications for production machine automation include the following:

- Packaging industry
- Plastics industry
- Metal forming technology
- Textiles
- Printing industry
- Industries processing wood, glass, ceramics and stone

2.1 Field of application

The device provides industrial PC systems for high-performance and space-saving applications in particular in the field of machine, plant and control cabinet construction:

- Measuring and controlling of process and machine data (for example, wind power plants, assembling machines, packaging machines)
- Operating and visualization tasks with separate display / monitor solutions (information terminals, large-scale displays in automotive production)
- Data acquisition and processing (e.g. process data acquisition, distributed process control)

2.1.2 Performance Features

SIMOTION P can control various I/O systems and HMI components via its PROFINET onboard controller.

SIMOTION P320-3 is only available with PROFINET onboard controller.

Both rotary axes and linear axes can be operated.

The following can be used as servo drives:

- SINAMICS S120 (PROFINET)

Subsequently, only drives will be mentioned in this context.

SIMOTION P contains the SIMOTION Kernel, which provides motion control and PLC functionality.

The SIMOTION P project is planned, configured, parameterized, commissioned, and programmed using the SIMOTION SCOUT engineering system (ES). This can be done using text or graphic input.

User data is stored on a fail-safe storage medium of the SIMOTION P320-3. The term "storage medium" is used for "fail-safe storage medium" in the rest of the document.

Siemens WinCC flexible software can be used to visualize operational sequences or to operate the machine. Third-party systems can be linked via the OPC interface.

Hardware and software requirements

Basic data	
Installation/mounting	<ul style="list-style-type: none"> • Mounting onto standard rail • Wall mounting • Book mounting • Suspended mounting
Processor	<ul style="list-style-type: none"> • Intel Core 2 Solo 1.2 GHz, 800 MHz FSB, 3 MB SLC
Main memory	<ul style="list-style-type: none"> • 2 GB DDR3-SDRAM SODIMM
Graphics	<ul style="list-style-type: none"> • Integrated Intel GMA4500 graphics • Resolution from 640x480 pixels up to 1920x1200 pixels • 32 to 256 MB graphics memory is taken from main memory (dynamic UMA)
Power supply	24 VDC (19.2 ... 28.8 V) max. 4 A
Operating conditions	Operation without fan
Drives and storage media	
CompactFlash card	4 GB
Floppy/CD-ROM drive	Optionally connectable via external USB interface
USB stick	Optionally connectable via external USB interface
Interfaces	
Serial	COM (RS232)
Graphics	DVI-I: Combined DVI and VGA
USB	4 x USB 2.0 high current
Ethernet	1 x RJ 45 (10/100/1000 Mbps)
PROFINET	3 x RJ 45 (10/100 Mbps), PROFINET onboard controller
Monitoring and safety functions	
LED display	Five LEDs to display the system states
Transient voltage interruption	Up to 15 ms buffer time at full load
Software	
Operating systems	
Scope of delivery	<ul style="list-style-type: none"> • Windows Embedded Standard 2009 • SIMATIC NET • SIMOTION P Runtime

Windows Embedded Standard 2009

The supplied Windows Embedded Standard has the product version 2009. The overview shows the basic device functions under Windows Embedded Standard 2009:

Function	Windows Embedded Standard 2009
Enhanced Write Filter (EWF)	In the RAM
SIMATIC IPC DiagBase	Available, V 1.2
Pagefile	Deactivated in favor of the EWF
System Restore Core	Available
File-Based Write Filter (FBWF)	Available
Registryfilter	Available
Device Update Agent (DUA)	Available
Telnet Server	Available
Windows Backup	Available
User Mode Driver Framework (UMDF)	Available
MUI	GER Default language: English
Administrator Account	Available
User Account	Available
Explorer Shell	Available
Internet Explorer (IE)	Available, IE7
Internet Information Server (IIS)	Available, V 5.1
Terminal Services	Available
Bluetooth	Available
Wireless Network Support	Available
Windows Firewall	Available
Windows Security Center	Available
MSN Explorer	Not available
Outlook Express	Available
Administrative Tools	Available
SMS Advanced Client	Not available
Remote Desktop	Available, V 6.0
Remote Assistance	Available
.NET Framework	Not available
ASP.NET	Not available
Windows .NET Messenger	Available, V 4.7
Codepages/User Locale/Keyboard	Selection available
Disk Management Services	Available
Windows Installer Service	Available, V 3.1
Class Installer	Available
CoDevice Installer	Available
Windows Movie Maker	Not available

Function	Windows Embedded Standard 2009
Media Player	Available, V11.0
Windows Media Player Tour	Not available
DirectX	V9.0c
Accessories	Available
Help files for all components	Not available
Games	Not available
Fonts	118
Windows XP Tour	Not available
Microsoft Silverlight	Available, V 1.0
NetMeeting	Available, V 3.1

See also

General specifications (Page 107)

2.1.3 System overview

System environment

SIMOTION, a modular system, consists of the SIMOTION SCOUT engineering system (ES) and a runtime system (RT) that can run on various hardware platforms.

The truly innovative aspect of SIMOTION is that it does away with the traditional separation between pure automation functions and motion functions. These functions are combined both on the hardware and on the software side.

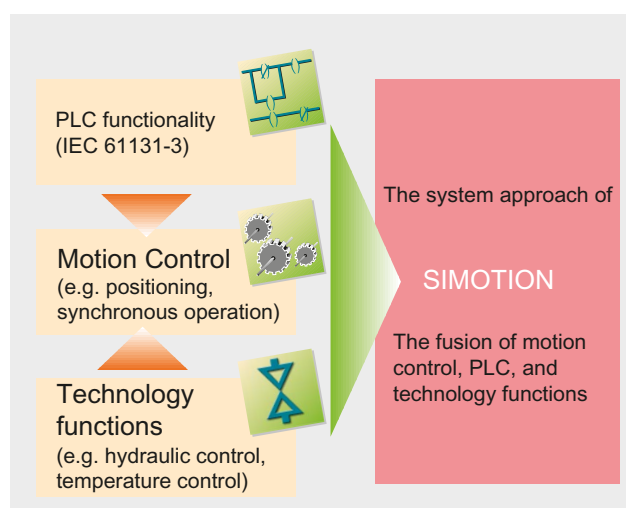


Figure 2-1 SIMOTION system environment

2.1 Field of application

Individual automation tasks for production machines are formulated in a uniform and consistent user interface. Logic and movement functions are programmed in the SIMOTION SCOUT graphic programming tool.

Technical tasks such as positioning or synchronous operation are available as functions that are simple to incorporate in the program, as are logic commands.

Consistency in the areas of programming and project design and data management and communication is the central feature of Totally Integrated Automation (TIA).

SIMOTION P system architecture

The three hardware platforms (SIMOTION D, SIMOTION P and SIMOTION C) form the basis of the SIMOTION motion control system. The application created with the SIMOTION SCOUT engineering system and the associated runtime software modules can be used on the various SIMOTION hardware platforms.

The advantage of the system architecture for the PC-based SIMOTION P320-3 solution lies in the fact that both the HMI and the runtime system run on the same hardware. This saves the cost for an additional HMI station.

2.2 SIMOTION P structure

2.2.1 SIMOTION P (hardware) structure

The following figure illustrates the integration of the SIMOTION P320-3 with the use of the PROFINET onboard controller in a target system.

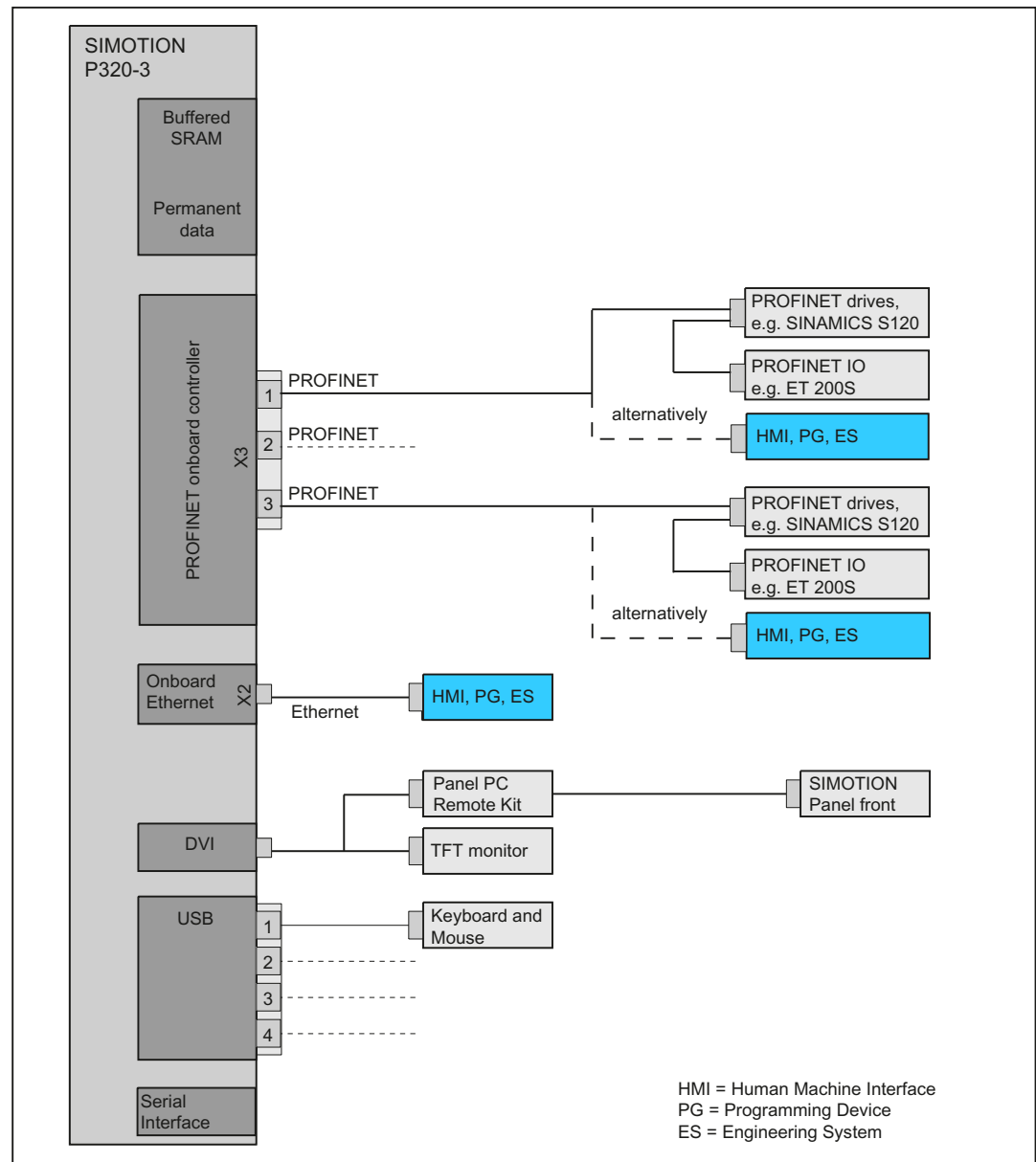


Figure 2-2 Hardware system overview - example with PROFINET onboard controller

2.2.2 SIMOTION P (software) structure

SIMOTION P contains the SIMOTION Kernel, which provides motion control and adaptive control.

The SIMOTION P project is planned, configured, parameterized, commissioned, and programmed using the SIMOTION SCOUT engineering system (ES). This can be done using text or graphic input.

User data can be stored on the storage medium of the SIMOTION P320-3.

Siemens WinCC flexible software can be used to visualize operational sequences or to operate the machine. Third-party systems can be linked via the OPC interface.

SIMOTION P

In SIMOTION P, the PLC and motion control functionality (from the position controller upwards) occupies a central position in a strictly deterministic task outside the Windows operating system.

Its main field of application is centralized motion control and control tasks requiring close coordination between multiple axes and/or input/output modules.

The communication with the digital drives is performed via PROFINET IO on the speed setpoint and actual position value level, and assumes constant bus cycle time. Additional connected I/O modules only need to satisfy the PROFINET standard protocol. They can be simple input/output modules or complex devices such as frequency converters or valve terminals.

Functionality ranges from simple positioning to high-performance synchronous operation.

SIMOTION SCOUT

The SIMOTION SCOUT engineering system is linked via the interfaces integrated in the SIMOTION P320-3.

HMI software

HMI software can be installed on the same PC, e.g. the Siemens WinCC flexible software. Other software packages can be linked by means of the OPC interface.

The following sections discuss only HMI software.

Internal communication

A locally installed HMI can use the local communication to access the following:

- Variables in the SIMOTION RT
- Drives on PROFINET IO
- Other SIMOTION devices on the PROFINET IO

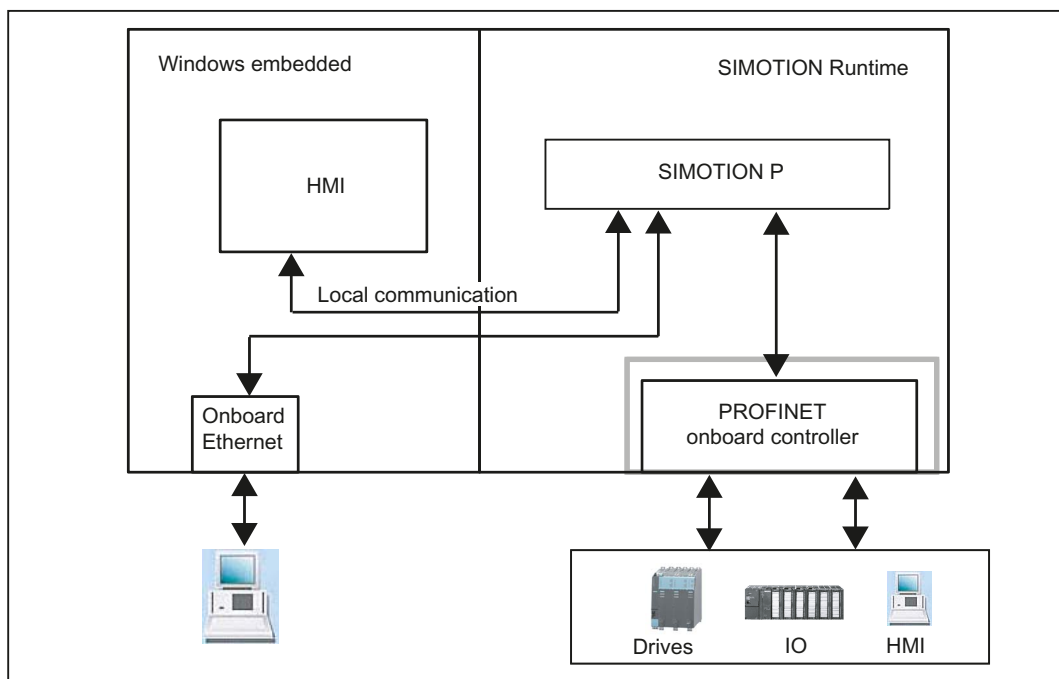


Figure 2-3 Local communication

Scope of delivery

The system software supplied with the SIMOTION P is either already installed on the SIMOTION P320-3 storage medium or is ready to be installed:

- SIMOTION Kernel
- SIMATIC NET
- UPDD Touch Driver
- UPS monitoring of SITOP units
- SIMOTION IT-Diag (under license)
- SIMOTION IT OPC XML-DA (under license)

Additional software (must be purchased and licensed separately)

- WinCC flexible RT
- OPC Server

2.2.3 Components

The most important components of a SIMOTION P application are listed below, along with their function.

Distributed I/O systems (PROFINET)

Table 2- 1 Components for distributed I/O

Component	Function
SIMATIC ET 200M	Modular I/O system for control cabinet installation and high channel density.
SIMATIC ET 200S	Highly modular I/O system for control cabinet installation including motor starters, safety technology, and individual grouping of the load groups.
SIMATIC ET 200eco	I/O system with IP67 degree of protection for machine-related, cabinet-free applications, featuring a flexible and fast connection system in ECOFAST or M12.
SIMATIC ET 200pro	Modular I/O system with IP65/67 degree of protection for machine-related, cabinet-free applications, including motor starters.

Note

Please note that not all modules of the above-mentioned I/Os or I/O systems are approved for SIMOTION. Moreover, system-related functional differences can occur when these I/O or I/O systems are used on SIMOTION vs. on SIMATIC. For example, special process-control functions (hot swapping, etc.) are not supported by SIMOTION for the ET 200M distributed I/O system.

For a detailed and routinely updated list of I/O modules enabled with SIMOTION as well as application information, visit us online at:

Siemens - Industry Automation and Drive Technologies - Service & Support
(<http://support.automation.siemens.com/WW/view/en/11886029>)

Further modules are integrated via the GSD file of the device's manufacturer.

Note

Please note that in individual cases, additional general conditions must be fulfilled.

Drive systems (via PROFINET IO)

Table 2- 2 List of typically connected drive systems

Component	function
SINAMICS S120	Servo drives, innovative single-axis and multi-axis solution

Optional components

Table 2- 3 Optional components

Centralized I/O	function
UPS	Uninterruptible power supply (UPS)
Panel PC Remote Kit	Enables the physical separation of the SIMOTION panel front and SIMOTION P320-3

Operator components

Operator components and the programming device (PG/PC) can be connected as follows:

- Local communication via PC-internal
- PROFINET
- Ethernet

2.3 HMI and SIMOTION SCOUT

2.3.1 HMI overview

The monitoring of the operational sequences on the SIMOTION P320-3 is generally performed via the HMI system (Human Machine Interface). The HMI software can be connected using the following methods:

- Local
- Via Ethernet
- Via PROFINET

Local communication of the HMI

Only a local connection to the local SIMOTION Runtime is possible. If HMI Runtime is also installed locally, "PC internal" can also be used to access other controllers via PROFINET onboard.

HMI communication via Ethernet/PROFINET

Several SIMOTION devices can be controlled and monitored with a single installation.

2.3.2 Local HMI on SIMOTION P320-3

This model is relevant for SIMOTION P-specific communication with a local HMI. The HMI system is installed directly on the SIMOTION P320-3.

For this model, set the communication (access point) to "PC internal". The SIMOTION P320-3 is delivered already configured for this communication variant.

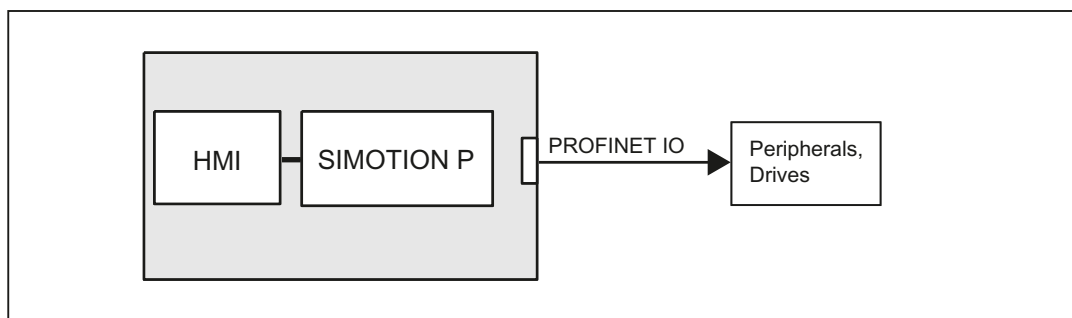


Figure 2-4 Local HMI model

2.3.3 HMI or ES via Ethernet (external access)

Complex networking with several HMI/ESs is only possible via Ethernet communication. This allows both an external HMI/ES to access several SIMOTION devices and a SIMOTION device to access another one (to display production data, for example).

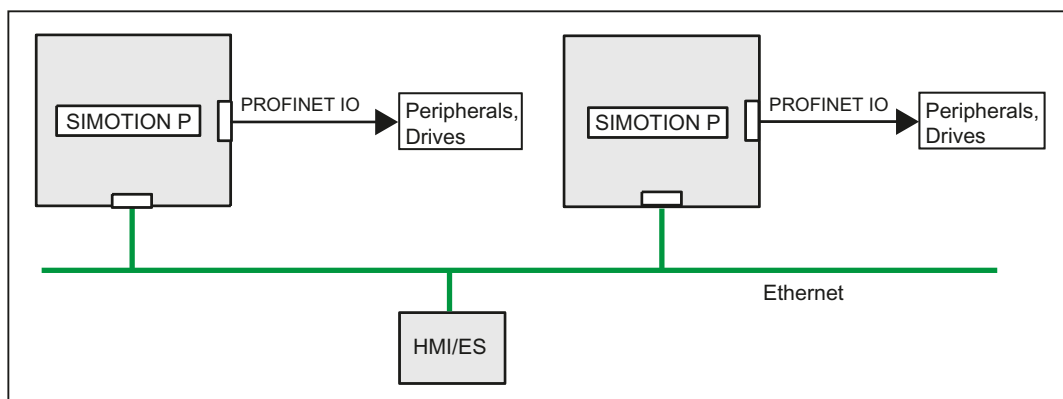


Figure 2-5 Model: Networking via Ethernet

Using Ethernet, several services are possible on a SIMOTION device:

- HMI software
WinCC flexible or OPC server can use Ethernet to access one or more SIMOTION devices.
- SIMOTION SCOUT engineering software
SIMOTION SCOUT can also use Ethernet to access one or more SIMOTION devices.
- SIMOTION IT
The SIMOTION devices support communication with standard IT protocols (HTTP) via the integrated Ethernet interface. This makes it possible to use the intranet/Internet from any location to access data or diagnostic information in the SIMOTION devices.

Note

Further information is contained in the SIMOTION IT Ethernet-based HMI and Diagnostic Function Diagnostics Manual.

2.3.4 HMI or ES via PROFINET

PROFINET is the innovative and open Industrial Ethernet standard (EN 61158) for industrial automation. With PROFINET, devices can be linked up from the field level through to the management level.

If a PROFINET network is established, an external HMI/ES that supports PROFINET can also be integrated into this network and exchange data directly with the SIMOTION device.

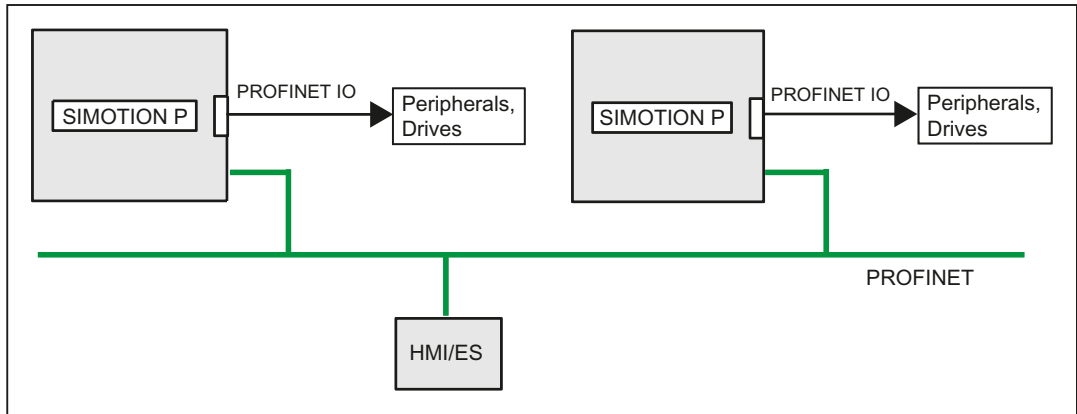


Figure 2-6 Model: Networking via PROFINET

This communication does not require any settings to be made for the SIMOTION P320-3.

These are made on the central HMI/ES as described in the documentation or online help for SIMOTION SCOUT.

2.4 SIMOTION panel fronts

2.4.1 Overview of SIMOTION panel fronts

The SIMOTION panel front is a control unit for use with SIMOTION P products. It is used in conjunction with the SIMOTION P320-3 computing unit and is designed for highly demanding tasks in PC-based automation applications.

The panel can be operated in a distributed configuration (separated from the computing unit) via the Panel PC Remote Kit.

Product brief

SIMOTION panel fronts are available with various device fronts. The difference between the variants lies in their support of operation with a membrane keyboard or operation with a touch screen.

The keyboard and touch screen variants are available.

View

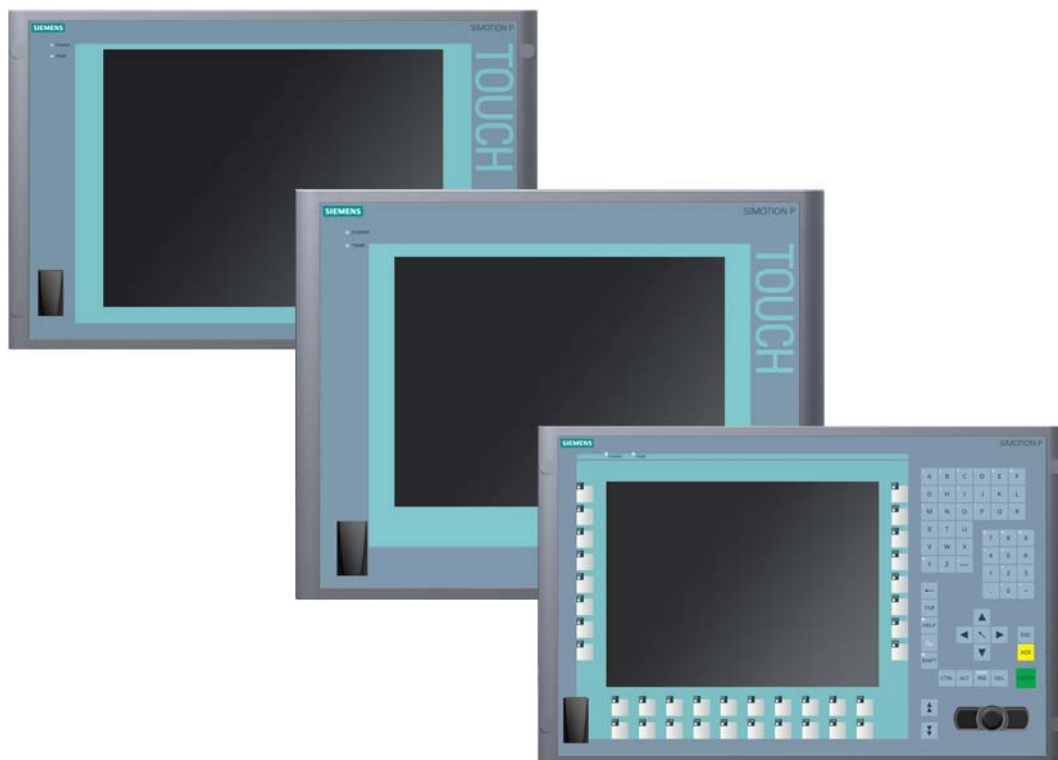


Figure 2-7 View of all SIMOTION panel fronts

2.4.2 SIMOTION P320-3 with panel front via Panel PC Remote Kit

The SIMOTION panel fronts can only be operated via a Panel PC Remote Kit on the SIMOTION P320-3. In this case, both units must be connected together.

The SIMOTION panel front is available with different control units which differ with regard to display dimensions and the inclusion of a membrane keyboard or touch screen.

Further information on the mounting / installation of the two components can be found in Assembly forms overview (Page 84).

Structure

The device is available as distributed configuration.

Computer unit and control unit are in separate locations. A Panel PC Remote Kit is screwed to the rear of the control unit. The connection from the computer unit to the control unit is established via the Panel PC Remote Kit.

Keyboard variant

The SIMOTION panel front as keyboard variant has the following properties:

- Color display with backlighting:
 - 12" TFT technology with 800 x 600 resolution
- Membrane keyboard with alphanumeric keys, numeric keys, cursor keys and control keys
- Function keys and softkeys
- Integrated mouse
- LEDs for power supply, temperature, softkeys, <Shift> and <ACK> keys
- Front-mounted USB 2.0 interface for connecting external I/O devices. The front-mounted USB interface is sealed and cannot be used for device variants for use in hazardous areas in accordance with FM Class I, Div. 2.

Touch screen variants

The SIMOTION panel front as touchscreen variant has the following properties:

- Color display with backlighting:
 - 12" TFT technology; 800 x 600 resolution
 - 15" TFT technology; 1024 x 768 resolution
- LEDs for power supply and temperature
- Front-mounted USB 2.0 interface for connecting external I/O devices.

For additional information, see Technical data for SIMOTION panel fronts (Page 60).

Note

Using a distributed configuration with the Panel PC Remote Kit reduces the data rate at the USB interface on the SIMOTION panel front.

2.4.3 SIMOTION P320-3 without panel front (headless)

The SIMOTION P320-3 is operated without a SIMOTION panel front, e.g. SIMOTION P320-3 installed in a control cabinet.

The maintenance/configuration of the SIMOTION P320-3 is performed via a computer that accesses the SIMOTION P320-3 by means of "Remote Desktop".

Description

2.4 SIMOTION panel fronts

Hardware description

3.1 SIMOTION P hardware components

Note

The order numbers of the components described below can be obtained from the online catalog in the Siemens A&D Mall (<http://www.siemens.com/automation/mall>).

SIMOTION P complete system

SIMOTION P (SIMOTION P320-3)

SIMOTION P spare parts

As standard, a SIMOTION P320-3 consists of the following hardware components:

- SIMOTION PC unit **SIMOTION P320-3**
- **Back-up battery** for the motherboard of the SIMOTION P320-3

Optional components

The following hardware components are optional and can be ordered separately:

Operation and display

- SIMOTION panel fronts
 - 12" panel front **SIMOTION P012T** (touch screen)
 - 12" panel front **SIMOTION P012K** (keys)
 - 15" panel front **SIMOTION P015T** (touch screen)
- Panel PC Remote Kit

Power supply of the SIMOTION P320-3

The power supply must meet the requirements listed at Power supply (Page 127). This can be ensured by using the following devices, for example:

- SITOP smart 24 V/10 A
- Optional 24 VDC UPS

Drives and I/O modules

Further information on the drives and I/O modules released for SIMOTION can be found in Catalog PM 21 (http://www.automation.siemens.com/_en/mc/mc-sol/en/99a87a12-7df7-4b4e-86af-ce8532cd7f43/index.aspx).

Note

Please note that not all modules of the mentioned I/O or I/O systems are approved for SIMOTION. Moreover, system-related functional differences can occur when these I/O or I/O systems are used on SIMOTION vs. on SIMATIC. For example, special process-control functions (hot swapping, etc.) are not supported by SIMOTION for the ET 200M distributed I/O system.

A detailed, regularly updated list of the I/O modules released for SIMOTION, as well as notes on their use, can be found on the Internet at: Siemens - Industry Automation and Drive Technologies - Service & Support (<http://support.automation.siemens.com/WW/view/en/11886029>).

3.2 SIMOTION P320-3 PC unit

3.2.1 SIMOTION P320-3 representation

View

The following diagram shows the SIMOTION P320-3.

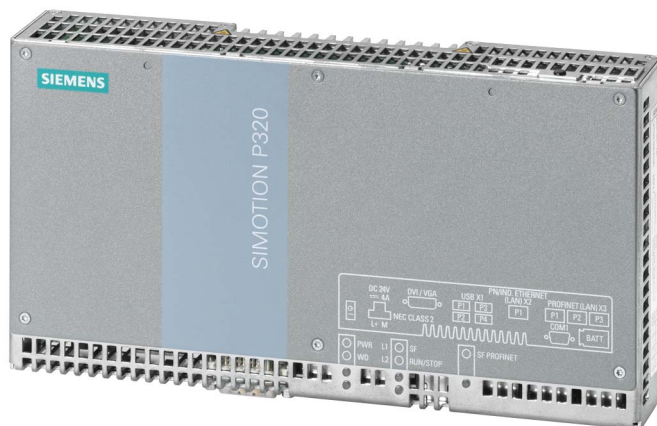
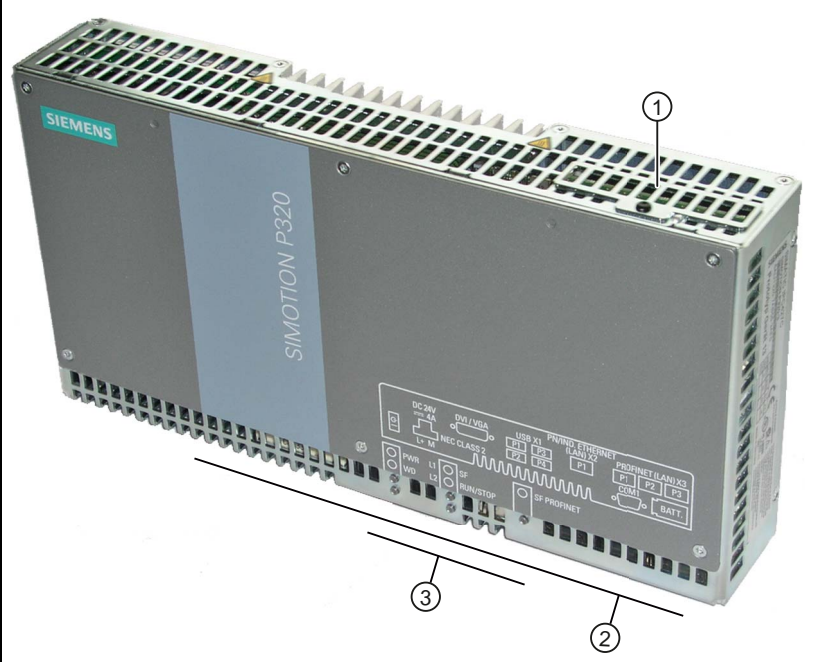


Figure 3-1 SIMOTION P320-3

Connection and display elements

The SIMOTION P320-3 provides the following connection and display elements.

Device components	Pos	Description
	①	Cover plate for CompactFlash module
	②	Connection elements
	③	Status indicators

3.2.2 Connection components

Interfaces and power supply


Position of the connection elements		
Pos	Designation	Description
①	24 VDC	Connection for a 24 VDC power supply
②	DVI/VGA	DVI/VGA connection for CRT or LCD monitor with DVI interface
③	USB	4 USB 2.0 connections, high-speed / low current
④	PN/IND. ETHERNET	RJ45 Ethernet connection 1 (exclusive PCI interrupt) for 10/100/1000 Mbps
⑤	PROFINET	PROFINET onboard interface with three ports (RJ45 connections)
⑥	COM	Serial interface (RS232) 9-pin D-Sub connector
⑦	USB strain-relief fastener	The USB strain relief must be fastened to the device enclosure with an oval-head screw (M4 thread). The USB cables can be fastened to the strain-relief assembly with a cable tie.
⑧	PE terminal	The PE terminal (M4 thread) must be connected to the protective ground conductor of the plant, in which the device is to be installed. The minimum conductor cross-section may not be less than 5 mm ² .

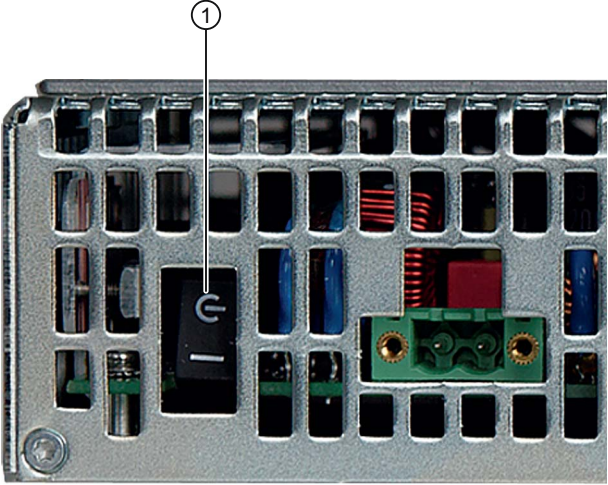
See also

SIMOTION P320-3 interfaces (Page 42)

3.2.3 Operator controls


On/Off switch

 CAUTION
The On/Off switch does not disconnect the device from the supply voltage.

Position of On/Off switch	Pos	Description
	①	The On/Off switch turns off the output voltages of the power supply but not disconnect from the supply system. The delivery condition is: Power switch turned off.

3.2.4 Status displays

Status indicator

Status indicator			
			
LED	Meaning	LED	Description
PWR	Power supply	GREEN	Indicates correct supply voltage of 3.3 V, 5 V and 12 V from the integrated power unit.
WD	Watchdog status display	OFF	Not relevant.
SF	Group errors	OFF	SIMOTION P is operating without error.
		RED: Slow flashing (0.5 Hz)	No license exists for technology/optional objects under license. Carry out the licensing to correct the error. Further information on the licensing can be found in the SIMOTION P320-3 and Panel Fronts Commissioning and Hardware Installation Manual.
		RED: Fast flashing (2 Hz)	A fault has occurred to which the user program cannot respond. The following actions may be required to rectify the fault: <ul style="list-style-type: none"> • Power OFF/ON • New commissioning procedure
RUN/STOP	RUN STOP	OFF	SIMOTION P Runtime is not running
		YELLOW	SIMOTION P in STOP mode
		GREEN	SIMOTION P in RUN mode
SF PROFINET	Status indicator for PROFINET onboard	OFF	SIMOTION P is operating without error.
		RED: Slow flashing (0.5 Hz)	Underlicensing
		RED: Fast flashing (2 Hz)	No or faulty configuration.
		RED	Acknowledgeable event

3.2.5 Internal components

SIMOTION P320-3 internal structure

The basic components of the device are

- the motherboard with processor, chipset, one slot for a RAM module, internal and external interfaces,
- a DC/DC converter for the power supply of the device

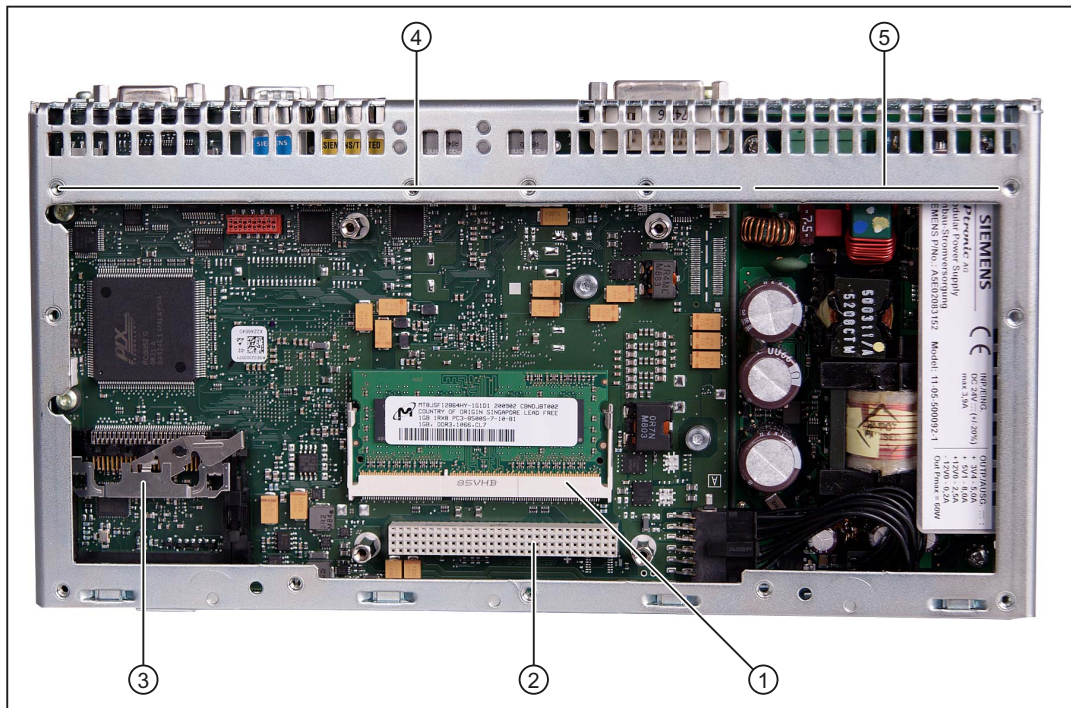


Figure 3-2 Internal layout of the device

①	Slot for a memory module	④	Motherboard
②	Slot - is not used	⑤	DC/DC converter
③	Slot for CompactFlash card		

Technical features of the motherboard

Component/interface	Description	Parameters
Chipset	Intel GM45+ICH-9m	-
BIOS	Insyde H20...	-
CPU	Intel Core 2 Solo	1.2 GHz, 800 MHz FSB, 3 MB SLC
Memory	DDR 3 SO-DIMM module	2048 MB
Graphics	Intel GMA4500	32 - 256 MB graphics memory taken dynamically from RAM

3.3 SIMOTION P320-3 interfaces

3.3.1 Interface overview

The interfaces and their meaning are described in following table.

Table 3- 1 Interfaces

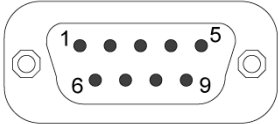
Interface	Position	Description	See Chapter
COM interface	external	24 V - 9-pin	COM interface (Page 43)
USB interface	external	4 x USB high current - USB 1.1/2.0	USB interface (Page 43)
PROFINET interface with 3 ports	external	3 x 8-pin RJ45 sockets X3 P1 , X3 P2 and X3 P3 for connecting to PROFINET subnets	PROFINET interface (Page 44)
Ethernet interface	external	1x 8-pin RJ45 socket X2 for connection to an Industrial Ethernet	Ethernet interface (Page 46)
DVI-I	external	DVI-I standard socket	DVI-I (Page 47)
Memory module slot (True IDE mode)	Internal	Slot for CompactFlash card (X3 connector) 50-pin CF socket, types I/II	Slot for CompactFlash card (Page 48)

3.3.2 COM interface

Interface assignment

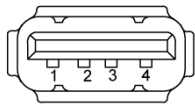
Designation: COM
Type: 24 V - 9-pin

Table 3- 2 COM interface assignment

COM serial interface, 9-pole (connector)		
		
Pin no.	Short designation	Meaning
1	DCD	Data carrier detect (I)
2	RxD	Received data (I)
3	TxD	Transmitted data (O)
4	DTR	Data terminal ready (O)
5	GND	Ground
6	DSR	Data set ready (I)
7	RTS	Request to send (O)
8	CTS	Clear to send (I)
9	RI	Incoming call (I)

3.3.3 USB interface

Interface assignment

USB interface, 4-channel high current		
		
Pin no.	Short designation	Meaning
1	USB_P5V_fused (O)	+ 5 V (fused) for external USB interface
2	USB_D0M (I/O)	Data+, USB channel 0
3	USB_D0P (I/O)	Data-, USB channel 0
4	USB_GND	Ground for external USB interface

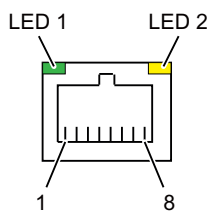
3.3.4 PROFINET interface

Interface assignment

Designation: **X3, PROFINET (LAN), three ports P1, P2, P3**

Type: 8-pin RJ45 socket

Table 3- 3 X3 interface assignment (ports P1, P2, P3)

PROFINET interface			
			
Pinno.	Short designation	Meaning	Input / output
1	RD+	Receive data *	Input
2	RD-	Receive data *	Input
3	TD+	Transmit data *	Output
4, 5 ¹⁾	SYMR	Internal 75 Ohm terminating resistor	–
6	TD-	Receive data *	Output
7, 8 ¹⁾	SYMT-	Internal 75 Ohm terminating resistor	–
S		Shield	
	LED 1	Lights up green: Link	
	LED 2	Lights up yellow: Activity	

* Auto negotiation and auto cross over are supported

Properties of PROFINET IO IRT on the SIMOTION P320-3

SIMOTION P320-3 has the following properties in conjunction with PROFINET IO:

- PROFINET IO specifies operation at 100 Mbps (full-duplex operation).
- Minimum sending cycle with SIMOTION P320-3 is 250 μ s.
- Maximum sending cycle is 4 ms:
 - Grid for IRT only: 125 μ s
 - Grid for mixed RT/IRT: 0.5 ms, 1 ms, 2 ms, 4 ms
- The SIMOTION P320-3 supports a total of max. 4 KB for each input and output.
- Controller-controller data exchange broadcast:
 - Max. 3 KB of data possible for each input and output direction.
 - As a publisher, an IO controller sends data to one or more IO controllers, e.g. to an additional SIMOTION P320-3 with PROFINET onboard controller.
- SIMOTION P320-3 as I-device (intelligent device):
 - Max. 1400 bytes possible. Each module can be up to 254 bytes in size.
- A standard Ethernet node, e.g. PC/ engineering system (SCOUT/STARTER) or HMI, can be connected to a free port of the PROFINET IO interface of the IRT modules.
 - Special settings on the standard Ethernet node are not required here.
- The PROFINET onboard controller has three ports that all belong to one interface and represent a switch.
- The cable length between two ports may not exceed 100 m with stiff copper conductors. There is no minimum length.
 - Greater distances can be bridged with fiber-optic cables, for example.
- SIMOTION and SINAMICS with PROFINET support PROFIdrive in accordance with IEC61800-7-203 (PROFIdrive Profile V4.1).

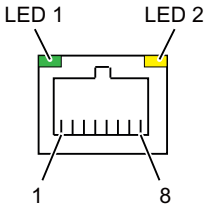
3.3.5 Ethernet interface

Interface assignment

Designation: **X2 (PN/IND. Ethernet), port P1**

Type: 8-pin RJ45 socket

Table 3- 4 X2 interface assignment

Ethernet RJ45 connection			
			
Pinno.	Short designation	Meaning	Input / output
1	BI_DA+	Bi-directional data A+	Input/output
2	BI_DA-	Bi-directional data A-	Input/output
3	BI_DB+	Bi-directional data B+	Input/output
4	BI_DC+	Bi-directional data C+	Input/output
5	BI_DC-	Bi-directional data C-	Input/output
6	BI_DB-	Bi-directional data B-	Input/output
7	BI_DD+	Bi-directional data D+	Input/output
8	BI_DD-	Bi-directional data D-	Input/output
S		Shield	–
	LED 1	Off: 10 Mbps Lit in green: 100 Mbps Lit in orange: 1000 Mbps	–
	LED 2	Lit: Active connection (to a hub, for example) Flashing: Activity	–


3.3.6 DVI-I

Interface assignment

Designation: **DVI-I**

Type: Standard socket

Table 3- 5 Assignment of the DVI-I interface

DVI-I interface		
		
Pin no.	Short designation	Meaning
1	TMDS Data2-	DVI data channel (O)
2	TMDS Data2+	DVI data channel (O)
3	TMDS Data2/4 Shield	Cable shield
4	NC*	
5	NC	
6	DDC Clock (SCL)	Display Data Channel – Clock (E/A)
7	DDC Data (SDA)	Display Data Channel – Data (E/A)
8	Analog Vertical Sync (VSYNC)	Analog Vertical Sync Signal (A)
9	TMDS Data1-	DVI data channel (O)
10	TMDS Data1+	DVI data channel (O)
11	TMDS Data1/3 Shield	Cable shield
12	NC	
13	NC	
14	+5V Power (VCC)	+5V Power for DCC (A)
15	Ground (return for +5V, Hsync and Vsync) (GND)	Analog Ground
16	Hot Plug Detect	
17	TMDS Data 0-	DVI data channel (O)
18	TMDS Data 0+	DVI data channel (O)
19	TMDS Data0/5 Shield	Cable shield
20	NC	
21	NC	
22	TMDS Clock shield	Cable shield
23	TMDS Clock+	DVI clock channel (O)
24	TMDS Clock-	DVI clock channel (O)
C1	Analog Red (R)	Analog Red Signal (A)
C2	Analog Green (G)	Analog Green Signal (A)
C3	Analog Blue (B)	Analog Blue Signal (A)

DVI-I interface		
C4	Analog Horizontal Sync (HSYNC)	Analog Horizontal Sync Signal (A)
C5	Analog Ground (analog R, G, & return) (GND)	Analog Ground

3.3.7 Slot for CompactFlash card

Interface assignment

Type: Slot

Table 3- 6 Slot for CompactFlash card

CompactFlash card interface		
Pin no.	Short designation	Meaning
41	RESET#	reset (output)
7	CS0#	chip select 0 (output)
32	CS1#	chip select 1(output)
34	IORD#	I/O-Read (output)
35	IOWR#	I/O-Write(output)
20, 19, 18,	A0-A2	Address bit 0-2 (output)
17, 16, 15, 14, 12, 11, 10, 8	A3-A10	Address bit 3-10 (output) to ground
21, 22, 23, 2, 3, 4, 5, 6, 47, 48, 49, 27, 28, 29, 30, 31	D0-D15	data bits 0-15(in/out)
37	INTRQ	Interrupt request (input)
9	OE# /ATA SEL#	Enables True IDE Mode
24	IOCS16#	I/O-chip select 16 (input)
39	CSEL#	cable select (output)
42	IORDY	I/O ready (input)
46	PDIAG#	Passed diagnostic
45	DASP#	drive active/slave present (not connected)
26, 25	CD1#, CD2#	card detect (not connected)
33, 40	VS1#, VS2#	Voltage sense (not connected)
43	DMARQ	DMA Request (input)
44	DMACK#	DMA Acknowledge (output)
36	WE#	write enable
1, 50	GND	Ground
13, 38	VCC	+ 5 V power

3.4 SIMOTION P state application

3.4.1 SIMOTION P State application overview

The LED, mode selector, and memory card handling indicators, which are implemented as hardware on other SIMOTION platforms, are displayed in virtual form in the SIMOTION P system.

This is achieved via the SIMOTION P state application. The following figure shows SIMOTION P state in the started state.

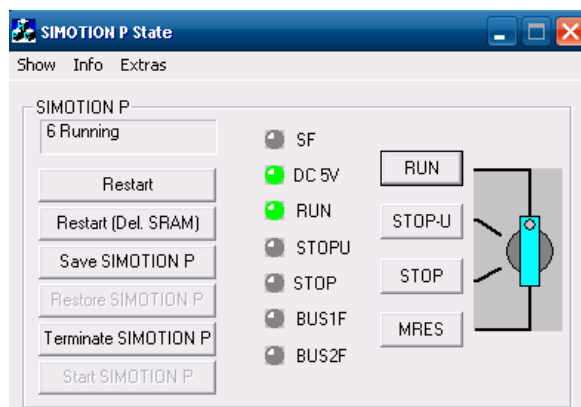


Figure 3-3 SIMOTION P state

3.4.2 LED display

The meaning of the LEDs and their colors is described in the table below.

Table 3- 7 Meaning of LEDs

LED	Meaning
SF (red) ¹	This LED indicates a fault state or underlicensing of the SIMOTION P.
5 VDC (green) SIMOTION P voltage on	This LED indicates that the voltage is present at P.
RUN (green) - SIMOTION P in RUN mode ²	This LED indicates that the user program is running.
STOPU (yellow) - SIMOTION P in STOP user program mode	This LED indicates that the technology packages (for example, synchronous operation and cam) are active. Test and commissioning functions can be executed without a user program. The user program is not active.
STOP (yellow) - SIMOTION P in STOP mode ²	This LED indicates that no user program is running. The technology packages are not active.
BUS1F (red) - group fault	Not relevant as no PROFIBUS DP interface available.
BUS2F (red) - group fault	Not relevant as no MPI/DP interface available.

¹ SF LED is also displayed for the hardware

² RUN/STOP LED is also displayed for the hardware and encompasses the RUN and STOP LED:
Green = RUN mode
Yellow = STOP mode

3.4.3 Mode selector

The mode selector is used to set the SIMOTION P application to different states. You can switch the control to RUN or STOP/STOPU and perform an overall reset.

A system status activated with the mode selector has **priority** over a status selected via SIMOTION SCOUT. Consequently, you cannot switch the control to RUN mode via SIMOTION SCOUT while the mode selector is set to STOP/STOPU on the SIMOTION P320-3. You must use the mode selector for this.

Further information on the mode selector function can be found in the SIMOTION P320-3 and Panel Fronts Commissioning and Hardware Installation Manual.

3.4.4 Current operating status

The current status of your SIMOTION P is indicated on the left-hand side of the SIMOTION P state window.

The following statuses can be indicated on the display:

"not started"	SIMOTION P is not started.
"0" ... "5"	Individual stages during SIMOTION P booting.
"6 Running"	SIMOTION P has completed power up and the cyclic tasks are activated.

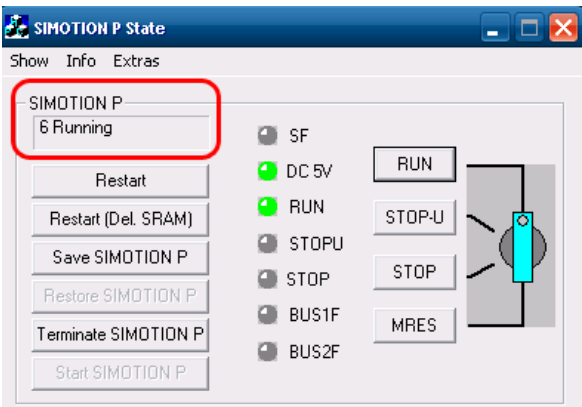


Figure 3-4 SIMOTION P state status display

The status LEDs and the current operating status are also displayed in the Windows task bar.

Table 3- 8 Display in the task bar



RUN status: Green



STOP status: Yellow



NOT STARTED status: Gray

3.5 SIMOTION panel fronts

3.5.1 Overview of SIMOTION panel fronts (hardware)

SIMOTION panel fronts are essentially available in 2 variants:

- Panel with keys
- Panel with touch screen.

Both variants feature status LEDs for power supply and temperature, a front-mounted USB interface and IP65 degree of protection.

A panel front with a 12-inch display is available for the variant with keys. Panel fronts with 12- or 15-inch displays are available for the touch screen variant.

3.5.2 Panels with keys view

The following figure shows the front view of the SIMOTION panel front with keys.

The SIMOTION P012K panel front display has a resolution of 800 x 600 pixels.

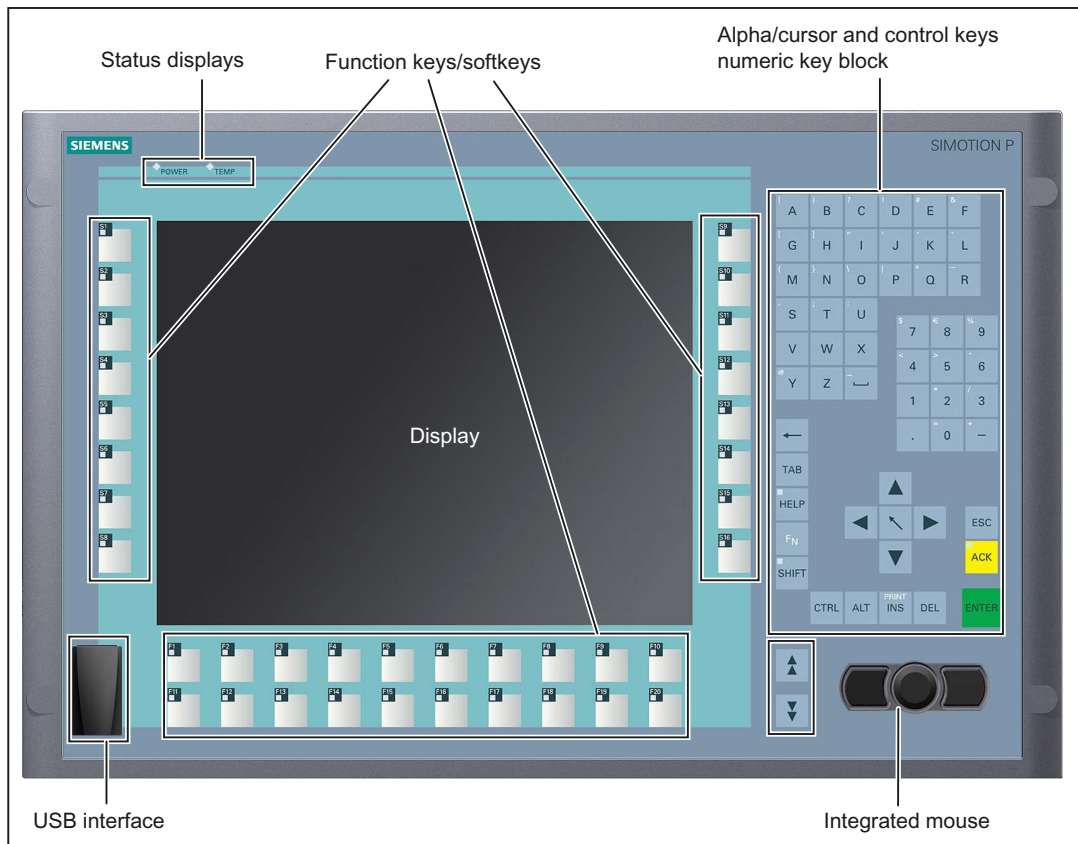


Figure 3-5 SIMOTION panel front with keys variant

3.5.3 Function blocks for panels with keys

The keys are grouped together in different keypads for different purposes:

- Function keys, softkeys
- Control keys
- Alpha keys
- Numerical keypad
- Cursor keys

Function keys, softkeys

Function keys are arranged on the left and right and in two rows below the display. The function keys are user-programmable and have LEDs.

Control keys

The control keys are used for general editing and control functions in the various applications.

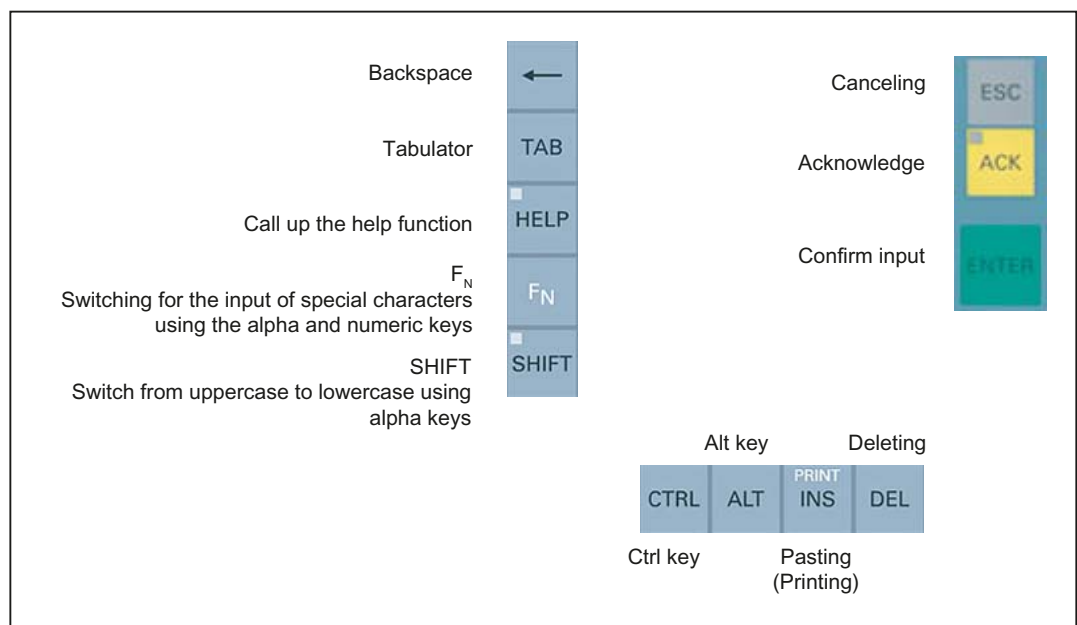


Figure 3-6 Control Keys

Note

When using SIMOTION P with a Windows operating system, you cannot enter the euro sign using the shortcut $\langle F_N+8 \rangle$.

Alpha keys

The alpha keys are used to enter letters, various special characters, blank spaces, and underscores:

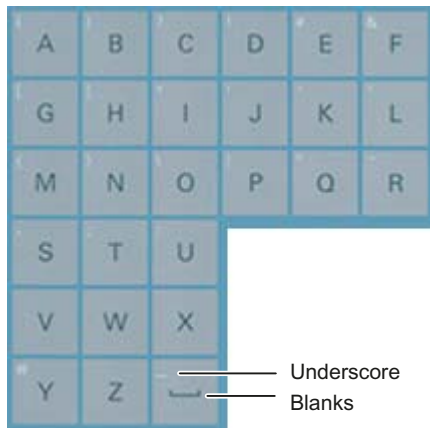


Figure 3-7 Alpha keys

Toggle between lowercase and uppercase characters

The default setting for alpha key input is lowercase characters. Hold down the SHIFT key to enter uppercase characters. The LED on the SHIFT key is illuminated; you can now enter uppercase characters with the alpha keys.

To enter lowercase characters, release the SHIFT key. The LED on the SHIFT key is no longer illuminated and you can enter lowercase characters again.

Entering special characters

Most of the alpha keys are also assigned with special characters. These are indicated by white symbols on the top left of the keys.

To enter a special character, hold down the <F_N> control key and press the corresponding alpha key. When you release the <F_N> key, you will be able to enter the default characters for the corresponding alpha key again.

Numerical keypad

The numerical keypad is used to enter the numbers "0" to "9", various special characters, "+" and "-", the hyphen "-", and the decimal point ".":

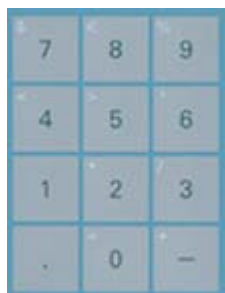


Figure 3-8 Numerical keypad

Entering special characters, arithmetic symbols, and signs

Most of the keys on the numerical keypad are assigned additional special characters, arithmetic symbols, or the plus sign. These are indicated by white symbols on the top left of the keys.

To enter a special character, an arithmetic symbol or the plus sign, press the <F_N> control key along with the corresponding key.

When you release the <F_N> key, you will be able to enter the default characters for the corresponding key again.

Cursor keys

The cursor keys are used for navigation (for example, scrolling) or moving the cursor.

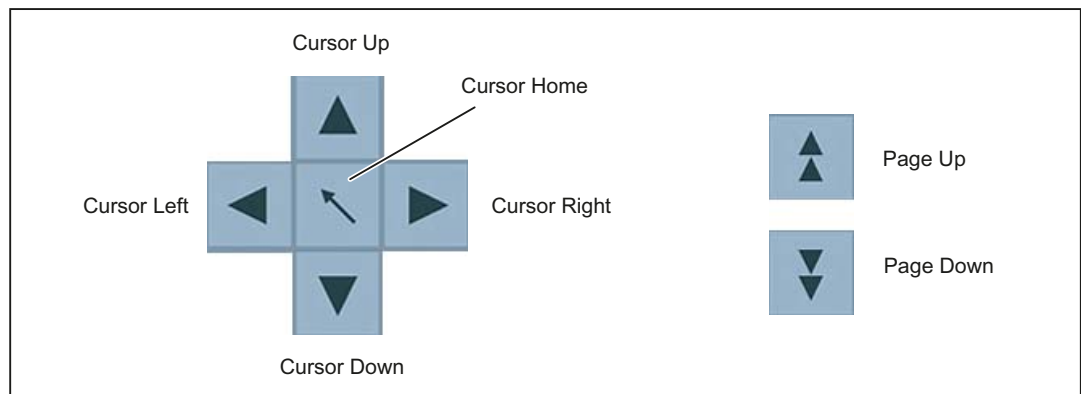


Figure 3-9 Cursor keys

Connecting external keyboards

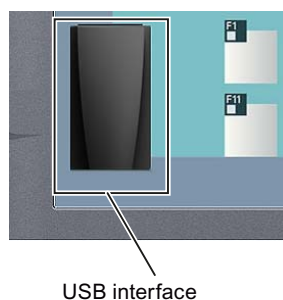


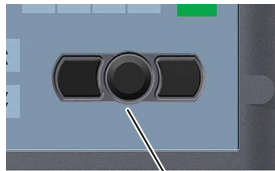
Figure 3-10 USB interface on the SIMOTION panel front

If you choose to use an external keyboard, a keyboard with the "English/USA international" layout is recommended.

The keyboard layout for Windows is also set up for "English/USA international". This ensures the use of standard key codes (for example, entering a "y" on the external keyboard and a "y" on the internal keyboard produces a "y" on the display in both cases).

3.5.4 Integrated mouse (only panels with keys)

The integrated USB mouse with 2 mouse buttons is a "piezoelectric mouse", i.e. the direction of the mouse pointer movements is determined by where pressure is applied on the round button in the center, and the speed of the mouse pointer movement is determined by the level of pressure applied. The parameters can be changed in "System Settings/Mouse".



Integrated mouse

Figure 3-11 Integrated mouse

If required, an external mouse can be connected to the front USB interface.

3.5.5 Panels with touch screen view

The following figure shows the front view of the touch screen variant of the SIMOTION panel front with display, including the USB interface and the status indicators.

The SIMOTION P012T panel front display has a resolution of 800 x 600 pixels.

The SIMOTION P015T panel front display has a resolution of 1024 x 768 pixels.

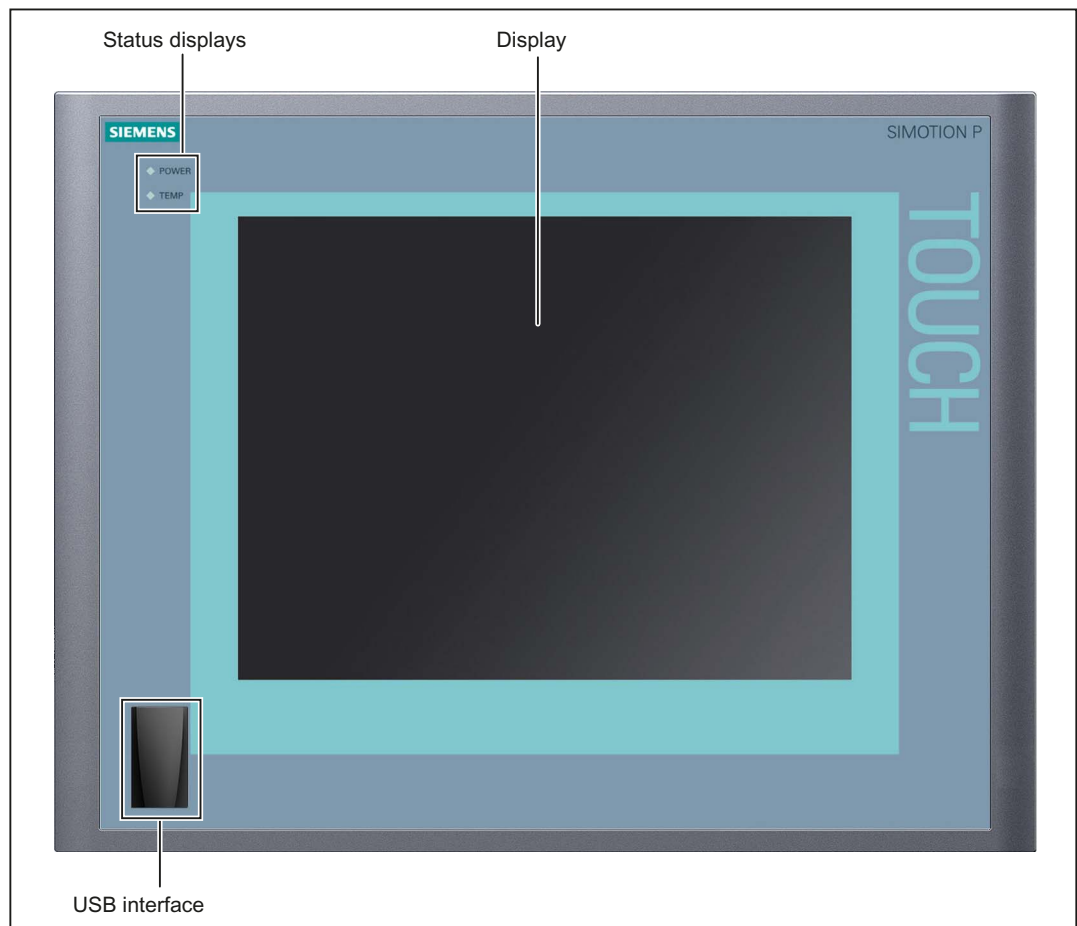


Figure 3-12 Panel with touch screen variant

operator control

The panel is operated by touching the application-specific functions shown on the touch-sensitive display with your finger (for example, by pressing a button on the display).

The resistive-type touch screen permits the user to operate it wearing gloves.

3.5.6 Panels interface description

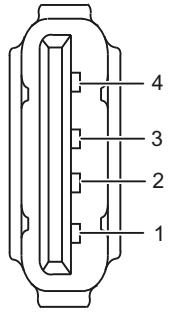
All of the panels have interfaces on the front and rear sides.

Front-mounted USB interface – standard USB 2.0

The USB interface is located at the front of the panel under the rubber cap. This interface can be used, for example, to connect an external keyboard or an external mouse.

Although additional USB devices (memory sticks, floppy drives, etc.) can be used, they can impair real-time capability (see the note below).

Table 3- 9 USB interface assignment on the panel front – standard USB 2.0

Layout	Pin	Name	Type	Comments
	4	GND	V	Ground for external USB interface
	3	+ Data	B	Data cable
	2	- Data	B	Data cable
	1	VCC	V	+ 5 V (fused) for external USB interface; Max. 100 mA; connect an external power supply for devices with higher power ratings.

Signal type

- V Voltage
- B Bidirectional VI

Note

The user can read the effect on the system software on the "Latency" tab in the SIMOTION P state tool. It displays there whether the installed software violates the real-time conditions. In case of doubt, please contact your local SIEMENS sales representative.

Note

Using a distributed configuration with the Panel PC Remote Kit reduces the data rate at the USB interface on the SIMOTION panel front.

Note

When using standard USB peripheral devices, please bear in mind that their EMC immunity level is frequently designed for office applications only.

Such devices are suitable for commissioning and servicing purposes; however, industrial components are recommended for normal operation in industrial environments.

NOTICE

IP65 degree of protection can no longer be guaranteed for an externally connected USB device. You can only assume a degree of protection IP20. This also applies if the rubber seal on the front-mounted USB interface is damaged or missing.

Rear-mounted interfaces

The SIMOTION panel fronts are usually supplied with an additional metal plate containing three cutouts for cable routing. The two ribbon cables used to connect the remote module (distributed configuration) as well as the USB cable, have to be connected to the interfaces on the remote module (see SIMOTION P320-3 and Panel Fronts Commissioning and Hardware Installation Manual). Removing this metal plate reveals the rear side of the panel front as shown in the figure.

- The USB I/O cable K1 at X1 is for all signals responsible for the connection of control units in addition to the display interface.
- Display cable K2
- USB cable

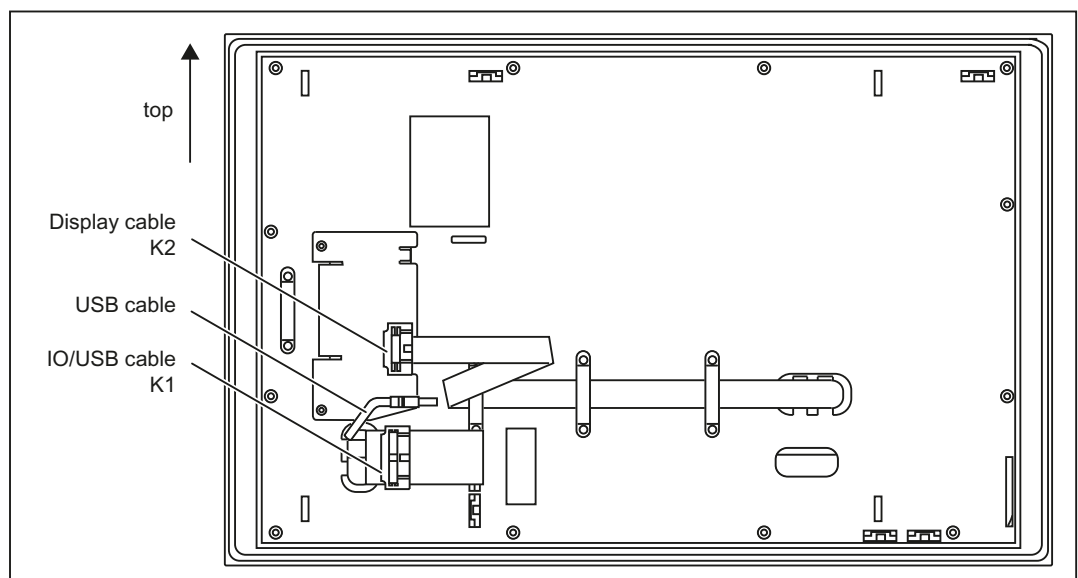


Figure 3-13 Interfaces on rear side of panel

See also

Assembly forms overview (Page 84)

3.5.7 Technical data for SIMOTION panel fronts

The data in the following tables is valid for all SIMOTION panel fronts.

SIMOTION panel front	P012K	P012T	P015T
Color display	12" TFT keyboard	12" TFT touch screen	15" TFT touch screen
Resolution	800 x 600	800 x 600	1024 x 768
MTBF backlighting	Typically 60,000 hrs (24-hour continuous operation, temperature-dependent)		
Keyboard and mouse			
Resistive analog touch screen	—	✓	✓
Membrane keyboard with alpha keys/numerical keypad	✓	—	—
Function keys	36 with LEDs	—	—
Labeling strips for function keys	✓	—	—
Front-mounted integrated mouse	✓	—	—
Dimensions			
Front			
- in mm	483 x 310	400 x 310	483 x 310
- in inches	19.0 x 12.216	15.75 x 12.216	19.0 x 12.216
Installation dimensions ¹⁾			
H x W x D			
- in mm	450 x 290 x 100	368 x 290 x 125	450 x 290 x 130
- in inches	17.72 x 11.42 x 3.9	14.49 x 11.42 x 4.92	17.72 x 11.42 x 5.12
Weight	Approximately 6 kg	Approximately 6 kg	Approximately 6 kg

¹⁾ Depth with computer unit mounted

Safety

Table 3- 10 Safety panels

Degree of protection according to EN 60529	IP65 at the front, with rubber cap fitted on USB port
Protection class	EN 61800-5-1
EMC compatibility	EN 61800-3
Certification	CE
Approvals	UL, cULus, CSA

Ambient conditions

Table 3- 11 Climatic environmental conditions

Climatic environmental conditions		
Heat dissipation	Through natural convection	
	Operation	Storage/transport
Temperature limits	5° C to 45° C	- 20° C to 60° C
Tested according to	EN 60068-2-1, EN 60068-2-2, EN 60068-2-14	
Limits for relative humidity	5% to 80% at 25° C	5% to 95% at 25° C
Tested according to	EN 60068-2-30	
Temperature change	Max. 10 K per hour	
Condensation	Not permissible	
Supply air	No corrosive gases	

Table 3- 12 Mechanical stress

Vibration and shock stressing in operation	
Tested according to	EN 60721-3-3, class 3M4

See also

Technical specifications of additional hardware components (Page 111)

3.5.8 SIMOTION panel fronts accessories

Components

The accessories comprise the following components:

Accessories	Order no.
Protective film to protect the touch screen front against soiling and scratching	
<ul style="list-style-type: none">for 12" touch screen (10 units)	6AV7671-2BA00-0AA0
<ul style="list-style-type: none">for 15" touch screen (10 units)	6AV7671-4BA00-0AA0
Film for labeling the function keys (10 units)	6AV7672-0DA00-0AA0

Accessories can be ordered online at <http://www.siemens.com/automation/mall>

3.6 Distributed configuration with the Panel PC Remote Kit

3.6.1 Overview of decentralized structure with the Panel PC Remote Kit

The Panel PC Remote Kit for a distributed configuration enables spatial separation between SIMOTION panel fronts and the SIMOTION P320-3.

After power-up, you can operate the SIMOTION P320-3 in the same manner as with the operator panel connected directly to the SIMOTION P320-3. All keys have the same action as for the directly connected operator panel.

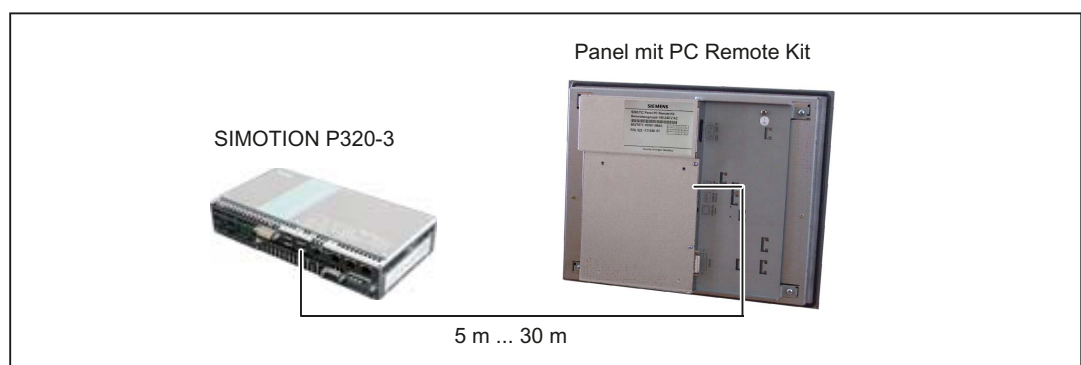


Figure 3-14 Example of a SIMOTION P320-3 distributed configuration with a panel front using the Panel PC Remote Kit

Validity

This description is valid for:

Designation	Order No.
Panel PC Remote Kit; 24 VDC	6AV7671-1EA0x-xAA1

Customer benefits

- Flat panel design with shallow mounting depth and low power loss
- Graphics: Resolution 800 x 600 to 1024 x 768 pixels; 16-bit color resolution
- Vibration-free installation of the SIMOTION P320-3 in the control cabinet
- Signal transmission between the SIMOTION P320-3 and the SIMOTION panel front via DVI-D and USB or USB extender cable (see Chapter Accessories for the Panel PC Remote Kit (Page 68))
- Easy installation and easy-to-service design through the component structure
- The distance between the SIMOTION P320-3 and the SIMOTION panel front can be up to 30 m

Requirements

- SIMOTION panel fronts (order no. 6AU1300-0xB00-0AA0)
- SIMOTION P320-3

Structure

Connections:

- DVI-D interface
- USB computer interface (> 5 m) RJ45
- 2 x USB 2.0 for the connection of external USB devices
- USB computer interface (≤ 5 m) USB B
- 24 VDC power supply: 3-pin Phoenix connector

3.6.2 Configurations

Note

Using a distributed configuration with the Panel PC Remote Kit reduces the data rate at the USB interface on the SIMOTION panel front.

Configuration for distances up to 5 m

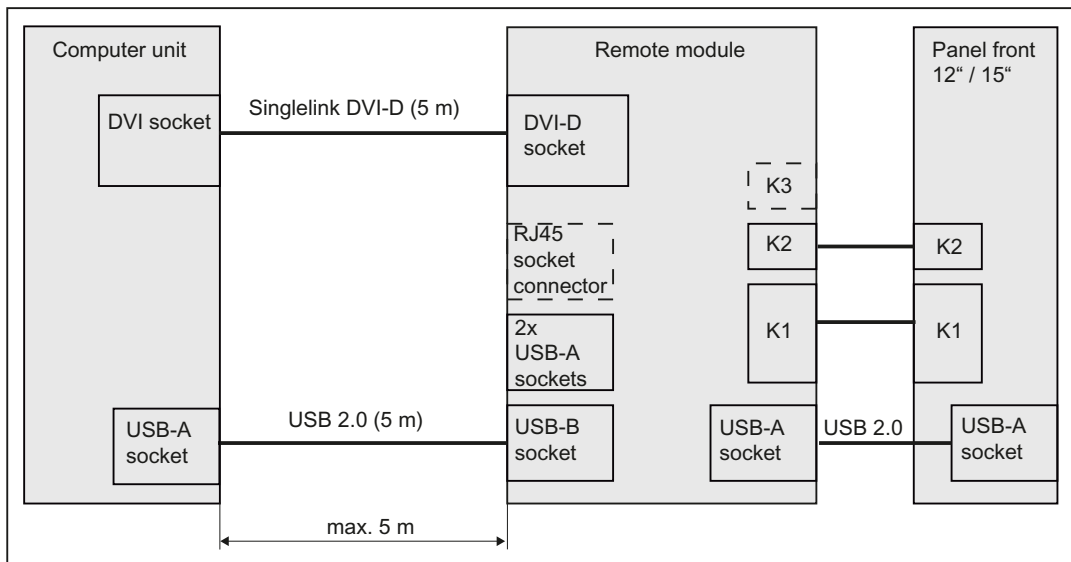


Figure 3-15 Configuration: Panel front using the Panel PC Remote Kit on the SIMOTION P320-3 (≤ 5 m)

Configuration for distances between 5 m and 30 m

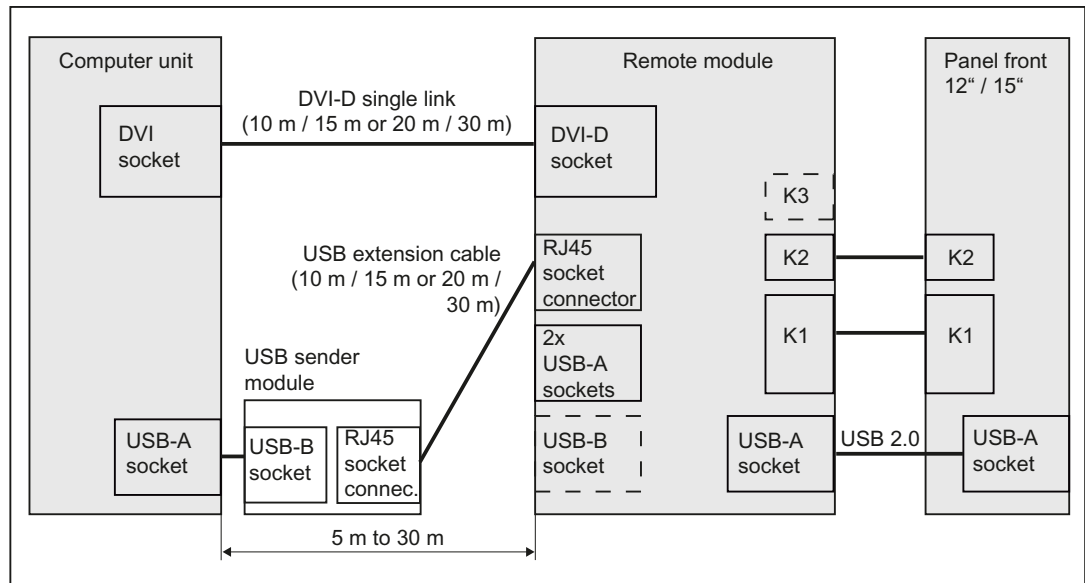


Figure 3-16 Configuration: Panel front using the Panel PC Remote Kit on the SIMOTION P320-3 (> 5 m)

3.6.3 Interface description for the Panel PC Remote Kit

Overview

The following figure shows the view of the Panel PC Remote Kit with its interfaces.

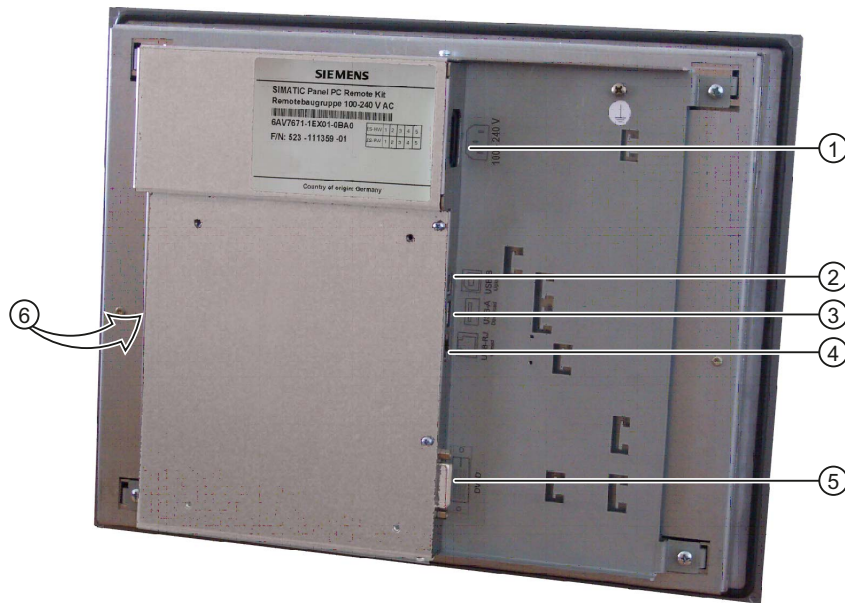


Figure 3-17 View of the Panel PC Remote Kit with its interfaces

Table 3- 13 Panel PC Remote Kit interfaces

No.	Function	Designation	Input/output	Type
①	Power supply	24 VDC	I	3-pin 24 VDC terminal block
②	USB computer interface (≤ 5 m)		I/O	USB socket, 4-pin, type B
③	USB 2.0 interface		O	USB socket, 2 x 4-pin, type A
④	USB computer interface (> 5 m)		I/O	8-pin standard RJ45 socket
⑤	DVI-D interface		I/O	(24 + 5)-pin socket
⑥	I/O USB interface ¹⁾	X44	I/O	2 x 13-pin plug connector
	USB 2.0 interface ¹⁾	USB	I/O	USB-A
	LVDS display interface ¹⁾	X300	O	2 x 10-pin plug connector

¹⁾ For the connection of a panel front

USB 2.0

Both interfaces are designed as high-current USB (500 mA).

Maximum cable length:

- Mouse, keyboard: 5 m
- If hub used: 3.5 m

*) Length including the supply cable to the hub and the connected terminal; only one hub is permitted. It should be noted that some keyboards already have a hub.

Interfaces for connecting a panel front

Interface	Description
X44	26-pin plug connector for the IO/USB cable K1 for connecting the panel front
USB	4-pin USB socket, type A, for connecting the USB cable from the panel front
X300	20-pin plug connector for the LVDS display cable K2 for connecting the panel front

Unless explicitly specified, you can obtain the pin assignment for the connections from section: SIMOTION P320-3 interfaces (Page 42).

3.6.4 Technical data for the Panel PC Remote Kit

Table 3- 14 Panel PC Remote Kit

Safety	
Degree of protection according to EN 60529	IP00
Approvals	CE/cULus (UL 508)
Electromagnetic compatibility	
	EN 61800-3
Voltage supply	
Rated voltage	24 VDC
Range	18 V to 36 VDC
Inrush current	42 A for 20 μ s
Power consumption, typ.	50 W
Mechanical specifications	
Dimensions W x H x D [mm]	337 x 269 x 53
Weight	1.8 kg

3.6 Distributed configuration with the Panel PC Remote Kit

Mechanical environmental conditions in operation		
Vibration resistance acc. to IEC 60068-2-6	10 Hz ... 58 Hz: 0.075 mm 58 Hz to 200 Hz: 9.8 m/s ²	
Shock stressing	50 m/s ² , 30 ms; 3 shocks per axis	
Climatic environmental conditions		
Heat dissipation	Free convection, without fan	
Condensation, splashwater and icing	Not permissible	
Supply air	Without caustic gases, dusts and oils	
	Operation	Storage/transportation (in transport packaging)
Relevant standards	EN 60068-2-1	EN 60068-2-14
Temperature limits	5° C to 50° C	-20° C to 60° C
Temperature change	Maximum of 10 K/hr	
Limits for relative humidity	5% to 85% at 25° C according to EN 60068-2-30	5% to 95% at 25° C according to EN 60068-2-56

3.6.5 Accessories for the Panel PC Remote Kit

Table 3- 15 Accessories for the Panel PC Remote Kit

Component	Description		Number	Order No.
Mounting bracket	SIMOTION P320-3	Mounting brackets for the SIMOTION P320-3 in the control cabinet	1 set (2 units)	A5E00417699
		Book mounting kit for the SIMOTION P320-3 in the control cabinet	1	6ES7648-1AA20-0YB0
Cable ¹⁾	Cable set for connecting the computer unit and the Panel PC Remote Kit	5 m; DVI-D and USB cable	1	6AV7671-1EX10-5AA0
		10 m; DVI-D and USB extension cable	1	6AV7671-1EX11-0AA0
		15 m; DVI-D and USB extension cable	1	6AV7671-1EX11-5AA0
		20 m; DVI-D and USB extension cable	1	6AV7671-1EX12-0AA0
		30 m; DVI-D and USB extension cable	1	6AV7671-1EX13-0AA0
Transmit module ¹⁾	USB interface for cable lengths > 5 m	Transmit module incl. USB cable 0.5 m	1	6AV7671-1EX02-0AA0

¹⁾ Included in the scope of delivery of the Panel PC Remote Kit

Application planning

4.1 Transport

Despite the device's rugged design, its internal components are sensitive to severe vibrations or shock. You must therefore protect the device from severe mechanical stress when transporting it.

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

CAUTION
Risk of damage to the device!
If you are transporting the device in extreme weather conditions with large fluctuations in temperature, care must be taken to ensure that no moisture forms on or in the device (condensation).
If condensation has developed on the device, wait at least 12 hours before you switch it on.

4.2 Unpacking and checking the delivery unit

Unpacking the device

Note the following when unpacking the device:

- It is advisable not to dispose of the original packaging material. Keep it in case you have to transport the device again.
- Please keep the documentation in a safe place. It is required for initial commissioning and is part of the device.
- Check the packaging and the package content for any visible transport damage.
- Verify that the shipment contains the complete device and your separately ordered accessories. Please inform your local dealer of any disagreements or transport damages.

Noting the device identification data

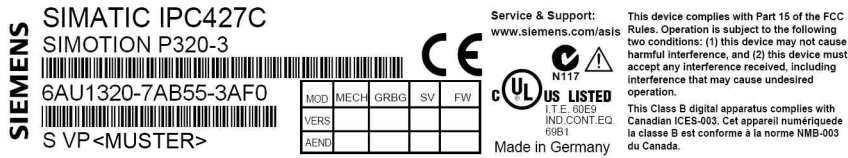
The device can be identified uniquely with the help of these numbers in case of repairs or theft.

Enter the data in the following table:

Serial number	S VP ...
Order number of the device	6AU1320-7AB55-3AF0
Microsoft Windows Product Key	
Ethernet address	

You can find the corresponding data here:

- Serial number: The serial number is available on the rating plate on the right-hand side of the device.



- Order number of the device: The order number is located on the rating plate.
- Ethernet address: The Ethernet address of the device is available in your BIOS Setup (<F2> key) at **Main > Hardware Options**
- Microsoft Windows "Product Key" from the "Certificate of Authenticity" (COA): The COA label is attached to the rear side of the device.

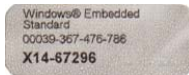


Figure 4-1 COA Label Windows Embedded Standard 2009

4.3 Ambient and Environmental Conditions

When you plan your project, you should make the following allowances :

- Observe the climatic and mechanical environment conditions described in section General specifications (Page 107).
- The device is approved for operation in closed rooms only.
- Avoid extreme ambient conditions. Protect the device against dust, moisture and heat.
- Do not place the device in direct sunlight.
- Ensure that the distance to other components or the sides of cabinets is at least 50 mm above and 100 mm below the device.
- Do not cover the ventilation slots of the device.
- Always observe the mounting positions permitted for this device.
- The connected or installed I/O must not generate a reverse voltage greater than 0.5 V in the device.




4.4 Mounting positions and fastening


Requirement

NOTICE
<p>The device is approved for operation in closed rooms only.</p> <p>Ensure that there is a minimum clearance to the other components or the walls of a housing:</p> <ul style="list-style-type: none"> • Below at least 100 mm • Above at least 50 mm

Mounting positions

Table 4- 1 Permissible mounting positions for the SIMOTION P320-3

Mounting position	Permitted temperatures / notes
Horizontal (preferred position) 	in RAL: 0 to +55° C
Vertical (power supply at the top) 	0 to +45° C Notes: When mounted on a DIN rail, the device should be secured to prevent shifting (e.g. with a DIN rail ground terminal). See Section Mounting on DIN rails (Page 76)
Suspended 	0 to +40° C Note: Mounting brackets are required if the device is suspended. See Section Mounting with mounting brackets (Page 77)

Mounting position	Permitted temperatures / notes
Book mounting 	0 to +45° C See Section Upright mounting (Page 79)

RAL = Restricted Access Location

(installation of the device in operating facilities with restricted access - for example, a locked control cabinet)

4.4.1 Permissible mounting positions of the panel front

Approval

Certain mounting positions are permitted for the SIMOTION panel fronts.

Permissible mounting positions for the SIMOTION panel front

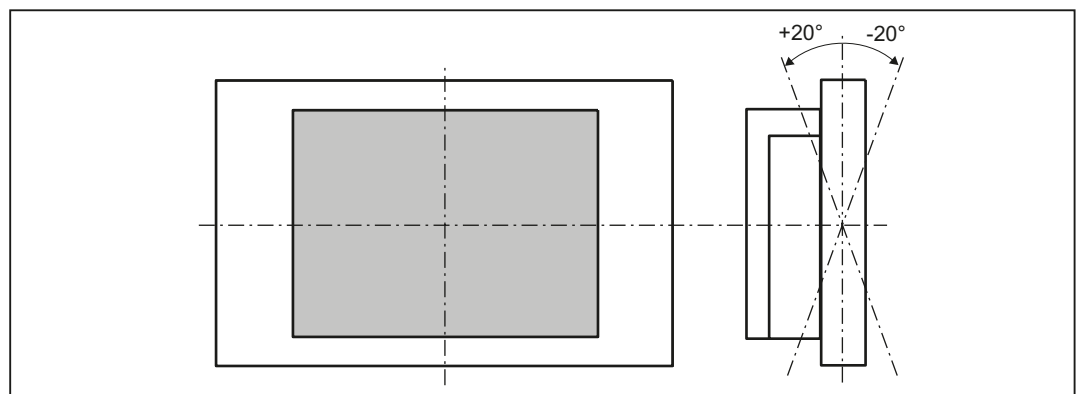


Figure 4-2 Permissible mounting position of the panel front

Vertical installation and deviations of up to +20° and -20° in the given directions is permissible.

Note

The mounting position illustrated has been tested and approved. In the event of deviations from it, you might need to have additional tests carried out to verify compliance with the general conditions applicable for the components used (e.g. temperature). Siemens can provide appropriate support on request.

4.4.2 Type of fixation

The control unit is secured in the mounting cut-out either with clamps or screws.

NOTICE

Securing with screws is not possible with the 12" touch screen variant.

Select the mounting type suitable for your requirements for the degree of protection.

4.4.3 Degree of protection

Principles

The degree of protection provided by the front side can only be guaranteed when the mounting seal lies completely against the mounting cutout.

CAUTION

Please ensure that the material strength at the mounting cutout does not exceed 6 mm. Please follow the specifications for the dimensions, see Panel front dimensions (Page 122) and SIMOTION panel fronts installation dimensions (Page 123).
--

The degrees of protection are only guaranteed when the following is observed:

- | |
|--|
| <ul style="list-style-type: none">• The material strength at the mounting cutout is at least 2 mm.• The deviation of the evenness of the mounting cutout with an HMI device installed is ≤ 0.5 mm relative to the outside dimensions of the HMI device. |
|--|

Degree of protection IP65

The IP65 degree of protection is only provided for a clamp mounting together with a ring seal.

Degree of protection IP54

This degree of protection is provided for screw mounting.

Installing/Mounting

5.1 Installing SIMOTION P320-3

5.1.1 Mounting information

Requirement

Before you install the device, read the following mounting instructions.

NOTICE

Adhere to the relevant DIN/VDE requirements or the country-specific regulations when installing in control cabinets.
--

NOTICE

Ensure that the device is classified as "Open Type" when using it in the area of Industrial Control Equipment (UL508). A UL508 conform enclosure is therefore a mandatory requirement for approval or operation according to UL508.

Types of installation

The following SIMOTION P320-3 installation types are permitted and described in the following sections:



- Mounting onto standard rail (Page 76)
- Mounting with mounting brackets (Page 77)
- Book mounting (Page 79)

5.1.2 Mounting on DIN rails

Mounting the device on standard rails

Note

Use of Siemens 35 mm standard mounting rail is recommended.

Steps for mounting on standard rail	
<p>1. Set the device inclined on the standard rails.</p>	
<p>2. Swing the device fully onto the rails until both clamps completely latch.</p>	

Note

To ensure secure vertical mounting on standard rails, a rail ground terminal should be mounted beneath the device.

NOTICE

The rails are secured to a wall or cabinet similar to mounting with mounting brackets. Ensure that the wall or ceiling can hold four times the total weight of the device (including the rails and additional expansion modules). See also section Mounting with mounting brackets (Page 77).

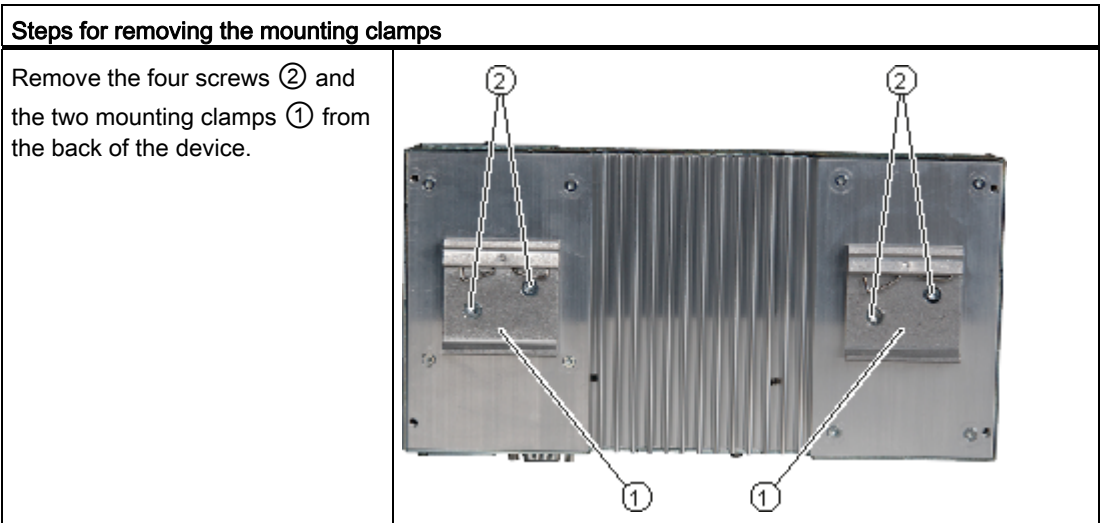
Removing the device from the mounting rails

- Push the device down until the clamps release it.
- Swing the device away from the rails.

5.1.3 Mounting with mounting brackets


Removing mounting clamps from the device

Two mounting clamps are factory installed on the device for mounting onto standard rail. These need to be removed before mounting the mounting brackets.



Mounting brackets on the device

Two mounting brackets are included in the device package. They can be attached to the device with four screws supplied.

Steps for installing the mounting brackets	
Install the mounting brackets on the device.	

Note

Required tools

You need a TORX T20 screwdriver to remove the mounting clamps and mount the mounting brackets.

Mounting/installing the device

For dimensions of the device variants with mounting clamps see Dimension drawings of the device with mounting brackets (Page 119).

Examples of mounting types		
Material	Hole diameter	Fixing
Concrete	8 mm diameter 60 mm depth	Dowel: 8 mm diameter 50 mm length Screws: 4 mm diameter 50 mm length
Plasterboard (min. 13 mm thick)	14 mm diameter	Cavity fixings: 4 mm diameter 50 mm length
Metal (min. 2 mm thick)	5 mm diameter	Metal screws M 4: 4 mm diameter 15 mm length

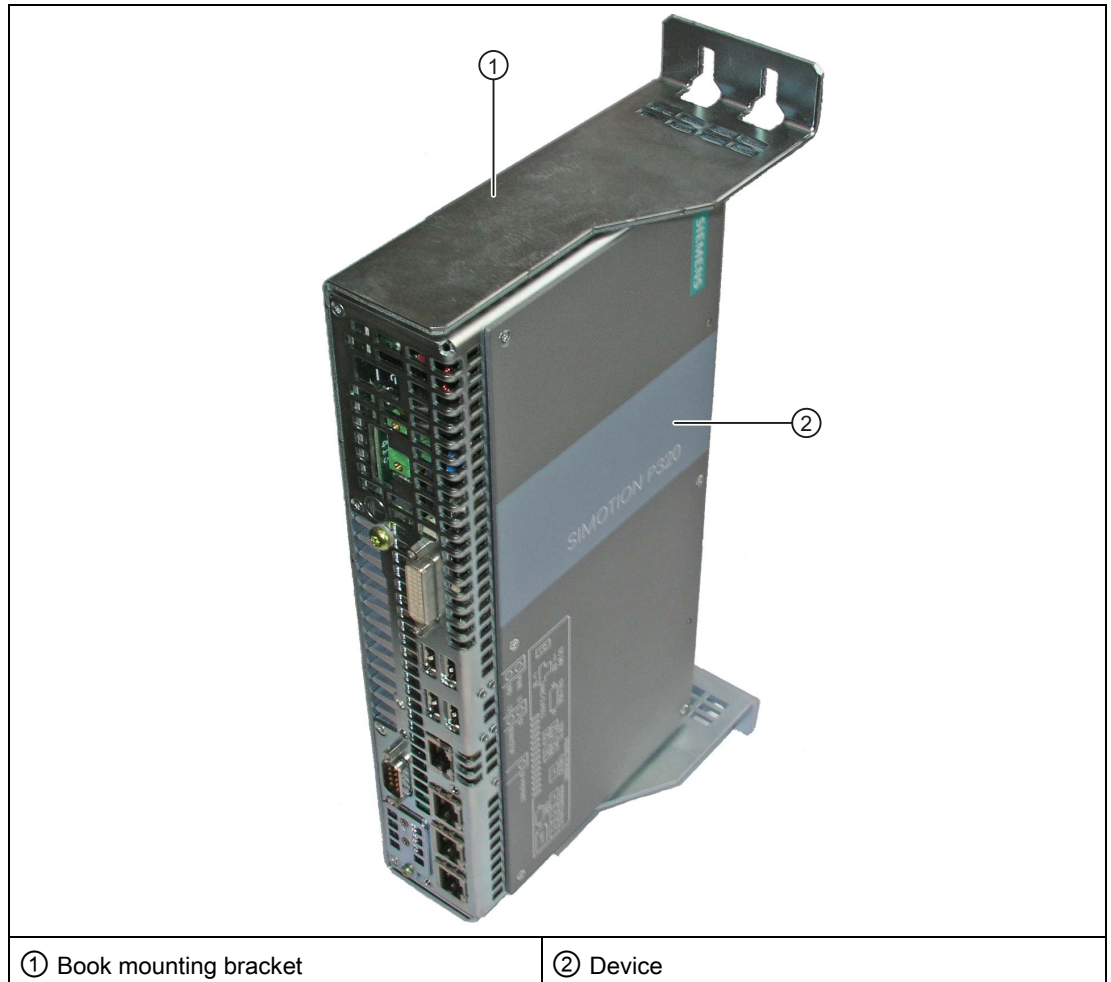
WARNING

Ensure that the wall or ceiling can hold four times the total weight of the device (including the mounting brackets and additional expansion modules).

5.1.4 Upright mounting

The optionally available book mounting front kit allows a space-saving installation.

Fixing the book mounting bracket to the device



Note

Information on installation and operation is available in the supplement of the accessories.

Table 5- 1 Spare parts and accessories

Parts for the SIMOTION P320-3	Order No.	Scope of delivery	Accessories
Book mounting kit	6ES7648-1AA20-0YB0		x

You can order the book mounting kit via the Siemens A&D Mall (<http://www.siemens.com/automation/mall>).

5.2 Installing/removing an accessible CompactFlash card

Memory expansion options

The device features an accessible slot for CompactFlash cards (types I / II).

Only use SIMATIC PC CompactFlash cards for industrial application.


 CAUTION
Replace the CompactFlash card only with a card of the same product version.
Only SIMATIC PC CompactFlash cards with product version 02 (ES 02) can be used for this device.




Figure 5-1 SIMATIC PC CompactFlash



Figure 5-2 SIMATIC PC CompactFlash 4 GB - rear side with product version ES 02

Preparation

 CAUTION
Data loss is possible on the CompactFlash card
Insertion/withdrawal of the CompactFlash card (CF card) while the device is switched on can result in data loss on the CF card.
Exit the running software applications via the menu Start > Shut down , switch the device off via the ON/OFF switch and disconnect the device from the power supply.

Note

The device is delivered with deactivated EWF (Enhanced Write Filter).

After commissioning the device, activate the EWF for drive C; this ensures the following:

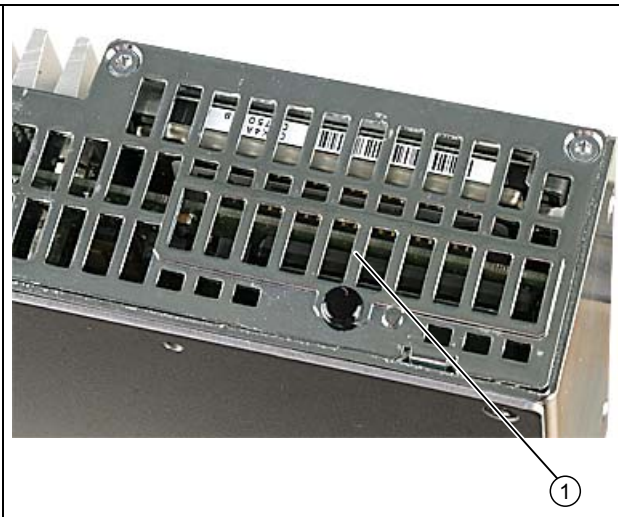
- An extended service life for the CF card
- No data loss when switching the device off via the line side switch or through disconnection from the power supply

⚠ CAUTION

The electronic components on the PCBs are highly sensitive to electrostatic discharge. Always take appropriate precautionary measures when handling these components. Refer to the directives for handling components that are sensitive to electrostatic charge. ESD guidelines (Page 141).

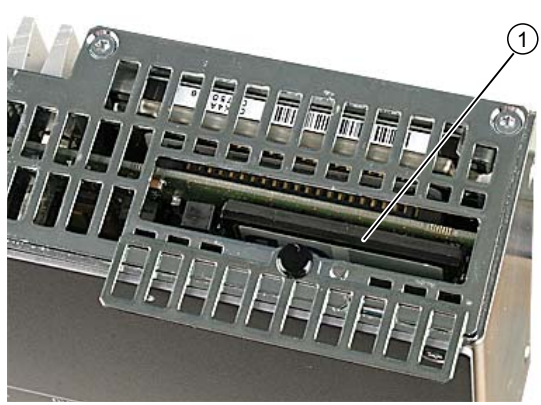
Opening the module receptacle

To open the module receptacle, turn the cover plate ① of the module receptacle 180 degrees counter-clockwise.




Installing the CompactFlash card

Steps for installing a CF card	
1	Open the module receptacle.
2	Insert the CF card with the connector facing in until it locks in the slot ①.
3	Close the module receptacle again.



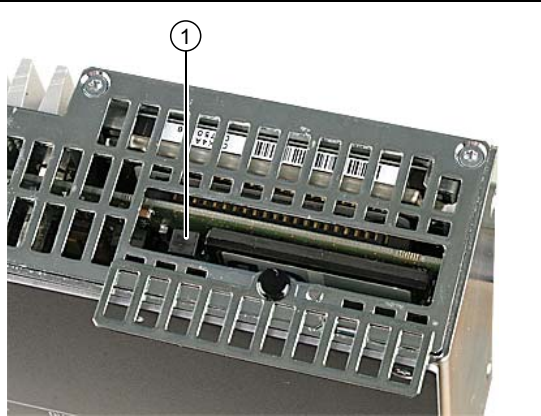
Note

The CompactFlash slot is coded against reversed insertion of the CF card. Insert it so that its upper side (label side) is facing the front panel of the device.

 CAUTION
If the CF card meets resistance, flip it over. Never insert the CF card with force.

Removing the CompactFlash card

Steps for removing a CF card	
1	Open the module receptacle.
2	Press the eject button ① and remove the CF card.
3	Close the module receptacle again.



See also

Slot for CompactFlash card (Page 48)

Available spare parts and accessories (Page 133)

5.3 Assembly forms overview

Various installation types are available for installing a SIMOTION P320-3.

The installation is in a distributed configuration, i.e. the panel is connected to the SIMOTION P320-3 in different physical locations. This requires several additional components that must be attached to the panel front or the SIMOTION P320-3.

As an alternative, the SIMOTION P320-3 can be installed without panel front (headless).

NOTICE
Securing with screws is not possible with the 12" touch screen variant.

Note

The installation and the removal of components and the mounting of the complete system are described in detail in the SIMOTION P320-3 and Panel Fronts Commissioning and Hardware Installation Manual.

5.4 Distributed configuration

5.4.1 Overview of decentralized structure

The distributed configuration makes it possible to connect SIMOTION panel fronts in different physical locations to a SIMOTION P320-3. The greater flexibility in terms of location allows the SIMOTION P320-3 to be positioned in non-critical areas of a plant (e.g. control cabinet).

The essential characteristics of a Panel PC Remote Kit are as follows:

- Signal transmission between SIMOTION P320-3 and SIMOTION panel front via DVI-D and USB or USB extender cable
- The distance between the SIMOTION P320-3 and the SIMOTION panel front can be up to 30 m
- Graphics resolutions: 800 x 600 to 1024 x 768 pixels; color resolution: 16 bits (specific to the panel front used)
- Interfaces on the remote module:
 - DVI-D interface
 - USB computer interface (> 5 m) RJ45
 - 2 x USB 2.0 for the connection of external USB devices
 - USB computer interface (≤ 5 m) USB B
 - Interfaces to the SIMOTION panel front:
 - LVDS interface (picture signals)
 - I/O USB interface (keys)
 - USB interface (for connection to front-mounted USB interface)
- External 24 VDC power supply required

Note

Using a distributed configuration with the Panel PC Remote Kit reduces the data rate at the USB interface on the SIMOTION panel front.

See also

Accessories for the Panel PC Remote Kit (Page 68)

5.4.2 Components for decentralized structure

The distributed configuration comprises several subcomponents based on the modular principal; it is suitable for all SIMOTION panel fronts:

- SIMOTION P320-3 (DVI interface and USB 2.0 port)
- Panel PC Remote Kit for mounting on a TFT operator panel front
- Cable set for connecting the computing unit and the Panel PC Remote Kit (5 m to 30 m)
- USB transmitter module for cable lengths > 5 m
- Installation-specific mounting kits, such as
 - Flat mounting brackets for fastening the SIMOTION P320-3 in the control cabinet
 - Book mounting brackets for fastening the SIMOTION P320-3 in the control cabinet

5.4.3 Mounting the Panel PC Remote Kit on a SIMOTION panel front

Procedure

To mount the Panel PC Remote Kit on a SIMOTION panel front, proceed as follows:

1. Attach the fastening hooks on the remote module to the panel front on the same side as the connecting cables.

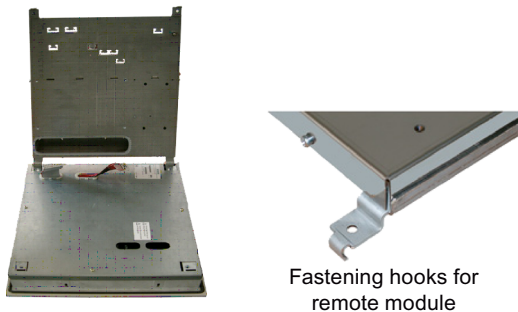


Figure 5-3 Hooking the remote module into the SIMOTION panel front

2. Connect the two flat cables K1 and K2, along with the USB cable on the panel front, to the remote module. Only use the white sockets and the USB socket as illustrated below.

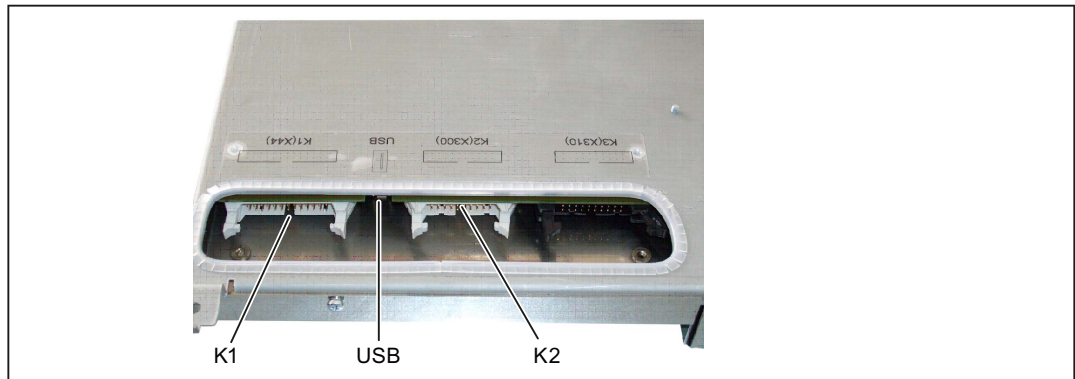


Figure 5-4 Interfaces for the connection of the SIMOTION panel front

3. Attach the remote module to the panel front and hook the fastening hooks to the second side.
4. Fasten the remote module to the SIMOTION panel front with four screws.

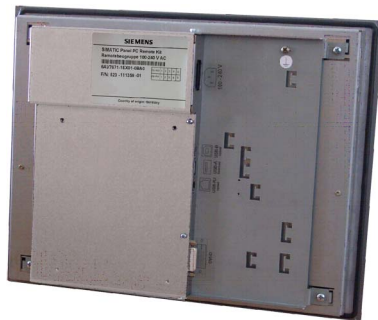


Figure 5-5 Ready-mounted remote module on the SIMOTION panel front

See also

- Interface description for the Panel PC Remote Kit (Page 66)
- Accessories for the Panel PC Remote Kit (Page 68)
- Panels interface description (Page 58)
- Connection components (Page 37)

5.5 Mounting the SIMOTION panel front

5.5.1 Overview of the mounting of SIMOTION panel fronts

With the exception of the SIMOTION P012T variant, the panels can be fastened either with screws or with clamps. Latch fasteners have to be used for the SIMOTION P012T variant.

IP65 degree of protection can be achieved by using mounting brackets (in conjunction with a surrounding seal).

Suspended screw mounting ensures only IP54 degree of protection.

Mounting position

As a unit with the Panel PC Remote Kit, the SIMOTION panel front may be installed in a vertical position with a maximum inclination of $\pm 20^\circ$.

Dimension drawings for the installation, see SIMOTION panel fronts installation dimensions (Page 123):

5.5.2 Securing the panel front with clamps

Skip this step if you have selected "Fasten panel front with screws" (Page 90).

Securing with clamps

A mounting kit containing six metal bar-type brackets with setscrews is provided for securing the clamp. The metal brackets are hooked into the slots on the panel front next to the seal area and are secured to the mounting surface using the setscrews supplied.

The SIMOTION P012T panel front can only be installed using latch fasteners.

Tension jacks with setscrews

The side view of the mounting brackets shows the projections that hook into the mounting slots on the panel front.

Requirement

- The mounting cutout has been opened.
- Latch fasteners are readily available in the accessories. Clamps and setscrews are included in the scope of delivery.



Figure 5-6 Clamp assembly

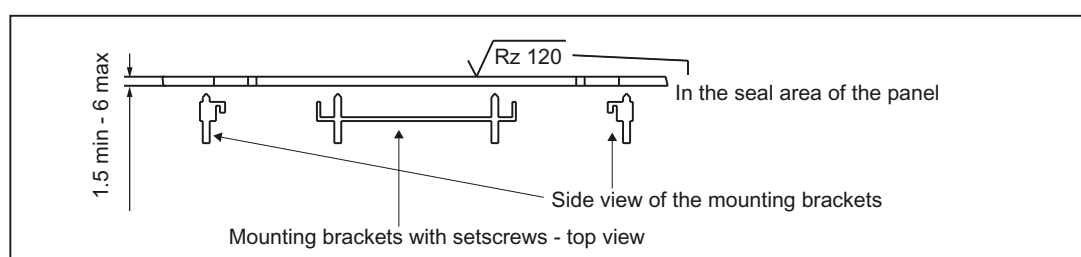


Figure 5-7 Mounting brackets with setscrews - top view

Procedure

Proceed as follows to install:

1. Follow the installation instructions!
2. Insert the SIMOTION panel front (with the Panel PC Remote Kit, if necessary) into the prepared mounting cutout from the front.
3. Secure the SIMOTION panel front to prevent it falling out of the mounting cutout.
4. Hook the brackets into the designated slots on the sides of the panel fronts, matching up the brackets with the dimensions of the mounting cutouts.
5. Secure the control unit in the mounting cutout from behind by tightening the setscrews (torque 0.4 Nm to 0.5 Nm).

CAUTION

Risk of damage to the panel front

If you tighten the screws to a higher torque, this can damage the panel front (e.g. in the form of fissures). Consequently, you should ensure strict compliance with the specified values.

Note

The mounting depth increases by 21 mm when an optical drive is installed in the device.
Take the dimensions from the dimension drawings.

5.5.3 Securing the panel front with screws

Skip this step if you have selected "Fasten panel front with clamps" (Page 88).

NOTICE

Securing with screws is not possible with the 12" touch screen variant (SIMOTION P012T).
--

Requirement

The mounting cutout has been opened.

Procedure

To screw on the panel front, proceed as follows:

1. Follow the installation instructions.
2. Drill four mounting holes at the prepared mounting cutout in accordance with the specified installation dimensions.
3. Carefully drill the front drill-hole covers on the control unit from behind.

CAUTION
Ensure that no metal cuttings enter the device. Cover the device with plastic sheeting, or use a suction device when drilling.

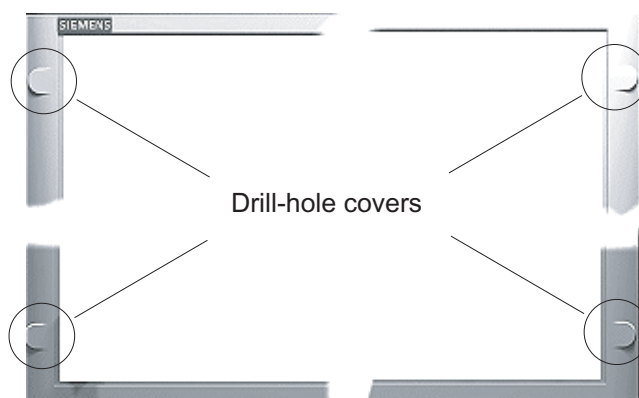


Figure 5-8 Designated location for holes on the control unit

4. Place the assembled control unit and computer unit components into the recessed mounting cutout from the front so that the holes are aligned.
5. Secure the control unit by inserting suitable screws through the holes and attaching nuts (torque 0.4 ... 0.5 Nm).

Note

The mounting depth increases by 21 mm when an optical drive is installed in the device. Take the dimensions from the dimension drawings.

Connecting

6.1 Requirements

General

During the installation of SIMOTION modules, you must pay attention to the "Electrical configuration design".

This chapter will also provide information on wiring and networking a complete SIMOTION system.

Further information on the connection of the complete system and the individual components can be found in the SIMOTION P320-3 and Panel Fronts Commissioning and Hardware Installation Manual.

Open equipment

These modules are open equipment. This means they may only be installed in housings, cabinets, or in electrical equipment rooms that can only be entered or accessed with a key or tool. Housings, cabinets, or electrical equipment rooms may only be accessed by trained or authorized personnel. An external fire-protection housing is required.

Observe the following points during installation:

- The device may only be connected to 24 VDC power supplies that meet the requirements of safe extra low voltage (SELV). The cable cross-section must be chosen large enough to ensure that no damage can result from a cable overheating in the event of a short-circuit in the SIMOTION P320-3.
- Avoid extreme environmental conditions as far as possible.
- Protect the device against dust, moisture, heat and severe vibration.
- Do not subject the SIMOTION P320-3 to direct sunlight.
- Install the device in such a way that it poses no danger, for example, by falling over.
- The clearance around the SIMOTION P320-3 must be at least 50 mm above and 100 mm below to ensure adequate ventilation.
- Do not cover the ventilation slots.

6.2 Overview of connections

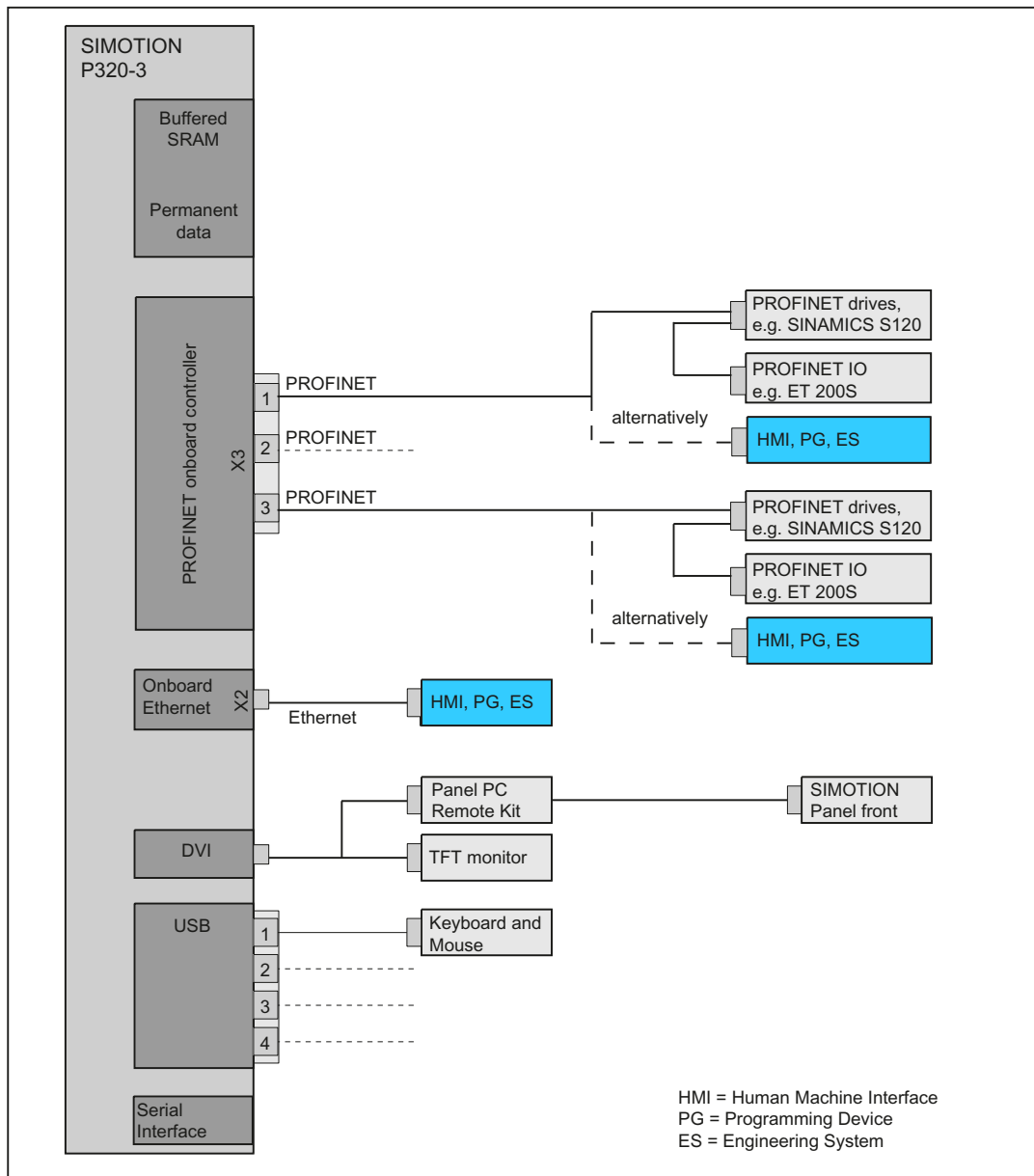


Figure 6-1 Hardware system overview - example with PROFINET onboard controller

The figure shows the SIMOTION P320-3 interfaces to which appropriate I/Os can be connected.

Any cabling made to all elements and components of the complete system may be done only when disconnected from the mains. The order of making connections is immaterial.

Further information on the connection of the individual components can be found in the SIMOTION P320-3 and Panel Fronts Commissioning and Hardware Installation Manual.

6.3 Connecting peripheral equipment

NOTICE

Connect only peripheral devices approved for industrial applications conforming to EN 61000-6-2 / IEC 61000-6-2.

CAUTION

Strictly adhere to the specifications for the peripheral devices.

NOTICE

The connected or built-in peripherals, such as USB drives, should not introduce a counter-EMF into the device.

Generation of reverse voltage greater than 0.5 V to ground on + 3.3 VDC / + 5 VDC / + 12 VDC at a connected or installed component can prevent normal operation or destroy components of the device.

6.4 Connecting the 24 V DC power supply

To be noted before you connect the device

Note the following in order to operate the device safely and according to regulation:

! WARNING

The device should only be connected to a 24 VDC power supply which satisfies the requirements of safe extra low voltage (SELV).

If the device is used on a wall, in an open rack or other similar locations, an NEC Class 2 current source is required in order to meet the UL requirements (UL 60950-1). In all other cases (IEC / EN / DIN EN 60950-1) either a current source of limited output (LPS = Low Power Source), or a line-side fuse or a line-side circuit breaker is necessary. The power needs to be limited to a value below 4.16 A. The fuse value required: Max. 4 A.

Use the special plug supplied to connect the supply voltage. Connect the protective conductor (see Chapter PE terminal (Page 97)).

NOTICE

The permitted cable cross-section for the 24 VDC connection is 0.75 mm² to 2.5 mm².

NOTICE

If a CompactFlash card is used in the device, make sure that the card is seated correctly before you connect it.

Connecting

Proceed as follows for connecting the device to the 24 VDC power supply:

1. Switch off the 24 VDC power source.
2. Connect the power supply using the plug (included in the package).
3. Connect the PE conductor.



Figure 6-2 Connecting the device to the 24 VDC power supply

6.5 Protective ground connection

Device safety

The PE terminal is needed to protect the device and ensures that interference signals generated by external power cables, signal cables or cables to the I/O modules are safely discharged to ground.

Required tools

Required tool for protective earth terminal: TORX T20 screwdriver

Procedure

Connect the PE terminal (M4 thread) ① on the device (large contact surface) to the PE conductor on the cabinet or system in which the PC will be installed. The minimum conductor cross-section may not be less than 5 mm².

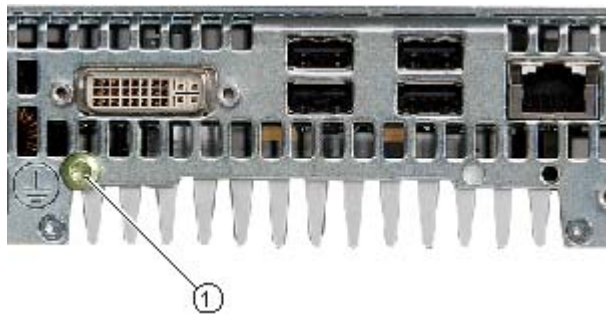


Figure 6-3 Connecting the protective earth

6.6 USB strain-relief

The USB strain-relief provided as an accessory is used to prevent accidental loosening of the USB cable from the device. A cable binder (not included in the package) is needed to use this accessory.

Required tools

To fix the USB strain relief, you will need a TORX T20 screwdriver.

Procedure

To attach the USB strain relief, proceed as follows:

1. Fasten the USB strain-relief ① to the device housing with an oval-head screw (M4 thread).
2. Thread the cable tie ② through the comb of the USB strain-relief to fasten the USB cable.

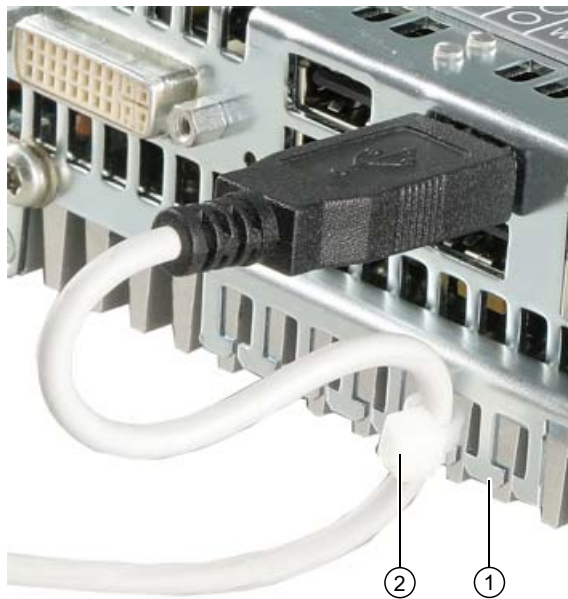
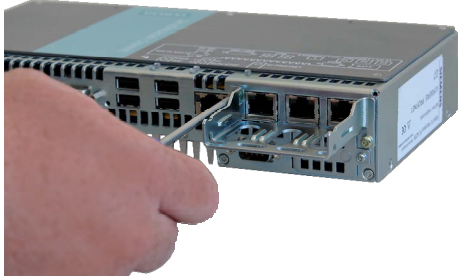
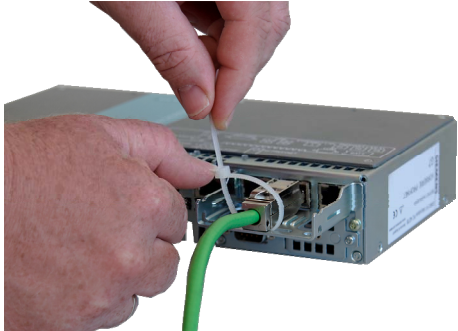


Figure 6-4 USB strain-relief

6.7 PROFINET strain relief

The PROFINET strain relief provided in the package is used to prevent accidental loosening of the cable from the device. One cable tie (not included in the package) is required for each interface.

To fix the PROFINET strain relief, you will need a TORX T10 screwdriver.

Attaching the PROFINET strain relief		
1	Attach the PROFINET strain relief.	
2	Attach the cable using the cable tie.	

Service and maintenance

7.1 Preventive maintenance

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

Component	Exchange interval:
CMOS backup battery	5 years

7.2 Replace the backup battery

To be noted before you replace the battery

Note

The service life of a backup battery is approximately 5 - 8 years, depending on the operating conditions.

CAUTION

Risk of damage!

The lithium battery may only be replaced with an identical battery or with a type recommended by the manufacturer (order number: A5E00331143).

WARNING

Risk of explosion and release of harmful substances!

Therefore, do not throw lithium batteries into an open fire, do not solder or open the cell body, do not short-circuit or reverse the polarity, do not heat to above 100° C, dispose of them in accordance with regulations, and protect them from direct exposure to sunlight, humidity, and condensation.

Note

A backup battery maintains the contents of the SRAM data on the SIMOTION P320-3 after the power supply is switched off.

Battery warning

The 3 V lithium battery to back up the SRAM and the clock module is monitored in two stages:

Battery voltage	Message
2.7 V \pm 0.1 V	Diagnostic buffer entry: Battery warning Battery warning threshold reached
2.25 V \pm 0.25 V	Diagnostic buffer entry: Battery failure Voltage below limit

In order to prevent data being lost, the battery should be replaced once the "Battery warning" entry appears in the diagnostic buffer or, at the very latest, the first time the "Battery error" entry appears in the diagnostic buffer.

Disposal

CAUTION

Batteries must be disposed of in accordance with local regulations.

Preparation

Note

The configuration data and contents of the SRAM in the device are buffered for at least 30 seconds.

Preparation – note the BIOS settings

Note

For the BIOS setting "Profile: Standard", the configuration data of the device will be deleted when the battery is replaced.
For the BIOS setting "Profile: User", the configuration data of the device will be retained; only the date and time needs to be reconfigured.

1. If necessary, note any specific BIOS setup settings if changes have been made.
2. Isolate the device from the power supply and disconnect all connecting cables.

Preparation – save SRAM data

As a result of replacing the battery (SRAM not backed up during this time), data loss may occur in the SRAM of the SIMOTION P320-3.

1. To avoid a lengthy repeat of the commissioning procedure, ensure that a backup of the non-volatile data is available before changing the battery. This is performed, for example, automatically when Windows is shut down correctly.
2. Correctly close the SIMOTION P320-3 or Windows.

To do this, use the Windows task bar: **Start > Shut Down**

Note

If Windows was not shut down properly before backup battery replacement, loss of bit values in SRAM memory cells during battery replacement cannot be detected reliably.

SIMOTION P must then undergo an overall reset.

Tool


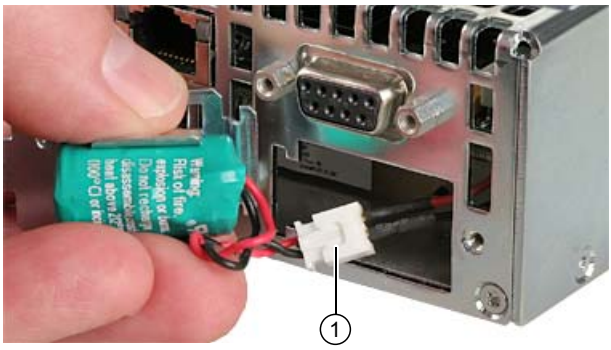
You will need a TORX T8 screwdriver to open the battery compartment.

Replacing the battery

NOTICE
The battery can also be replaced when the device is operating. However, we recommend switching off the device beforehand.

Proceed as follows:

7.2 Replace the backup battery

Steps for replacing the battery		
1	Open the battery compartment.	
2	Remove the battery holder.	
3	Pull out the battery plug ①.	
4	Reconnect the battery plug to the new battery.	
5	Take the old battery out of the holder.	
6	Secure the new battery in the holder.	
7	Close the battery compartment.	

Reconfiguring the BIOS Setup

If the battery replacement has been performed while the device is running or does not take longer than 30 seconds when the device is switched off, the BIOS settings will be retained. The SRAM and CMOS data of the SIMOTION P320-3 is certainly deleted only when the battery is disconnected for a longer period of time (more than 15 minutes) and in the switched-off state.

The BIOS Setup must be performed again if the data has been cleared. The CMOS data must be restored to the default values; the date, time, and any special settings must be set again.

Exception:

If the CMOS data has been saved previously with a USER profile, only the date and the time may be set again. All other settings will be made automatically. This means that the default values must not be loaded in this special case.

Troubleshooting/FAQs

8.1 General problems

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

Problem	Possible cause	To correct or avoid error
The device is not operational.	There is no power supply to the device.	<ul style="list-style-type: none"> Check whether the 24 VDC power supply is connected (see Connecting the power supply (24 VDC) (Page 96)). Check whether the line side switch is activated (see Operator controls (Page 38)).
The monitor remains dark.	The monitor is switched off.	Switch on the monitor.
	The monitor is in "powersave" mode.	Press any key on the keyboard.
	The brightness button has been set to dark.	Set the monitor brightness button to obtain more light. For detailed information, refer to the monitor operating instructions.
	The power cord or the monitor cable is not connected.	<ul style="list-style-type: none"> Check whether the power cord has been properly connected to the monitor and to the system unit or to the grounded shockproof outlet. Check whether the monitor cable has been properly connected to the system unit and to the monitor. <p>If the monitor screen still remains dark after you have performed these checks, please contact your technical support team.</p>
The mouse pointer does not appear on the screen.	The mouse driver is not loaded.	Check whether the mouse driver is properly installed and present when you start the application program. For more detailed information, refer to the manuals for the mouse or application programs.
	The mouse is not connected.	<p>Check whether the mouse cord is properly connected to the system unit. If you use an adapter or extension on the mouse cable, also check the connectors.</p> <p>If the mouse pointer still does not appear on the screen after you have performed these checks and measures, please contact your technical support team.</p>
Wrong time and/or date on the PC.		<ul style="list-style-type: none"> Press <F2> within the boot sequence to open BIOS Setup. Set the time and date in the setup menu.
Although the BIOS setting is OK, the time and date are still wrong.	The backup battery is dead.	<p>Replace the back-up battery (see Replacing the back-up battery (Page 101)).</p> <p>If the problem is not corrected by replacing the battery, then contact your technical support team in this case (see Hotline and Internet addresses (Page 5)).</p>

8.1 General problems

Problem	Possible cause	To correct or avoid error
USB device not responding	The operating system does not have a suitable driver for the USB device.	Install a suitable driver; the correct driver can often be downloaded from the homepage of the device's manufacturer. The EWF for Windows Embedded Standard 2009 must first be disabled for this purpose.
IP address assigned twice (e.g. through series commissioning).	Default IP address for Windows (see SIMOTION P320-3 and Panel Fronts Commissioning and Hardware Installation Manual)	Assign a new IP address for Windows (see SIMOTION P320-3 and Panel Fronts Commissioning and Hardware Installation Manual). This must be different to the previous default IP address and may not have been assigned already in the network.
Error message during project download. (Download of the HW configuration not possible)	When the write filter is activated, a project download can only be performed when no changes have been made in the HW configuration.	Deactivate the write filter and restart the project download. If the problem is not corrected by deactivating the write filter, then contact your technical support team in this case (see Hotline and Internet addresses (Page 5)).

Technical data

9.1 General specifications

General technical data	
Order No.	6AU1320-7AB55-3AF0
Dimensions	262x142x47 (WxHxD in mm)
Weight	Approximately 2 kg
Supply voltage (DC)	24 VDC ¹ (19.2 to 28.8 V)
Brief power failure according to Namur	Min. 15 ms (at 20.4 V) Max. 10 events per hour; min. 1 s recovery time
Maximum power consumption	4 A (at 24 V)
Noise emission	<40dB (A) according to DIN 45635-1
Degree of protection	IP 20 according to IEC 60529
Safety	
Protection class	Protection class I according to IEC 61140
Safety regulations	EN 60950-1; UL 60950; CAN/CSA-C22.2 No. 60950-1; UL 508; CAN/CSA-C22.2 No. 142 or CAN/CSA-C22.2 No. 14-05
Electromagnetic compatibility (EMC)	
General rules (Page 135)	
<p>1) The generation of the 24 VDC supply voltage by the line-side power supply must be made as functional extra-low voltage with safe electrical isolation according to IEC 60364-4-41 or as SELV in conformity to IEC/UL/EN/DIN-EN 60950-1 and LPS / NEC Class 2.</p>	
Climatic ambient conditions	
Temperature	Tested according to IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14
<ul style="list-style-type: none"> During operation 	Horizontal mounting position: In RAL: 0° to +55° C Vertical mounting position / book mounting: 0° to +45° C Horizontal mounting position: 0° to +40° C RAL = Restricted Access Location (installation of device in operating facilities with restricted access, for example, a locked control cabinet)
<ul style="list-style-type: none"> Storage/transport 	-40° C to +70° C
<ul style="list-style-type: none"> Gradient 	Operating mode: Max. 10° C/h; Storage: 20° C/h; no condensation
Relative humidity	Tested acc. to IEC 60068-2-78, IEC 60068-2-30
<ul style="list-style-type: none"> During operation Storage/transport 	<ul style="list-style-type: none"> 5% to 80% at 25° C (no condensation) 5% to 95% at 25° C (no condensation)

Technical data

9.1 General specifications

Mechanical ambient conditions	
Vibration	Tested acc. to DIN IEC 60068-2-6
• During operation	With CompactFlash card: 5 to 9 Hz: 3.5 mm 9 to 500 Hz: 9.8 m/s ²
• Storage/transport	5 to 9 Hz: 3.5 mm 9 to 500 Hz: 9.8 m/s ²
Resistance to shock	Tested to DIN IEC 60068-2-27
• During operation	150 m/s ² , 11 ms
• Storage/transport	250 m/s ² , 6 ms
Special features	
Quality assurance	Acc. to ISO 9001
Motherboard	
Processor	Intel Core 2 Solo 1.2 GHz, 3 MB SLC
Front side bus	800 MHz
Main memory	2048 MB DDR3-SDRAM SO-DIMM module
Drives / storage media	
CompactFlash card	4096 MB
Graphics	
Graphics controller	Intel GMA4500
Graphics memory	32 - 256 MB shared memory
Resolutions/frequencies/colors	CRT: 640 x 480 to 1920 x 1200 / 60 - 120 Hz DVI-LCD: 640 x 480 to 1920 x 1200 / 60 Hz
Interfaces	
COM	RS232, max. 115 Kbps, 9-pin Cannon, male
VGA/DVI	VGA integrated in the DVI-I
USB	4x USB 2.0 high current
PROFINET ²⁾	3x RJ45 connection, PROFINET onboard interface based on ERTEC 400, 10/100 Mbps electrically isolated
Ethernet ²⁾	1x Ethernet interface (RJ45) Intel 82574L 100/1000 Mbps, electrically isolated

²⁾ For unambiguous labeling, the LAN interfaces are numbered on the housing. The numbering by the operating system can differ.

Status displays on the device		
PWR	GREEN	Indicates correct supply voltage of 3.3 V, 5 V and 12 V from the integrated power unit
WD	OFF	Not relevant.
SF (Group fault)	OFF	SIMOTION P is operating without error.
	RED: Slow flashing (0.5 Hz)	No license exists for technology/optional objects under license. Carry out the licensing to correct the error. Further information on the licensing can be found in the SIMOTION P320-3 and Panel Fronts Commissioning and Hardware Installation Manual.
	RED: Fast flashing (2 Hz)	A fault has occurred to which the user program cannot respond. The following actions may be required to rectify the fault: <ul style="list-style-type: none"> • Power OFF/ON • New commissioning procedure
	RED	An interrupt which can be acknowledged is present (alarm, message, note). (See Diagnostics Guide)
RUN/STOP	OFF	SIMOTION P Runtime is not running
	YELLOW	SIMOTION P in STOP mode
	GREEN	SIMOTION P in RUN mode
SF PROFINET	OFF	SIMOTION P is operating without error.
	RED: Slow flashing (0.5 Hz)	Underlicensing
	RED: Fast flashing (2 Hz)	No or faulty configuration
	RED	Acknowledgeable event

9.2 Power requirements of the components

Maximum power consumption of the auxiliary components

Auxiliary components		Maximum permitted power consumption				Max. total power
		+5 V	+3.3 V	+12 V	-12 V	
USB device	High current	500 mA	--	--	--	10 W (for all USB devices)

9.3 Integrated DC power supply

Technical data

Input voltage	24 VDC (19.2 to 28.8 VDC)
Power consumption ¹⁾	Max. 72 W
Power failure buffering	Hold-up time > 15 ms (after > 5 ms DC_FAIL becomes active)
Maximum continuous output power ¹⁾	60 W
Degree of protection	IP 20
Protection class	Safety class I (a protective conductor must be connected to the device)

¹⁾ The power specifications apply to the power supply component, but not to the SIMOTION P320-3 device.

Note

Inrush current

A minimum of 4.5 A inrush current for 15 ms is required for starting the SIMOTION P320-3.

The peak value of the inrush current depends on the input voltage and the impedance of the 24 V source; peak values higher than 4.5 A are possible. This will not inhibit the operation of the SIMOTION P320-3.

Typical power consumption

	Current consumption	Power consumption (at 24 V rated voltage)
Base device with Core 2 Solo processor	550 mA	13 W
Field bus (PROFINET)	120 mA	3 W
USB expansion	Max. 500 mA	Max. 12 W

9.4 Technical specifications of additional hardware components

Technical data of additional hardware components can be found at:

- Technical data for SIMOTION panel fronts (Page 60)
- Technical data for the SITOP smart 24 V / 10 A (Page 128)

9.5 Keyboard table (for keyboard panel version only)

The following table can be used to check the default keyboard assignments and key codes.

Explanation of values in table

- <Key number>**a1**: Press **F_N** key in additional
- <Code value>**/s**: **SHIFT** also transmitted
- <Code value>**/a**: **ALT** also transmitted
- <Code value>**/as**: **ALT+SHIFT** also transmitted
- <Code value>**/c**: **CTRL** also transmitted

Table 9- 1 Standard key assignments for panel fronts with keyboard

Key number	Code	Key labeling/ name
1	0x43	F10
2	0x41/s	F20 (Shift F8)
3	0x09	f
3a1	0x24/s	&
4	0x08	e
4a1	0x20/s	#
5	0x07	d
5a1	0x1e/s	!
6	0x06	c
6a1	0x38/s	?
7	0x05	b
7a1	0x27/s)
8	0x04	a
8a1	0x26/s	(
9	0x42	F9
10	0x40/s	F19 (Shift F7)
11	0x0f	l
11a1	0x35	'
12	0x0e	k
12a1	0x34/a	'
13	0x0d	j
13a1	0x34	'
14	0x0c	i
14a1	0x34/s	"
15	0x0b	h
15a1	0x30]
16	0x0a	g
16a1	0x2f	[

9.5 Keyboard table (for keyboard panel version only)

Key number	Code	Key labeling/ name
17	0x41	F8
18	0x3f/s	F18 (Shift F6)
19	0x15	r
19a1	0x35/s	~
20	0x14	q
20a1	0x33/as	x
21	0x13	p
21a1	0x31/s	'
22	0x12	o
22a1	0x31	\
23	0x11	n
23a1	0x30/s	}
24	0x10	m
24a1	0x2f/s	{
25	0x40	F7
26	0x3e/s	F17 (Shift F5)
27	0x26	9
27a1	0x22/s	%
28	0x25	8
28a1	0x22/a	€
29	0x24	7
29a1	0x21/s	\$
30	0x18	u
30a1	0x33/s	:
31	0x17	t
31a1	0x33	;
32	0x16	s
32a1	0x36	,
33	0x3f	F6
34	0x3d/s	F16 (Shift F4)
35	0x23	6
35a1	0x23/s	^
36	0x22	5
36a1	0x37/s	>
37	0x21	4
37a1	0x36/s	<
38	0x1b	x
39	0x1a	w
40	0x19	v
41	0x3e	F5
42	0x3c/s	F15 (Shift F3)

9.5 Keyboard table (for keyboard panel version only)

Key number	Code	Key labeling/ name
43	0x20	3
43a1	0x38	/
44	0x1f	2
44a1	0x25/s	*
45	0x1e	1
46	0x2c	(BLANK)
46a1	0x2d/s	–
47	0x1d	z
48	0x1c	y
48a1	0x1f/s	@
49	0x3d	F4
50	0x3b/s	F14 (Shift F2)
51	0x56	–
51a1	0x57	+
52	0x27	0
52a1	0x2e	=
53	0x37	.
56	0x2a	(Backspace)
57	0x3c	F3
58	0x3a/s	F13 (Shift F1)
61	0x52	(CURSOR UP)
62	0x4b	(PAGE UP)
63	0x4e	(PAGE DOWN)
64	0x49	(INSERT)
65	0x3b	F2
66	0x45	F12
67	0x29	(ESC)
68	0x4f	(CURSOR RIGHT)
69	0x4a	(HOME)
70	0x50	(CURSOR LEFT)
72	0x4c	(DELETE)
73	0x3a	F1
74	0x44	F11
75	0x3a/a	(ACK - ALT F1)
76	0x28	(ENTER)
77	0x51	(CURSOR DOWN)
79	0x0b/a	(HELP)
80	0x2b	(TAB)
80A1	0x2b/s	(SHIFT TAB)
81	0x00/c	(CONTROL)
82	0x00/s	(SHIFT)

9.5 Keyboard table (for keyboard panel version only)

Key number	Code	Key labeling/ name
82A1	0x39	(CAPS LOCK)
83	0x00/a	(ALT)
89	0x42/s,1	S1 (Shift F9)
90	0x43/s,2	S2 (Shift F10)
91	0x44/s,3	S3 (Shift F11)
92	0x45/s,4	S4 (Shift F12)
93	0x3a/c,5	S5 (Control F1)
94	0x3b/c,6	S6 (Control F2)
95	0x3c/c,7	S7 (Control F3)
96	0x3d/c,8	S8 (Control F4)
97	0x3e/c,9	S9 (Control F5)
98	0x3f/c,10	S10 (Control F6)
99	0x40/c,11	S11 (Control F7)
100	0x41/c,12	S12 (Control F8)
101	0x42/c,13	S13 (Control F9)
102	0x43/c,14	S14 (Control F10)
103	0x44/c,15	S15 (Control F11)
104	0x45/c,16	S16 (Control F12)

Dimension drawings

10.1 SIMOTION P320-3 dimensions

10.1.1 Overview of the dimensional drawings

This section contains the following dimension drawings:

- Dimension drawings of the device (Page 117)
- Dimension drawings of the device with mounting brackets (Page 119)
- Dimensional drawings of the device with book mounting bracket (Page 121)

Note

The dimensions are always given in mm and inch (top: Millimeter, bottom: Inch)

10.1.2 Dimension drawings of the device

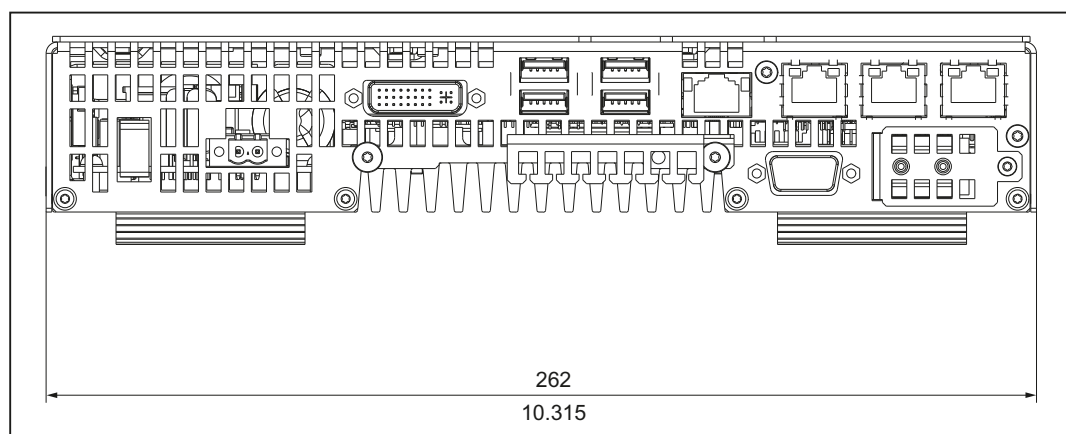


Figure 10-1 Dimension drawing of the device: Front view

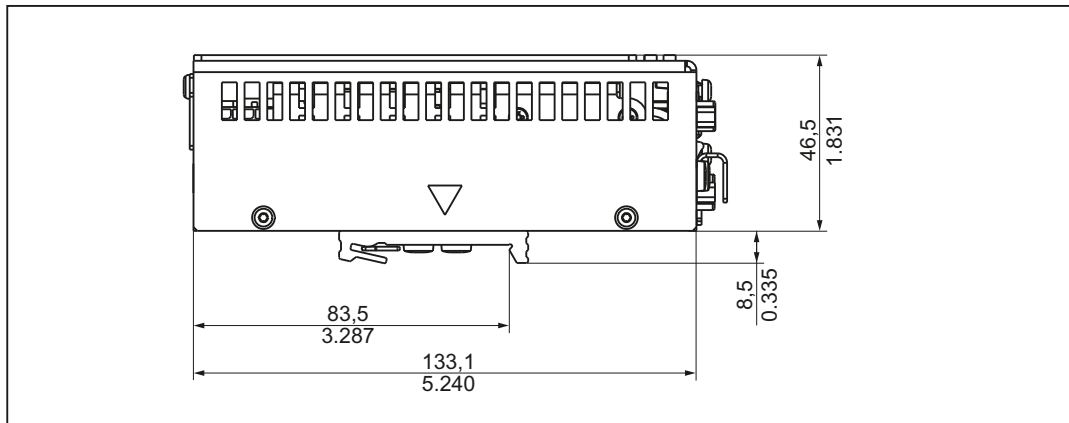


Figure 10-2 Dimension drawing of the device: Side view

See also

Panel front dimensions (Page 122)

10.1.3 Dimension drawings of the device with mounting brackets

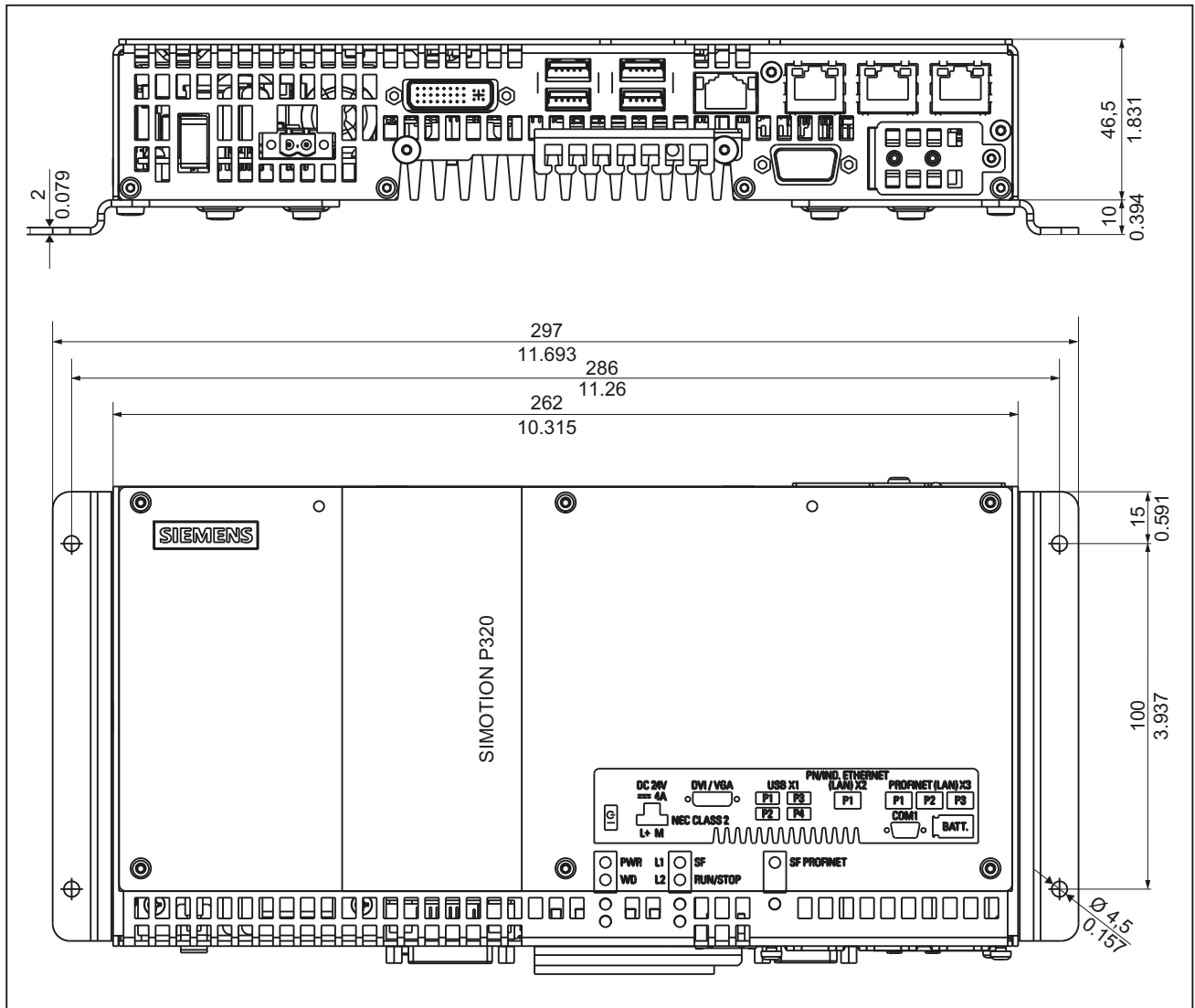


Figure 10-3 Dimension drawing of the device with mounting brackets: Front view and top view

10.1 SIMOTION P320-3 dimensions

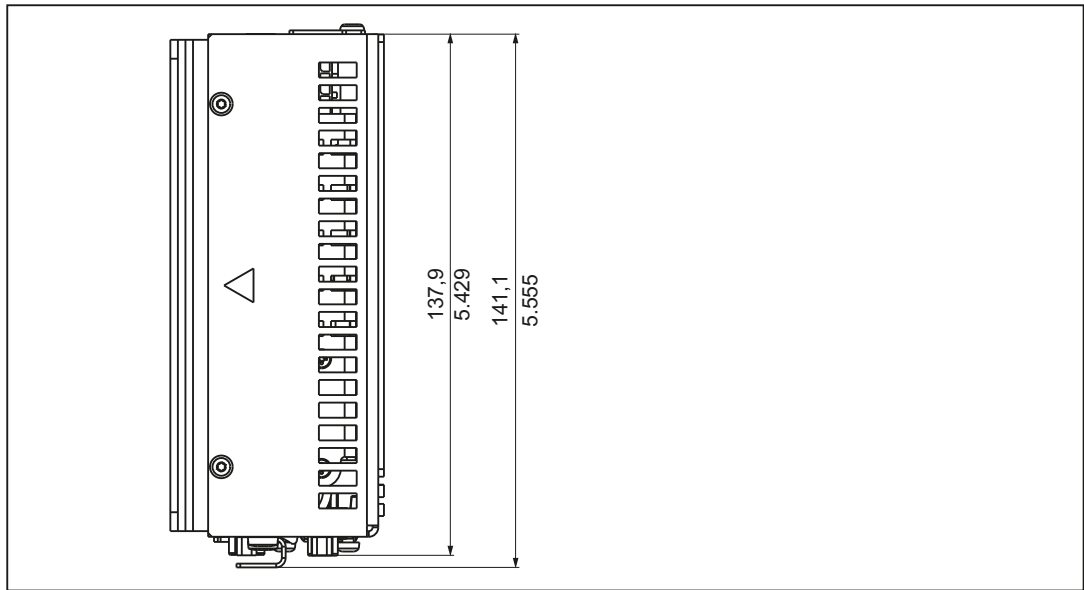


Figure 10-4 Dimension drawing of the device with mounting brackets: Side view

10.2 Panel front dimensions

The following dimension drawing shows the device dimensions of the SIMOTION panel fronts in [mm]. All dimensions are specified without screw protrusions.

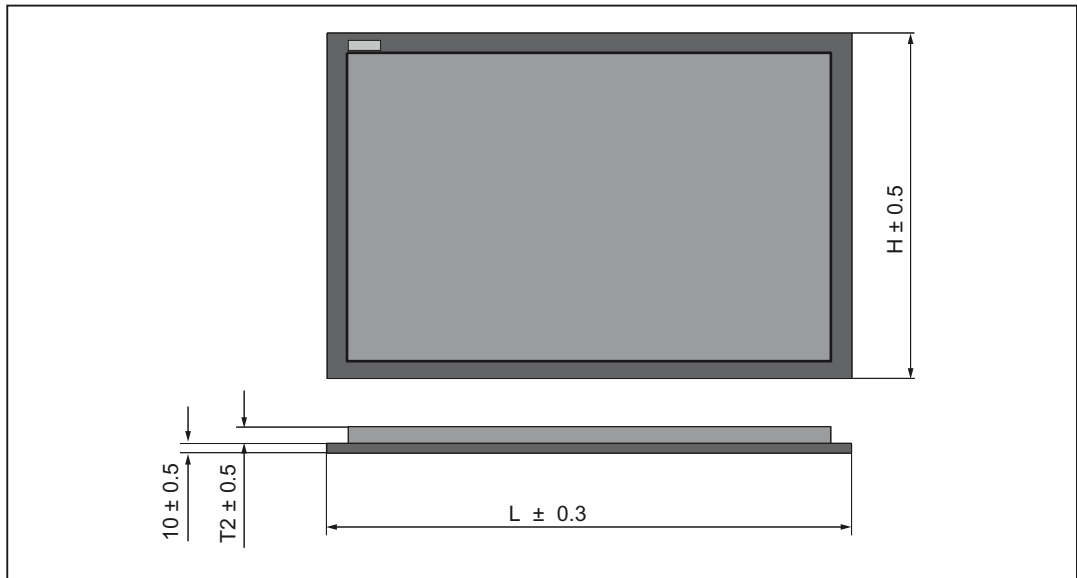


Figure 10-6 SIMOTION panel fronts device dimensions

Panel fronts	L	H	T2
With keys:			
P012K	483	310	20
With touch screen:			
P012T	400	310	36
P015T	483	310	42

10.3 SIMOTION panel fronts installation dimensions

The following dimension drawings show the installation dimensions of the panel fronts in [mm].

Installation dimensions for SIMOTION P012K

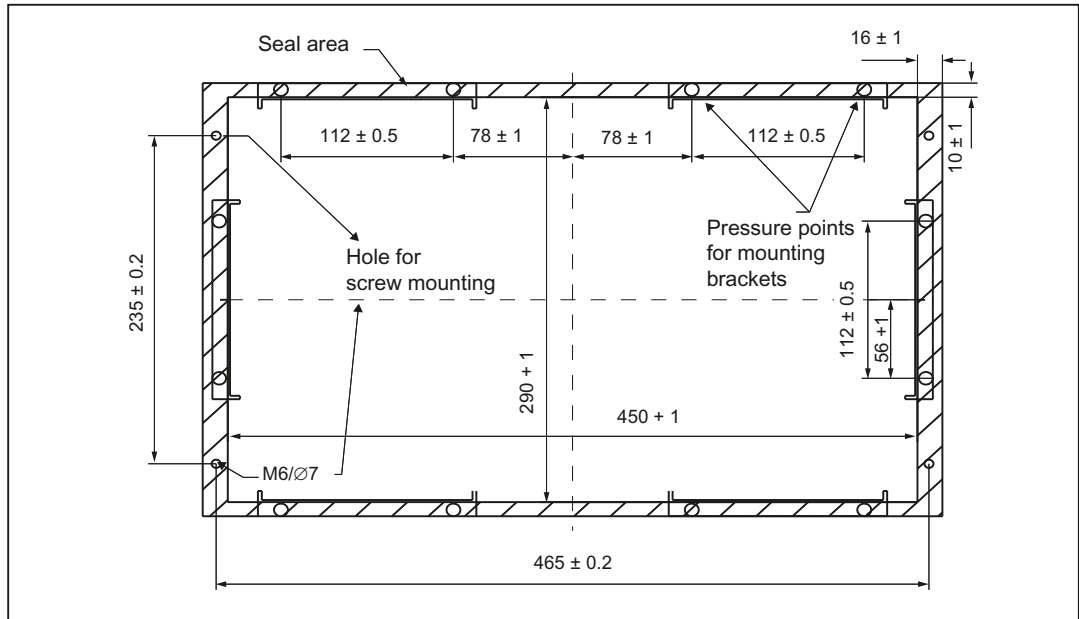


Figure 10-7 Installation dimensions for SIMOTION P012K

SIMOTION P012T installation dimensions

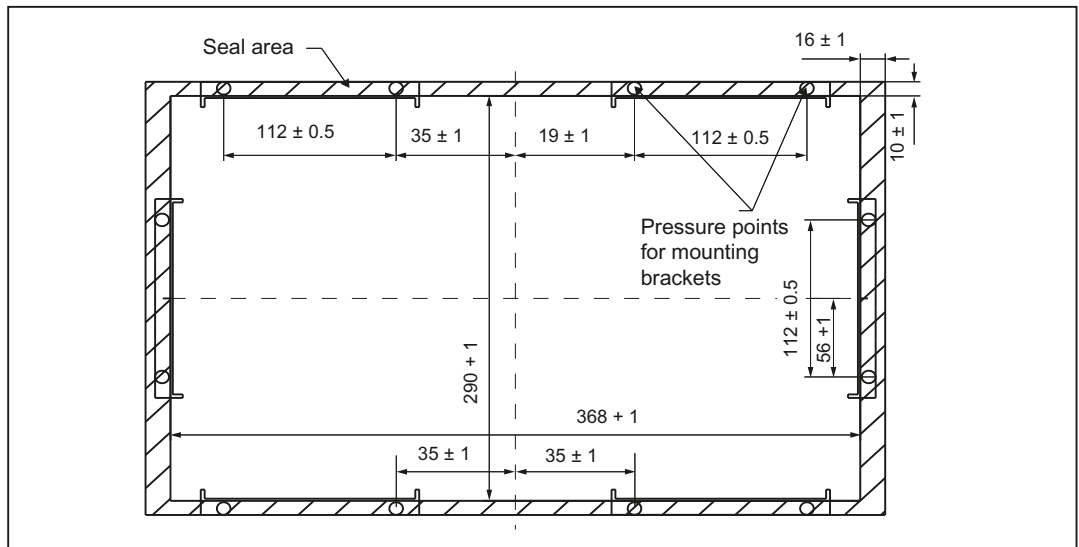


Figure 10-8 SIMOTION P012T installation dimensions - dimensions in [mm]

SIMOTION P015T installation dimensions

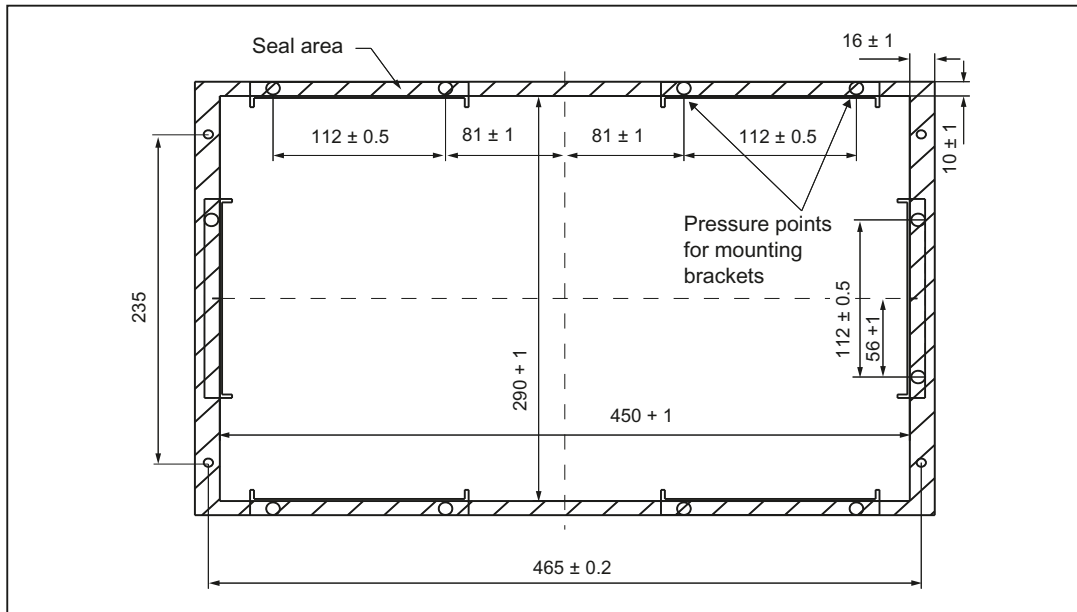


Figure 10-9 SIMOTION P015T installation dimensions

10.4 Dimensional drawing of SIMOTION panel front with Panel PC Remote Kit

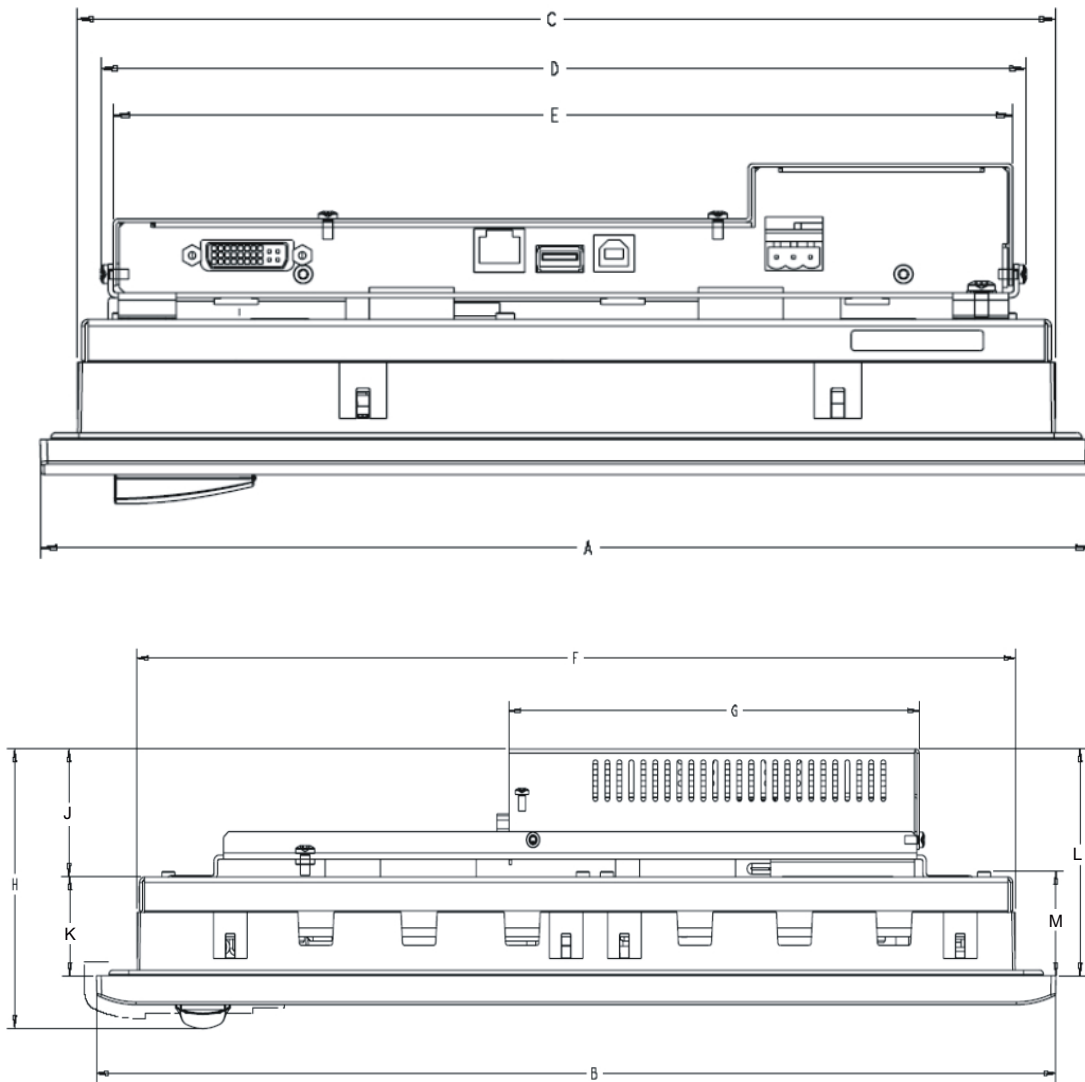


Figure 10-10 Dimension drawing of SIMOTION panel front with Panel PC Remote Kit

Panel front	A height	B width	C	D	E	F	G	H depth	J	K	L	M
12" Touch	310,3	400,0	288,3	273,0	265,2	366,0	171,0	101,5	47,0	35,8	82,3	37,8
15" Touch	310,3	482,6	288,3	273,0	265,2	447,2	171,0	99,2	47,0	33,1	79,6	48,1
12" Keys	310,3	482,6	288,3	273,0	265,2	447,2	171,0	83,0	48,0	16,3	63,8	29,3

Spare parts/Accessories

11.1 Power supply

11.1.1 Over of power supply

An external power supply is needed to connect the SIMOTION P320-3 to the network.

The power supply must provide the following values for the SIMOTION P320-3:

Output voltage:	20.4 ... 28.8 VDC, typically 24 V
Output power:	Typically 40 W (SIMOTION P320-3 alone), max. 130 W
Max. start-up current (for 30 ms):	4.5 A
Power failure buffering:	At least 3 ms with 10 s recovery time
Dynamic upper voltage limit:	30.2 V
Dynamic lower voltage limit:	18.5 V
Voltage ripple:	5%

Note

The relevant order numbers and more detailed information about the listed accessories can be obtained from the online catalog in the Siemens A&D Mall (<http://www.siemens.com/automation/mall>).

11.1.2 Example: SITOP smart 24 V/10 A

The SITOP smart 24 V / 10 A power supply meets all requirements of a SIMOTION P320-3 and is therefore ideal for this application.



Figure 11-1 View of the SITOP smart 24 V/10 A

11.1.3 Technical data for the SITOP smart 24 V/10 A

Input data	
Input voltage rated value	120/230 VAC
Input voltage range	85 to 132 VAC / 170 to 264 V
Power failure bridging	> 20 ms at $V_{in} = 93/187$ V
Mains frequency rated value	50/60 Hz
Mains frequency range	47 ... 63 Hz
Input current rated value	4.1/2.4 A
Switch-on current (at +25° C)	< 65 A
Recommended miniature circuit breaker	10 A, Characteristic C
Output data	
Output voltage rated value	24 VDC
Output voltage tolerance	± 3 %
Residual ripple/spikes	< 150/240 mV _{pp}
Output voltage adjustment range	22.8 to 28 VDC
Output current rated value	10 A (12 A up to +45° C)
Efficiency	Typ. 90%
Electronic short-circuit protection	Yes; constant current approx. 1.3 × output current rated value; for 5 seconds extra power at 1.5 × output current rated value

Environmental conditions	
Ambient temperature	<ul style="list-style-type: none"> • During storage and transportation • -40° to +85° C • During operation • 0° to +60° C
Humidity class	Climate class 3K3 acc. to EN 60721; relative atmospheric humidity 5 to 95%; no condensation
Degree of protection (EN 60529)	IP20
Radio suppression level (EN 55022)	Class B
Supply harmonics limitation according to EN 61000-3-2	No
EMC immunity	EN 61000-6-2; EN 61000-4-2/-3/-4/-5/-6/-11
EMC interference emission	EN 61000-6-4
Safety	
Protection class (IEC 536; VDE 1006 T1)	Class I
Primary/secondary galvanic isolation	SELV output voltage acc. to EN 60950 and EN 50178; transformer acc. to EN 61558-2-17; overvoltage protection in the event of an internal fault $U_a < 60 \text{ V}$
Dimensions and weight	
Dimensions (W x H x D) in mm	70 x 125 x 125
Weight	Approx. 0.75 kg
Certifications and approvals	
CE	CE conformity acc. to 98/336 EEC and 73/23 EEC
UL/CSA	UL 508 (Listed, File E197259); CSA C22.2 No. 14, No. 60950-1-03
Shipbuilding	Germanischer Lloyd
Directive 94/9/EC	Declaration of conformity acc. to EN 60079-15: ATEX94/9/EC Cat.3;Eex, nA, II, T4 U
C-Tick	AS/NZS 2064:1997
Order numbers	
	6EP1334-2AA01, 6EP1334-2BA01

11.2 UPS system

11.2.1 UPS system overview

When the power supply of the UPS system fails or is switched off, the UPS system continues to provide the supply voltage to the SIMOTION P for several minutes. The user can configure the system so that Windows, and thus also the SIMOTION Kernel, can be closed down correctly.

The required values (accumulator switching threshold, end-of-charge voltage, backup times, etc.) are set using DIP switches on the SITOP DC UPS module. Further information on this can be found in the Operating Instructions for your DC-UPS module.

Note

If the SIMOTION P is usually switched off before Windows is correctly shut down, the use of a UPS system is strongly advised.

Otherwise, there is a risk of the Windows installation sustaining damage, and it may no longer be possible to execute SIMOTION P.



Figure 11-2 SITOP DC UPS module with accumulator module

11.2.2 SITOP DC UPS module

The UPS module backs up the power supply for the SIMOTION P using a lead accumulator module. The back-up time of the battery is several minutes. This gives the user sufficient time to shut-down the SIMOTION P in an orderly fashion.

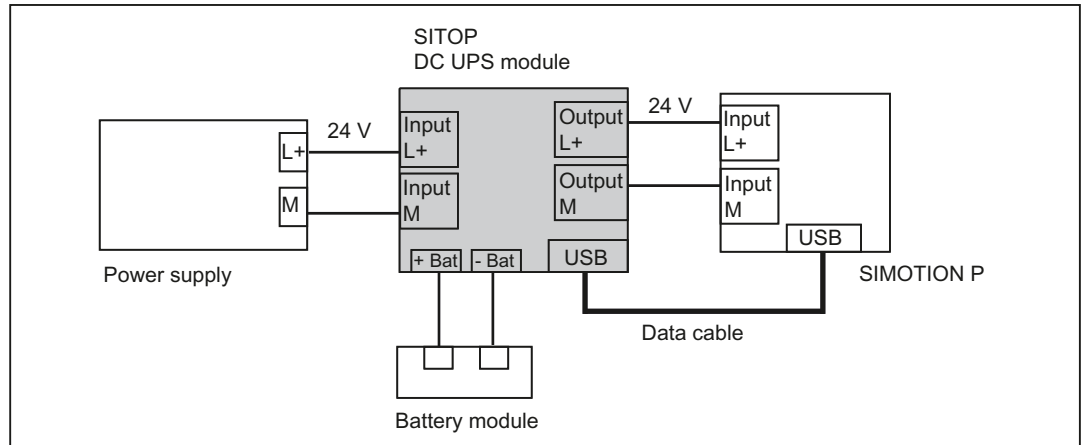


Figure 11-3 Connection of the UPS system / schematic display

There are DIP switches on the UPS module for setting the accumulator switching threshold, the end-of-charge voltage, the charging current, and the buffering time.

More detailed information about the SITOP DC UPS module is available in the documentation supplied with the device.

The UPS module uses the USB data interface to forward information to the SIMOTION P; this can subsequently be displayed with the UPS monitoring application.

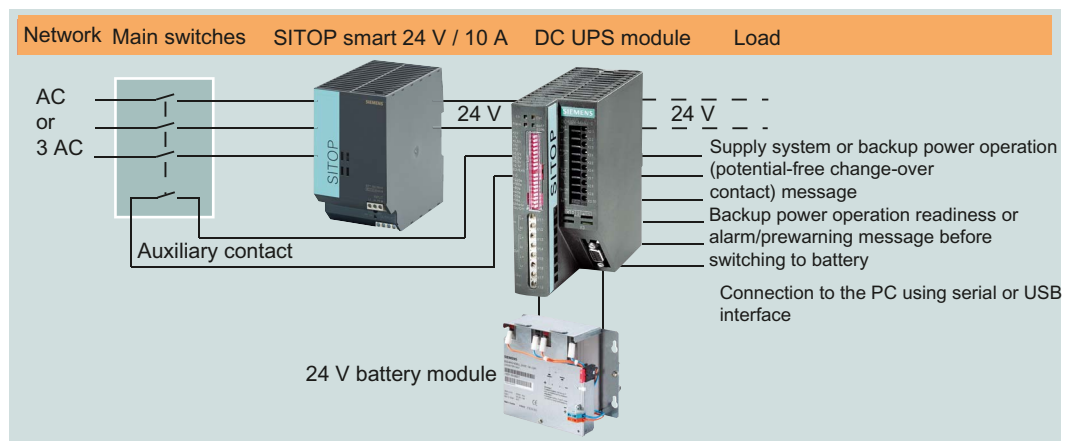


Figure 11-4 Power supply overview

11.3 Accessory kit

The components listed below are supplied with the SIMOTION P320-3.

- Restore DVD
- Accessory kit with mechanical parts and connectors



Figure 11-5 Accessory kit

Table 11- 1 Components in the accessory kit

Two mounting brackets
USB strain-relief
PROFINET strain-relief bracket
24 V power supply connector

11.4 Accessories for the hardware components

The accessories of the SIMOTION P320-3 hardware components are described in the following sections:

- SIMOTION panel fronts accessories (Page 62)
- Accessories for the Panel PC Remote Kit (Page 68)

11.5 Available spare parts and accessories

Table 11-2 Spare parts and accessories

Parts for the SIMOTION P320-3	Order No.	Scope of delivery	Accessories
CompactFlash card (CF card) 4 GB Note: Windows Embedded Standard 2009 and SIMOTION P Runtime are only contained on the CF card that is part of the scope of delivery. A restore DVD or your own image must be used for a CF card ordered as an accessory.	6ES7648-2BF02-0XG0	x	x
SIMATIC USB FlashDrive, USB 2.0, 2 GB	6ES7648-0DC40-0AA0		x
3 V lithium battery for battery-backed SRAM/CMOS	A5E00331143	x	x
24 V power supply connector		x	
1 unit	-	x	
10 units	6AV6671-8XA00-0AX0		x
DVI-I VGA-compliant adapter cable, 250 mm long	6ES7648-3AB00-0XA0		x
Book mounting kit	6ES7648-1AA20-0YB0		x

Note

Only SIMATIC PC CompactFlash cards with product version 02 (ES 02) can be used for this device.

You can order the accessories via the Siemens A&D Mall (<http://www.siemens.com/automation/mall>).

Spares On Web


Spares On Web (<http://workplace.automation.siemens.de/sparesonweb>) is an information system that enables you to find out which spare parts are available for your device.

Standards and approvals

A

A.1 General rules

CE marking


	<p>Our products satisfy the requirements and protection objectives of the EC Directives and comply with the harmonized European standards (EN).</p>
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Electromagnetic compatibility

Standards for EMC are satisfied, if the EMC Installation Guideline is observed.

SIMOTION products are designed for industrial use in accordance with product standard DIN EN 61800-3, Category C2.

cULus Approval

	<p>Listed component mark for United States and the Canada Underwriters Laboratories (UL) according to Standard UL 508, File E164110, File E115352, File E85972.</p>
---	---

EMC

USA	
<p>Federal Communications Commission Radio Frequency Interference Statement</p>	<p>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.</p>
<p>Shielded Cables</p>	<p>Shielded cables must be used with this equipment to maintain compliance with FCC regulations.</p>

A.1 General rules

USA	
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 B digital apparatus complies with Canadian ICES-003.
Avis Canadien	Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

SOUTH KOREA	
<p>이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.</p> <p>For sellers or other user, please keep in mind that this device in an A-grade electromagnetic wave device. This device is intended to be used in areas other than home.</p>	
<p>The EMC limit values to be observed for Korea correspond to the limit values of the EMC product standard for variable-speed electric drives EN 61800-3 of category C2 or the limit value class A, Group 1 to EN55011. By implementing appropriate additional measures, the limit values according to category C2 or limit value class A, Group 1, are observed. For this purpose, additional measures, such as the use of an additional RFI suppression filter (EMC filter) may be necessary. In addition, measures for EMC-compliant configuration of the plant are described in this Manual and/or the Configuration Manual "EMC Installation Guideline". Please note that ultimately it is always the label on the device that provides the decisive information on the compliance with standards.</p>	


Declaration of conformity

The current Declaration of conformity is available on the Internet at Declaration of conformity (<http://support.automation.siemens.com/WW/view/en/10805446/134200>).

General warning information

CAUTION
<p>There is a risk of injury or of damage to assets. In hazardous areas, personal injury or damage to assets can occur if plug-in connections are disconnected during operation. Make sure that your system is always de-energized before disconnecting plug-in connections in hazardous areas.</p>

C-Tick

AUSTRALIA	
	This product meets the requirements of the AS/NZS CISPR 22.

A.2 Safety of electronic controllers

Introduction

The following remarks relate to fundamental criteria and apply irrespective of the type of controller and the manufacturer.

Risk

A higher degree of safety standard applies to all applications and situations where there is a risk of material damage or injury to persons if there is a failure. Special regulations specific to the system apply to such applications. These must be taken into account for configuration of the controller (e.g. VDE 0116 for furnaces).

For electronic controllers with safety responsibility, the measures required for preventing or controlling faults depend on the hazard inherent in the plant. In this respect, the basic measures listed above are no longer adequate once the hazard exceeds a certain potential. Additional measures (e.g. double redundancy, tests, checksums, etc.) for the controller must be implemented and certified (DIN VDE 0801).

The residual risk

When assessing his machine's risk in accordance with the EC Machinery Directive, the machine manufacturer must take into account the following residual risks emanating from the control and drive components:

1. Unintentional movements of driven machine components during commissioning, operation, maintenance, and repairs caused by, for example:
 - Hardware defects and/or software errors in the sensors, controllers, actuators, and connection technology
 - Response times of the controller and drive
 - Operating and/or ambient conditions not within the scope of the specification
 - Parameterization, programming, cabling, and installation errors
 - Use of radio devices / cellular phones in the immediate vicinity of the controller
 - External influences / damage
2. Exceptional temperatures as well as emissions of light, noise, particles, or gas caused by, for example:
 - Component malfunctions
 - Software errors
 - Operating and/or ambient conditions not within the scope of the specification
 - External influences / damage
3. Hazardous shock voltages caused by, for example:
 - Component malfunctions
 - Influence of electrostatic charging
 - Induction of voltages in moving motors
 - Operating and/or ambient conditions not within the scope of the specification
 - Condensation / conductive contamination
 - External influences / damage
4. Electrical, magnetic and electromagnetic fields generated in operation that can pose a risk to people with a pacemaker, implants or metal replacement joints, etc. if they are too close
5. Release of environmental pollutants or emissions as a result of improper operation of the system and/or failure to dispose of components safely and correctly

A.3 Certificates

DIN ISO 9001 certificate

The Siemens quality management system for all production processes (development, production and sales) meets DIN ISO 9001:2000 requirements.

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

Q-Net certificate no.: DE-001108 QM

Software License Agreement

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

ESD guidelines

B.1 ESD definition

What does ESD mean?

All electronic modules are equipped with highly integrated modules or components. Because of the technology used, these electronic components are very sensitive to overvoltages and thus to discharge of static electricity.

The acronym **ESD** has become the established designation for such **E**lectrostatic **S**ensitive **D**evices. The **ESD** designation is used internationally to refer to electrostatic sensitive devices.

Electrostatic sensitive devices are identified by the following symbol:

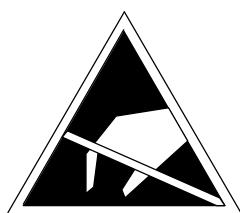



Figure B-1 Symbol for identification of electrostatic sensitive devices

 CAUTION
Electrostatic sensitive devices can be irreparably damaged by voltages that are far lower than anything a person can perceive. These voltages occur if you touch a component or the electrical connection of a module without having previously discharged any static from your body. Any damage that occurs to a module as a result of overvoltage is generally not recognized immediately and only comes to light after the equipment has been operating for some time.

B.2 Electrostatic charging of individuals

Any person who is not conductively connected to the electrical potential of the environment can accumulate an electrostatic charge.

This figure indicates the maximum electrostatic charges that can accumulate on an operator when he comes into contact with the indicated materials. These values comply with the specifications in IEC 801-2.

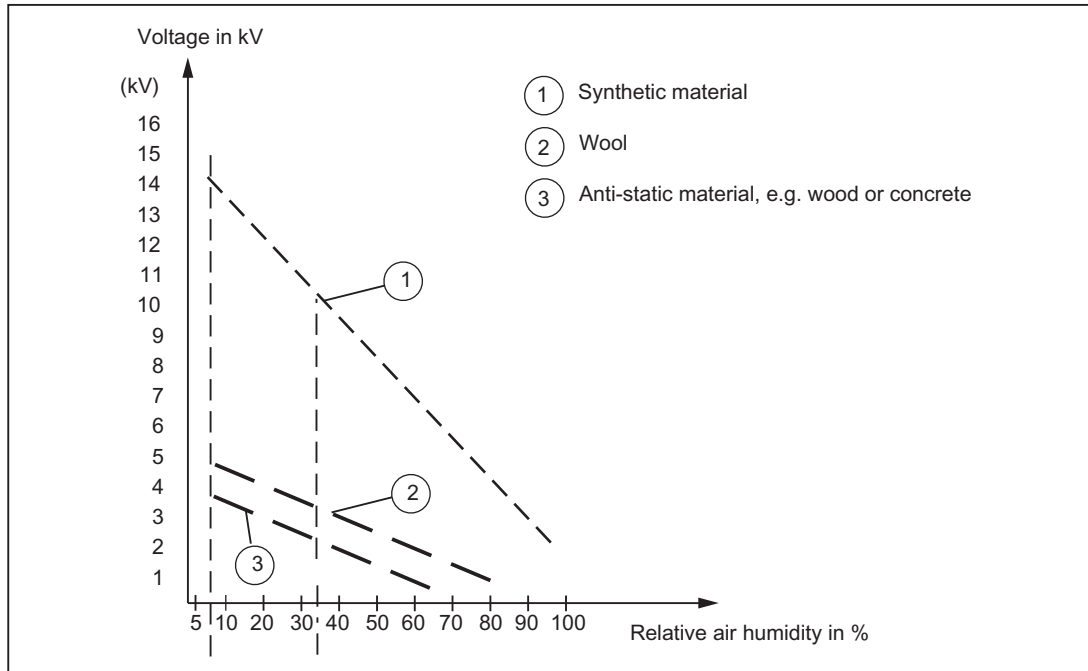


Figure B-2 Electrostatic voltage that can accumulate on operating personnel

B.3 Basic measures for protection against discharge of static electricity

Ensure sufficient grounding

When working with electrostatic sensitive devices, make sure that the you, your workstation, and the packaging are properly grounded. This prevents the accumulation of static electricity.

Avoid direct contact

You should only touch ESD components if unavoidable (for example, during maintenance work). When you touch modules, make sure that you do not touch either the pins on the modules or the printed conductors. If you follow these instructions, electrostatic discharge cannot reach or damage sensitive components.

If you have to take measurements on a module, make sure that you first discharge any static that may have accumulated in your body. To do this, touch a grounded metal object. Only use grounded measuring instruments.

List of abbreviations

Abbreviation	Term	Meaning
AC	Alternating Current	Alternating current
ATA	Advanced Technology Attachment	
CE	Communauté Européenne (CE-Symbol)	The product is in conformance with all applicable EC directives
CF	CompactFlash	
CMOS	Complementary Metal Oxide Semiconductors	Complementary metal oxide semiconductors
COA	Certificate of Authenticity	Microsoft Windows Product Key
COM	Communications Port	Term for the serial interface
CPU	Central Processing Unit	CPU
CRT	Cathode Ray Tube	
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	Disc Operating System	Operating system without GUI
DP	Distributed I/O	
DSR	Data Set Ready	Ready for operation
DTR	Data Terminal Ready	Data terminal is ready
DVI-I	Digital Visual Interface	Digital display interface with digital and VGA signals
ESD	Components sensitive to electrostatic charge	
EN	European standard	
EFW	Enhanced Write Filter	
FAQ	Frequently Asked Questions	FAQs
FBWF	File Based Write Filter	
FSB	Front Side Bus	
GND	Ground	Chassis ground
HMI	Human Machine Interface	User interface
HW	Hardware	
I/O	Input/Output	Data input/output on computers
IDE	Integrated Device Electronics	
IEC	International Electrotechnical Commission	
IP	Ingress Protection	Degree of protection
LAN	Local Area Network	Computer network that is limited to a local area.

List of abbreviations

Abbreviation	Term	Meaning
LCD	Liquid Crystal Display	Liquid crystal display
LED	Light Emmitting Diode	Light emitting diode
LVDS	Low Voltage Differential Signaling	
MTBF	Mean Time Between Failure	
MUI	Multilanguage User Interface	Language localization in Windows
NC	Not Connected	Not connected
OPC	OLE for Process Control	Standardized interface for industrial processes
PC	Personal Computer	
PCI	Peripheral Component Interconnect	High-speed expansion bus
PE	Protective Earth	Protective conductor
PG	Programming device	
POST	Power On Self Test	
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	
RT	Runtimesystem	
RTS	Reliable Transfer Service	Request to send
RxD	Receive Data	Data transfer signal
SCOUT	SIMOTION Controlling with Optimized Usability Toolbox	Engineering System of the SIMOTION product family
SDRAM	Synchronous DRAM	
SELV	Safety Extra Low Voltage	Safety extra low voltage
SLC	Second Level Cache	
SO-DIMM	Small Outline Dual Inline Memory Module	
SRAM	Static Random Access Memory	Static RAM
SW	Software	
TFT	Thin-Film-Transistor	Type of LCD flat-screen
TIA	Totally Integrated Automation	
TxD	Transmit Data	Data transfer signal
UL	Underwriters Laboratories Inc.	US organization for tests and certifications according to own or binational standards (with CSA / Canada) standards
UMA	Unified Memory Architecture	Video memory
UMDF	User Mode Driver Framework	
USB	Universal Serial Bus	
UPS	Uninterruptible power supply (UPS)	
VCC		Positive supply voltage of integrated circuits
VGA	Video Graphics Array	Video adapter which meets industrial standard
WD	Watchdog	Program monitoring with error detection and alarming.

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