SIEMENS

SIMOTION

SIMOTION P350-3 and Panel Fronts

Manual

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02/2012

Legal information

Warning notice system

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

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

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

⚠CAUTION
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE
indicates that an unintended result or situation can occur if the relevant information is not taken into account.

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Qualified Personnel

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

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Note the following:

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

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

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Foreword

Scope of validity

This document is part of the **SIMOTION P350-3 documentation package**.

This manual applies to the hardware of a SIMOTION P350-3 with SIMOTION panel fronts for the SIMOTION SIMOTION V4.2 product level.

The type designation of your SIMOTION P is shown on the rating plate ②. The PC unit's rating plate (box label) is located on the side under ①.

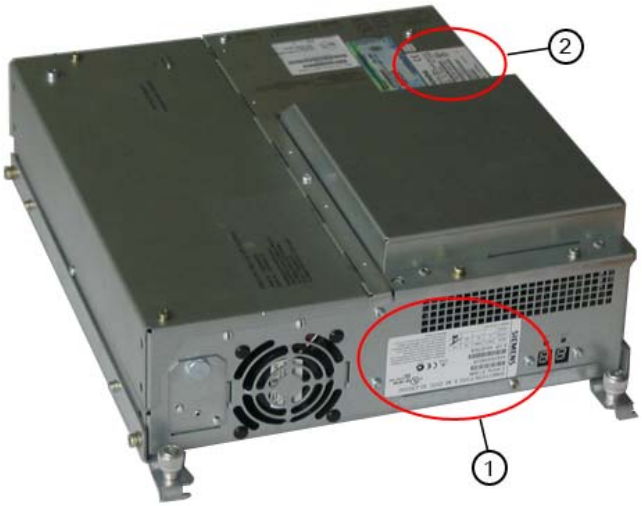

Figure 1 Box label ① and component label ② for the SIMOTION P350-3

① Box label (PC unit data)

② Component label

Standards

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

Contents of the Product Manual

This manual describes the PC-based SIMOTION P350-3 device and panel fronts.

Sections in this manual

The following describes the purpose and objectives of the manual:

- Safety instructions

  Contains important notes, warnings and precautionary measures that you must observe for handling the SIMOTION P350-3.

- Description

  Provides general information about the SIMOTION P350-3, the SIMOTION panel fronts and the integration in the SIMOTION system.

- Hardware description

  Describes the connections, the displays of the SIMOTION P state application, optional modules, SIMOTION panel fronts with keys and touch screen, the decentralized structure, and the technical data for the individual components.

- Use planning

  Informs not only about the setup, transport and storage conditions, but also the environmental and ambient conditions that apply to the SIMOTION P350-3 during operation.

- Installation/mounting

  Describes the possibilities of the mechanical fastening of the SIMOTION P350-3 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 P350-3 and the SIMOTION panel fronts.

- Spare parts / Accessories

  Provides information about spare parts and accessories of the SIMOTION P350-3.

- Appendices with factual information for reference (for example, standards and approvals, certificates, ESD)

- Index to locate information

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

Additional information

Click the following link to find information on the the following topics:

- 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:
docu.motioncontrol@siemens.com

My Documentation Manager

Click the following link for information on how to compile documentation individually on the basis of Siemens content and how to adapt this for the purpose of your own machine documentation:

http://www.siemens.com/mdm

Training

Click the following link for information on SITRAIN - Siemens training courses for automation products, systems and solutions:

http://www.siemens.com/sitrain

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 instructions

1

1.1 General safety instructions

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

This device corresponds with the respective safety regulations in EN and VDE. 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 risk of personal injury to the user.

System expansions

Only install system expansions intended 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 device 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 only with the same type or with an equivalent type recommended by the manufacturer. Dispose of used batteries in accordance with local regulations.

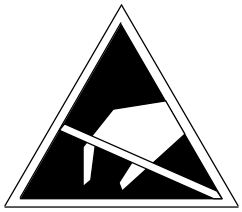
⚠ WARNING

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; do not reverse the polarity; do not heat up above 100° C; dispose of in accordance with regulations; protect against direct exposure to sunlight, humidity, and condensation.

ESD guidelines

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



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

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

Refer to section ESD guidelines (Page 131) in the Appendix!

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

2.1 Applications

2.1.1 Product description

Technical Description

The PC-based SIMOTION P350-3 motion control system runs with the Windows XP operating system augmented 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 system is controlled with the IsoPROFIBUS board for PROFIBUS and/or with the MCI-PN board 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
- Large data storage
- Control and HMI tasks on one system (HMI = **H**uman **M**achine **I**nterface)

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

2.1.2 Performance Features

SIMOTION P can control various I/O systems and HMI components via its modules, IsoPROFIBUS board and/or MCI-PN board extension.

SIMOTION P is available in the following variants:

- with IsoPROFIBUS board
- with MCI-PN board
- with IsoPROFIBUS board and MCI-PN board

All the examples in the remainder of this document are based on using the IsoPROFIBUS board.

Both rotary axes and linear axes can be operated.

The following can be used as servo drives:

- SINAMICS S120 (PROFIBUS and PROFINET)
- SIMOVERT MASTERDRIVES MC (PROFIBUS)
- SIMODRIVE 611U (PROFIBUS)

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 the hard drive of the SIMOTION P350-3.

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.

See also

Technical data for SIMOTION P350-3 (Page 105)

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.

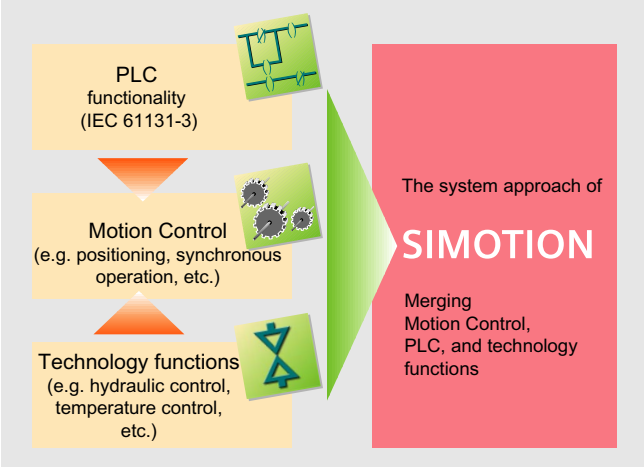


Figure 2-1 SIMOTION system environment

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 P350-3 solution lies in the fact that both the engineering system and the runtime system run on the same hardware. This saves the costs for an additional Engineering Station.

2.2 SIMOTION P structure

2.2.1 SIMOTION P (hardware) structure

The following figure illustrates the integration of SIMOTION P350-3 with the use of the IsoPROFIBUS board and also with the MCI-PN board (optional) in a target system.

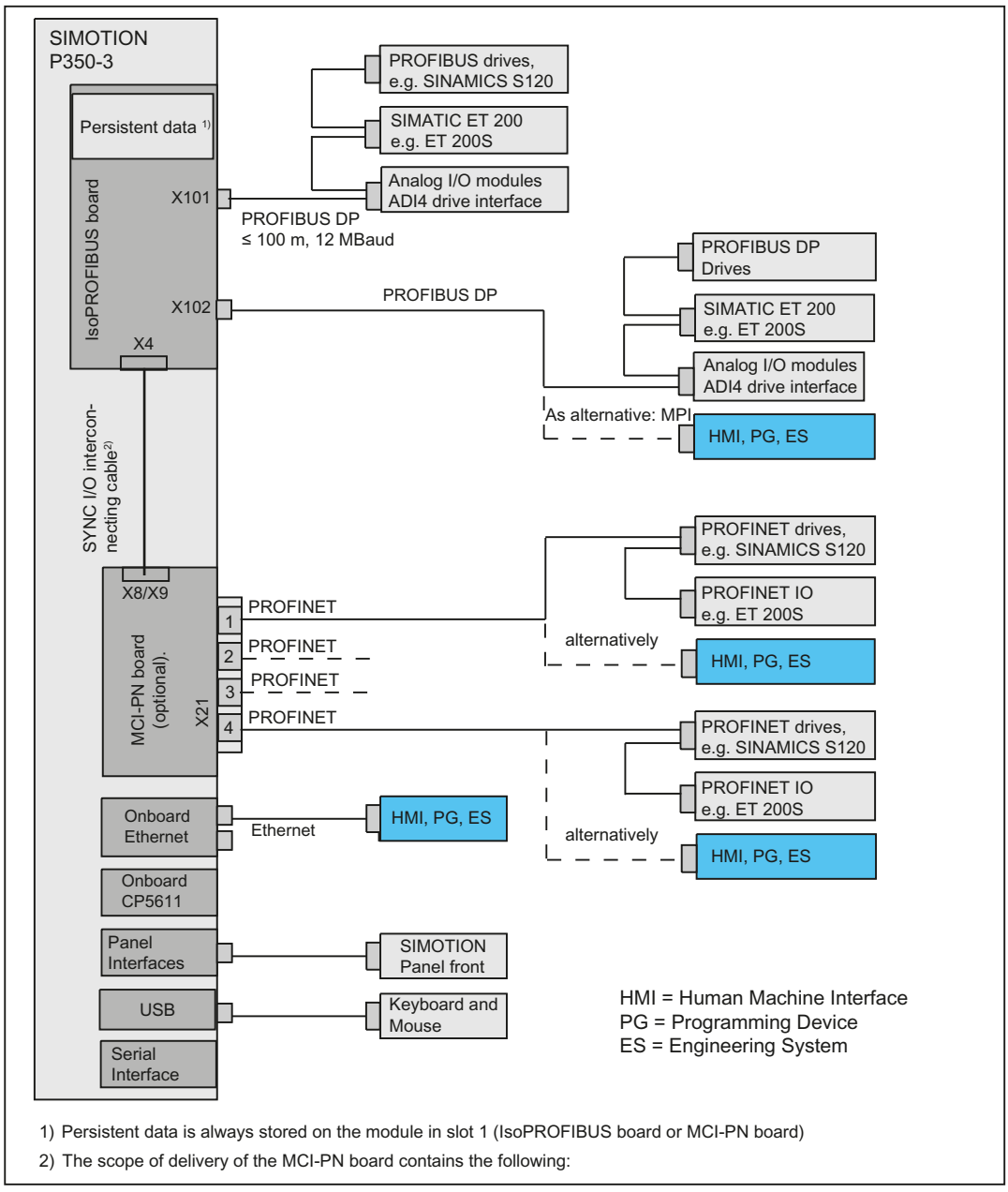


Figure 2-2 Hardware system overview - example with IsoPROFIBUS board and MCI-PN board

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 hard drive of the SIMOTION P350-3.

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.

Communication with digital drives takes place by means of PROFIBUS DP or alternatively/additionally using PROFINET IO (optional) on the speed setpoint and actual position value level, which, however, requires equidistance. Other connected I/O modules need only comply with the PROFIBUS DP or 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 either installed on the PC (at least 1024 MB main memory recommended) or connected using interfaces integrated in the SIMOTION P350-3.

HMI software

HMI software can also be installed on the same PC. WinCC flexible is available for this. Other software packages can be linked by means of the OPC interface.

The following sections discuss only HMI software.

Internal communication

The local communication can be used to access a locally installed HMI/ES to the following items:

- to variables in the SIMOTION RT
- to drives on PROFIBUS DP or PROFINET IO
- to other SIMOTION devices on PROFIBUS DP or PROFINET IO

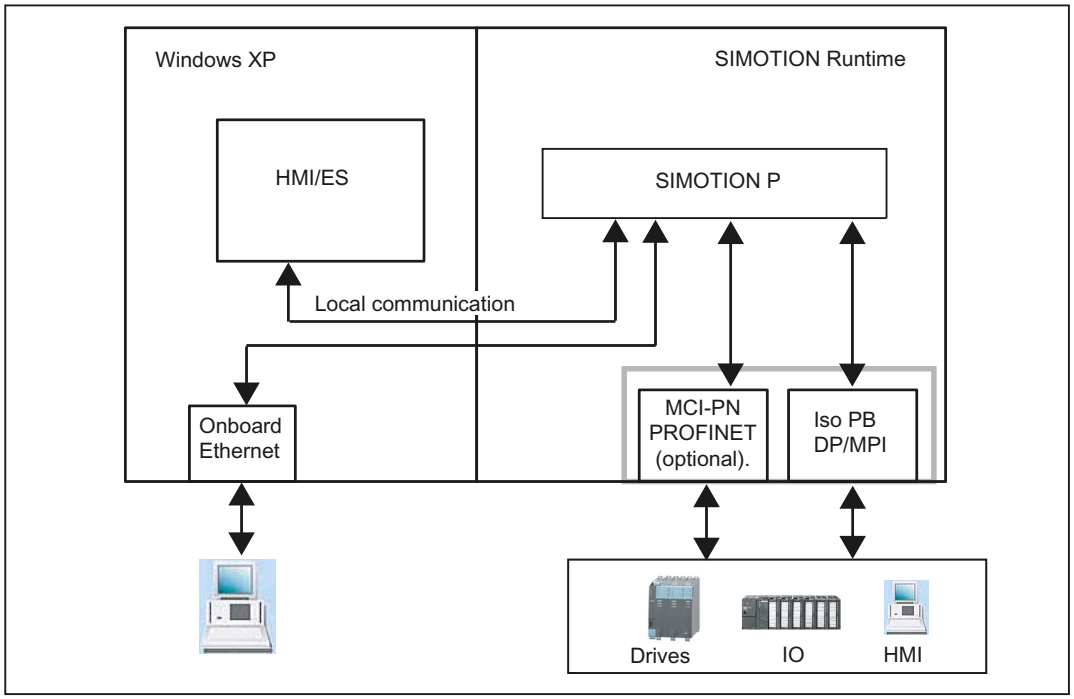


Figure 2-3 Local communication

Scope of delivery

The system software supplied with the SIMOTION P is either already installed on the SIMOTION P350-3 hard disk 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)

- SIMOTION SCOUT [1)]
- OPC Server

[1)] The main memory should be expanded to at least 1 GB.

Note

WinCC flexible integration in SIMOTION SCOUT is not released for SIMOTION P350-3.

2.2.3 Components

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

Distributed I/O systems (PROFIBUS/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.
DP V0 standard slaves DP-V1 standard slaves DP-V2 standard slaves	All standard slaves certified by PNO can be operated.

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 rather than SIMATIC. For example, special process-control functions (e.g. insertion and removal under voltage, etc.) are not supported by SIMOTION for the ET 200M distributed I/O system.

A detailed, regularly updated list of the I/O modules approved for use with SIMOTION, as well as notes on their use, can be found on the Internet at: Address (http://support.automation.siemens.com/WW/view/en/11886029).

In addition to the I/O modules approved for SIMOTION, all certified standard slaves can, in principle, be connected to SIMOTION provided they support the following data traffic:

- Cyclic data traffic (DP V0)
- Acyclic data traffic (DP V1)
- Isochronous data traffic (DP V2)

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

Note

Please note that in individual cases additional boundary conditions must be fulfilled in order to integrate a standard slave into SIMOTION.

Drive systems (via PROFIBUS DP on the IsoPROFIBUS board)

Table 2- 2 List of typically connected drive systems

Component	function
Micromaster	Frequency converter in compact form as AC/AC devices
MASTERDRIVES VC	Frequency converter with vector control in DC/AC or in AC/AC version
MASTERDRIVES MC	Servo drives in DC/AC or in AC/AC version
SIMODRIVE 611U	Servo drives typically used for multiaxis applications
SIMODRIVE POSMO	Servo drives, in distributed configuration, integrated in the motor or remotely, placed next to the motor
SINAMICS S120	Servo drives, innovative single-axis and multi-axis solution
I/O Module Analog ADI4 Drive Interface	Connection of drives with analog ±10 V setpoint interface or for external encoders
I/O Module IM174 Interface Module	Connection of drives with analog ±10 V setpoint interface for external sensors or the connection of stepper drives with pulse/direction interface

Drive systems (via PROFINET IO on the MCI-PN board)

Table 2- 3 List of typically connected drive systems

Component	function
SINAMICS S120 as of V2.4	Servo drives, innovative single-axis and multi-axis solution

Optional components

Table 2- 4 Optional components

Centralized I/O	function
MCI-PN board	PROFINET connection (optional or as alternative to PROFIBUS)
UPS	Uninterruptible power supply (UPS)
Panel PC Remote Kit	(permits the physical separation of the SIMOTION panel front and SIMOTION P350-3)

Note

Only one further board can be inserted in addition to the IsoPROFIBUS board (or, alternatively, the MCI-PN board).

Operator components

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

- Local
- MPI/DP
- PROFINET
- Ethernet

2.3 HMI and SIMOTION SCOUT

2.3.1 HMI and SIMOTION SCOUT Overview

Operational sequences on the SIMOTION P350-3 are generally monitored using the HMI (**H**uman **M**achine **I**nterface) system or the SIMOTION SCOUT ES (**E**ngineering **S**ystem). The HMI/ES software can be connected using the following methods:

- Local
- Via Ethernet
- Via PROFIBUS
- Via PROFINET

Local communication of the HMI/ES

Only a local connection to the local SIMOTION RT is possible. If HMI/ES RT is also installed locally, "PC internal" can also be used to access other controllers via the IsoPROFIBUS board.

Communication of the HMI/ES via Ethernet / PROFIBUS / PROFINET

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

2.3.2 Local HMI or ES on SIMOTION P350-3

This model is relevant for SIMOTION P-specific communication with a local HMI/ES. The SIMOTION SCOUT Engineering System or the HMI system is installed directly on the SIMOTION P350-3.

For this model, you must set the communication (access point) to "PC internal". The SIMOTION P350-3 is delivered already configured for this communication variant.

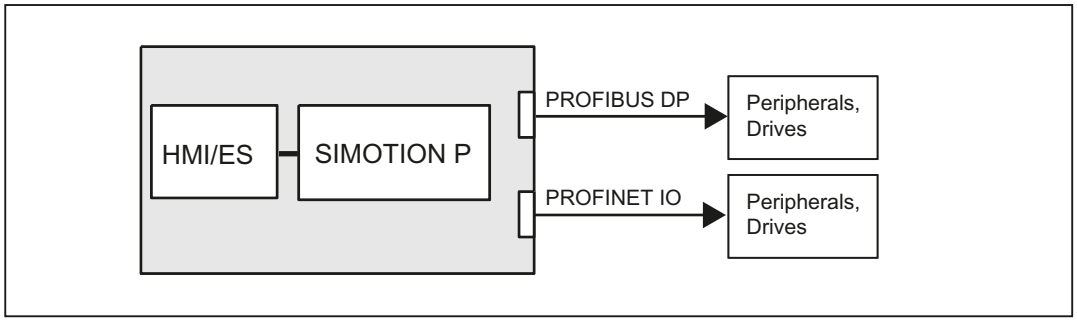


Figure 2-4 Model: Local HMI

2.3.3 HMI or ES via Ethernet (external access)

A complex interconnection with several HMI/ESs is only possible using an 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).

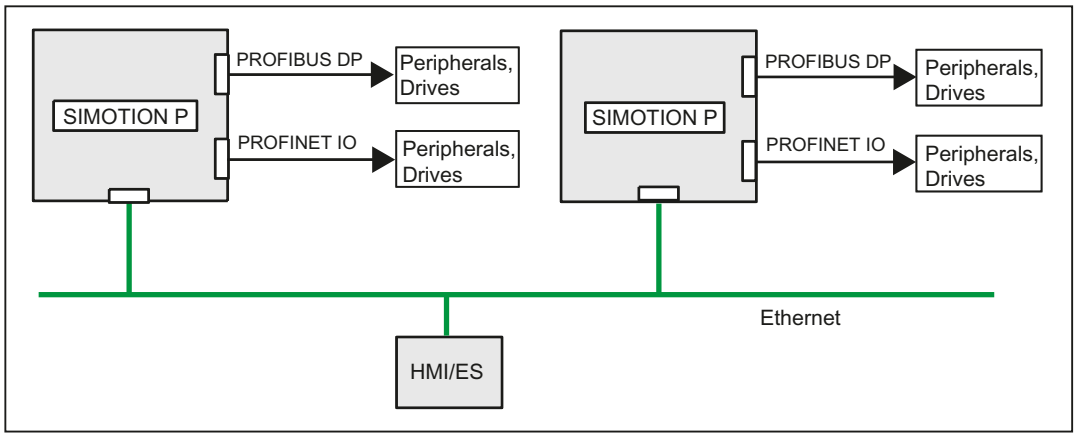


Figure 2-5 Model: Networking via Ethernet

Using Ethernet, the following services are possible on a SIMOTION device:

- HMI software

  WinCC flexible or the 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 a number of SIMOTION devices.

- SIMOTION IT

  The SIMOTION devices support communication with standard IT protocols (HTTP) over the integrated Ethernet interface. This makes it possible to use intranet/Internet from any location to access data or diagnostic information in the SIMOTION devices.

Note

Further information can be found in the SIMOTION IT Diagnostics and Configuration Manual.

2.3.4 HMI or ES via PROFIBUS DP/MPI

If a central HMI is to be connected using PROFIBUS DP, only the DP/MPI interface X102 of the IsoPROFIBUS board may be used.

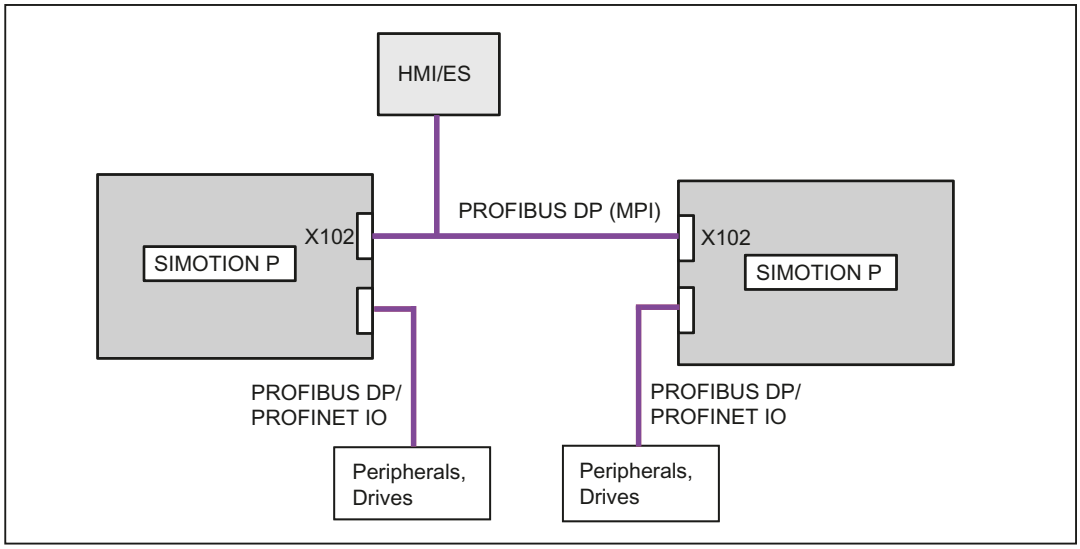


Figure 2-6 Model: Networking via PROFIBUS DP

The interconnection via PROFIBUS DP does not require any settings to be made for SIMOTION P350-3. These are made on the central HMI/ES as described in the documentation or online help for SIMOTION SCOUT.

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

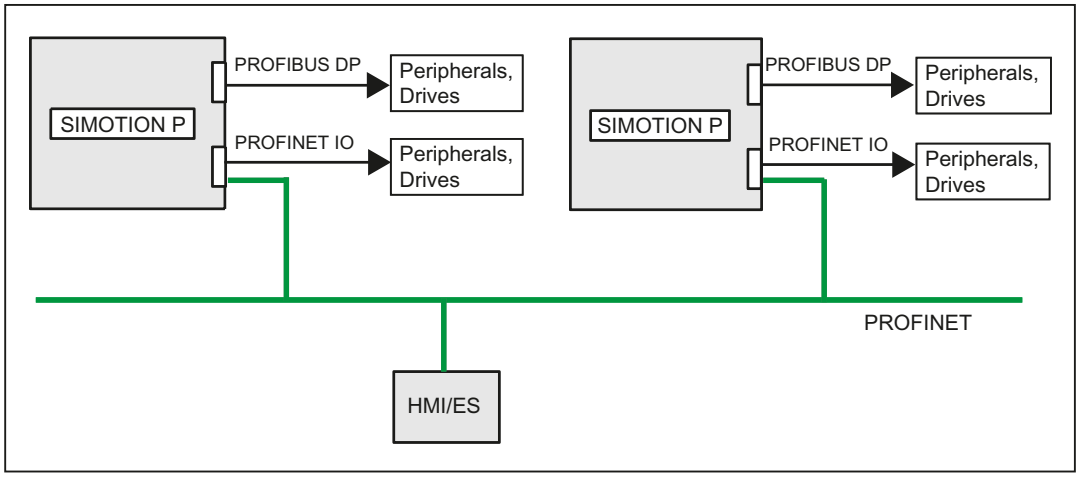


Figure 2-7 Model: Networking via PROFINET

The interconnection via PROFINET does not require any settings to be made for SIMOTION P350-3. 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 P350-3 computing unit and is designed for highly demanding tasks in PC-based automation applications. The complete system comprising the computer unit and panel is intended for local operation as a built-in unit in:

- Control cabinets/consoles
- 19" cabinets / controller housings.

In addition, the panel can also be operated distributed (separate from the computer unit).

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

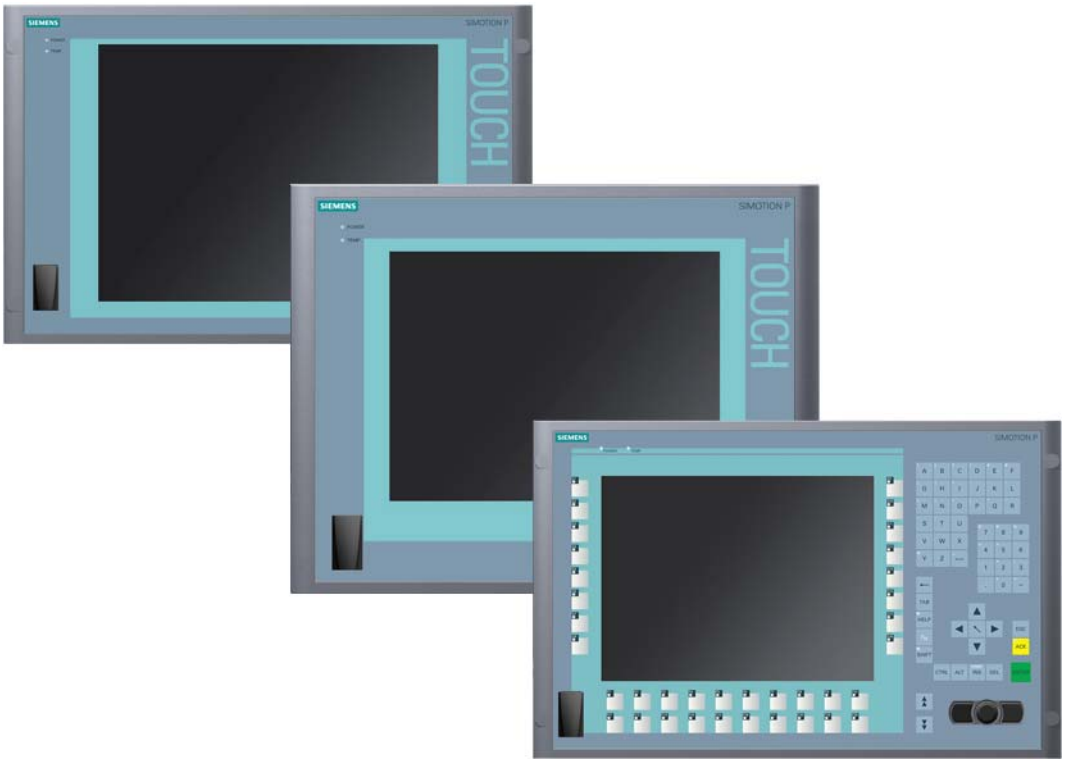


Figure 2-8 View of all SIMOTION panel fronts

2.4.2 Computer unit with panel

SIMOTION panel fronts must be connected to a SIMOTION P350-3 for the purpose of operation. 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.

Details for the assembly of the two components are contained in chapter Assembly forms overview (Page 89)

Structure

The device is available in two different configurations:

- Centralized configuration: Computer unit and control unit form an entity.

  The computer unit is screwed to the rear of the control unit with two mounting rails.

- 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

- 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

- 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 66).

Hardware description

3

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 P350-3 with a communication module - IsoPROFIBUS board or MCI-PN board)

SIMOTION P spare parts

As standard, a SIMOTION P350-3 consists of the following hardware components:

- SIMOTION PC unit **SIMOTION P350-3**
- **Back-up battery** for the motherboard of the P350-3
- Communication module
  - SIMOTION P350-3 IsoPROFIBUS board or/and
  - SIMOTION P350-3 MCI-PN board

Optional components

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

Motion Control interface expansion for PROFINET

- SIMOTION P350-3 MCI-PN board

PROFINET components such as connectors, cables, etc. are listed in the *IK PI* catalog.

SIMOTION P350-3 memory expansion

- Memory expansion possible to max. 2 GB

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 P350-3

The supply voltage must meet the requirements listed in the chapter titled Over of power supply (Page 121). 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

The drives and I/O modules released for SIMOTION are described in the ordering document *SIMOTION, SINAMICS S120 and motors for production machines,* 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 rather than SIMATIC. For example, special process-control functions (e.g. insertion and removal under voltage, 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: Address (http://support.automation.siemens.com/WW/view/en/11886029)

In addition to the I/O modules approved for SIMOTION, all certified standard slaves can, in principle, be connected to SIMOTION provided they support the following data traffic:

- Cyclic data traffic (DP V0)
- Acyclic data traffic (DP V1)
- Isochronous data traffic (DP V2)

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

Note

Please note that in individual cases additional boundary conditions must be fulfilled in order to integrate a standard slave into SIMOTION.

3.2 SIMOTION P350-3 PC unit

3.2.1 SIMOTION P350-3 representation

View

The "SIMOTION P350-3" SIMOTION PC unit forms the basis of SIMOTION P, along with the IsoPROFIBUS board or MCI-PN board.

The following figure illustrates an example of the SIMOTION P350-3 with IsoPROFIBUS board and DVD-ROM drive.

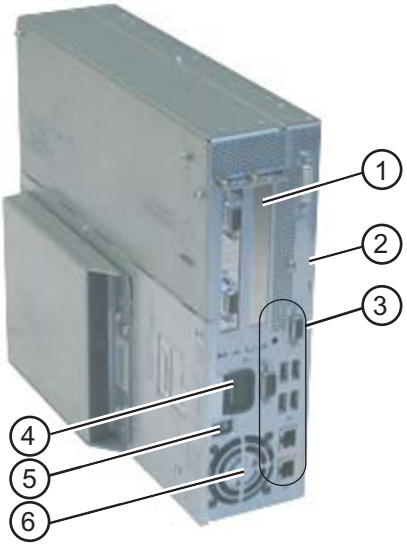
Figure 3-1 SIMOTION P350-3 with DVD-ROM drive: Perspective view

Figure 3-2 View of the opened housing with IsoPROFIBUS board

Interfaces and connection elements

The SIMOTION P350-3 offers the connection elements and interfaces described below. The figures show a SIMOTION P350-3 with optional DVD drive.

Connection side



①	Expansion slot
②	Cover plate for the CompactFlash card slot
③	Front interfaces
④	Socket for power supply via 24 VDC connector
⑤	On / Off switch
⑥	Power supply fan

Rear view

①	Status display: Two-digit 7-segment display and two LEDs for status information
②	Cover of the interfaces for operator panels (loosely enclosed)
③	Type plate
④	Device fan
⑤	Battery compartment

Equipotential bonding side

①	Equipotential bonding

See also

Display elements (Page 38)
Identification data (Page 79)

3.2.2 Control elements

On / Off switch

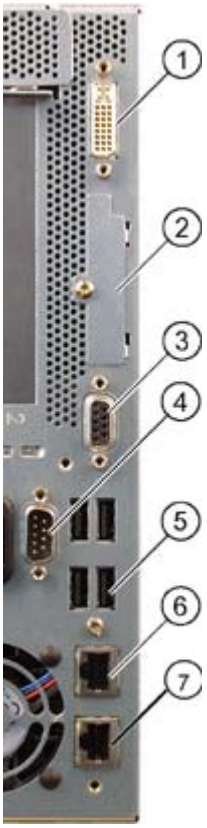
On / Off switch	Description
	The On / Off switch does not disconnect the device from mains. When the switch is in the 0 position (off), the power supply unit remains live.

⚠ WARNING
The On / Off switch does not disconnect the device from the power supply system. To remove power from the device, the power supply plug must be removed.

3.2.3 Connection elements

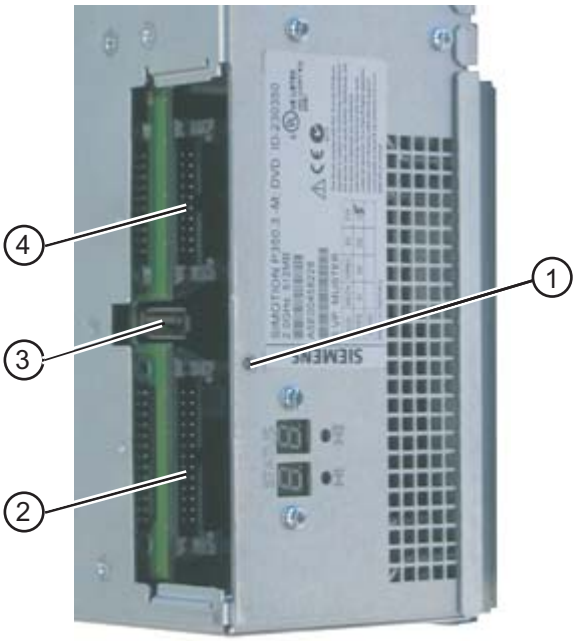
Interfaces

Location of the interfaces on the front of the device



Item	Designation	Description
①	DVI/VGA	DVI/VGA connection for CRT or LCD monitor with DVI interface, VGA via DVI/VGA adapter
②	CompactFlash card	CompactFlash card slot
③	PROFIBUS/MPI/DP	MPI interface (RS 485, isolated), 9-pin SUB D socket
④	COM	V.24 serial interface
⑤	USB 2.0	4 ports for USB devices (only 2 ports can be simultaneously used as high current)
⑥	ETHERNET 1	RJ45 Ethernet connection for 10/100 MBit/s
⑦	ETHERNET 2	RJ45 Ethernet connection for 10/100 MBit/s

Interfaces for connecting operator panels / displays

Location of the interfaces (at opened display cover)		
	①	Retaining screw for the steel cover plate that covers the interfaces described below.
	②	I/O interface for connecting keyboard signals from the SIMOTION panel front
	③	USB 2.0 for the connecting the front-mounted USB interface on the SIMOTION panel front
	④	LVDS display interface for TFT displays up to 1024 x 768 pixels

DC power supply

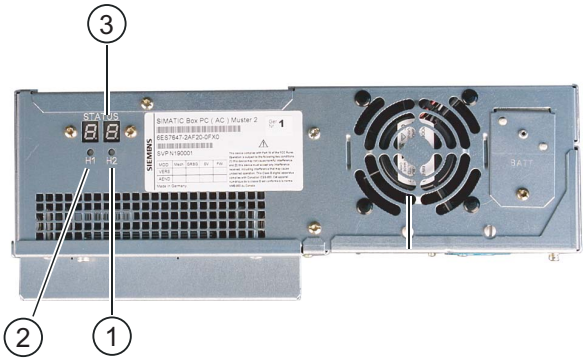
Location of the DC power connector	Description
	DC power connector for DC power supply of the device

3.2.4 Display elements

Status display

The status display is located on the rear side of the SIMOTION P350-3.

The status display consists of two 7-segment displays with two 2-color LEDs.



(1)	LED H2
(2)	LED H1
(3)	2 x 7-segment display

The following table shows the meaning of the display elements during the SIMOTION operation and the BIOS startup.

Table 3- 1 Meaning of display elements

Indicator	Meaning	
	SIMOTION operation	BIOS powering up
LED H1	no use assigned	The two LEDs light up in two colors (red and green) in order to test their operation. The two LEDs switch off when the startup is completed without errors.
LED H2 (next to the box label)	SIMOTION status • Green flashing - RUN SIMOTION P has started up and is in RUN mode. • Orange flashing - STOP SIMOTION P has started up and is in STOP mode. • Red flashing / red continuous light (internal status)	
7-segment display 1	Not currently used (preassigned with "0")	The POST codes of the associated test step and of the operating mode are displayed. The POST code of the most recently started test step is displayed when an error occurs. Code 00 is displayed when the startup is completed without error.
7-segment display 2 (next to the box label)	SIMOTION status (operating status display for SIMOTION P state) • 6 - RUNNING SIMOTION P has started up and the cyclic tasks are activated. • 0 to 5, a to f - internal status	

3.2.5 SIMOTION P350-3 interface description

Overview of the interfaces

The following table provides an overview of the SIMOTION P350-3 interfaces.

Table 3- 2 Interface overview

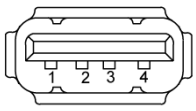
Interface	Description
USB 2.0 interface	X40 lower USB channel 0, X40 upper USB channel 2 X41 lower USB channel 4, X41 upper USB channel 5
PROFIBUS DP/MPI interface	9-pin sub D socket for connection to PROFIBUS DP, electrically-isolated interface
Ethernet interface	2 x 8-pin RJ45 socket for connection to Industrial Ethernet
DVI-I/VGA interface	26-pole socket for connection of a CRT or LCD monitor with DVI interface or VGA with DVI/VGA adapter
Slot	Slot for CompactFlash card 50-pin CF socket, types I/II
Serial interface COM1	V.24 serial interface

The assignments of the interfaces are described below.

USB interfaces

The Universal Serial Bus interfaces have the following pinout:

Table 3- 3 Assignment of the USB interfaces

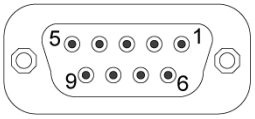
USB port			
			
Pin No.	**Name**	**Meaning**	**Input/output**
1	VCC	+ 5 V (fused)	Output
2	– Data	Data cable	Input/output
3	+ Data	Data cable	Input/output
4	GND	Ground	–

The connectors are of type A.

All interfaces are designed as high-current USB (500 mA). You cannot, however, operate more than two concurrently as high current.

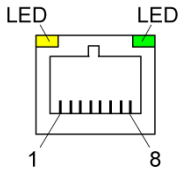
PROFIBUS/MPI interface

Table 3- 4 Assignment of the PROFIBUS/MPI interface

PROFIBUS/MPI interface			
			
PinNo.	**Name**	**Meaning**	**Input/output**
1	–	Unassigned	–
2	–	Unassigned	–
3	LTG_B	Signal line B of MPI module	Input/output
4	RTS_AS	RTSAS, control signal for received data stream. The signal is "1" active when the directly connected PLC is sending.	Input
5	M5EXT	M5EXT return line (GND) of the 5 V power supply The current load of an external consumer connected between P5EXT and M5EXT is not permitted to exceed 90 mA.	Output
6	P5EXT	P5EXT supply (+ 5 V) of the 5 V supply The current load of an external consumer connected between P5EXT and M5EXT is not permitted to exceed 90 mA.	Output
7	–	Unassigned	–
8	LTG_A	Signal line A of MPI module	Input/output
9	RTS_PG	RTS output signal of the MPI module. The control signal is "1" when the programming device is sending.	Output
Shield		On connector housing	

Ethernet RJ45 connector

Table 3- 5 Assignment of the Ethernet interface

Ethernet RJ45 connector			
			
Pinno.	**Name**	**Meaning**	**Input/output**
1	TD+	Transmit data	Output
2	TD-	Transmit data	Output
3	RD+	Receive data	Input
4, 5 [1]	SYMR	Internal 75 ohm terminating resistor	–
6	RD-	Receive data	Input
7, 8 [1]	SYMT	Internal 75 ohm terminating resistor	–
S		Shield	–
	Green LED	Off: 10 MBit/s Lit: 100 MBit/s	–
	Yellow LED	Lighting: Active connection (to a hub, for example) Flashing: Activity	–

[1] is not necessary for data transfer

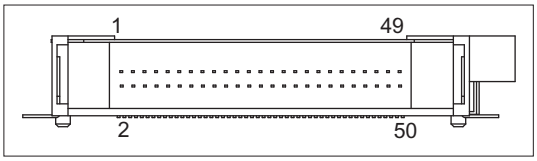
DVI-I interface

Table 3- 6 Assignment of the DVI-I interface

DVI-I interface			
			
Pinno.	**Name**	**Meaning**	**Input/output**
S	GND	Ground	–
S1	GND	Ground	–
C1	R	Red	Output
C2	G	Green	Output
C3	B	Blue	Output
C4	HSYNC	Horizontal synchronizing pulse	Output
C5	GND	Ground	–
CSA	GND	Ground	–
1	TX2N	TDMS data 2-	Output
2	TX2P	TDMS data 2+	Output
3	GND	Ground	–
4	NC	Unassigned	–
5	NC	Unassigned	–
6	DDC CLK	DDC clock	Input/output
7	DDC CLK	DDC data	Input/output
8	VSYNC	Vertical synchronizing pulse	Output
9	TX1N	TDMS data 1-	Output
10	TX1P	TDMS data 1+	Output
11	GND	Ground	–
12	NC	Unassigned	–
13	NC	Unassigned	–
14	+5 V	+ 5 V	Output
15	GND	Ground	–
16	MONDET	Hot plug detect	Input
17	TX0N	TDMS data 0-	Output
18	TX0P	TDMS data 0+	Output
19	GND	Ground	–
20	NC	Unassigned	–
21	NC	Unassigned	–
22	GND	Ground	–
23	TXCP	TDMS clock +	Output
24	TXCN	TDMS clock -	Output

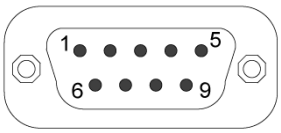
CompactFlash card slot

Table 3- 7 Assignment of the CompactFlash card interface

CompactFlash card interface		
		
Pin No.	**Name**	**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	+ 3.3 V power

Serial interface COM1

Table 3- 8 Assignment of the COM1 serial interface

Serial interface COM1			
			
PinNo.	**Name**	**Meaning**	**Input/output**
1	DCD (M5)	Receiving signal (level carrier)	Input
2	RxD (D2)	Receive data	Input
3	TxD (D1)	Transmit data	Output
4	DTR (S1)	Terminal ready	Output
5	GND (E2)	Functional ground (reference potential)	–
6	DSR (M1)	Readiness for operation	Input
7	RTS (S2)	Request To Send	Output
8	CTS (M2)	Clear To Send	Input
9	RI (M3)	Incoming call	Input

3.3 SIMOTION P State application

3.3.1 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.

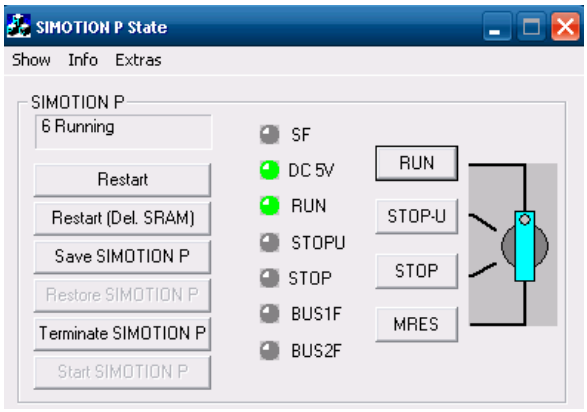


Figure 3-3 SIMOTION P state

3.3.2 LED display

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

Table 3- 9 Meaning of LEDs

LED	Meaning of the LEDs
SF (red)	Indicates an error state of the SIMOTION P.
5 VDC (green) SIMOTION P voltage on	Indicates that the voltage is present at P.
RUN (green) - SIMOTION P in RUN mode	Indicates that the user program is running.
STOPU (yellow) - SIMOTION P in STOP user program mode	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	Indicates that a user program is not running. The technology packages are not active.
BUS1F (red) - Group fault	Indicates a fault on the PROFIBUS DP interface (X101).
BUS2F (red) - Group fault	Indicates a fault on the MPI/DP interface (X102).

For additional information, see SIMOTION P350-3 and Panels Commissioning and Hardware Installation Manual.

3.3.3 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.

The change of the operating status 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 P350-3. You must use the mode selector for this.

For more information, please refer to SIMOTION P350-3 and Panels Commissioning and Hardware Installation Manual

3.3.4 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.

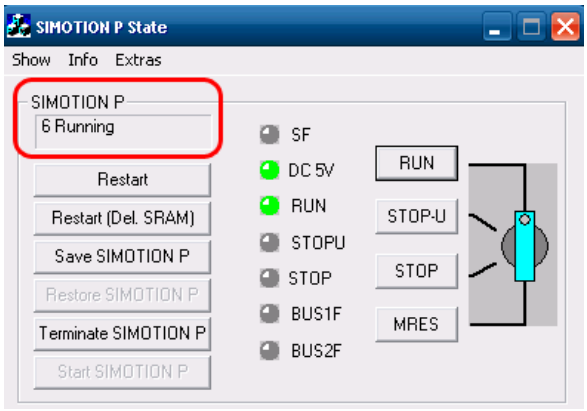


Figure 3-4 SIMOTION P state status display

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

Table 3- 10 Display in the task bar

		
RUN status: Green	STOP status: Yellow	NOT STARTED status: Gray

3.4 IsoPROFIBUS board for SIMOTION P350-3

Note

The IsoPROFIBUS board for SIMOTION P350-3 (order no. 6AU1390-0AA00-0AA1) is a further development and is not compatible with the previous version (SIMOTION P350).

Please take this into account when ordering spare parts and when handling the board (in particular the battery connector).

3.4.1 View of the IsoPROFIBUS board

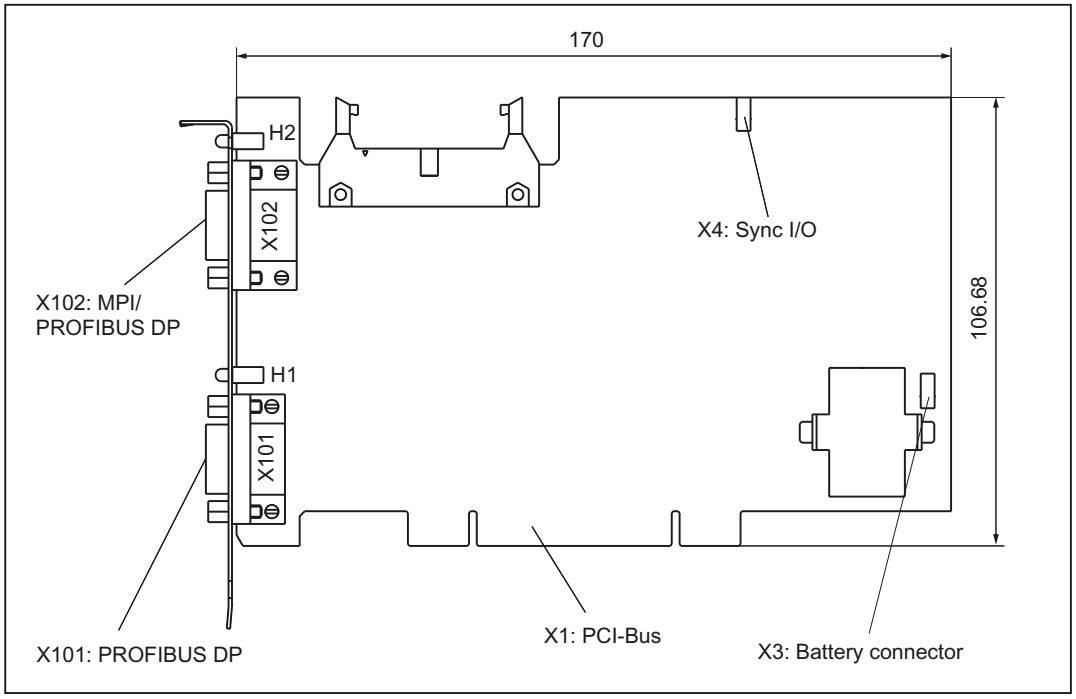


Figure 3-5 View of the IsoPROFIBUS board

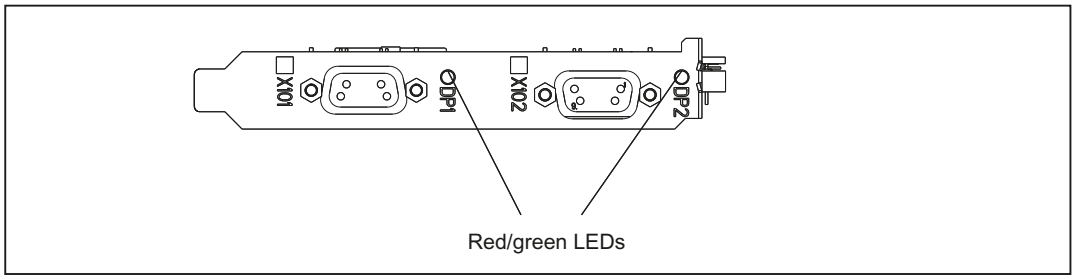


Figure 3-6 Interface view of the IsoPROFIBUS board

3.4.2 Display elements of the IsoPROFIBUS board

A two-colored LED (red/green) is located on each of the two interfaces on the IsoPROFIBUS board.

These elements are used to display the communication status of the two PROFIBUS DP interfaces.

Table 3- 11 LEDs on the IsoPROFIBUS board

LED (color and status)	Meaning
LED - Off	Interface not configured
Configuring the interface as **slave**:	
Red LED - On	Bus fault Searching for baud rate
Red LED - flashing (0.5 Hz)	Parameterization errors No cyclic data exchange
Green LED - On	Cyclic data exchange
Configuring the interface as **master**:	
Red LED - On	Bus fault Bus short-circuit
Red LED - flashing (0.5 Hz)	Bus fault Slaves have failed or cable broken
Green LED - On	No fault or no interface configured

3.4.3 IsoPROFIBUS board interface description

Interface overview

Table 3- 12 Interfaces on the IsoPROFIBUS board

Interface name	Connector name	Type
1. PROFIBUS DP	X101	9-pin Sub-D socket
2. PROFIBUS DP/MPI	X102	9-pin Sub-D socket
SYNC I/O	X4	3-pin plug connector
Battery connector	X3	2-pin plug connector
PCI bus	X1	124-pin direct connector (5 V/3.3 V interface)

Pin assignment: Battery connection X3 (is lead to the mainboard)

Table 3- 13 Battery connection pin assignment

Pin	Signal designation	Signal type
1	BATT- (minus pole)	VI
2	BATT+ (plus pole)	VI

Signal type: VI (Voltage Input)

Note

The board inserted into slot 1 is connected to the mainboard battery connection via battery connection cable A5E00435941. If two plug-in boards with battery connection are used simultaneously, the board in slot 2 is not connected!

Pin assignment: PROFIBUS DP interfaces X101 and X102

Maximum cable length: 100 m at 12 MBaud

Table 3- 14 Pin assignment of the PROFIBUS DP interfaces

Pin	Signal designation	Signal type
1	Unassigned	-
2	Unassigned	-
3	RS-DP (RS 485 differential signals)	B
4	RTS (request to send)	O
5	Mext (external ground)	VO
6	P5ext (5 V supply voltage)	VO
7	Unassigned	-
8	XRS-DP (RS 485 differential signals)	B
9	Unassigned	-

Signal type

O	Output
VO	Voltage output
B	Bidirectional

Note

The PROFIBUS DP interfaces are isolated from each other and from the SIMOTION P350-3. The P5ext/Mext voltage is used only to supply the bus terminating resistor.

The use of OLPs (optical link plugs) is not permitted.

Note

The PROFIBUS DP interfaces of the IsoPROFIBUS board do not supply any 24 V power!

When you use a USB PC adapter on the SIMOTION P350-3 with IsoPROFIBUS board, you must also connect the power unit of the USB adapter. The plug-in power unit set is not supplied with the USB PC adapter and must be ordered as accessory.

The order numbers for the USB PC adapter and for the plug-in power unit set are contained in section IsoPROFIBUS board accessories (Page 52).

3.4.4 Technical data for the IsoPROFIBUS board

Table 3- 15 Technical data for the integrated IsoPROFIBUS board

Power consumption for + 5 V PCI voltage		
Standard	2.5 W	
Maximum	3.5 W	
Permissible ambient conditions		
Heat dissipation	Open circuit ventilation	
Temperature	**Operation**	**Storage/transport**
• IsoPROFIBUS board in SIMOTION P	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	
Relative atmospheric humidity	**Operation**	**Storage/transport**
• IsoPROFIBUS board in SIMOTION P	5 % … 80 %	5 % … 95 %
Tested according to	EN 60068-2-30	
Temperature change	Max. 10 K per hour in operation	
Moisture condensation and ice formation	Not permissible	
Design		
Module	Card (3.3 V/5 V, 32 bits)	
Dimensions (H x D) in mm	107 x 170	
Weight	150 g	
Space requirements	Short PCI slot	

Safety

Degree of protection	IP20 in mounted state
Safety class	I complies with VDE 0106
Safety regulations	EN 60950
Approvals	CE, UL508, cULus

Quality assurance

Quality assurance complies with ISO 9001.

Note

The safety regulations, approvals, degree of protection, and protection class specified are only valid if the board is inserted in a SIMOTION P.

3.4.5 IsoPROFIBUS board accessories

You can order the following optional accessories for the IsoPROFIBUS board for SIMOTION P350-3:

Table 3- 16 IsoPROFIBUS board accessories

Accessories	Order number
USB PC adapter	6ES7972-0CB20-0XA0
Plug-in power unit set for USB PC adapter	6ES7972-0CA00-0XA0

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

3.5 MCI-PN board for SIMOTION P350-3

3.5.1 View of the MCI-PN board

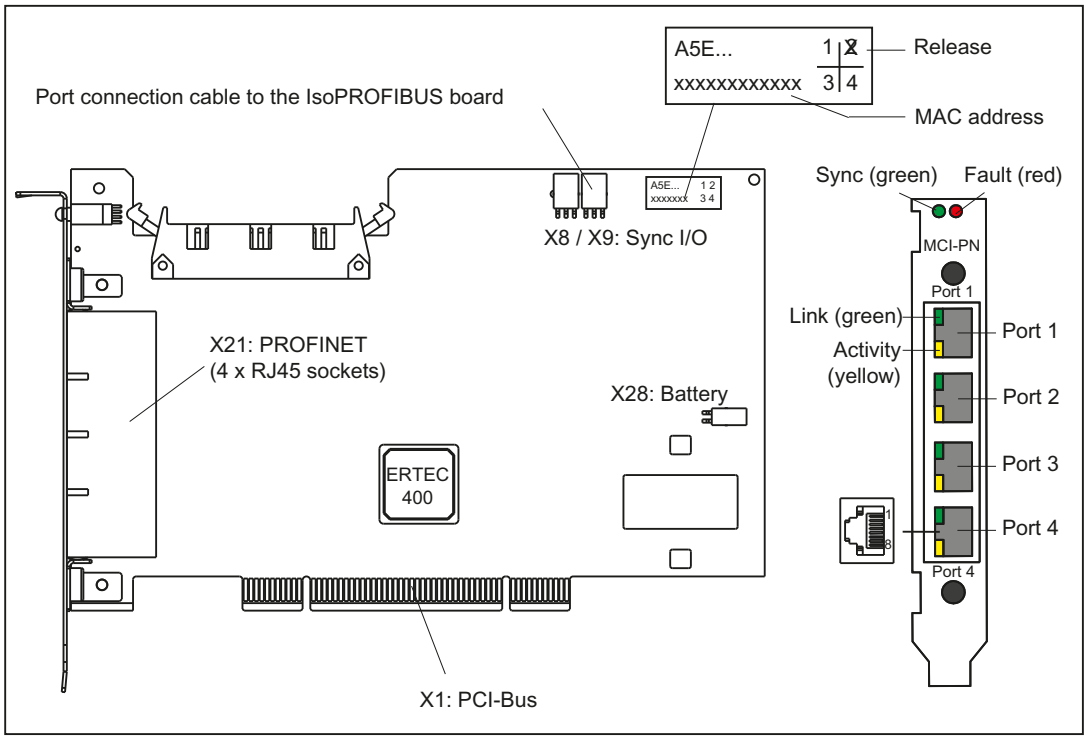


Figure 3-7 View of the MCI-PN board with interfaces (order no. 6AU1390-0BA00-0AA0)

3.5.2 Display elements of the MCI-PN board

LED displays

The PROFINET interface with the four ports provides integrated LEDs used to display the link and the activity. The front panel of the board has two LEDs (Fault and Sync) which indicate the status.

Table 3- 17 Meaning of the LED displays

Name	Color	Status	Meaning
Link port (4x)	Green	On	A device is connected to port x and a physical connection exists.
Activity port (4x)	Yellow	On	Data is being received or sent at Port x.
Fault	Red	Off	MCI-PN board is running correctly, data exchange with all configured I/O devices is running.
		Flashing (2 Hz) [2]	Bus fault • Failure of a connected I/O device • At least one of the assigned I/O devices cannot be addressed • Incorrect or no configuration
Sync [1]	Green	Off	The SIMOTION P task system is not synchronized with the send cycle of PROFINET IO. An internal substitute cycle of the same size as the send cycle will be generated. If no PROFINET IO has been configured, then generally no synchronization will be made to the send cycle.
		On	The SIMOTION P task system has synchronized with the send cycle of PROFINET IO and data exchange is running. The IsoPROFIBUS board (PROFIBUS) is synchronized to the send cycle of PROFINET IO.
		Flashing (2 Hz)	The SIMOTION P task system has synchronized with the send cycle of PROFINET IO and cyclic data exchange is running. The IsoPROFIBUS board (PROFIBUS) is not yet synchronized to the send cycle of PROFINET IO.
		Flashing (0.5 Hz)	Firmware download in progress

[1] If no PROFINET IO with IRT has been configured, there will generally be no synchronization with the send cycle.

[2] Minimum flashing duration 3 s

3.5.3 MCI-PN board interface description

Interface overview

Table 3- 18 Interfaces of the MCI-PN board

Interface name	Connector name	Type
PROFINET	X21	4 x RJ45 sockets
SYNC I/O	X8 and X9	3-pin plug connector
Backup battery	X28	2-pin plug connector
PCI bus	X1	124-pin direct connector (5 V/3.3 V interface)

PROFINET interface X21

The interface has four full-duplex 10/100 MBit Ethernet ports. The four ports are connected as an Ethernet terminal device.

Table 3- 19 Interface features

Features	Type
Connector type	RJ45 socket connector
Cable type	Industrial Ethernet cable
Maximum cable length	100 m

Table 3- 20 X21 interface pin assignment (Port x)

Pin	Signal name	Signal type	Meaning
1	TXP	Output	Ethernet transmit differential signal
2	TXN	Output	Ethernet transmit differential signal
3	RXP	Input	Ethernet receive differential signal
4	--		4 together with 5 via 75 ohm at the 1 nF capacitor to the shield ground
5	--		
6	RXN	Input	Ethernet receive differential signal
7	--		7 together with 8 via 75 ohm at the 1 nF capacitor to the shield ground
8	--		
Screened backshell	M_EXT		Screen, permanently connected

MAC address

Note

The MAC address can be viewed in the device diagnostics of the SIMOTION SCOUT Engineering System.

The IP address is set using the SIMOTION SCOUT Engineering Software (HW Config).

The MAC address of the MCI-PN board is also indicated on a label on the computer unit.

- If the MCI-PN board is installed in a SIMOTION P complete system, the label with the MAC address has already been attached under the type plate on the housing of the computer unit.
- If the MCI-PN board is ordered and installed as optional communications module, the label with the MAC address is already affixed to the module on delivery.

  Pull the label off the module and stick it to the computer unit's housing underneath the rating plate.

SYNC I/O interface X8/X9 to the IsoPROFIBUS board X4

The supplied ribbon cable (A5E00447905) is used to connect the two modules. See also SIMOTION P (hardware) structure (Page 18).

Note

The SYNC I/O cable MUST be plugged in when both modules (MCI-PN and IsoPROFIBUS board) are used.

The enclosed battery cable does not serve any purpose when the MCI-PN is used as an optional board (plugged into slot 2); it is not connected.

3.5.4 Slots for the MCI-PN board

Possible slots

The slot for the MCI-PN board is determined by the SIMOTION P350-3 equipment.

- If the MCI-PN board is being used as an option together with the IsoPROFIBUS board, the modules are plugged in as follows:
  - IsoPROFIBUS always in slot 1
  - MCI-PN-Board in slot 2 (directly above the motherboard)
- In the case of a PROFINET-only solution, the MCI-PN board is always connected to slot 1.

The above slot rules are fixed and must always be observed. If you do not follow the slot rules, real-time capability problems (latency) can occur in SIMOTION P350-3.

3.5.5 Technical data for the MCI-PN board

Table 3- 21 Technical data for the integrated MCI-PN board

Technical data		
Data transfer		
Data transmission rate	10/100 Mbps (PROFINET only 100 Mbps)	
Interfaces		
Connection to 10BaseT/100BaseTx	RJ45 connection (4 units)	
Connection to programming device/PC	PCI slot	
Voltage		
PCI power supply	DC + 5 V, ± 5%	
Current consumption		
Current consumption for PCI voltage + 5 V	Max. 900 mA	
Permissible ambient conditions		
Temperature	**Operation**	**Storage/transport**
• MCI-PN board in SIMOTION P	5° C to 45° C	-20° C to 60° C
Tested according to	IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14	
Relative atmospheric humidity	**Operation**	**Storage/transport**
• MCI-PN board in SIMOTION P	5 % … 80 %	5 % … 95 %
Tested according to	IEC 60068-2-78, IEC 60068-2-30	
Temperature change	Max. 10 K per hour in operation	
Moisture condensation and ice formation	Not permissible	
Design		
Module	Card (3.3 V/5 V, 32 bits)	
Dimensions (H x D) in mm	107 x 167	
Weight	110 g	
Space requirements	Short PCI slot	

Safety

Degree of protection	IP20
Safety class	I complies with VDE 0106
Safety regulations	EN 60950
Approvals	CE, UL508, cULus

Quality assurance

Quality assurance complies with ISO 9001.

Note

The safety regulations, approvals, degree of protection, and safety class specified are only valid if the module is inserted in a SIMOTION P350-3.

3.5.6 Scope of delivery and accessories pack

The scope of delivery of the MCI-PN board includes:

- SYNC I/O cable (connecting cable to the IsoPROFIBUS board)
- Replacement battery cable
- Tension relief bracket

Figure 3-8 Accessory kit: Strain relief clamp to the MCI-PN board (A5E00815933)

3.6 SIMOTION panel fronts

3.6.1 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.

3.6.2 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.

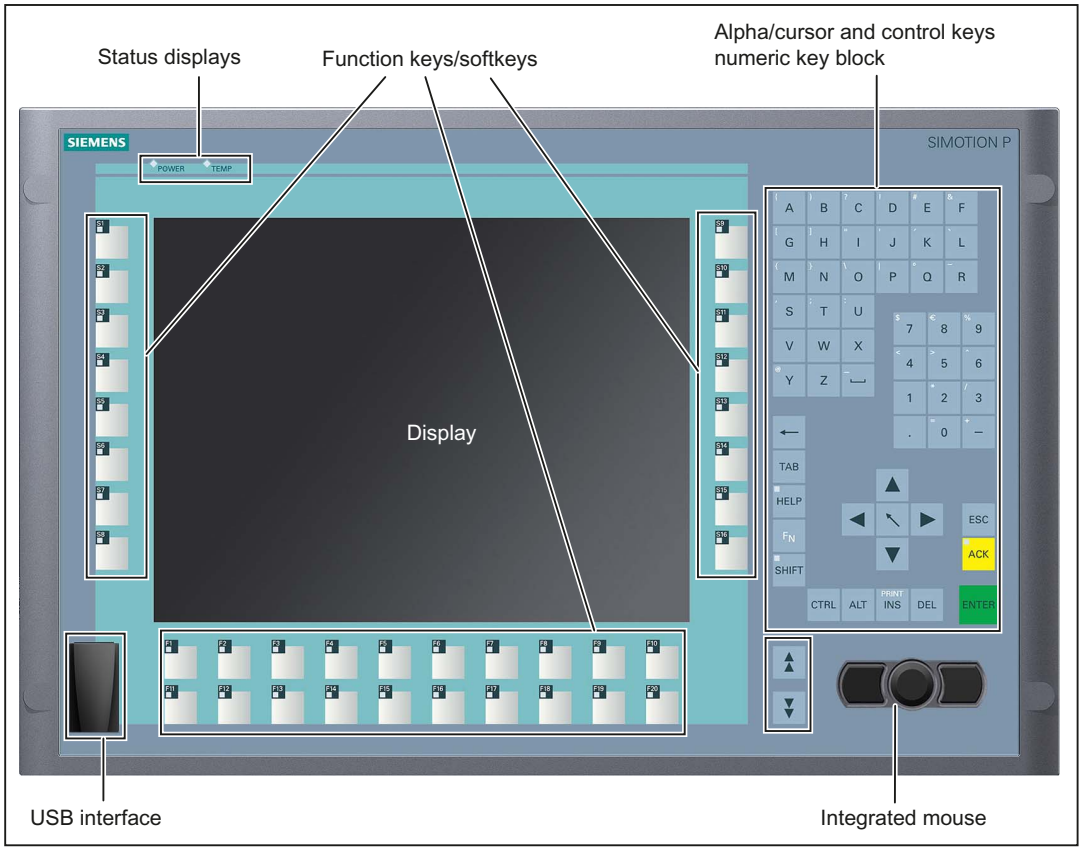


Figure 3-9 SIMOTION panel front with keys variant

3.6.3 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.

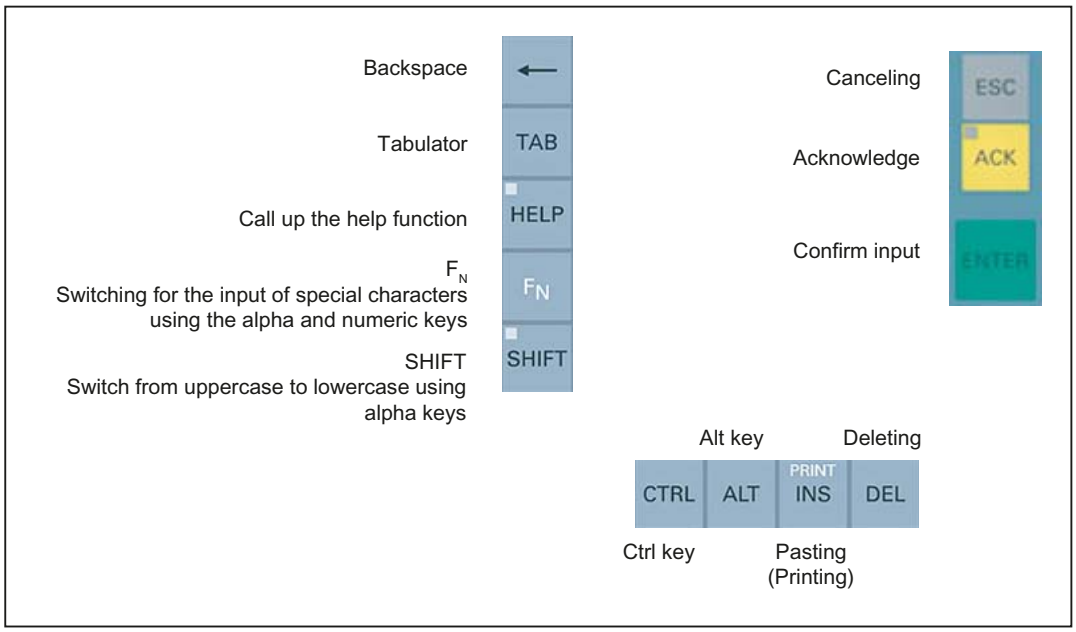


Figure 3-10 Control Keys

Note

When using SIMOTION P with a Windows operating system, you cannot enter the euro sign using the shortcut <F_N+8>.

Alpha keys

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

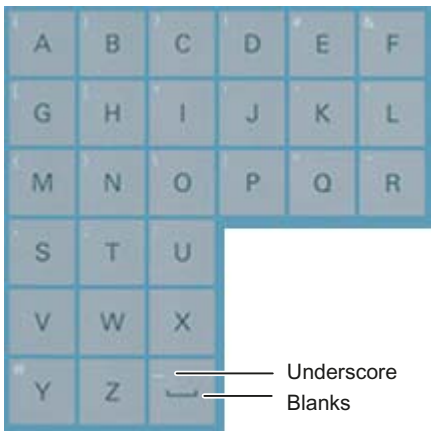


Figure 3-11 Alpha keys

Toggling 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 ".":

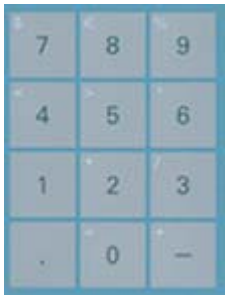


Figure 3-12 Numerical keypad

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.

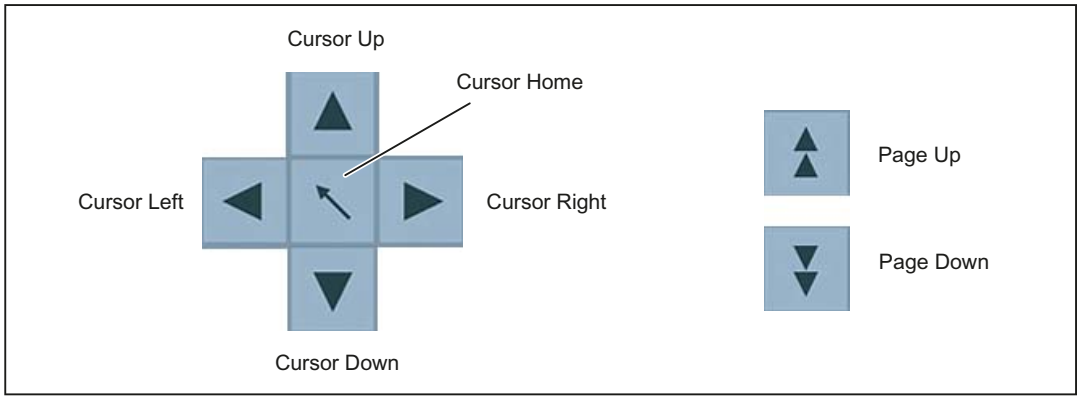


Figure 3-13 Cursor keys

Connecting external keyboards

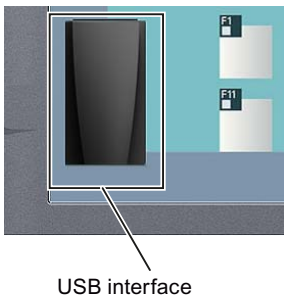


Figure 3-14 USB interface on the SIMOTION panel front

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).

3.6.4 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".

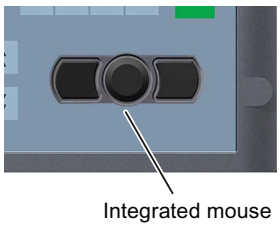


Figure 3-15 Integrated mouse

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

3.6.5 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.

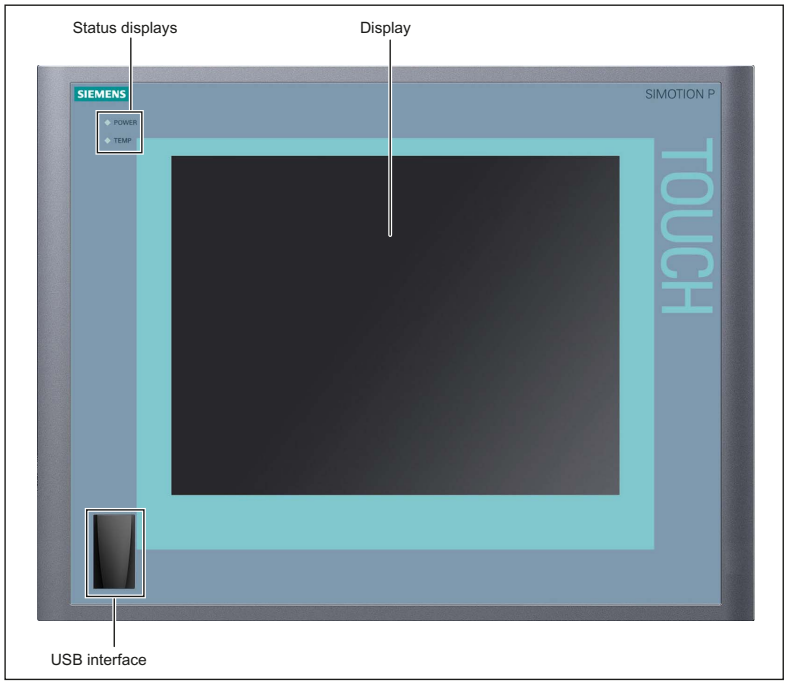


Figure 3-16 Panel with touch screen variant

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.

3.6.6 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- 22 USB interface assignment on the panel front – standard USB 2.0

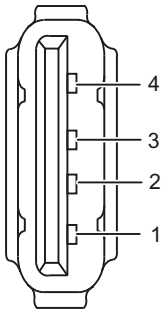
Layout	Pin	Name	Type	Comments
	4	GND	V	Ground for external USB interface
	3	+ Data	B	Data cable
	2	– Data	B	Data cable
	1	VCC	V	+ 5 V (fused) for external USB interface; maximum of 100 mA; connect an external power supply for devices with higher power ratings.

Table 3- 23 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

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 port 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 flat cables used to connect the computing unit, and the USB cable, have to be connected to the interfaces on the computer unit (see the "Installation" section of the "SIMOTION P350-3 and Panel Fronts" Commissioning and Hardware Installation Manual). Removing this metal plate reveals the rear side of the panel front as shown in the following 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

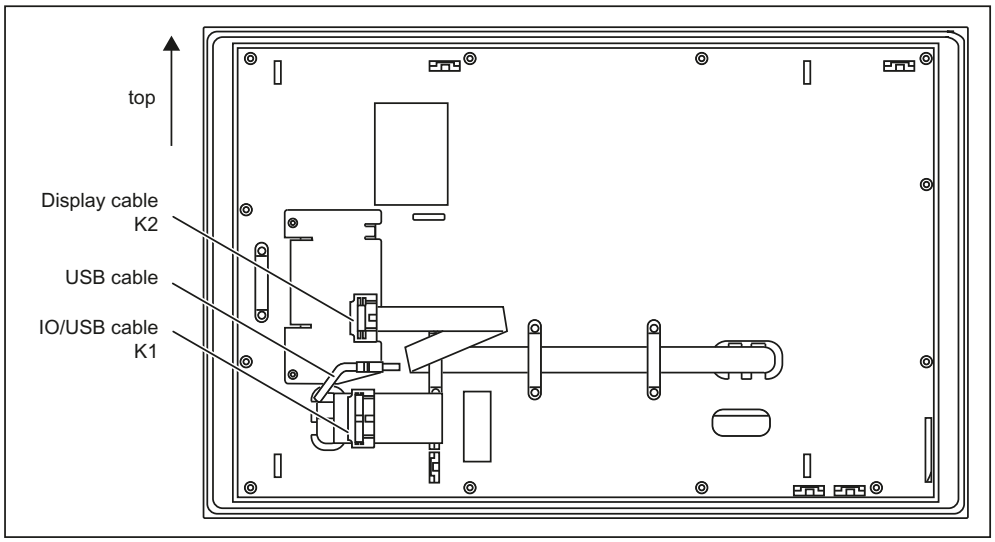


Figure 3-17 Interfaces on rear side of panel

See also

Assembly forms overview (Page 89)

3.6.7 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 - in inches	 483 x 310 19.0 x 12.216	 400 x 310 15.75 x 12.216	 483 x 310 19.0 x 12.216
Installation dimensions [1] H x W x D - in mm - in inches	 450 x 290 x 100 17.72 x 11.42 x 3.9	 368 x 290 x 125 14.49 x 11.42 x 4.92	 450 x 290 x 130 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- 24 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- 25 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- 26 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 110)

3.6.8 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	
• for 12" touch screen (10 units)	6AV7671-2BA00-0AA0
• 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**

3.7 Decentralized structure with the Panel PC Remote Kit

3.7.1 Overview of decentralized structure with the Panel PC Remote Kit

The Panel PC Remote Kit for a decentralized structure allows spatial separation between SIMOTION panel fronts and SIMOTION P350-3.

After booting, you can operate the SIMOTION P350-3 in the same manner as with the operator panel connected directly to the SIMOTION P350-3. All keys have the same action as for the directly connected operator panel.

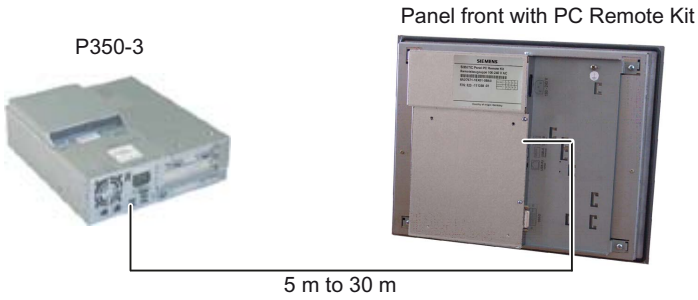


Figure 3-18 Example of a decentralized structure for the P350-3 with a panel front using the Panel PC Remote Kit

Validity

This description is valid for:

Designation	Order number
Panel PC Remote Kit; 24 V DC	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 P350-3 in the control cabinet
- Signal transmission between SIMOTION P350-3 and SIMOTION panel front via DVI-D and USB or USB extender cable (see the section titled "Accessories for the Panel PC Remote Kit").
- Easy installation and easy-to-service structure through the component structure.
- Functionality of the SIMOTION P350-3 as in the case of a centralized structure. Following power up, operation using a Panel PC Remote Kit proceeds in the same way as when using a panel front connected directly to the SIMOTION P350-3.
- The distance between the SIMOTION P350-3 and the SIMOTION panel front can be up to 30 m.

Requirements

- SIMOTION panel fronts (order no. 6AU1300-0x**B**00-0AA0)
- SIMOTION P350-3 V4.0

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 V DC power supply: 3-pin Phoenix connector

See also

Accessories for the Panel PC Remote Kit (Page 73)

3.7.2 Configurations

Note

Note

Using a decentralized structure 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

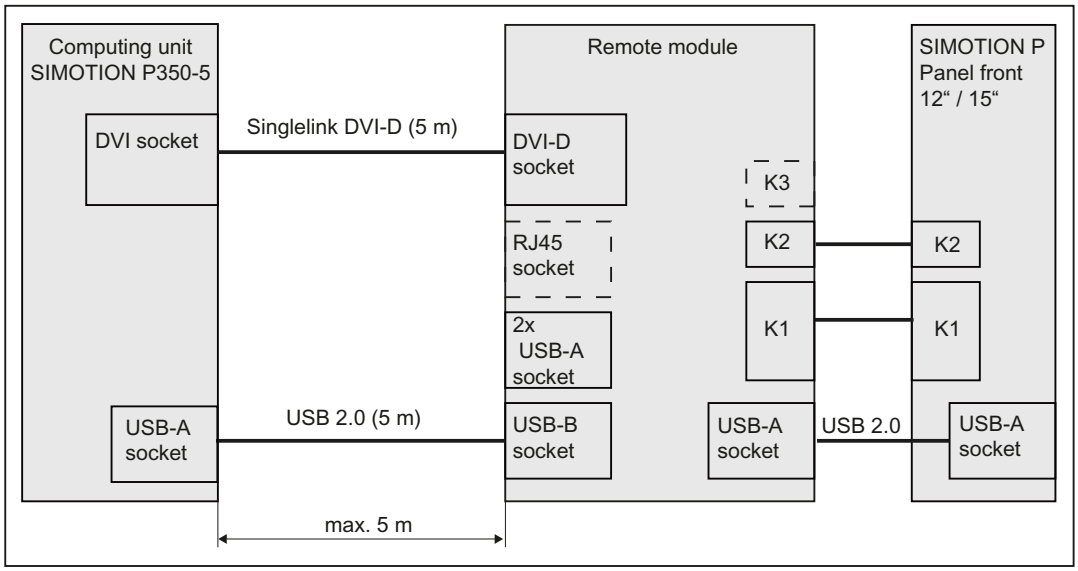


Figure 3-19 Configuration: Panel front using the Panel PC Remote Kit on the P350-3 (≤ 5 m)

Configuration for distances between 5 m and 30 m

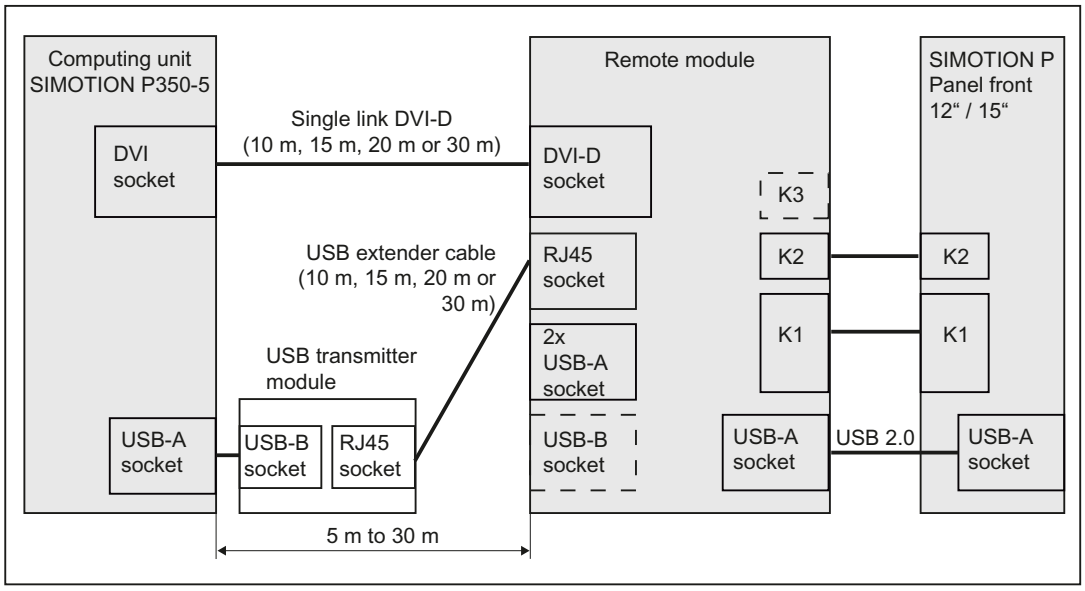


Figure 3-20 Configuration: Panel front using the Panel PC Remote Kit on the P350-3 (> 5 m)

3.7.3 Interface description for the Panel PC Remote Kit

Overview

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

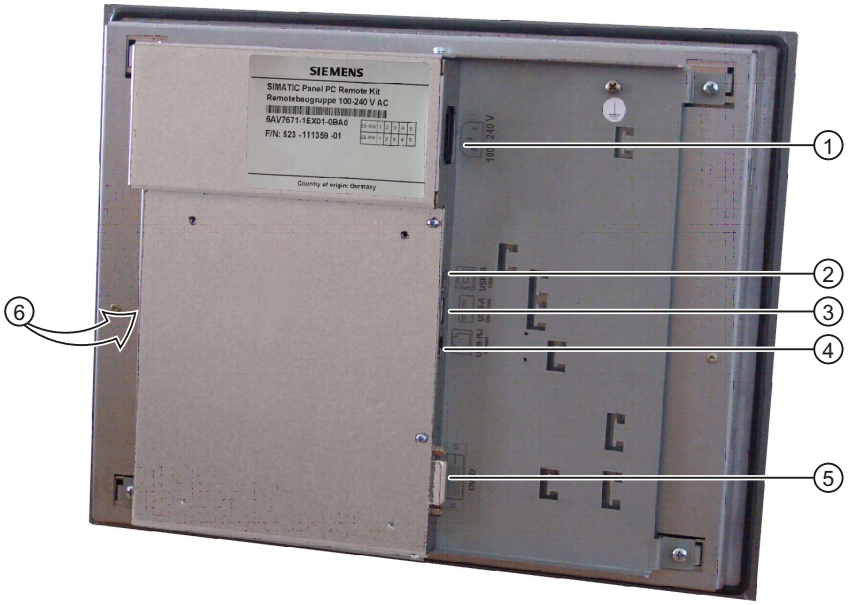


Figure 3-21 View of the Panel PC Remote Kit with its interfaces

Table 3- 27 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 P350-3 interface description (Page 39).

3.7.4 Technical data for the Panel PC Remote Kit

Table 3- 28 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 µs
Power consumption, typ.	50 W
Mechanical specifications	
Dimensions W x H x D [mm]	337 x 269 x 53
Weight	1.8 kg
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/s²
Shock stressing	50 m/s², 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 50º C	–20° C to 60º 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

3.7.5 Accessories for the Panel PC Remote Kit

Table 3- 29 Accessories for the Panel PC Remote Kit

Component	Description		Number	Order number
Mounting bracket	SIMOTION P350-3	Flat mounting brackets for SIMOTION P350-3 in the control cabinet	1 set (2 units)	6FC5248–0AF20–0AA0
		Book mounting brackets for SIMOTION P350-3 in the control cabinet	1	6ES7648–1AA10–0YA0
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 extender cable	1	6AV7671–1EX11-0AA0
		15 m; DVI-D and USB extender cable	1	6AV7671–1EX11-5AA0
		20 m; DVI-D and USB extender cable	1	6AV7671–1EX12-0AA0
		30 m; DVI-D and USB extender 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

4.1 Overview of application planning

Introduction

This section describes the first steps after unpackaging, the permitted mounting positions and the fixation and provides general information about transportation and operation. The section describes the necessary considerations for EMC.

Field of application

SIMOTION P350-3 is a PC platform for highly demanding tasks in PC-based automation applications. The SIMOTION panel front is designed for local use directly on the machine, and is installed for example as follows:

- Switchgear cabinets
- Swivel arms (booms)
- Consoles

Note

In the following, the term "switchgear cabinet" also refers to rack, mounting rack, switchboard, operator panel and console. The term "device" is used to refer to the SIMOTION P350-3 and its variants.

General information about operation

CAUTION
The device is approved for operation in closed rooms only. The guarantee is void if this stipulation is ignored. **Condensation** When transporting the device at low temperatures, ensure that no moisture gets on or into the device. This also applies if the device is subjected to extreme changes in temperature. **Commissioning** Allow the device to slowly adjust to room temperature before commissioning the device. Do not place the device near heat radiation. If condensation develops, wait 12 hours before you switch on the device. **Vibration** DVD drives are sensitive to vibration. Inadmissible vibration during operation may result in loss of data or damage to the drive or data medium. Before transporting the device, wait at least 20 seconds following power off to allow the drive to stop completely.

Avoid extreme environmental operating conditions. Protect your device against dust, moisture and heat. For additional information, refer to the technical data.

Do not place the device in direct sunlight.

Chemical resistance

CAUTION
Adhere to the information regarding chemical resistance. Please refer to the information available online at Address (http://support.automation.siemens.com/WW/view/en/16532108).

Sources of light

NOTICE
Position the screen so that it is not subject to direct sunlight or other strong sources of light.

TFT-LC display

A permanent picture with bright images can lead to a burn-in effect on the TFT LCD.

If a screen saver is activated, please observe the following:

- Screens that are configured to actively switch to a black screensaver when the backlighting is on (e.g. flying stars "starfield simulation") provide the liquid crystals with a chance to recover. Pay attention to the length of time the backlighting is activated.
- The following applies to screen savers which turn off the backlighting: Each time the backlighting is turned on, its life is reduced by 50 minutes.

Consider the following carefully:

- Screen saver
- Switch off the backlighting regularly
- Permanent display of the customer application

4.2 Shipping and storage conditions

Despite the fact that the device is of a rugged design, its internal components are sensitive to severe vibrations or shock. You must therefore protect the PC from severe mechanical stress when transporting it.

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

Unpack the device only at the its installation location.

Do not transport the device when it is mounted.

CAUTION
Risk of damage to the device! When transporting the PC in cold weather it may be submitted to extreme variations in temperature. In this situation, should make sure that no moisture (condensation) develops on or inside the device. If condensation develops, wait approximately 12 hours before you switch on the device.

NOTICE
Adhere to these stipulations each time the device is transported, otherwise the guarantee is void.

Table 4- 1 Shipping and storage conditions

Type of Condition	Permissible range
Temperature	– 20 °C to 60 °C
Maximum temperature increase	10 K/h
Relative atmospheric humidity	5 to 95% (at 25 °C)
Moisture condensation and ice formation	Not permissible

4.3 Unpacking and checking the delivery

Procedure

1. If you are the person receiving the goods, check the packaging for damage caused during transport.
2. If any transport damage is present at the time of delivery, lodge a complaint at the shipping company in charge. Have the shipper confirm the transport damage immediately.
3. Unpack the device.

CAUTION
Do not lie the device on its back. This will avoid any damage to an optical drive which may be present.

4. Keep the packaging material in case you have to transport the unit again.

NOTICE
The packaging protects the device during transport and storage. Transport the device only in the original packaging!

5. Please keep the enclosed documentation in a safe place. You will need the documentation when you start up the device for the first time.
6. Check the package contents for completeness and any visible transport damage. Check for completeness using the enclosed "Contents of Delivery" list.
7. Notify the delivery service in charge immediately if the packages contents are incomplete or damaged.

⚠ WARNING
Make sure that a damaged device is not installed nor put into operation.

4.4 Identification data

Procedure

You require the identification data in order to be able to clearly identify the device in the "Product Equipment Data" (PED) database. All important components of your SIMOTION P350-3 are stored there.

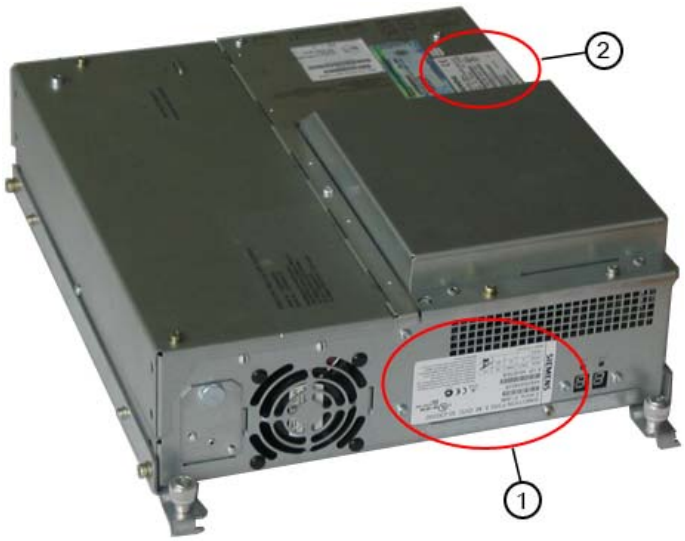


Figure 4-1 Box label ① and component label ② for the SIMOTION P350-3

Figure 4-2 Box label (data for the PC unit)

The PC unit can be uniquely identified by the identification number in **S VP <sample>**. <sample> is an 8-digit character string.

Figure 4-3 Component label

The component label has the order number **6AU…** of the general device and its serial number **S T-xxxxxxxxx**.

Further information is available at the product support link in the Preface (Page 5).

4.5 Mechanical and climatic environmental conditions

Operating conditions

SIMOTION P is designed for use in a stationary, weather-protected installation.

SIMOTION P satisfies the operating conditions for Class 3C3 in accordance with EN 60721-3-3 (locations of use with high traffic densities and in the immediate vicinity of industrial installations with chemical emissions).

Observe the following points during installation:

- Observe the climatic and mechanical environmental conditions in the technical data in your Operating Instructions.
- The clearance in the area of the ventilation slots must be at least 100 mm, so that the PC is sufficiently ventilated.
- Do not cover the ventilation slots of the device.
- Since the device with DC power supply does not satisfy fire protection requirements to EN 60950 in the power supply connection area, the installation must meet the requirements expected of fire protection housings in this area.
- Always observe the mounting positions permitted for this device.

⚠ WARNING
Failure to adhere to these conditions when installing the system will invalidate approval to UL 60950, UL 508, and EN 60950!

Use prohibition

SIMOTION P must not be used in the following locations without additional measures being taken:

- Locations with a high percentage of ionizing radiation
- Aggressive environments characterized, for example, by:
  - Dust accumulation
  - Corrosive vapors or gases
- Installations requiring special monitoring such as:
  - Elevator installations
  - Electrical plants in particularly hazardous areas

An additional measure for using SIMOTION P can, for example, be installation in cabinets.

Ambient conditions

For details of the mechanical and climatic environmental conditions, consult Section Technical data for SIMOTION P350-3 (Page 105)

4.6 Electromagnetic compatibility

Definition

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

General rules (Page 127)

4.7 Selecting and manufacturing the mounting cut-out

Requirement

The degree of protection suitable to the field of application and thereby the method of attachment have been selected.

Procedure

1. Follow the installation instructions.
2. Select a location suitable for installation, taking into account the installation instructions and the chosen installation position.

3. On the basis of the dimension diagrams, check whether the required screw and pressure points on the rear and the hatched seal area are easily accessible after the completion of the mounting cut-out. Otherwise the mounting cut-out is useless.
4. Complete the mounting cut-out in accordance with the dimensions.

See also

SIMOTION panel fronts installation dimensions (Page 118)

4.8 Mounting positions and fastening

4.8.1 Installation guidelines

Before installing the device, read the following general notes relating to installation.

⚠WARNING

Danger, high voltage

Isolate the power supply to the control cabinet before opening it. Ensure that the power to the control cabinet cannot be turned on accidentally.

- Ensure that the protective contact socket of the building installation is easily accessible and that there is a mains disconnect switch in control cabinet installations.
- Position the screen in an ergonomic position favorable to the user. Choose a suitable installation height.
- Position the screen so that it is not subject to direct sunlight or other strong sources of light.
- DVD drives are susceptible to vibration. Shocks during operation can lead to the loss of data or damage to the drive or data carrier. Burners and DVDs are not suitable for continuous operation.
- Applies to devices which are installed in swivel arm housings: Avoid rapid or jerky movements of the swivel arm during operation. The ensuing forces could lead to possible irreversible damage of the hard disk.
- The device with DC power supply is considered an open piece of equipment where the voltage supply is concerned. Therefore, make sure that the control cabinet fulfills the the requirements of a fire-proof housing.
- Provide adequate volume in the control cabinet for air circulation and heat transport. Keep 5 cm clearance on all sides between the device and the control cabinet. This clearance is increased accordingly with connection cables.
- Do not allow the maximum air intake temperature to exceed 45° C. The temperature measured at a distance of 5 cm from an air inlet is decisive. The maximum air intake temperature must be accounted for especially when sizing closed control cabinets.

- The minimum distance between the device and the housing is 5 cm on the air output side at the ventilator.
- Position the device so that the air vents of the housing are not covered up following installation.
- Ensure there is enough free space in the control cabinet to allow the sheet metal cover to be removed. You will otherwise have to remove the device from the control cabinet or swivel arm when replacing the memory or the back-up battery.
- Also provide enough free space to add on to the device.
- Equip the control cabinet with struts for stabilizing the installation cutout. Install struts where necessary.
- Install the device in such a way that it poses no danger, for example, by falling over.
- During assembly, please comply with the approved installation positions.

NOTICE
Installing the device in an impermissible position will invalidate approval to UL 508 and EN 60950!

Installation notes for the decentralized structure

The following notes apply only to decentralized structures:

- Provide an extra 1 cm of space for air circulation for the decentralized structure.
- The maximum length of the connecting cable between the control unit and the computer unit is 30 meters.

See also

SIMOTION P350-3 dimension drawings (Page 115)

SIMOTION panel fronts installation dimensions (Page 118)

Technical data for SIMOTION panel fronts (Page 66)

4.8.2 Permissible mounting positions of the SIMOTION P350-3 and distributed configuration

Mounting positions for the PC conforming to UL 60950/UL 508/EN 60950/CSA 22.2 No. 60950

An inclination of ±20° is permitted for all approved mounting positions.

Position 1 (preferred) 	Position 2 
Position 3 (desktop) 	Position 4 (top) **Not permitted** with built-in DVD drive! 

Permissible mounting position for the PC conforming to UL 508/CSA 22.2 No. 142

An inclination of ±20° is permitted in this mounting position. An external fire-protection housing is required.

Position 5 (interfaces facing down) **Not permitted** with built-in DVD drive!	Position 6 (interfaces facing up)
	

4.8.3 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

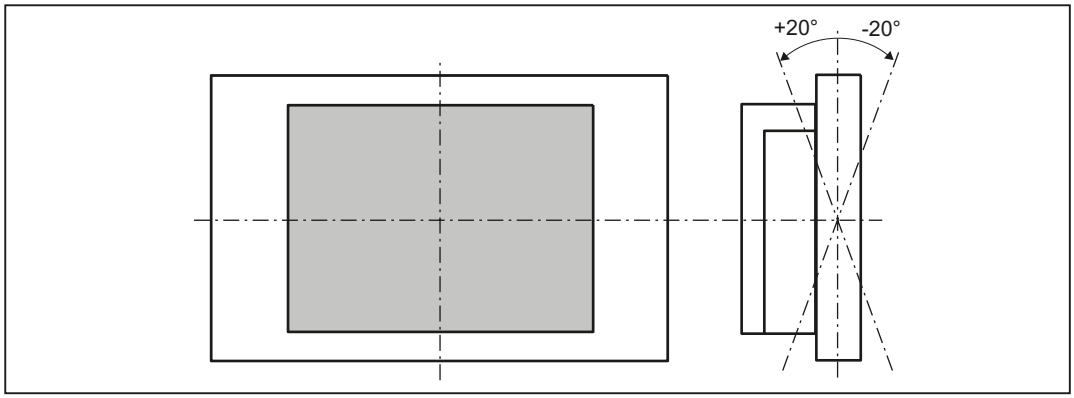


Figure 4-4 Permissible mounting position of the panel front

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.

4.8.4 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.

4.8.5 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, seePanel front dimensions (Page 117) and SIMOTION panel fronts installation dimensions (Page 118). The degrees of protection are only guaranteed when the following is observed: • 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.

Installation/mounting 5

5.1 Assembly forms overview

Various installation types are available for installing a SIMOTION P. A SIMOTION P is generally always installed together with a SIMOTION panel front.

The installation can be made centrally, i.e. the panel is connected with the SIMOTION P. As an alternative, the panel can be assembled separately. This requires several additional components that must be attached to the panel front or the SIMOTION P.

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

Note

Before you can install a complete system consisting of SIMOTION P with the associated panel in a control cabinet or a rack, you should first decide whether the SIMOTION P should be expanded with optional components.

In this case, the device must be opened and the following procedure observed:

1. Open the SIMOTION P housing.
2. Install or remove the required components, e.g. memory expansion or MCI-PN board.
3. Close the housing.
4. Mount on the SIMOTION panel front.
5. Mount the complete system.

Note

The installation and the removal of components and the mounting of the complete system are described in detail in the SIMOTION P350-3 and Panel Fronts Commissioning and Hardware Installation Manual.

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

5.2 Centralized configuration

For a centralized structure, the SIMOTION P350-3 and the selected panel front are connected to one another directly using guide rails and screws. Both are then installed together in the control cabinet or controller housing.

5.2.1 Connecting the panel front to the computing unit

To connect a SIMOTION panel front to the SIMOTION P350-3, proceed as follows:

1. Place the panel face down on a table (make sure to use a suitable surface to avoid scratching the screen).

   At the rear of the panel front, you will find 2 flat cables and one USB cable leading through slots in the metal cover.

2. With the computing unit standing on its edge, slot it into the cutouts on the panel front by the lugs on the attached guide rails (side with 7-segment display).
3. Connect the cables from the panel front to the interfaces on the computer unit.
   - 2x flat cable
     The cable grips must snap into place.
   - 1x USB cable
4. Lower the computer onto the panel and tighten the thumbscrews on the guide rails.

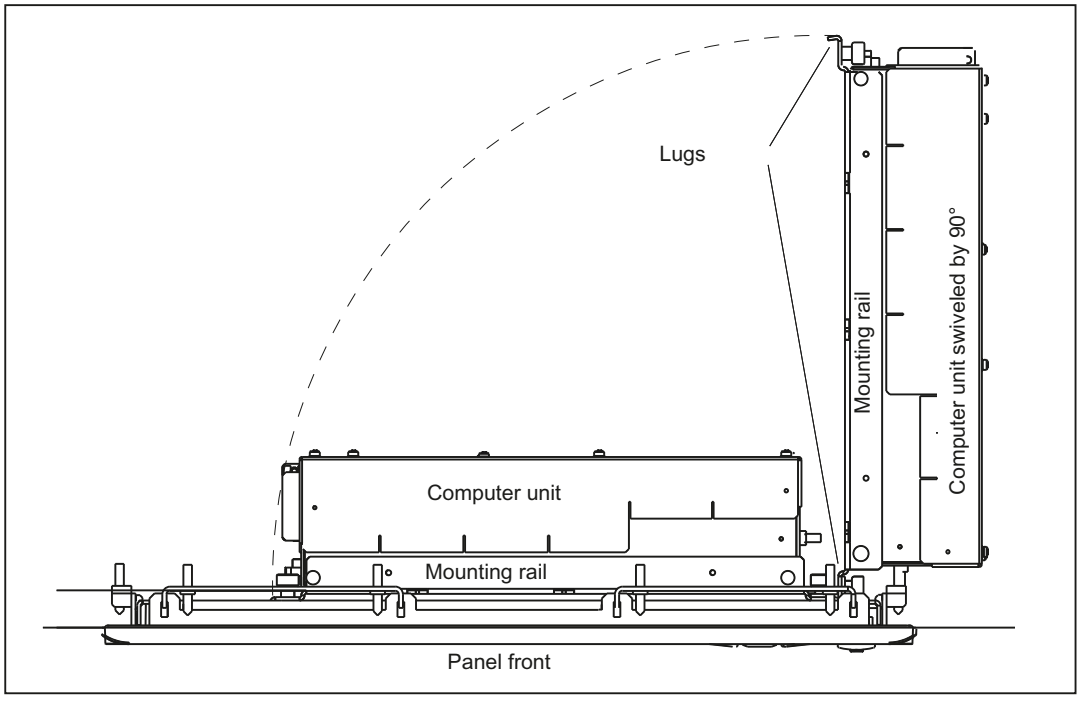


Figure 5-1 Connection of panel front and computing unit viewed from the top

The SIMOTION panel front can now be installed in the mounting cutout.

5.3 Distributed configuration

5.3.1 Overview of decentralized structure

The decentralized structure makes it possible to connect SIMOTION panel fronts in different physical locations to a SIMOTION P350-3. This makes for flexibility in terms of location which enables the SIMOTION P350-3 to be positioned in non-critical areas of an installation (e.g. control cabinet).

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

- Signal transmission between SIMOTION P350-3 and SIMOTION panel front via DVI-D and USB or USB extender cable
- The distance between SIMOTION P350-3 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 V DC power supply required

Note

Using a decentralized structure 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 73)

5.3.2 Components for decentralized structure

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

- SIMOTION P350-3 (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 transmit module for cable lengths > 5 m
- Installation-specific mounting kits, such as
  - Flat mounting brackets for fastening the SIMOTION P350-3 in the control cabinet
  - Book mounting brackets for fastening the SIMOTION P350-3 in the control cabinet

5.3.3 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.

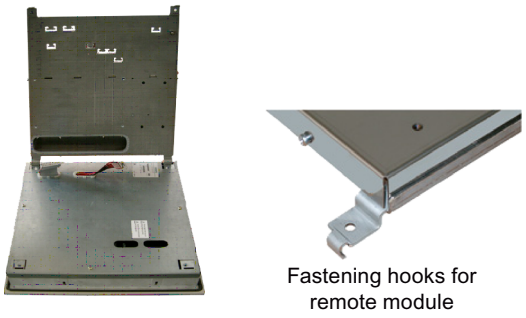


Figure 5-2 Hooking the remote module into the SIMOTION panel front

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.

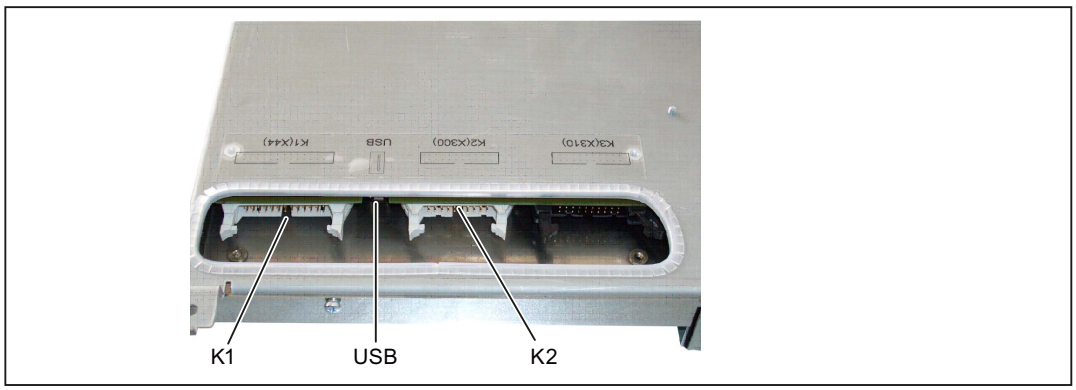


Figure 5-3 Interfaces for the connection of the SIMOTION panel front

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 5-4 Ready-mounted remote module on the SIMOTION panel front

See also

Accessories for the Panel PC Remote Kit (Page 73)

Connection elements (Page 36)

Interface description for the Panel PC Remote Kit (Page 71)

Panels interface description (Page 64)

5.4 Mounting the SIMOTION panel front

5.4.1 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

The permissible mounting positions depend on the specifications of the attached computer unit. As a unit with the SIMOTION P350-3, the SIMOTION panel front may be installed in a vertical position with a maximum inclination of ±20°.

Dimension drawings for the installation, see SIMOTION panel fronts installation dimensions (Page 118)):

5.4.2 Securing the panel front with clamps

Skip this step if you have selected "Fasten panel front with screws" (Page 96).

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 5-5 Clamp assembly

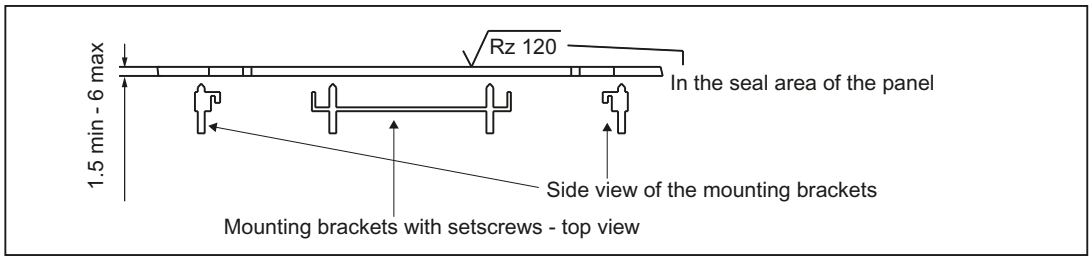


Figure 5-6 Mounting brackets with setscrews - top view

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.

See also

SIMOTION panel fronts installation dimensions (Page 118)

Installation guidelines (Page 82)

5.4.3 Securing the panel front with screws

Skip this step if you have selected "Fasten panel front with clamps" (Page 95).

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.

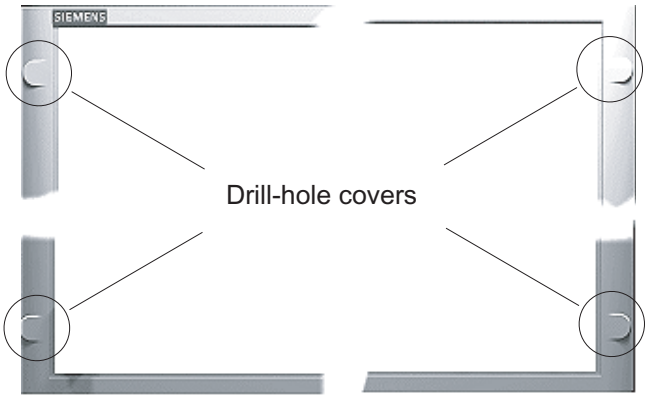


Figure 5-7 Designated location for holes on the control unit

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.

See also

SIMOTION panel fronts (Page 27)

SIMOTION panel fronts installation dimensions (Page 118)

Installation guidelines (Page 82)

Connection

6

6.1 Requirements

General

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

This section also provides information on wiring and networking a complete SIMOTION system.

More detailed information about the connection of the complete system and the individual components appears in the *SIMOTION P350-3 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 a protective extra-low-voltage (PELV). The selected cable cross-section must be sufficiently large to ensure that no damage can result from a cable overheating in the event of a short-circuit in the SIMOTION P Box.
- Avoid extreme environmental conditions as far as possible.
- Protect the device against dust, moisture, heat and severe vibration.
- Do not expose the SIMOTION P 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 P Box must be at least 100 mm to ensure adequate ventilation.
- Do not cover the ventilation slots.
- The only permissible mounting position for mounting on a vertical panel is vertical. Maximum inclination ± 20 degrees.

6.2 Overview of connections

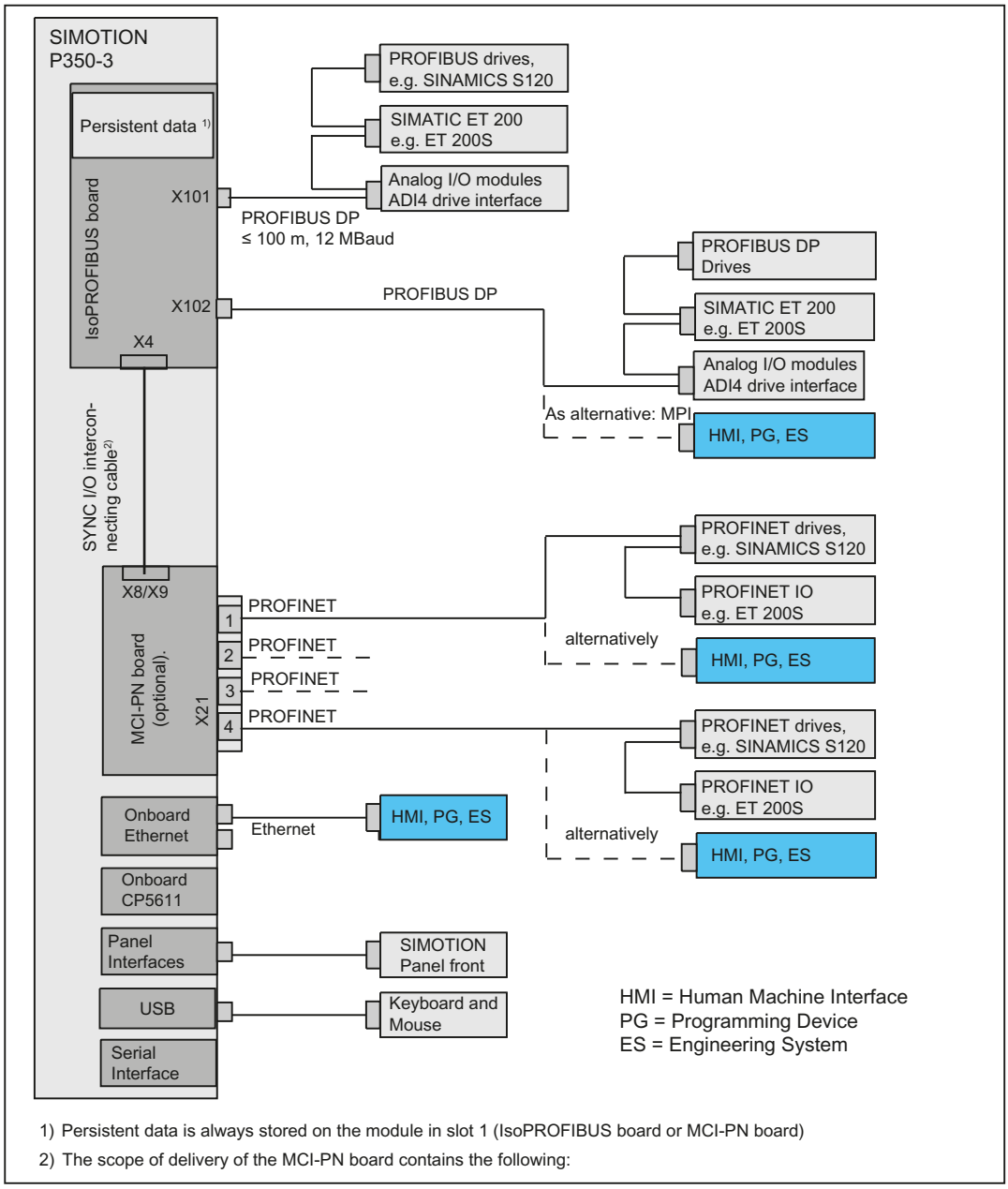


Figure 6-1 Hardware system overview - example with IsoPROFIBUS board and MCI-PN board

The figure shows the SIMOTION P350-3 interfaces to which appropriate I/O 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.

The connection of the individual components is described in the *SIMOTION P350-3 and Panel Fronts Commissioning and Hardware Installation Manual*.

6.3 Connecting I/Os

Note before connecting

NOTICE
Connect only I/O devices approved for industrial applications in accordance with EN 61000-6-2:2001.

Note

Hot-plug I/O devices (USB) may be connected while the PC is in operation.

CAUTION
I/O devices that do not support hot-plugging may only be connected after the device has been disconnected from the power supply.

CAUTION
Strictly adhere to the specifications for I/O devices.

6.4 Connecting the power supply

Note before connecting

⚠ WARNING
Only connect the device to 24 VDC power supply systems that meet the requirements of a protective extra-low voltage (PELV); in addition, a protective conductor must be connected. The cable cross-section must be dimensioned as appropriate for the short-circuit current of the 24 VDC power source, so that a short-circuit will not damage the cables. Only connect cables with a minimum cross-section of 1.3 mm^2 (AWG16) and a maximum cross-section of 3.3 mm^2 (AWG12).

NOTICE
The 24 VDC power source must be adapted to the input data of the device (see Technical Data).

Prerequisite

Ensure that the On/Off switch is set to "0" (OFF). Otherwise, the device will start up unintentionally when the 24 V supply is connected.

Procedure

1. Switch off the 24 VDC power source.
2. Connect your power supply (e.g. SITOP smart 24 V/10 A) directly to the power-supply socket of the SIMOTION P350-3.

Figure 6-2 Power supply connection

⚠ WARNING
The On/Off switch does not disconnect the device from the power supply system. To remove power from the device, the power supply plug must be removed.

See also

SITOP DC UPS module (Page 125)

6.5 Connecting the equipotential bonding circuit

A low-impedance ground connection ensures that interference signals generated by external power supply cables, signal cables or cables to the I/O modules are safely discharged to ground.

Procedure

Connect the equipotential bonding strip on the device (large surface, large-area contact) with the central grounding point of the cabinet or system in which the PC is installed. The minimum conductor cross-section may not be less than 5 mm^2.

Figure 6-3 Equipotential bonding strip on the SIMOTION P350-3

Technical specifications

7

7.1 Technical specifications overview

The "Technical data" section contains both a table listing the technical data for the SIMOTION P complete system and cross-references to the subsections containing the technical data for the individual components.

7.2 Technical data for SIMOTION P350-3

Table 7- 1

Technical data	
Order numbers	6AU1350-3AK4x-
Dimensions W x H x D [mm]	Without DVD: 297 x 267 x 80 With DVD: 297 x 267 x 100
Weight	Approximately 7 kg
Supply voltage	24 VDC (20.4 VDC to 28.8 VDC)
Input current	Continuous current up to 9 A (up to 14 A for 30 ms on start-up)
Transient voltage interruption	max. 3 ms (at 20.4 V to 28.8 V) (min. recovery time 10 s)
Max. power consumption	190 W
Max. current output	+ 5 V/16.5 A * (18.5 W peak) + 3.3 V/8.5 A * * a total of 90 W is permitted + 12 V/6.5 A (8 A peak) – 12 V/0.3 A The total power of all voltages is a maximum of 150 W.
Noise emission	< 55 dB(A) according to EN 60034-9
Degree of protection according to EN 60529	IP20
Safety	
Protection class	Protection class III (PELV) according to EN 61800-5-1
Safety regulations	DC: UL508; CSA C22.2 No. 142
Electromagnetic compatibility (EMC) General rules (Page 127)	
Climatic conditions	

Technical data	
Temperature • During operation • Storage/transport • Gradient	Tested according to EN 60068-2-1, EN 60068-2-2, EN 60068-2-14 +5° C to +45° C +5° C to +50° C (with a total slot power of max. 15 W) • -20° C to +60° C • max. 10 °K/hr in operation, 20 °K/hr storage, no condensation
Relative humidity • During operation • Storage/transport	Tested according to EN 60068-2-78, EN 60068-2-30 • 5% to 80% at 25° C (no condensation) • 5% to 95% at 25° C (no condensation)
Mechanical ambient conditions	
Vibration • During operation *1 • Storage/transport	Tested according to EN 60068-2-6: • 10 Hz … 58 Hz: 0.075 mm, 58 Hz ... 500 Hz: 9.8 m/s² • 5 Hz … 9 Hz: 6.2 mm, 9 Hz to 200 Hz: 19.6 m/s²
Shock resistance (shock) *1 • During operation • Storage/transport	Tested according to EN 60068-2-27, EN 60068-2-29 • 50 m/s², 30 ms • 250 m/s², 6 ms
Special features	
Product standard	EN 61800-3
Quality assurance	according to EN ISO 9001
Motherboard	
Processor	Pentium M 2 GHz
Internal processor cache	2048 KB second level cache
Front side bus	533 MHz
Main memory	2 sockets, maximum 2 GB SDRAM DDR2 533 MHz See ordering documentation for memory expansion.
Free expansion slot	Slot 2: PCI max. 175 mm long
Max. permissible power consumption per PCI slot	5 V/2 A or 3.3 V/2 A, 12 V/0.3 A, – 12 V/0.05 A The total power (all slots) must not exceed 30 W.
Drives	
Hard drive	3.5" Serial ATA, see ordering documentation for hard disk capacity.
DVD drive *2	ATA 33, see ordering documentation for features.
Graphics	
Graphics controller	Intel
Graphics memory	Graphics memory 8 MB to 128 MB SDRAM, some using dynamic sharing of system memory
Resolutions/frequencies/colors	VGA: 1600 x 1200/32-bit color depth/85 Hz DVI-I: 1600 x 1200/32-bit color depth/60 Hz LCD: 1280 x 1024/18-bit
Interfaces	
DVI	Port for external CRT/LCD monitor

Technical data	
USB	External: 4 x USB 2.0 on the interface side (max. 2 can be operated simultaneously as high current)
Onboard MPI/DP interface • Transmission rate • Operating mode • Physical interface • Memory address area • Interrupts	9-pin sub D socket • 9.6 KBaud … 12 MBaud, can be parameterized by the software • Electrically isolated: – Data wires A,B – Control lines RTS AS, RTS_PG – 5 V power supply (max. 90 mA) • Grounded: – Shielding of the DP12 connection line • RS485, electrically isolated *2 • Configured automatically • Configured automatically
Ethernet	2 x Ethernet interfaces (RJ45), 10/100 Mbits, VIA MAC. VT6106S
COM1	Serial port 1 9-pin SUB D connector
CompactFlash	CompactFlash Card slot
Status displays on the device	
	DVD access (on drive, if installed) 2 x status LEDs red/green 2x 7-segment displays for POST codes and status

*1 Constraint affecting DVD drives: 10 Hz … 58 Hz: 0.019 mm/58 Hz to 500 Hz: 2.5 m/s^2

*2 Galvanic isolation within the safety extra-low voltage circuit (SELV)

7.3 Current demand of the components

Basic system

Component	Voltage			
	+ 5 V	+ 3.3 V	+ 12 V	-12 V
Motherboard	1.8 A	2.1 A	0.01 A	0.02 A
Pentium M processor	6.4 A			
Hard disk drive; 1 x 3.5" [1]	0.3 A		0.5 A	
DVDdrive [1]	0.8 A			
Device fan			0.4 A	
Power supply fan			0.15 A	
Total (basic device)	**9.3 A**	**2.1 A**	**1.06 A**	**0.02 A**
PCI slots (total)	4 A	[2]	0.6 A	0.20 A
Front interface (maximum 15" panel) + USB	1.7 A	0.1 A	4.2 A	
Box USB	1.2 A			
Single lines of current (max. permissible)	**16.5 A** [3]	**8.5 A** [3]	**6.5 A**	**0.3 A**
Total power (max. permissible)			150 W	

[1] Depends on the selected device configuration

[2] As an alternative to 5 V, the PCI slots can also be operated on 3.3 V with the same total power.

[3] The max. permissible total power of the + 5 V and + 3.3 V voltages is 90 W.

7.4 DC voltage supply

Technical data

Input voltage	24 V DC (20.4 DC to 28.8 V)
Input current	Continuous current up to 9 A (up to 14 A for 30 ms at startup)
Power consumption	190 W
Power failure buffering	20 ms at nominal voltage
Maximum continuous output power	150 W
Degree of protection	IP20 (in installed state)
Safety class	Degree of protection III in accordance with EN61800-5-1

Output voltages

Voltage	Max. current
+12 V	6.5 A, peak 8 A
– 12 V	0.3 A
+5 V	16.5 A [1]; peak 18.5 A
+3.3 V	8.5 A [1]

[1] The max. permissible total power of the + 5 V and + 3.3 V voltages is 90 W.

Power good signal of 24 V DC power supply

(Schematic diagram)

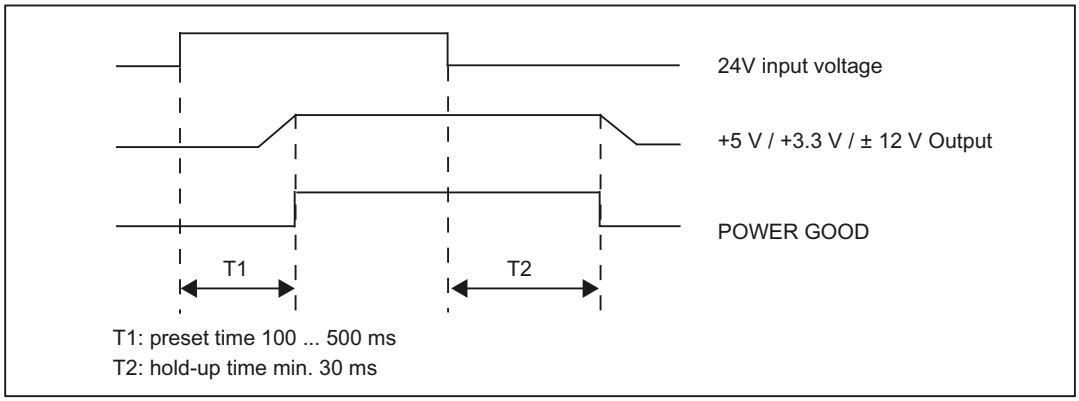


Figure 7-1 Power good signal of 24 V DC power supply

Power failure signal of the 24 V DC power supply

(Schematic diagram - power failure alarm)

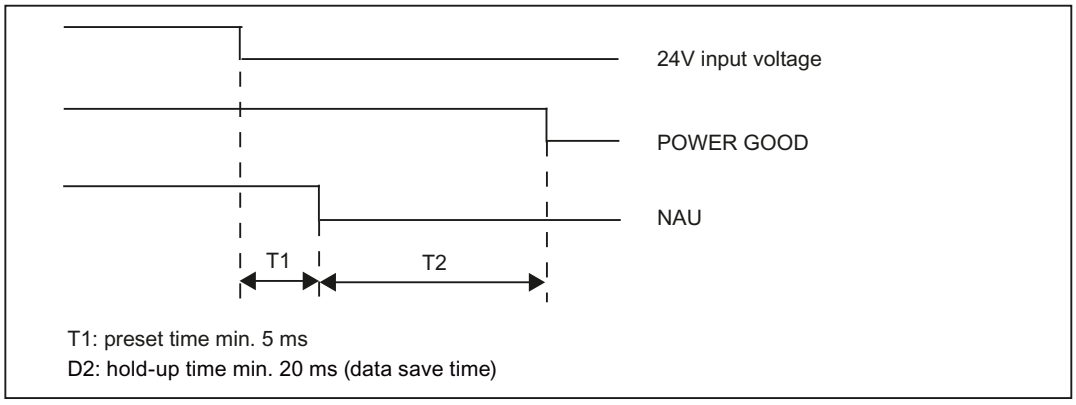


Figure 7-2 Power failure signal of the 24 V DC power supply

7.5 Technical specifications of additional hardware components

You find the technical data for other hardware components in the following chapters:

- Technical data for the IsoPROFIBUS board (Page 51)
- Technical data for the MCI-PN board (Page 57)
- Technical data for the SITOP smart 24 V/10 A (Page 122)
- Technical data for SIMOTION panel fronts (Page 66)

7.6 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 **FN** 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 7- 2 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	‘

Key number	Code	Key labeling/ name
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	[
17	0x41	F8
18	0x3f/s	F18 (Shift F6)
19	0x15	r
19a1	0x35/s	~
20	0x14	q
20a1	0x33/as	×
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

Key number	Code	Key labeling/ name
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)
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)

Key number	Code	Key labeling/ name
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)
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)

Dimensional drawings

8

8.1 SIMOTION P350-3 dimension drawings

The following dimension drawings show the SIMOTION P350-3 both with and without mounting bracket.

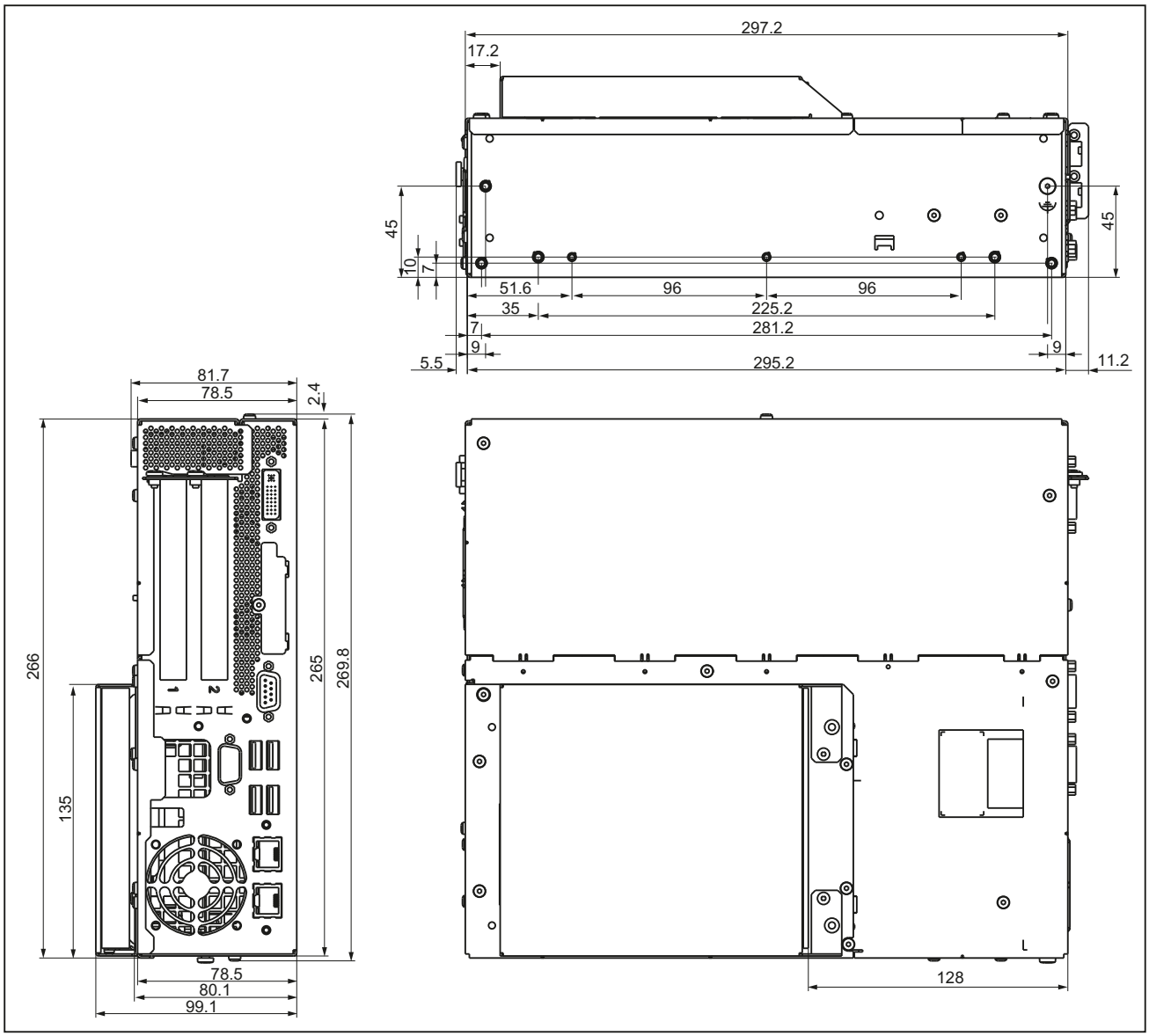


Figure 8-1 SIMOTION P350-3 dimension drawing without mounting bracket

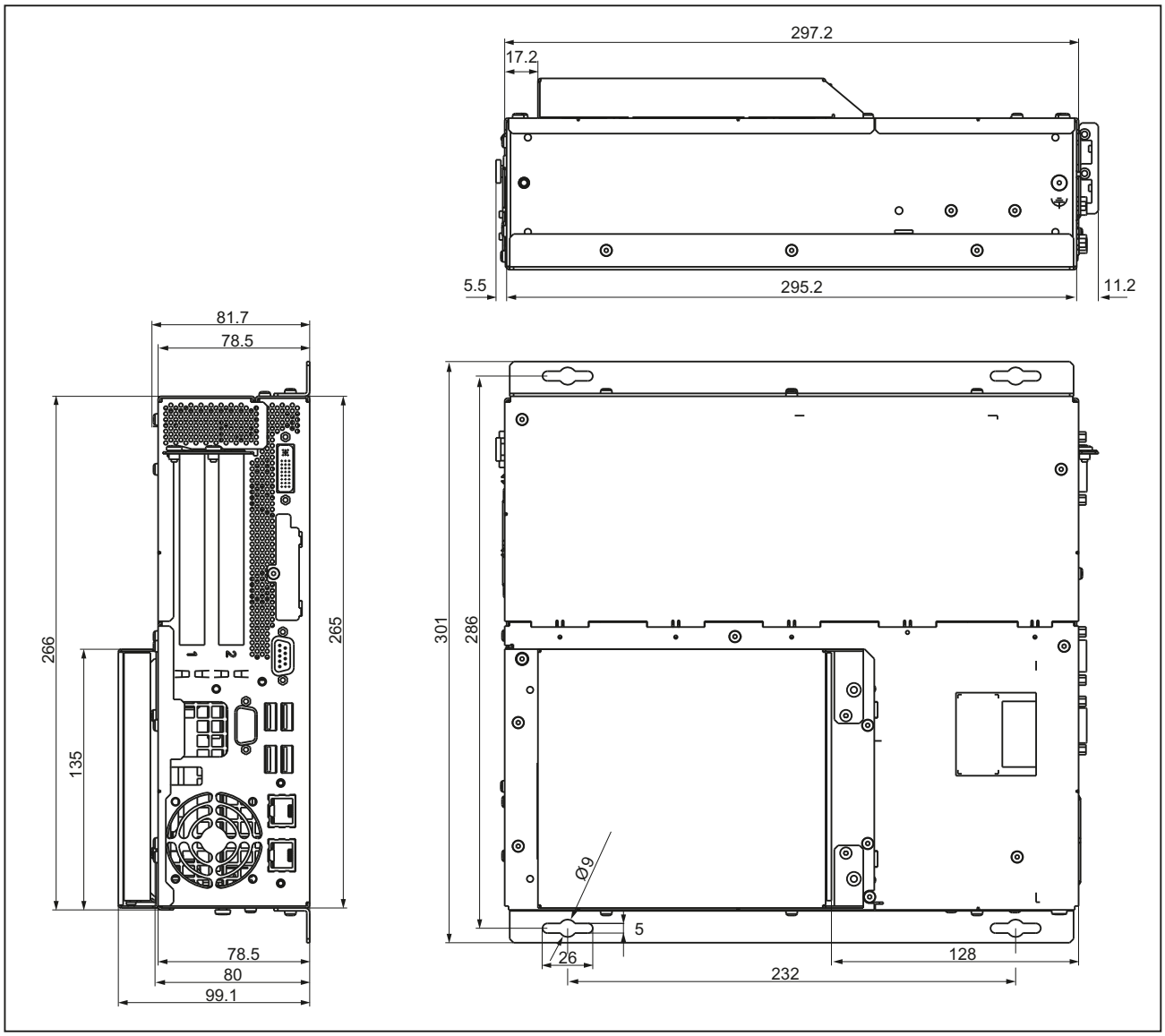


Figure 8-2 SIMOTION P350-3 dimension drawing with mounting bracket

Note

The mounting depth decreases to approx. 80 mm for a device without DVD drive.

Note

Refer to the dimensions in the Panel front dimensions (Page 117) section when mounting the device directly on the SIMOTION panel front.

8.2 Panel front dimensions

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

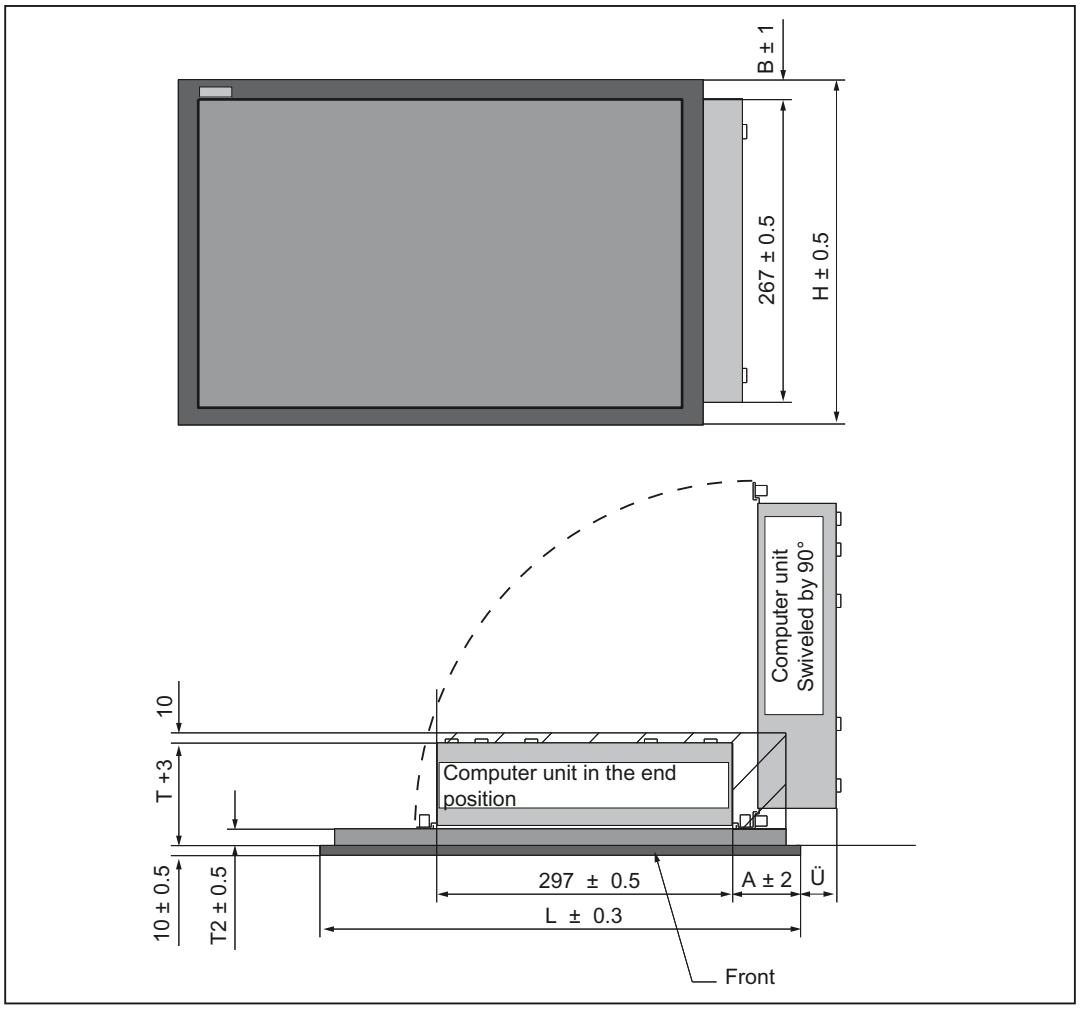


Figure 8-3 Panel fronts device dimensions

Panel fronts	L	H	T	T2	A	B	C
With keys:							
P012K	483	310	100	20	68	21	38
With touch screen:							
P012T	400	310	125	36	58	23	50
P015T	483	310	130	42	87	23	22

8.3 SIMOTION panel fronts installation dimensions

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

Installation dimensions for SIMOTION P012K

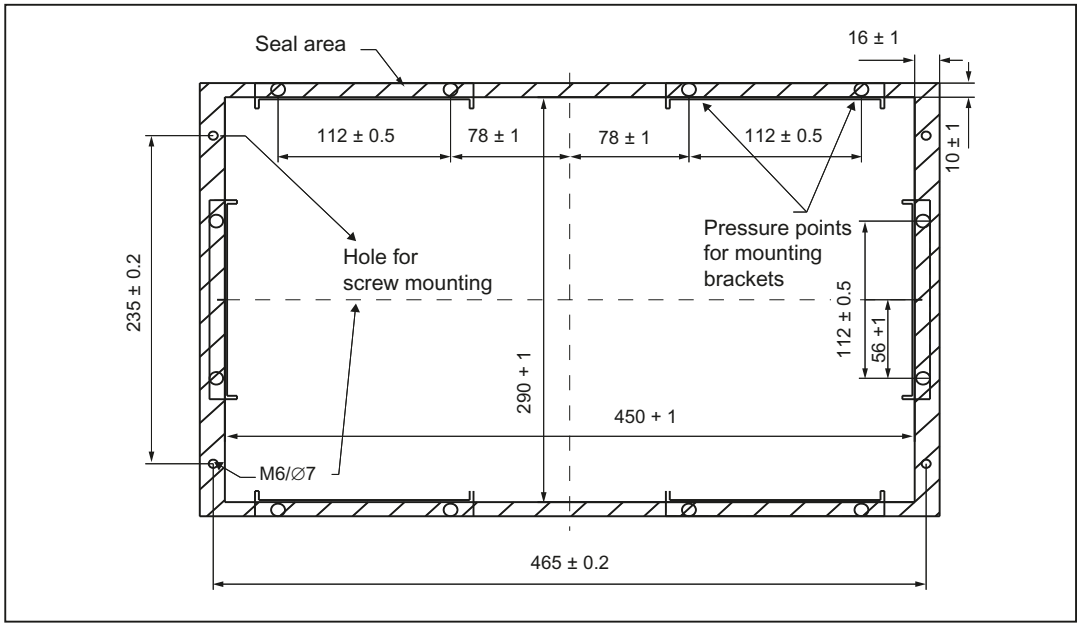


Figure 8-4 Installation dimensions for SIMOTION P012K

SIMOTION P012T installation dimensions

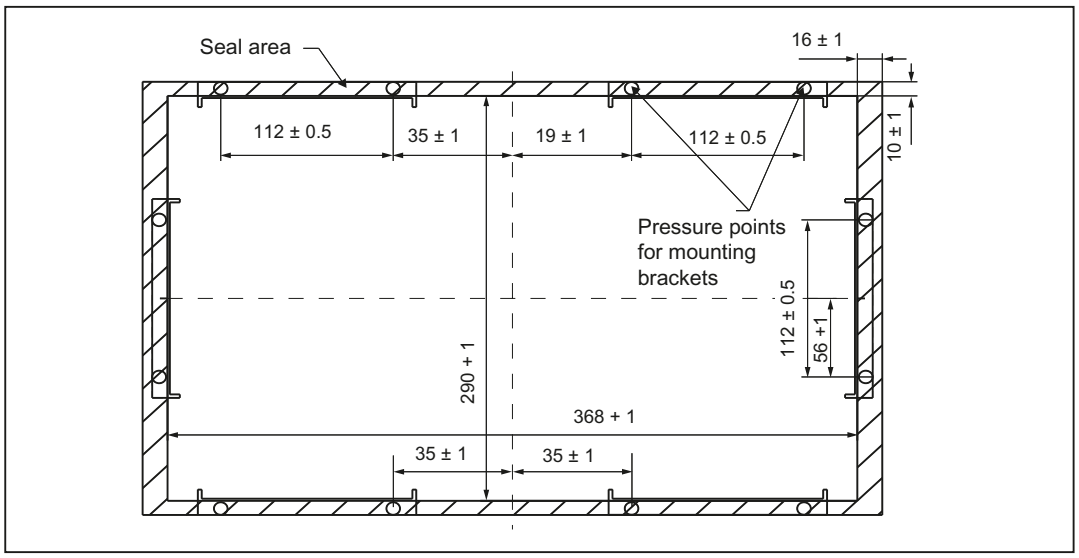


Figure 8-5 SIMOTION P012T installation dimensions - dimensions in [mm]

SIMOTION P015T installation dimensions

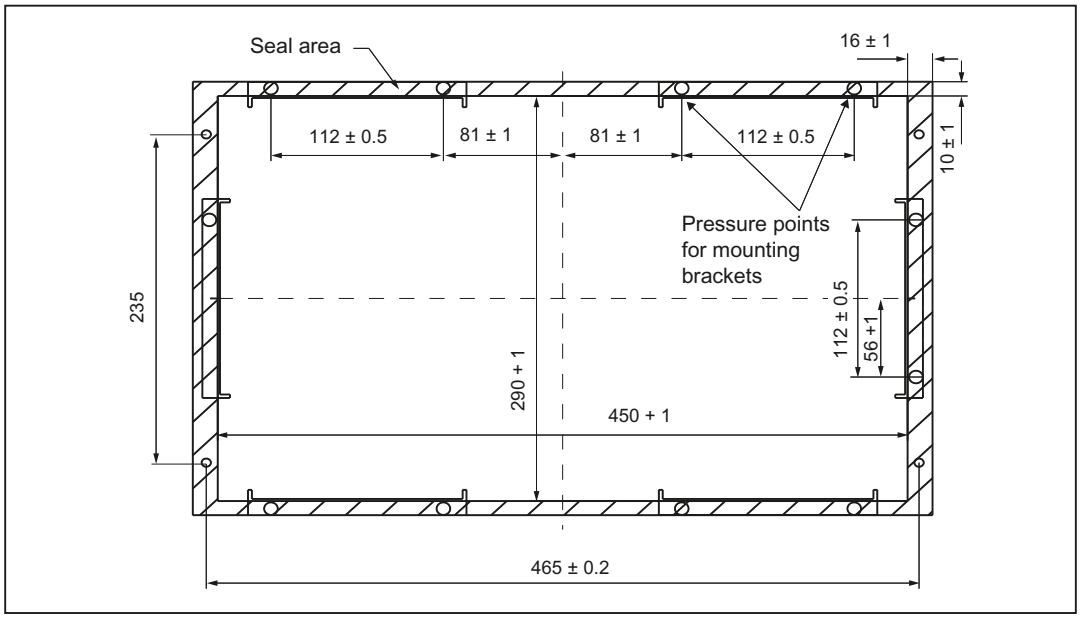


Figure 8-6 SIMOTION P015T installation dimensions

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

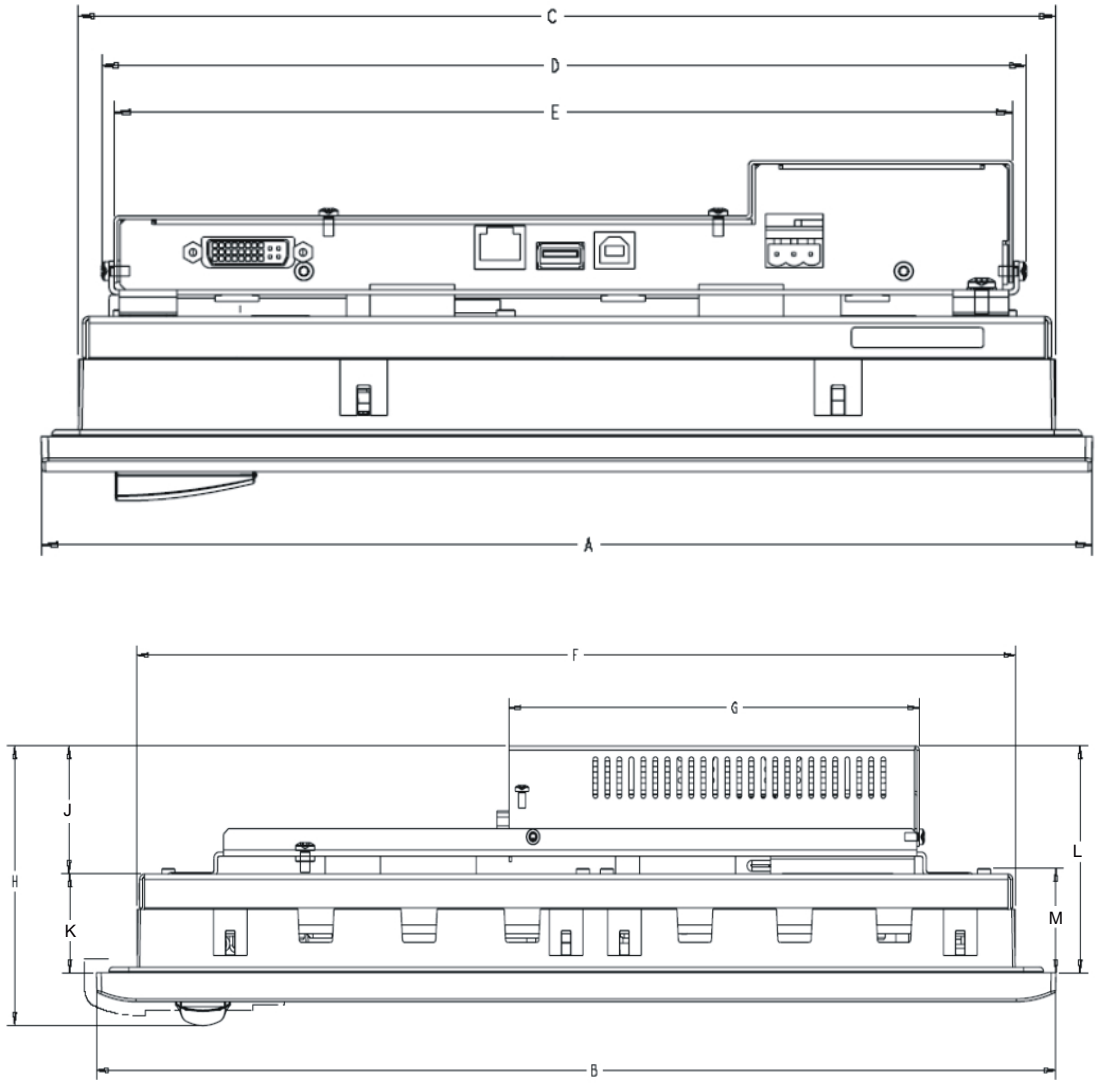


Figure 8-7 Dimension drawing of SIMOTION panel front with Panel PC Remote Kit

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

Accessories

9

9.1 Power supply

9.1.1 Over of power supply

An external power supply is needed to connect the SIMOTION P350-3 to the AC supply.

The power supply must provide the following values for the SIMOTION P350-3:

Output voltage:	20.4 V to 28.8 V DC, typical 24 V
Output power:	Typically 40 W (P350-3 alone), max. 130 W
Max. start-up current (for 30 ms):	14 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 order numbers for and more detailed information about the accessories described can be obtained from the online catalog which is available on the Internet at:

http://www.siemens.com/automation/mall

9.1.2 Example: SITOP smart 24 V/10 A

The SITOP smart 24 V/10 A power supply meets all requirements of a SIMOTION P350-3 and is, therefore, ideal for this application. This device in particular is the only one that can cover the inrush current of 14 A for SIMOTION P350-3 that occurs for a short period of time.

Figure 9-1 View of the SITOP smart 24 V/10 A

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

Table 9- 1 Technical data for the SITOP smart 24 V / 10 A

Input data	
Input voltage rated value	120/230 V AC
Input voltage range	85 to 132 V AC / 170 to 264 V AC
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 during storage and transport	-40° … +85° C
Ambient temperature during operation	0° … +60° C
Humidity class	Climate class 3K3 according to EN 60721; relative atmospheric humidity 5 to 95%; no condensation
Degree of protection (EN 60529)	IP20
Radio suppression level (EN 55022)	Class B
Line harmonic 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	
Safety 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 error U_a < 60 V
Dimensions and weight	
Dimensions (W x H x D) in mm	70 x 125 x 125
Weight	Approximately. 0.75 kg
Certifications and approvals	
CE	CE conformity in accordance with 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

9.2 UPS system

9.2.1 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 informationen 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 9-2 SITOP DC UPS module with accumulator module

9.2.2 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.

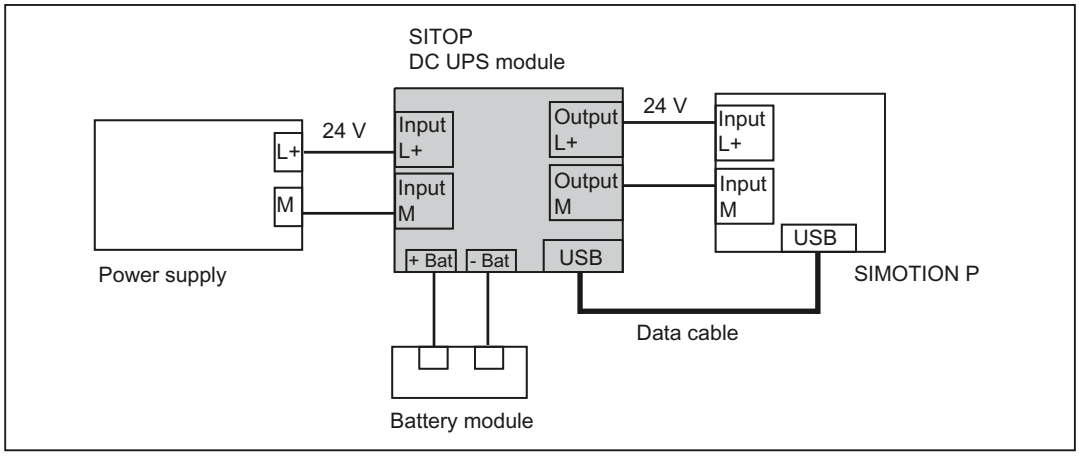


Figure 9-3 Connection of the UPS system / schematic display

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.

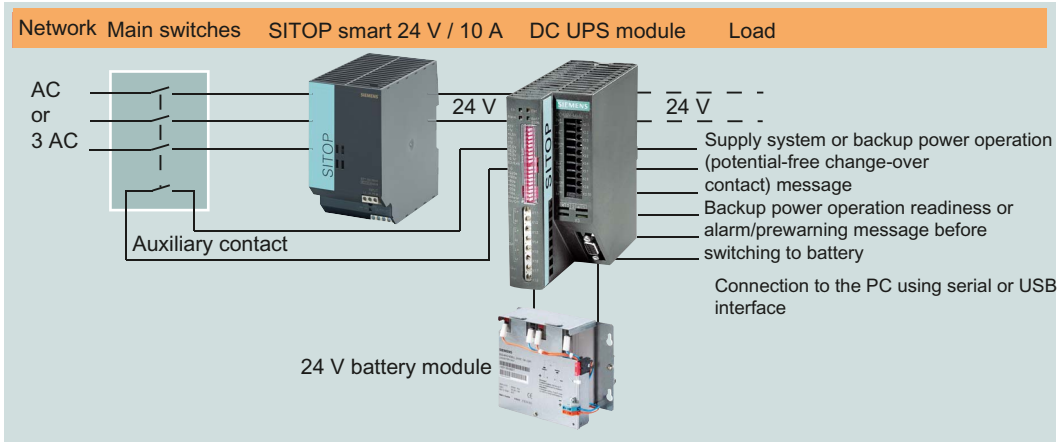


Figure 9-4 Power supply overview

9.3 Accessory kit

The components listed below are supplied with the SIMOTION P350-3.

- Recovery DVD
- Accessories pack with mechanical parts and connectors

Figure 9-5 Accessory kit

Table 9- 2 Accessory kit A5E00477794 (also contains Ethernet strain relief clamp A5E00417699)

Ethernet strain relief clamp (A5E00417699)
Cover plate for panel interface
24 V power supply connector
2 card retainers

9.4 Accessories for the hardware components

The accessories of the SIMOTION P350-3 hardware components are described in the following sections:

- IsoPROFIBUS board accessories (Page 52)
- SIMOTION panel fronts accessories (Page 67)
- Accessories for the Panel PC Remote Kit (Page 73)

Standards and approvals

A

A.1 General rules

CE marking

CE	Our products satisfy the requirements and protection objectives of the EC Directives and comply with the harmonized European standards (EN).

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

c UL us	Listed component mark for United States and the Canada Underwriters Laboratories (UL) according to Standard UL 508, File E164110, File E115352, File E85972.

EMC

USA	
Federal Communications Commission Radio Frequency Interference Statement	This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
Shielded Cables	Shielded cables must be used with this equipment to maintain compliance with FCC regulations.

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
이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다. 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.
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.

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
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.

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 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 EN ISO 9001 certificate

The quality assurance system for our entire product process (development, production, and marketing) is compliant with DIN EN ISO 9001.

This has been certified by the DQS (Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagementsystemen mbH, the German society for the certification of quality management systems).

Software license agreement

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

A.4 Approvals for control units

The control units have the following approvals:

cULus	FCC	FM	Marine approvals
Yes	Yes	No	No

Note

The approval or approbation is located on the type plate.

ESD guidelines

B

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 **e**lectrostatic **s**ensitive **d**evices.

Electrostatic sensitive devices are identified by the following symbol:

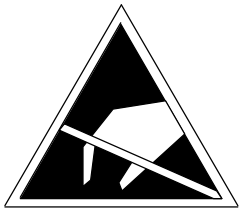


Figure B-1 Symbol for identification of electrostatic sensitive devices

⚠ 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.

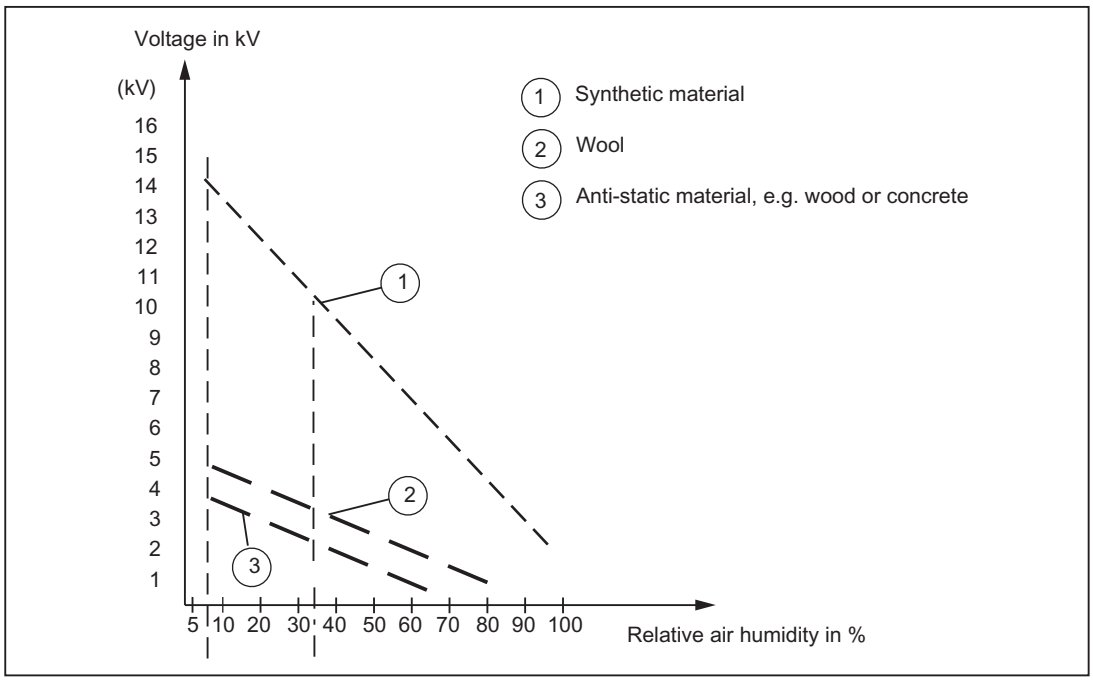


Figure B-2 Electrostatic voltage that can accumulate on operating personnel

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/acronyms

C

Table C- 1 Abbreviations

Abbreviation	Meaning
CF	CompactFlash
DP	Distributed Peripheral
ESD	Electrostatic Sensitive Devices
EMC	Electromagnetic Compatibility
ES	**E**ngineering **S**ystem
HMI	**H**uman **M**achine **I**nterface
HW	Hardware
I/O	Input/Output
PC	Personal Computer
PG	Programming device
PN	PROFINET
PNO	PROFIBUS-Nutzerorganisation
SCOUT	SIMOTION Controlling with Optimized Usability Toolbox
SW	Software
USB	**U**niversal **S**erial **B**us
UPS	Uninterruptible power supply (UPS)

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